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

PROCEEDINGS

1981 ANNUAL CONFERENCE

May 1981

Dalhousie University

Halifax

COMPTE RENDU

CONGRÈS ANNUEL DE 1981

Mai 1981

Université Dalhousie

Halifax

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The Canadian Academic Accounting Association

P.O. Box 6
Royal Bank Plaza
Toronto, Ontario
M5J 2J1
(416) 865-0311

November 27, 1981

The Members
The Canadian Academic Accounting Association

The Association's 1981 Annual Conference was held at Dalhousie University, Halifax, from May 21st to 23rd. The conference program is set out on the next few pages, in both English and French.

A table of contents follows the programs. It is in English alone, since the only French paper was that presented by Professor Houle as part of the Education Committee's report. (However, other papers presented as part of that report have French abstracts, which are included herein - as is the English abstract of Houle's paper.) Several of the conference papers were, at the decision of the authors, not submitted for inclusion in these Proceedings.

The Conference Program Chairman was Dean Samuel H. Jopling of Saint Mary's University. We are indebted to him for all he did with regard to organizing the conference, including assembly of the papers for inclusion in this volume.

Publication of the Proceedings is made possible by the generosity of Peat Marwick Mitchell & Co., Chartered Accountants. Their assistance is most appreciated.

Alister K. Mason
President

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

P.O. Box 6
Royal Bank Plaza
Toronto, Ontario
M5J 2J1
(416) 865-0311

le 27 novembre 1981

Aux membres de
L'Association Canadienne des Professeurs de Comptabilité

Le congrès annuel de 1981 de l'Association a eu lieu à l'université Dalhousie à Halifax du 21 au 23 mai dernier. Le programme du congrès, en français et en anglais, est énoncé dans les pages suivantes.

La table des matières suit le programme, mais elle est uniquement en anglais comme le seul mémoire français a été celui présenté par le professeur Houle dans le cadre du rapport du comité d'enseignement. (Cependant, les autres mémoires qui font partie de ce rapport comportent des résumés français que vous trouverez ci-joint, de même que le résumé anglais du mémoire du professeur Houle). A la demande des auteurs, plusieurs mémoires présentés au congrès n'ont pas été inclus dans ce compte rendu.

Le doyen Samuel H. Jopling de l'université Saint Mary's était président du programme du congrès. Nous le remercions de s'être chargé d'organiser le congrès et notamment d'avoir réuni les mémoires qui sont inclus dans ce compte rendu.

Ce compte rendu a été publié grâce à la générosité du cabinet de comptables agréés Peat Marwick Mitchell & Cie, et nous les en remercions.

Le président,

Alister K. Mason

CANADIAN ACADEMIC ACCOUNTING ASSOCIATION

1981 Conference
May 21-23, 1981

Dalhousie University
Halifax, Nova Scotia

Thursday, May 21

1:30 - 5:00 p.m. — Registration

(Student Union Building)

9:00 - 11:00 p.m. — Welcoming Reception

(Arts Centre: Sculpture Court)

Hosted by the Institute of Chartered Accountants of Nova Scotia

Friday, May 22

All Day — Registration

(Student Union Building)

8:45 - 10:20 a.m. — Plenary Session

(Institute of Public Affairs: Auditorium)

"Accounting for Changing Prices - Research Opportunities and Imperatives"

Panel Participants: Bryan V. Carsberg
Financial Accounting Standards Board

Jack R. Hanna
University of Waterloo

Chairperson: W. John Brennan
The University of Saskatchewan

10:20 - 10:40 a.m. — Break

(Institute of Public Affairs)

10:40 - 12:00 noon — Plenary Session

(Institute of Public Affairs)

"Research in Auditing"

Panel Participants: William R. Scott
Queens University

William R. Kinney
University of Michigan

10:40 - 12:00 noon — Plenary Session (continued)

Panel Participants: Donald A. Leslie
Clarkson Gordon

Maier Zelman
Office of the Auditor General
of Canada

Chairperson: Daniel Simunic
University of British Columbia

12:00 - 2:00 p.m. — Luncheon

(Student Union Building: McInnes Room)

Sponsored by the Certified General Accountants Association of Canada

Address: "Confessions of an Ex-Accounting Theorist: Over the Hill and Far Away"

Guest Speaker: Arthur L. Thomas
University of Kansas

Chairperson: Leonard J. Brooks
Erindale College
University of Toronto

2:00 - 3:20 p.m. — Concurrent Sessions

Session A

(Case Room 1, School of Business Administration - "Old Arts College" on certain maps of the campus)

Coordinator: Frank P. Dougherty
Saint Mary's University

"Accounting Systems in a Database Environment"

Howard M. Armitage
Michigan State University

"A Simulation Analysis of the Effect of Cost Variances on Investigation Decisions"

A. W. Richardson and Duane Kennedy
McMaster University

2:00 - 3:20 p.m. — Concurrent Sessions

Session B

(Case Room 2, School of Business Administration - "Old Arts College" on certain maps of the campus)

"Research in Auditing: A Follow On to the Morning Plenary Session"

2:00 - 3:20 p.m. Concurrent Sessions

Session C

(Institute of Public Affairs Auditorium)

"Using Video Tapes to Enhance Accounting Instruction: An Opportunity for Inter-University Cooperation"

Chairperson: Robert H. Crandall
Queens University

3:20 - 3:40 p.m. Break

(Vicinity of Institute of Public Affairs: Auditorium)

3:40 - 5:20 p.m. Plenary Session

(Institute of Public Affairs Auditorium)

"Educating Tomorrow's Accountants"

Panel: CAAA Education Committee

Panel Participants: Yvone Houle
Universite du Quebec a Trois Rivieres

Robert Long
University of Waterloo

George J. Murphy
The University of Saskatchewan

Carson M. Duncan
Saint Francis Xavier University

Chairperson: Michael Gibbins
University of British Columbia

5:45 - 7:00 p.m. Reception

(Student Union Building: McInnes Room)

Sponsored by Prentice-Hall Canada, Inc.

Saturday, May 23

Morning Hours Only Registration

(Student Union Building)

8:45 - 10:20 a.m. Plenary Session

(School of Business Administration, Room 212)

Annual Meeting of the Canadian Academic Accounting Association (Reports of Committee activities and plans. Report on American Accounting Association)

8:45 - 10:20 a.m. Plenary Session (continued)

Guest: A. Rashad Abdel-Khalik
Director of AAA Research and
member of AAA Executive Committee

Chairperson: David J. Blazouske
President
Canadian Academic Accounting
Association

10:20 - 10:40 a.m. Break

(School of Business Administration, Art Gallery)

10:40 - 12:00 noon Concurrent Sessions

(School of Business Administration)

Session D

(Case Room 1)

Coordinator: Frank P. Dougherty
Saint Mary's University

"To A Brave New World for Professional Accounting"

Harvey Mann
Concordia University

"Information Economics of an Auditing Institution: An Introductory Analysis"

Daniel B. Thornton
University of Toronto

Session E

(Case Room 2)

Coordinator: Izzy Elkhazin
Saint Mary's University

"Students' Performance on and Preference for Unstructured Course Materials: The Impact of Cognitive Complexity"

Joel Amernic
University of Toronto

Thomas H. Beechy
York University

10:40 - 12:00 noon — Concurrent Sessions (continued)

Session E (continued)

"Information System Skills and Professional Accountants: A Survey"

Izak Benbasat and Albert S. Dexter
University of British Columbia

Session F

(Case Room 3)

"The CAAA Grant Program to Support Basic Research in Accounting"

Gerald A. Feltham
University of British Columbia

12:00 - 1:30 p.m. — Informal Buffet Lunch

Sponsored by the Society of Management Accountants of Canada

1:30 - 4:30 p.m. — Concurrent Sessions

(School of Business Administration)
(with break from 3:00 to 3:20 p.m. in Art Gallery)

1:30 - 4:30 p.m. — Session G

(Case Room 1)

Coordinator: Frank P. Dougherty
Saint Mary's University

"The Discipline of Accountancy"

L. G. Eckel
McMaster University

"Toward A Framework for Developing Positive Theories of Accounting"

Murray J. Bryant and Daniel B. Thornton
University of Toronto

"Private Interest and Public Interest"

James C. Gaa
McMaster University

"Toward Open-System Based Accounting: A Resiliency Approach"

Gerald H. B. Ross
University of Michigan

1:30 - 4:30 p.m. Concurrent Sessions (continued)

Session H

(Case Room 2)

Coordinator: Izzy Elkhazin
Saint Mary's University

"The Impact of Deferred Taxes on Net Income"

Thomas H. Beechy
York University

"A Computer Simulation for Studying Accounting Income Models"

Paul V. Dunmore
McMaster University

"A Conceptual Model to Teach Certain Financial Statement Items"

James T. Mackey
University of Wisconsin, Madison

"Job Satisfaction Among Accountants Employed in Different Work Environments"

Slavik J. Hurka
University of Saskatchewan

Session I

(Case Room 3)

Coordinator: Charles J. Dirksen
Dalhousie University

"Inflation and the Market for Public Utility Cost Information"

Howard Teasley
Simon Fraser University

"A General Approach to Variance Analysis"

Charles J. Dirksen and Donald C. Cherry
Dalhousie University

"Assessment of the Development of Auditors of Public Companies in Ontario 1870-1900"

5:30 - 6:30 p.m. Reception

(Student Union Building: Green Room)

Co-sponsored by the Province of Nova Scotia and the President of Dalhousie University

(x)

L'ASSOCIATION CANADIENNE DES PROFESSEURS DE COMPTABILITE

Congres Annuelle 1981
Le 21 - 23 mai, 1981

Université Dalhousie
Halifax, Nouvelle Ecosse

Jeudi, Le 21 Mai

13:30 - 17:00h — Enregistrement

(Student Union Building)

21:00 - 23:00h — Réception d'Accueil

(Arts Centre: Sculpture Court)

Parrainee par: The Institute of Chartered Accountants of Nova Scotia

Vendredi, Le 22 Mai

Journee Entiere — Enregistrement

08:45 - 10:20h — Séance Plénière

(Institute of Public Affairs: Auditorium)

"Comptabilisation des effets des changements de prix - Possibilités et exigences en matière de recherches"

Orateurs: Bryan V. Carsberg
Financial Accounting Standards Board

Jack R. Hanna
Université de Waterloo

President: W. John Brennan
Université de Saskatchewan

10:20 - 10:40h — Pause Café

(Institute of Public Affairs)

10:40 - 12:00h — Séance Plénière

(Institute of Public Affairs)

"Formation et Recherche en verification"

Orateurs: William R. Scott
Université Queens

William R. Kinney
Université du Michigan

10:40 - 12:00h — Seance Pleniere

Orateurs: Donald A. Leslie
Clarkson Gordon

Maier Zelman
Bureau du Commissaire des Brevets du Canada

Président: Daniel Simunic
Université de la Colombie-Britannique

12:00 - 14:00h — Déjeuner

(Student Union Building: Salle McInnes)

Parrainée par L'Association des Comptables généraux licenciés du Canada

Sujet de l'adresse: "Confessions of an Ex-Accounting Theorist: Over the Hill and Far Away"

Conférencier invité: Arthur L. Thomas
Université du Kansas

President: Leonard J. Brooks
Collège Erindale
Université de Toronto

14:00 - 15:20h — Séances Concomitantes

(A - Case Room I - School of Business Administration "Old Arts College" - sur vos cartes du campus)

Coordinateur: Frank P. Dougherty
Université Saint Mary's

"Accounting Systems in a Database Environment"

Howard M. Armitage
Michigan State University

"A simulation Analysis of the effects of Cost Variances on Investigation Decisions"

A. W. Richardson et Duane Kennedy
Université McMaster

14:00 - 15:20h — (B - Case Room 2 - School of Business Administration "Old Arts College" - sur vos cartes du campus)

"Discussion sur la séance sur la vérification"

14:00 - 15:20h — Séances Concomitantes

(C - Institute of Public Affairs Auditorium)

"Using Video Tapes to Enhance Accounting Instruction: An opportunity for Inter-University Cooperation"

Président: Robert H. Crandall
Université Queens

15:20 - 15:40h — Pause Café
(Proximité de l'auditorium Institute of Public Affairs)

15:40 - 17:20 h — Séances Plénière

(Institute of Public Affairs Auditorium)

"Formation du Comptable de Demain:

Orateurs: Comité de Recherche de l'ACPC

Participant: Yvonne Houle
Université du Québec a Trois-Rivières

Robert Long
Université de Waterloo

George J. Murphy
L'Université de la Saskatchewan

Carson M. Duncan
Université Saint Francis Xavier

President: Michael Gibbins
Université de la Colombie-Britannique

17:45 - 19:00h — Reception

(Student Union Building: Salle McInnes)

Parrainée par Prentice-Hall Canada Inc.

Samedi, Le 23 Mai

Matin Seulement — Enregistrement

(Student Union Building)

8:45 - 10:20h — Séance Plénière

(School of Business Administration, Classe 212)

Assemblée annuelle et rapport sur les activités et les projets des comités rapport sur les activités de l'AAA

8:45 - 10:20h — Seance Pleniere

Invité: A. Rashad Abdel-khalik
Membre du Comité
Executive de l'AAA
Directeur de l'AAA

Président: David J. Blazouske
Président
L'ACPC

10:20 - 10:40h — Pause Café

(School of Business Administration, Art Gallery)

10:40 - 12:00h — Séances Concomitantes

(School of Business Administration)

(D - Case Room 1)

Coordinateur: Frank P. Dougherty
Université Saint Mary's

"To a brave New World for Professional Accounting"

Harvey Mann
Université Concordia

"Information Economics of an Auditing Institution: An Introductory Analysis"

Daniel B. Thornton
Université de Toronto

(E - Case Room 2)

Coordinateur: Izzy Elkhazin
Université Saint Mary's

"Students' performance on and Preference for Unstructured Course Materials: The Impact of Cognitive Complexity"

Joel Amernic
Université de Toronto

et

Thomas H. Beechy
Université York

10:40 - 12:00h — Séances Concomitantes

"Information Systems Skills and Professional Accountants: A Survey"

Izak Benbasat

et

Albert S. Dexter
Université de la Colombie-Britannique

(F - Case Room 3)

"The CAAA Grant Program to support Basic Research in Accounting"

Gerald A. Feltham
Université de la
Colombie-Britannique

12:00 - 13:30h — Déjeuner

Parrainée par la Société des Comptables en Management du Canada

13:30 - 16:30h — Séances Concomitantes

(School of Business Administration)
(avec pause café de 15:00 a 15:20 a la Gallerie D'Art)

(G - Case Room 1)

Coordinateur: Frank P. Dougherty
Université Saint Mary's

"The Discipline of Accountancy"

L. G. Eckel
Université McMaster

"Toward A Framework for Developing Positive Theories of Accounting"

Murray J. Bryant

et

Daniel B. Thornton
Université de Toronto

"Private Interest and Public Interest"

James C. Gaa
Université McMaster

"Toward Open-System Based Accounting: A Resiliency Approach" (xv)

13: 30 - 16:30h Seances Concomitantes

Gerald H. B. Ross
Université du Michigan

(H - Case Room 2)

Co-ordinateur: Izzy Elkhazin
Université Saint Mary's

"The Impact of Deferred Taxes on Net Income"

Thomas H. Beechy
Université York

13:30 - 16:30h "A Computer Simulation for Studying Accounting Income Models"

Paul V. Dunmore
Université McMaster

"A Conceptual Model to Teach Certain Financial Statement Items"

James T. MacKay
Université du
Wisconsin, Madison

"Job Satisfaction Among Accountants Employed in Different Work Environments"

Slavik J. Hurka
Université de la Saskatchewan

(I - Case Room 3)

Coordinateur: Charles J. Dirksen
Université Dalhousie

"Inflation and the Market for Public Utility Cost Information"

Howard Teasley
Université Simon Fraser

"A General Approach to Variance Analysis"

Charles J. Dirksen

et

Donald C. Cherry
Université Dalhousie

"Assessment of the Development of Auditors of Public Companies in Ontario 1870 - 1900"

17:30 - 18:30h **Réception**

(Student Union Building: Green Room)

Parrainée par la Province de la Nouvelle Ecosse
et le Président de l'Université Dalhousie

TABLE OF CONTENTS

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Papers Presented at Concurrent Sessins (continued)

ACCOUNTING IN THE CANADIAN UNIVERSITY ENVIRONMENT: SOME SUGGESTIONS

Yvon Houle

ABSTRACT

This paper describes briefly the prevailing situation in the field of accounting education. The scope is restricted to undergraduate university programmes having an accounting concentration. The author argues that the accounting academic has to be sure to teach, do research, advise students and do all the other things that accompany the teaching task, as do other university professors, but find himself in most cases: teaching large numbers of students, advising others involved in running similar courses, accepting a public evaluation of his teaching, with emphasis on the professional examinations which his students must take, justifying to other academics why he does not do research of the sort generally expected by universities, meeting the immediate needs of professional accounting organizations, and serving as a link between such organizations and his university.

This portrait of the besieged accounting academic makes one seriously question the quality of education that will result.

In effect, can the overburdened accounting professor deliver education of true quality? Also, if the professor's teaching is evaluated according to his students' success on professional examinations, will he not tend to give a professional rather than university education to his university students? If one adds to this certain problems of the

teaching profession, the lack of full-time accounting academics, inadequate academic training of most full-time accounting academics and the small amount of accounting research that is done in universities, one finds a situation which is not very bright.

The author argues that a university discipline's educational excellence is encouraged by the following components: a sufficient number of qualified professors, a work environment conducive to university education, appropriate teaching methods and sustained research effort. The author's specific recommendations in these four selected areas are:

A. The supply of accounting professors

(1) Fill vacant positions.
(2) Encourage the further training of present professors.

B. The work environment

(3) Limit the numbers of students in courses.
(4) Ensure that professional examinations are not used to judge the quality of university education.

C. Teaching methods

(5) Encourage the development of and experimentation with new teaching methods.
(6) Encourage professors to exchange information about teaching methods.
(7) Encourage research to identify better teaching methods.

D. Research

(8) Increase the number of graduate programmes in accounting.
(9) Demystify research.
(10) Value and promote research.
(11) Encourage exchanges among universities, professional organizations and practitioners.

LES SCIENCES COMPTABLES EN MILIEU UNIVERSITAIRE CANADIEN: QUELQUES SUGGESTIONS

YVON HOULE

Le présent document décrit brièvement la situation qui prévaut dans le domaine de l'enseignement des sciences comptables au premier cycle en milieu universitaire et formule certaines recommandations susceptibles d'améliorer la qualité de cet enseignement. L'enseignement auquel nous nous intéressons principalement dans ce document concerne les programmes avec concentration en comptabilité.

Avant d'aborder comme tel le vif du sujet, il nous apparaît important de répondre à la question suivante: l'enseignement aux futurs comptables doit-il être à caractère professionnel ou de type universitaire traditionnel? Pour être en mesure de répondre adéquatement à cette question, on peut considérer les caractéristiques de chacune des approches. L'enseignement à caractère professionnel vise normalement la préparation immédiate des candidats à l'exercice de la profession, le corps professoral est composé pour une bonne part de professionnels du milieu, et l'enseignement est orienté vers des réponses aux comment plutôt que vers des réponses aux pourquoi. L'enseignement purement universitaire de son côté est plutôt intéressé par la discipline que par la profession, on recherche des réponses aux pourquoi plutôt qu'aux comment, et le corps professoral est composé d'universitaires qui dans la mesure du possible doivent détenir un doctorat.

A notre avis, ni l'une ni l'autre de ces approches à l'état pur, n'est souhaitable en soi. Un enseignement typiquement universitaire pourrait être préjudiciable à la profession du moins à court terme alors qu'un enseignement purement professionnel ralentirait énormément le développement de la

discipline. Nous favorisons donc une approche hybride i.e. à la fois universitaire et professionnelle tout en acceptant qu'il y a plusieurs façons de la réaliser. Bien que nous n'abordons pas comme tel ce sujet dans le présent document, les recommandations que nous formulons tiennent compte de cette ligne de pensée.

L'ENSEIGNEMENT DANS LE DOMAINE DES SCIENCES COMPTABLES

Le professeur en sciences comptables en milieu universitaire doit bien sûr enseigner, faire de la recherche, encadrer ses étudiants et participer à toute autre activité que peut lui commander sa tâche d'enseignement comme tout autre professeur d'université. Il est appelé souvent de plus à: dispenser son enseignement à un grand nombre d'étudiants, encadrer les chargés de cours qui dispensent les mêmes cours que lui, accepter d'avoir une forme d'évaluation publique de la qualité de son enseignement par le biais des examens des corporations professionnelles auxquels sont soumis ses étudiants, justifier devant les universitaires des autres disciplines pourquoi il ne fait pas de recherche telle qu'on la définit dans le contexte universitaire, suivre de près les exigences des corporations professionnelles de comptables et servir de lien entre ces corporations et l'institution qu'il représente.

Bien que ce ne soit pas tous les professeurs en sciences comptables qui doivent accomplir toutes les tâches précédemment énumérées, beaucoup d'entre elles sont assumées par une bonne majorité. Ce portrait robot du professeur en sciences comptables permet de s'interroger tant sur la qualité que sur le

type d'enseignement. En effet, un professeur dont la charge est excessive peut-il donner un enseignement vraiment de qualité? De même, le professeur dont l'enseignement est évalué par le succès de ses étudiants aux examens des corporations professionnelles ne sera-t-il pas plus tenté de donner un enseignement professionnel plutôt qu'universitaire?

En plus du contexte de travail dans lequel les professeurs évoluent, deux autres facteurs à part la recherche contribuent à améliorer la qualité de l'enseignement. Ces facteurs sont le corps professoral et la pédagogie. La recherche de Beechy[1] a permis de relever les problèmes suivants dans différents programmes de comptabilité relativement à ces deux facteurs.

1) Un nombre excessif et grandissant de chargés de cours.

2) Une formation académique inadéquate pour la plupart des professeurs plein temps.

3) Un nombre d'étudiants beaucoup trop élevé dans les cours d'introduction.

4) Un contenu insuffisant en comptabilité de gestion de même qu'en comptabilité et contrôle pour les organisations du secteur public.

5) Une emphase excessive sur les procédures et les calculs dans les premiers cours de comptabilité financière et de comptabilité de gestion; une emphase insuffisante sur l'utilisation et sur les conséquences de l'utilisation de l'information comptable.

6) Une préparation insuffisante des étudiants à se servir de leurs connaissances dans des situations complexes ou non structurées, i.e. analyse de cas.

7) Une préparation insuffisante des étudiants en théorie comptable.

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1 Beechy Thomas H., University accounting programs in Canada: Inventory and Analysis 1980.

Bolton[2] a fait ressortir certaines faiblesses des gradués en sciences comptables qui jusqu'à un certain point découlent de méthodes pédagogiques et/ou de contenus de programmes inadéquats. Ces faiblesses sont l'étroitesse d'esprit des gradués dans leur façon de penser, leur sens des affaires peu développé et leurs difficultés d'analyse et de communication. Les difficultés de communication ont également été mentionnées par Skousen[3].

LA RECHERCHE DANS LE DOMAINE DES SCIENCES COMPTABLES

Les universitaires de la comptabilité dans le contexte canadien ont très peu contribué en tant que groupe au développement de la discipline comptable. Comment expliquer ce peu d'intérêt pour la recherche? Le fait qu'il se fasse peu de recherche n'est pas nécessairement un manque d'intérêt. Plusieurs raisons peuvent être invoquées pour expliquer ce qui semble être un désintéressement. Dans les lignes qui suivent nous présentons quelques-unes des raisons pouvant expliquer ce phénomène.

Le manque de temps

Comme nous l'avons déjà mentionné précédemment, le professeur de comptabilité fait souvent face à un grand nombre d'étudiants, ce qui lui exige beaucoup en termes de disponibilité, de correction de travaux et d'examens. Le fait

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2 Bolton L.R., Education Expectations (Public Practice), Proceedings, CICA Symposium on Education and the Professional Accountant, Toronto 1979.

3 Skousen Fred. K., "Accounting Education: The New Professionalism", The Journal of Accountancy, (July 1977) pp. 54-58.

qu'il doive parfois encadrer les chargés de cours de sa discipline lui demande également plusieurs heures. La préparation des cours demande souvent beaucoup de son temps même s'il a déjà eu l'occasion de dispenser les cours en question, à cause de l'évolution de la discipline. En plus d'avoir à assumer sa charge annuelle normale d'enseignement, le professeur en sciences comptables est souvent sollicité par l'institution qui l'emploie pour dispenser certains cours préparatoires aux examens des différentes corporations professionnelles de comptables et dans certains cas, (au Québec par exemple) il est pratiquement forcé d'accepter. Ces quelques particularités de la tâche du professeur en sciences comptables font qu'il lui est très difficile de se consacrer à des activités de recherche d'envergure demandant un effort continu.

Un personnel insuffisant

Il est bien connu de tous que les départements de sciences comptables dans les différentes universités ont continuellement énormément de difficultés à combler les postes disponibles. Ces difficultés s'expliquent tout d'abord du fait que les universités exigent normalement des professeurs d'avoir le doctorat ou l'équivalent et qu'il n'y en a pas sur le marché. Pour tenter de combler leurs postes, certaines universités depuis quelques années font des offres à des candidats qui n'ont pas le doctorat mais qui par contre s'engagent à entreprendre de telles études à l'intérieur d'une période de temps donnée. Malgré cette ouverture des universités, il semble qu'elles aient énormément de difficultés à combler leurs postes et le recrutement demeure donc à l'heure actuelle un problème très important. Il est permis

de croire que si les universités réussissaient à combler leurs postes par du personnel ayant le doctorat, l'impact se ferait sentir au niveau de la recherche ou du moins, on serait en droit de s'attendre à une amélioration à ce niveau puisque nombre de professeurs dans certains départements de sciences comptables à l'heure actuelle se sentent un peu isolés.

Un personnel peu préparé à la recherche

Selon Beechy[4], seulement 30% des professeurs plein temps en sciences comptables détiennent un doctorat. Toujours selon Beechy, 80% des professeurs plein temps détiennent un diplôme professionnel (CA, CGA, RIA, etc.). Ces quelques statistiques suffisent à se rendre compte que la majorité des professeurs en place n'ont pas été formés à faire de la recherche. La recherche pour eux c'est souvent de l'inconnu, du mystérieux et ils craignent par conséquent de s'y embarquer.

Peu d'incitation à la recherche

Malgré que la majorité des professeurs en place n'aient pas une formation de chercheur, il n'est pas dit qu'ils ne sont pas intéressés à en faire mais pour que cela se réalise il faut les inciter de quelque façon que ce soit. L'Institut Canadien des Comptables Agréés par exemple à titre d'organisme assumant un certain leadership dans le domaine de la recherche en sciences comptables, pourrait certainement jouer un rôle important dans ce domaine en invitant plus de professeurs à participer aux différents

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4 ibid., 1.

comités et projets de recherche ou encore en leur donnant davantage de commandites de recherche. De même, si les universités valorisaient par des promotions accélérées les quelques professeurs en sciences comptables qui font de la recherche peut être que les autres seraient incités à en faire. Dans la plupart des cas les professeurs-chercheurs en sciences comptables ont des difficultés à avoir des promotions puisque leur production en termes de recherche est de beaucoup inférieure à celle des professeurs d'autres départements qui n'ont pas les mêmes exigences en termes d'enseignement et qui souvent sont supportés dans leurs recherches par des étudiants des deuxième et troisième cycles, ce qui n'est pas le cas pour les comptables à cause de la pénurie de programmes gradués. Dans un contexte comme celui-là, il ne fait pas se surprendre de voir un si grand nombre de professeurs de comptabilité faire de la consultation.

Quelques suggestions relatives à l'enseignement et à la recherche

Les quelques pages précédentes ont tenté de décrire la situation qui prévaut si non dans tous, du moins dans bon nombre de départements de sciences comptables. Cette brève description permet de se rendre compte: que les professeurs de sciences comptables travaillent dans des conditions relativement difficiles, que l'enseignement semble respecter certains critères de qualité du moins si l'on se fie aux examens des corporations professionnelles, et que la recherche n'est pas valorisée.

Globalement, la situation actuelle ne permet pas de favoriser un enseignement de très grande qualité. A notre avis, pour favoriser l'excellence dans l'enseignement d'une discipline en milieu universitaire, les ingrédients suivants doivent être présents: un corps professoral qualifié et suffisant en nombre, un milieu de travail propice à l'enseignement universitaire, une pédagogie appropriée et des efforts de recherche soutenus. Les quelques lignes qui suivent présentent certaines recommandations favorisant l'excellence dans l'enseignement des sciences comptables.

A. LE CORPS PROFESSORAL

(1) Combler les nombreux postes ouverts

Il n'est de secret pour personne que la rareté des ressources est chronique dans le domaine de l'enseignement des sciences comptables. Les différents moyens mis de l'avant par les universités jusqu'à ce jour pour tenter de combler les postes se sont avérés peu efficaces. A ce titre, les personnes intéressées sont invitées à prendre en considération les recommandations formulées par R.A. Long dans son document de travail soumis en novembre 1980 au comité de la formation.

(2) Favoriser le perfectionnement des professeurs déjà en place

Le domaine des sciences comptables a fait exception à la règle dans le passé en engageant des professeurs qui n'ont pas de doctorat. De plus en plus cependant, les universités avec raison, exigent des départements

de comptabilité de respecter la règle établie et d'engager dans la mesure du possible des docteurs ou encore des jeunes qui s'engagent à réaliser de telles études à l'intérieur d'une certaine période de temps. Il semble par contre que très peu de jeunes se sont montrés intéressés à entreprendre de telles études. Pourquoi? Sans avoir fait une analyse exhaustive des raisons de ces refus, il est permis de croire que l'aspect financement y est pour quelque chose. Si l'on désire intéresser des jeunes à entreprendre des études de doctorat il faut à notre avis leur assurer un financement adéquat et cette condition signifie: un salaire équivalent à celui d'un professeur plein temps, une allocation pour les frais de déménagement pour aller et revenir des études et enfin, une allocation couvrant l'achat des volumes et les frais de scolarité. Quant aux sources de financement il y a bien entendu les universités respectives qui jusqu'à date ont offert leur contribution mais il faudrait également penser davantage à faire appel aux firmes de comptables, aux corporations professionnelles, et aux différents gouvernements. L'Association Canadienne des Professeurs de Comptabilité à titre d'organisme neutre, pourrait jouer le rôle de gestionnaire pour percevoir et distribuer ces différents fonds provenant de sources autres que les universités.

Quand il s'agit de perfectionnement, on peut penser à autre chose que des études de doctorat, surtout dans un domaine comme celui des sciences comptables. Le perfectionnement peut en effet prendre la forme: de stages de travail dans des firmes de comptables, de cours suivis dans des firmes de comptables, de cours de perfectionnement

offerts par les corporations professionnelles, de séminaires offerts par différentes universités ou tous autres cours offerts par différents organismes reconnus. Malheureusement, cette forme de perfectionnement semble avoir eu peu d'adeptes dans le milieu universitaire. Ce type de perfectionnement est souhaité du moins pour l'enseignement de certaines disciplines.

Les universitaires devraient faire les premiers pas pour favoriser ce type de perfectionnement en faisant des contacts auprès des organismes concernés. Il ne semble pas y avoir de raison fondamentale pourquoi ils se verraient refuser une telle contribution d'autant plus que comme professeurs ils peuvent apporter grandement à ces différents organismes. L'Association Canadienne des professeurs de comptabilité pourrait probablement jouer le rôle de premier démarcheur auprès des principaux intéressés afin de voir les échanges possibles et par la suite informer tous ses membres. Un exemple d'item qui pourrait être négocié avec l'Institut Canadien des Comptables Agréés serait d'obtenir que les universitaires puissent s'inscrire gratuitement aux différents cours de perfectionnement ou encore à titre gratuit qu'on leur fasse parvenir sur demande le matériel utilisé dans les différents cours.

B. LE MILIEU DE TRAVAIL

(3) Limiter le nombre d'étudiants par cours

Pour plusieurs professeurs en sciences comptables, les activités reliées à l'enseignement (i.e. encadrement des étudiants, corrections de travaux

et examens, préparations de cours) occupent une grande part de leur temps. Les matières enseignées qui exigent normalement beaucoup en termes de disponibilité et d'encadrement auprès des étudiants et le grand nombre d'étudiants par cours sont fondamentalement les principales causes de ce phénomène. Le temps exagérément consacré à des activités d'enseignement pourrait avantageusement être utilisé à des activités de recherche pour ainsi favoriser le développement de la discipline tout en contribuant à améliorer la qualité de l'enseignement.

Dans le but de rendre la tâche des professeurs en sciences comptables un peu plus universitaire nous recommandons par conséquent de réduire le nombre d'étudiants par cours. Beechy[5] propose à ce sujet 35 étudiants en moyenne par cours. Au plan pédagogique, il va de soi que plus le groupe d'étudiants par cours est petit, plus il y a possibilité d'échanges entre le professeur et les étudiants. Pour permettre aux professeurs de sciences comptables de travailler dans un contexte vraiment universitaire, pour favoriser la qualité de l'enseignement, nous recommandons de limiter le nombre d'étudiants par cours à 40. Pour certains cours de type séminaire il va de soi que cette règle ne s'applique pas.

(4) Faire en sorte que les examens des corporations professionnelles ne servent pas d'outils pour juger de la qualité de l'enseignement universitaire

Les corporations professionnelles publient des statistiques relatives à la réussite des candidats des différentes universités à leurs examens.

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5 ibid., 1

Malheureusement, les étudiants, le public en général et les corporations professionnelles jugent souvent le corps professoral, l'enseignement et les programmes de par le taux de réussite des étudiants à ces différents examens. De telles comparaisons sont injustes puisque ce ne sont pas tous les cours qui concernent directement les examens des corporations professionnelles et de plus la réussite des étudiants dépend de beaucoup d'autres facteurs que l'enseignement reçu.

Cette forme d'évaluation publique de la qualité de l'enseignement peut biaiser jusqu'à un certain point le contenu et l'orientation de certains cours et cela au détriment de la formation universitaire des étudiants. Pour éviter ces biais et favoriser un enseignement vraiment universitaire lorsque la situation l'exige, nous recommandons que des pressions soient faites auprès des différentes corporations professionnelles pour qu'elles cessent la publication de statistiques par institution.

C. LA PEDAGOGIE

(5) Favoriser le développement et l'expérimentation de nouvelles méthodes pédagogiques

A part quelques exceptions, il semble que l'enseignement dans le domaine des sciences comptables se fait encore de nos jours de façon assez traditionnelle, c'est-à-dire un enseignement où le professeur transmet un

certain nombre de connaissances à ces étudiants et la communication est essentiellement unilatérale. Dans ce type d'enseignement, l'emphase est surtout mise sur la quantité des connaissances transmises. Cet enseignement est normalement très apprécié des étudiants puisqu'ils ont très peu d'efforts à faire si ce n'est de noter les connaissances transmises et de même ils se sentent très sécurisés puisque le professeur filtre et structure pour eux les sujets étudiés.

Les remarques comme celles auxquelles nous avons fait allusion précédemment à l'effet que les cours d'introduction sont plutôt techniques ou encore que les étudiants ont certaines difficultés de communication et qu'ils témoignent d'une étroitesse d'esprit ne sont pas étrangères à notre avis à cet enseignement dit traditionnel. Dans le contexte actuel, les connaissances acquises deviennent périmées très rapidement dans le domaine des sciences comptables et un enseignement axé uniquement sur la transmission de connaissances est à notre avis tout à fait inadéquat.

Le type d'enseignement recherché devrait être plus adapté à l'environnement changeant dans lequel nous vivons et ainsi mieux préparer les étudiants à faire face à des situations complexes qui ne cessent d'évoluer. Cette réforme ne peut se faire du jour au lendemain et les personnes concernées devront y mettre les efforts voulus. Il est peu probable à notre avis que l'initiative d'une telle démarche vienne des professeurs sur une base individuelle et même si c'était le cas, la sensibilisation des autres professeurs serait beaucoup trop lente et c'est pourquoi nous suggérons qu'un organisme comme l'Association Canadienne des Professeurs de Comptabilité joue un rôle important dans ce processus. Un premier geste à poser pourrait être de sensibiliser les professeurs au besoin d'innovation pédagogique. Cette

sensibilisation pourrait se faire par le biais des missives de l'Association à l'endroit des membres ou encore par la formation d'un sous-comité du Comité de formation dont la mission serait de promouvoir l'innovation pédagogique. Une fois passée l'étape de la sensibilisation, il faudrait penser à des mécanismes visant à inciter les professeurs à rechercher de nouvelles méthodes pédagogiques et à les expérimenter. De telles mesures incitatives pourraient être: l'organisation de congrès régionaux sur le sujet, la formation d'ateliers de travail sur le sujet dans le cadre du congrès annuel, l'octroi de subventions pour des projets d'innovation pédagogique, etc.

(6) Favoriser les échanges entre les professeurs sur leurs expériences pédagogiques

Il faudrait prévoir certains mécanismes d'échanges entre les professeurs concernant leurs enseignements. De tels échanges pourraient porter sur les contenus et les syllabus de cours, les volumes utilisés et les approches pédagogiques. La meilleure façon de réaliser ces échanges serait probablement en organisant des rencontres entre les professeurs concernés et dans un premier temps la périodicité de ces rencontres pourrait être une fois l'an. Encore ici nous croyons que l'Association Canadienne des Professeurs de Comptabilité pourrait jouer un rôle très important du moins pour démarrer le processus. Une autre façon de favoriser les échanges entre les professeurs serait d'avoir une chronique dans le journal de l'Association ou encore de créer un bulletin pédagogique (toujours sous l'égide de l'Association) qui pourrait être publié deux fois l'an et dans lequel on ferait état de certaines expériences pédagogiques, de la publication de récents volumes et de leurs critiques, etc.

(7) Favoriser les recherches visant à identifier les meilleures méthodes pédagogiques

Doit-on utiliser des approches pédagogiques différentes pour les cours d'introduction et pour les cours plus avancés? Certaines matières commandent-elles des méthodes pédagogiques particulières? Dans quel type de cours telle méthode pédagogique (ex. méthode des cas) est-elle plus appropriée? Ce sont là quelques interrogations sur lesquelles il serait intéressant d'avoir réponse si l'on désire améliorer la qualité des enseignements. La recherche de nouvelles méthodes pédagogiques mieux adaptées au contexte d'aujourd'hui dans le cas de certains cours, tel que nous le suggérons en (5), devrait donc à notre avis être accompagnée de recherches visant à évaluer les méthodes existantes tenant compte des niveaux et des matières enseignées.

Quant aux moyens qui peuvent être utilisés pour sensibiliser et inciter les professeurs à entreprendre ce type de recherches, ceux que nous proposons en (5) conviennent à notre avis parfaitement.

D. LA RECHERCHE

(8) Augmenter le nombre de programmes de 2ième et 3ième cycles en sciences comptables

Au Canada à l'heure actuelle, il existe qu'un petit nombre de programmes gradués en sciences comptables et ce phénomène n'est pas étranger au fait

qu'il se fait peu de recherche. Si l'on désire favoriser la recherche il faut donc augmenter le nombre de programmes gradués.

Puisqu'il revient à chaque université de décider de développer de tels programmes qui finalement doivent être approuvés par les gouvernements, on peut être porté à croire qu'une recommandation du genre, est difficilement réalisable. A notre avis, cette recommandation peut devenir réalité si les parties intéressées (i.e. les universités et les gouvernements) sont sensibilisées à l'urgent besoin d'études graduées en sciences comptables visant à favoriser le développement de la discipline. L'Association Canadienne des Professeurs de Comptabilité est l'organisme tout désigné pour jouer un rôle de premier plan dans ce domaine et nous espérons que des actions seront prises en ce sens à brève échéance.

(9) Démystifier la recherche

Pour plusieurs professeurs (sans doctorat) en sciences comptables, la recherche c'est quelque chose de relativement complexe qui n'est accessible qu'aux docteurs. Bien que les docteurs ont une formation de chercheurs, il est absolument faux de prétendre qu'ils sont les seuls à pouvoir faire de la recherche. De tels préjugés doivent disparaître et il faut trouver des moyens d'intéresser ces nombreux professeurs sans doctorat à des activités de recherche.

L'organisation de colloques régionaux sur les domaines de recherche possibles en sciences comptables pourrait constituer dans ce sens-là une démarche intéressante. Des rencontres du genre favoriseraient les échanges entre les professeurs relativement à leur champs disciplinaires

respectifs et de là pourraient naître des projets de recherche intéressants. L'Institut Canadien des Comptables Agréés pourrait contribuer au processus de démystification en sollicitant plus fréquemment la contribution des professeurs aux travaux de ses comités de recherche. L'Association Canadienne des Professeurs de Comptabilité pourrait également jouer un rôle important en supervisant certains projets de recherche d'envergure et en invitant les professeurs à y participer.

Ce ne sont là que quelques-uns des moyens qui peuvent être utilisés pour intégrer les nombreux professeurs sans doctorat à des activités de recherche. En démystifiant chez nombre de comptables la recherche comme activité, la discipline ne pourra que s'en mieux porter puisque nous croyons que bon nombre d'entre eux emboîteront le pas sans trop d'hésitations.

(10) Valoriser et promouvoir la recherche

La recherche en sciences comptables est très peu valorisée dans le contexte actuel. On n'a qu'à penser au fait que dans certains départements de sciences comptables, les professeurs sont libres de faire ou de ne pas faire de la recherche et cela suffit pour apprécier l'importance accordée à la recherche. Il ne faut pas se surprendre dans des cas semblables de constater que bon nombre de professeurs vont préférer s'adonner à des consultations, ne serait-ce que pour les honoraires qu'ils en retirent.

Si l'on désire vraiment que les professeurs fassent de la recherche, on devra à tout le moins considérer très sérieusement cette dimension de leur tâche au moment de leur évaluation et si possible favoriser vraiment ceux qui font de la recherche. Il y a plusieurs façons de favoriser ceux qui font de la recherche: des promotions accélérées, des primes d'excellence à la recherche, un appui sous forme d'assistants dans les activités d'enseignement, l'octroi de fonds pour la participation à des congrès, etc. Ces quelques mesures visent à donner à la recherche la place qui lui revient en milieu universitaire ou à tout le moins à encourager ceux qui jouent vraiment le rôle d'universitaires.

Ces quelques mesures sont absolument essentielles pour rétablir l'équilibre, mais on doit également penser à certaines mesures pour encourager les professeurs à persévérer dans leurs efforts de recherche. L'organisation d'un réseau d'échanges de documents de travail (working papers), l'organisation de séminaires sur des thèmes précis, l'organisation d'un congrès annuel sur la recherche, voilà quelques-uns des moyens qui peuvent être mis sur pied pour stimuler la recherche.

(11) <u>Favoriser les échanges entre le milieu universitaire, les corporations professionnelles et les professionnels en exercice</u>

Les échanges entre les différentes parties intéressées à la recherche peuvent se faire de deux façons: sur la base de contacts personnels ou sur la base de contacts entre les représentants des différents groupes. Les échanges entre les représentants des groupes n'ont pas vraiment existé jusqu'à ce jour. Les groupes formels qui auraient intérêt à

échanger pour le mieux être de la recherche et de la discipline en sciences comptables sont à notre avis: les professeurs d'universités, les corporations professionnelles, les firmes de comptables et les autres professionnels de la comptabilité. Une concertation est donc souhaitée entre ces différentes parties et nous croyons que l'Association Canadienne des Professeurs de Comptabilité pourrait être l'instigatrice de ce mouvement.

Cette concertation n'empêche pas la poursuite des contacts qui ont pu s'établir sur une base individuelle, mais au contraire, elle pourra favoriser ce genre de contacts. Que ces échanges se fassent par l'entremise des canaux formels ou sur la base individuelle, les universitaires en ont besoin et il est permis de croire que ce besoin est réciproque. Dans cette perspective, les universitaires ont intérêt à mieux se faire connaître et du même coup à bien informer les autres parties de leurs préoccupations s'ils désirent avoir leur entière collaboration et améliorer dans certains cas leur crédibilité face à ces groupes.

CONCLUSION

Le présent document a tenté de décrire un peu ce qui se passe au niveau de l'enseignement et de la recherche dans le domaine des sciences comptables en milieu universitaire. La description qui a été faite ne correspond probablement pas à ce qui se passe effectivement dans tous les départements de comptabilité, mais elle se veut quand même la description d'une certaine réalité.

On peut se rendre compte que les problèmes vécus ne sont pas insolubles et qu'en mettant les efforts nécessaires il y aura moyen d'améliorer grandement la situation. Il ressort des différentes solutions proposées, que les universitaires ont tout intérêt à s'unir pour tenter de solutionner leurs problèmes et l'Association Canadienne des Professeurs de Comptabilité pourrait dans ce sens-là être l'organisme privilégié. Si l'Association est prête à jouer ce rôle, le travail peut commencer dès maintenant parce qu'il y a du pain sur la planche.

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AN ACTION PLAN TO ALLEVIATE THE CRITICAL SHORTAGE OF CAREER ACADEMICS IN ACCOUNTING PROGRAMS AT CANADIAN UNIVERSITIES

(Plan d'action pour alléger la dangereuse pénurie de professeurs de carrière dans les programmes de comptabilité des universités canadiennes)

R.A. Long, université de Waterloo, mars 1981

Résumé

La sérieuse pénurie de professeurs de comptabilité compétents dans les universités canadiennes dure depuis plus d'une décennie et la situation , qui va de mal en pis d'année en année, a aujourd'hui atteint un seuil critique. Si l'on ne parvient pas à augmenter rapidement le nombre de professeurs de carrière, les programmes de comptabilité dans la plupart des universités canadiennes seront en péril. Les innovations dans les divers programmes seront tout au mieux médiocres et l'on ne parviendra pas à satisfaire aux attentes des étudiants et des employeurs relativement à une formation comptable de qualité.

La société à tout intérêt à améliorer la qualité de la formation comptable. La complexité et l'ampleur de l'environnement que dessert le comptable augmentent sans cesse. Parallèlement, la demande de comptables bien formés continue elle aussi de s'accroître. Cependant, l'insuffisance du personnel dans les facultés ne peut permettre à l'étudiant d'acquérir les techniques de pointe qui sont maintenant mises à sa disposition à une époque où la comptabilité se forge une identité disciplinaire. Sans un encadrement professoral convenable, nombre d'étudiants parmi les plus prometteurs abandonneront toute intention d'étudier la comptabilité et se tourneront vers d'autres disciplines où l'offre de professeurs ne représente pas un problème majeur.

La situation a commencé à inquiéter de nombreuses associations professionnelles en comptabilité en Amérique du Nord qui ont beaucoup à perdre si l'on ne parvient pas à trouver une solution à cette crise. La profession comptable au Canada collabore aujourd'hui avec les universités grâce aux ressources qu'elle leur fournit non seulement pour étudier le problème mais aussi pour appuyer les facultés dans leurs tentatives d'y remédier.

Au cours des vingt dernières années, une poignée seulement de chercheurs ont entrepris des études en profondeur de la relève chez les professeurs de comptabilité. Le travail le plus significatif mené jusqu'à maintenant s'insère dans

une étude plus vaste commanditée par l'Association Canadienne des Professeurs de Comptabilité et terminée par le professeur Thomas Beechy en 1980. Parmi les découvertes importantes de l'étude du professeur Beechy, intitulée University Accounting Programs in Canada: Inventory and Analysis, l'on observe que seulement 335 professeurs de comptabilité à plein temps encadrent entre cinq et six mille étudiants qui ont terminé l'équivalent d'un programme de comptabilité complet. Ces professeurs de carrière sont appuyés par environ 300 chargés d'enseignement à mi-temps. Ces deux groupes réunis doivent offrir des cours à des milliers d'étudiants qui ne se spécialisent pas en comptabilité. L'on a qu'à songer par exemple aux 26 800 étudiants inscrits en 1978-1979 au seul cours d'initiation à la comptabilité financière. Le professeur Beechy a aussi découvert que seulement 97 des professeurs à plein temps détenaient un doctorat et il prévoyait que ce nombre devait s'accroître de 200 pour cent dans un avenir rapproché pour que ses recommandations se réalisent.

Les recommandations "d'urgence" assureraient un meilleur examen d'ensemble de la théorie comptable, de la comptabilité de gestion et de la comptabilité et des contrôles dans le secteur public. De plus, suivant ses recommandations dites "vitales", les professeurs à plein temps seraient tenus de donner 90% des heures de cours et l'on assisterait à une baisse de la taille des groupes et à une augmentation de la proportion des détenteurs de doctorat parmi les enseignants à plein temps, soit de 30% à 60%.

Le sous-financement chronique représente la cause la plus significative de l'absence de professeurs de comptabilité compétents. Sans ressources convenables, les programmes de troisième cycle en comptabilité ne se sont pas développés et, à ce jour, les universités canadiennes ont décerné un nombre nettement insuffisant de diplômes de doctorat. De plus, trop peu de ressources ont été affectées à l'augmentation des postes d'enseignement et de la rémunération des professeurs de carrière qui encadrent les programmes de premier et de deuxième cycles en pleine effervescence.

Au cours des dernières années, les professeurs se sont fiés dans une large mesure à la profession comptable pour les aider à résoudre le problème du sous-financement. D'après le présent document, cependant, la profession ne devrait être tenue de jouer qu'un rôle d'appui. Il faut trouver une solution à long terme à la pénurie chronique de professeurs, principalement par les professeurs eux-mêmes. Il est temps qu'ils donnent suite à l'élan donné par l'étude du professeur Beechy au moyen du développement et de la création de programmes destinés

à venir combler la grande pénurie de professeurs qualifiés.

Plusieurs mesures que peuvent suivre les professeurs actuels sont énoncées dans le présent document. Mais il porte surtout en définitive sur le plan d'action à mettre en oeuvre pour améliorer la diffusion d'information relativement aux aspects favorables de la carrière universitaire du professeur de comptabilité. Ces renseignements rendraient plus facile l'effort de coopération en vue d'attirer des professeurs au Canada et ensuite de contribuer à l'avancement de leur carrière. Ces mesures devraient inciter les professeurs actuels à demeurer à l'université et à accroître l'intérêt à l'égard de l'enseignement universitaire. Si plus d'étudiants manifestent de l'intérêt à poursuivre une carrière dans l'enseignement, il y aura une demande plus forte de programmes de doctorat en comptabilité dans les universités canadiennes. Une augmentation substantielle de la demande pourrait bien entraîner une répartition plus élevée de ressources aux programmes de doctorat qui, une fois fermement implantés, pourraient attirer davantage d'étudiants.

Le présent document invite les professeurs de carrière à assumer la responsabilité de concevoir une démarche à caractère coopératif en vue d'attirer les étudiants dans des programmes de doctorat, de recruter des professeurs dans les universités canadiennes et d'améliorer les perspectives de carrière du professeur de comptabilité.

An Action Plan to Alleviate the Critical Shortage of Career Academics in Accounting Programs at Canadian Universities

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I. INTRODUCTION

1. Canadian Perspectives

I stood before a similar academic assembly much earlier, in 1967, at the inaugural meeting of the Canadian Region of the American Accounting Association (AAA) to present my preliminary analysis of empirical findings collected for my study of Undergraduate Accounting and Auditing Instruction at Canadian Universities. The objectives of my study were three-fold: first, to collect factual data directly from administrators and professors on the actual state of instruction in Canadian university accounting programs; next, to compare findings on instructional practices with the technology available as determined by an extensive search of academic and professional literature and; finally, to make recommendations for improvements in instruction which were achievable by the existing professoriat.

The study was undertaken both to fulfill my MBA thesis requirement and also to satisfy a strong personal interest. I had graduated from the Bachelor of Commerce (Accounting Major) program at the University of British Columbia and was completing my third year of full-time teaching at the university of Saskatchewan. Both of these western

universities had well established accounting programs yet, from my viewpoints, first as a student and then as a junior instructor, I was not satisfied with the quality of either program. The empirical data collected for my study from 72% of all accounting program administrators and a coincidental 72% of all full-time instructors in anglophone universities indicated clearly that the western university programs which had provided my education and experience were representative of the state of university accounting instruction across anglophone Canada. The pedagogy available, especially throughout the United States, was not being used in most of Canada. This conclusion about Canadian accounting instruction at anglophone universities in the 1960's indicated that there had been rather disappointing progress since Professor John Parker had reported on instructional practices in similar university programs during the 1950's.[1]

The audience at that first meeting of the Canadian Region of the AAA numbered only about thirty professors plus a few members from professional accounting organizations. I did not present a formal paper and neither did most of the other speakers. Accordingly, there are no published proceedings.

What changes can I point to as I return to this forum fourteen years later? The Canadian Region of the AAA has been replaced by a more appropriate learned society, our Canadian Academic Accounting Association (CAAA). The standard for speakers now requires formal papers and they will be published in the Proceedings of this meeting. A significant change, however, is the vast increase in the whole scale of university commerce education. Table 1 compares government statistics for 1965-66, as

reported in my study, with the latest available enrolment figures for 1978-79.[2]

Table 1 : Number of Full-time Students

	Undergraduate		Graduate Commerce		
	All Disciplines	Commerce	Masters	Doctorate	Total
Total English and French					
1965-66	125,954	7,485	N/A	N/A	502
1978-79	323,554	32,894	3,064	132	3,196

N/A - data not available

Although reliable disaggregate data is not available for comparative purposes,[3] a significant portion of the increases in commerce enrolment probably occurred in the accounting discipline, especially since the chartered accountancy profession introduced a university degree pre-requisite to its education program, generally commencing in 1970. The foregoing changes could be considered as indicators of progress.

On the other hand, there has been a discouraging lack of progress. For most of the fourteen year period since 1967, there had been virtually no improvement in our data bases. It seems that the only in-depth collections of Canadian empirical data remained in the unpublished thesis written by either Professor John Parker or myself. Ironically, even those data were available mainly due to the authors' degree requirements while studying at the same American university.

2. CAAA Study by Beechy

The most significant changes since 1967 have occurred only in the

last few years. Critical problems with Canadian university accounting education have begun to attract considerable attention from all major parties, including university administrators and an increasing number of accounting faculty members and professional accounting organizations.[4] In 1979, the CICA funded a major CAAA undertaking to examine university accounting programs in Canada. The study,[5] which was researched by Professor Thomas Beechy, covered all undergraduate and graduate programs, in English and/or French languages, and it focused on the 1978-79 academic year. We now have data on developments in Canadian accounting education during the 1970's.

Dr. Beechy did not find evidence of major improvements. In his summary comparison he states:

> "Certainly, progress has been made in improving faculty qualifications, although even more progress is needed. And clearly, there is some innovation going on and some new methods and approaches are being used. But on average, the current approaches to accounting education do not seem much different than they were in 1966..."[6]

3. Purpose of this paper

The purpose of this paper is to call upon the academic accounting community to act immediately on the abundant data collected and analyzed by Dr. Beechy lest we experience another decade without measurable improvement. Dr. Beechy's findings will guide us to the critical problem areas. Three of his "vital recommendations"[7] are closely interrelated, namely, "the number of full-time accounting faculty must be increased"; "the proportion of full-time accounting faculty which possess a doctorate degree must be drastically increased" and "the number of Ph.D. programs in accounting in Canadian universities must be increased". This paper will present an action plan, among several other things, which will facilitate the

implementation of these recommendations over the next decade.

4. Scope of this paper

In my attack on the critical shortage of qualified accounting professors, I will direct your attention to what I call the "too few teaching too little to too many" syndrome of university accounting education. In particular, my plea is for the existing accounting professoriat to take the lead in eliminating this syndrome.[8]

II. PROBLEM DEFINITION AND ANALYSIS

1. Shortage of accounting professors

At the core of this syndrome is the critical shortage of qualified accounting professors available to teach at Canadian universities. Understaffed faculties cannot be expected to introduce pedagogical improvements. This is especially regrettable in light of the increasing complexity of the environment served by accountants. There are increasing demands for expanding the body of knowledge and problems caused by these demands are compounded by the needs of a continuously increasing student body. There is increasing student interest in accounting both for service courses and for degree major courses.[9]

The scope of this paper is limited primarily to the critical shortage of qualified accounting professors, leaving the interrelated problems with the expanding body of knowledge and student enrolment to my colleagues on the CAAA Education Committee who are also presenting papers to this Conference. We must find a long-run solution for improving the supply of career academics or the accounting programs at most Canadian universities will continue to be in jeopardy. Curricular developments will be mediocre at best and reasonable expectations of students and employers for quality

accounting education will remain unfulfilled.

An important finding in Professor Beechy's study is that there are only about 335 full-time accounting faculty members serving an estimated total number of between five to six thousand students who complete the equivalent of a full accounting program. These career professors are assisted by about 300 part-time instructors, but together they must instruct thousands of additional students who do not major in accounting. For example, at the introductory financial accounting level alone, there were 26,800 students enrolled in 1978-79. Professor Beechy also found that only about 97 of the full-time faculty held doctorate degrees and he estimated that this number would have to increase to 274, or by almost another 200%, in the near future if his recommendations were to be implemented.

His "urgent" recommendations would provide greatly increased coverage of accounting theory, management accounting and public sector accounting and control. In addition, his "vital" recommendations would increase full-time faculty to teach 90% of the class sections, decrease the average introductory class size, and increase the proportion of full-time faculty members holding doctorate degrees from about 30% to 60%.[10]

2. Chronic underfunding

Chronic underfunding has been the most significant cause of the lack of qualified accounting professors. Without adequate resources, doctorate accounting programs have not developed and, to date, Canadian universities have produced an unacceptably low number of doctorate graduates. Moreover, both the number of faculty positions and the remuneration of the career professors staffing the expanding undergraduate and masters degree programs have suffered from insufficient resource allocation.

A long-run solution to chronic underfunding probably cannot be achieved by the accounting faculties without substantial help from society, students and employers. Society has the ultimate stake in improving the quality of accounting instruction. Accountants who do not receive satisfactory university education will not be able to provide the most beneficial service to the public. Students can help by lobbying for quality education. This is a very indirect proposition and students cannot wait for improved funding. Accordingly, if students' needs are ignored, an indeterminable number of the potentially best students will abandon their plans to study accounting and turn to alternative disciplines in which the supply of professors is not a major problem.

The accounting profession and other major employers must provide the major assistance to alleviate the university underfunding problem or they will soon be faced with the effects of the inadequate throughput from the university programs.[11] It is encouraging to report that the Canadian accounting profession is beginning to co-operate with universities by providing resources for studying educational problems and they are even funding faculty positions, doctoral study and faculty research.

The Canadian Association of University Teachers has failed to achieve any long-run solutions to the national problem of government underfunding. It is not surprising, therefore, that accounting faculties have made little progress themselves in dealing with underfunding.

3. Misallocations by deans

Although it appears that government underfunding must be accepted as a major constraint, the resource allocations within universities are not totally beyond the control or, at least, the effective influence, of

accounting faculties. We must resist developing the convenient alibi that the shortage of accounting professors is caused mainly by unfair practices by arrogant deans who reallocate funds away from accounting to other disciplines, in response to disappointing initial allocations by university administrations of the unrealistically low grants from governments.[12] Deans often are able to misallocate resources from accounting programs because their accounting faculties inadvertently engage in dysfunctional behaviour and/or fail to recruit sufficiently qualified professors to fill open faculty positions.

These faults are interrelated and they contribute to a confusing situation. Given that the chronic shortage of accounting professors has been widely publicized, the unsatisfied demand should attract candidates to graduate accounting programs who plan to qualify eventually for these unfilled positions. Surprisingly, however, Professor Beechy found that there are only three doctorate programs in Canada which offer study concentration in accounting, and together they had only twelve students enrolled in 1979. This represents only about 8% of the total number of Ph.D. students in Canadian faculties of management.[13] It is obvious, therefore, that Canadian doctorate programs are able to provide only a token supply of faculty recruits annually and, of course, they are unable to provide the vast increase in the number of doctorates required to implement Professor Beechy's recommendations.

4. Dysfunctional behaviour

As mentioned above, dysfunctional behaviour of existing faculty members could discourage potential career recruits from enrolling in doctorate accounting programs. Major types of this undesirable faculty behaviour include:

a) Emphasis on the negative instead of the positive.

It appears that the faculty has been extremely successful in convincing everyone (except resource allocators) of the gloom and doom in academic accounting. We often describe ourselves as a powerless group of teachers caught in a highly stressful environment in terms of excessive workloads, grossly inadequate salaries and, with great despair, poor prospects for career advancement.[14] In sum, with so many constraints and problems, we participate in a dying industry.

It is no wonder that young, ambitious and promising students do not wish to sacrifice four or five additional years of formal study, at high opportunity costs, high study costs, and high endurance risk, just to be like "professor accounting", the slave to the business world. Surely competent professors have mobility out of academia.[15] However, most accounting professors seem to be staying at the universities. The reasons why they remain, i.e. the positive characteristics of university teaching, should not remain undisclosed, but rather they should be identified and promoted to encourage recruits. I will have more to say about this later.

b) Coping beyond the call of duty, or inadvertently facilitating sub-standard instruction.

Deans are well aware of the accounting faculty's abilities to endure pressure. Despite chronic understaffing, we cope with expanding enrolments by agreeing to fill classrooms with part-time instructors or instructors with limited term contracts.[16] Apparently it is our duty to serve all students the whole array of courses needed for their programs, when they want them. Many deans thrive on full-time faculty members who save them full salary and benefits costs by bringing in temporary teaching assistance. Frequently, the career professors also oblige by carrying the part-time

instructors' administrative and research loads. Eventually deans begin to treat the career academics as interchangeable with part-time instructors and their economic goal becomes substitution of the former with the latter. After all, if the career academics can accept such strategy, and will even facilitate it by finding the part-time staff, why should deans deny themselves of the bargain part-time services? The more we cope in the "short-run", the more deans plan for part-time instructors in the long-run. Of course, some argue that they have introduced enrolment limits in many courses, and, therefore, cope only if there is a freeze on enrolments. But few of us refuse to cope at all by demanding course cutbacks or cancellations due to lack of qualified faculty.

How does this affect potential doctoral students? Too often, we request them to teach without the necessary formal education and training. This helps us to cope. It provides faculty recruits with teaching opportunities without having to enroll in doctorate programs. Isn't this dysfunctional for the long-run solution to the critical shortage of qualified instructors? Deans realize short-run cost savings; students receive instruction from bright young teachers who teach current practices because they have not completed their formal doctorate education; and, the career professors advance on the deans' coping index. When most parties receive measurable satisfaction it is often difficult to see that students and qualified instructors actually lose in the longer run.

c) Confusing credentials with qualifications

At this time, comments on the criteria used to define "qualified instructors" are appropriate. Professional accounting designations and academic degrees are credentials which represent formal study, training and experience. The nature of the subject matter should determine which credentials are necessary to deem the instructor qualified in terms of orientation and competence to teach the subject at hand. One can teach only

what one has learned.[17] If a teacher has not studied the research methodologies and underlying theories of accounting s(he) cannot bring this knowledge to university students. The body of knowledge presented by teachers with professional accounting designations usually will be more practice-oriented, consistent with the interests, training, and skills of the individual who has not undertaken doctorate study. When the accounting program is staffed more by part-time instructors with professional credentials than with full-time instructors with academic credentials, the curriculum will be suspiciously practice-oriented rather than legitimately academically-oriented.

On the other hand, it has usually been reasonable to assume that doctorates will ensure that the research and theory dimensions of academic programs will be satisfied.[18] Accordingly, only those who hold doctorate degrees are deemed to be qualified for career positions and those without doctorates are usually offered only part-time positions.

An interesting phenomenon has been developing during the last several years. Universities have been reserving all career positions for doctorates. However, accounting programs have been expanding consistently and instructors with professional accounting credentials have been appointed to staff the growth in these programs, in the short-run, until the doctorates arrive to fill the career positions. However, the doctorate graduates have not been arriving in any large numbers and this situation, which will be explained later, is not likely to improve for many years. Ironically, therefore, one obvious inference from this situation is that accounting programs have been, and will continue to be, staffed by unqualified instructors.

Coping is dysfunctional behaviour indeed. It is not surprising that when offered only "part-time" positions with very limited career advance-

ment opportunities, the unqualified instructors turn their interests outwardly to their accounting profession. In fact, they often spend their energies keeping abreast with current accounting practices rather than participating actively in the activities of the university community.

Of course program directors and deans do not always expect their part-time instructors to teach research methodology or accounting theory so they either specifically request them to teach the more practical aspects of accounting or they look the other way when these instructors re-orient courses, and perhaps even programs, from theory to practice. It is reasoned, therefore, that the students do not receive sub-standard instruction from unqualified instructors; they benefit by receiving practical, contemporary training from instructors who have professional credentials. In other words, the curriculum is often shaped to fit the orientation and credentials of the best instructors available until, alas, the professorial recruits, who are qualified with doctorates, arrive to upgrade the curriculum to academic respectability.

As reported earlier, Dr. Beechy found that only 97 out of 335 full-time instructors held doctorates and that an additional 300 part-time instructors served Canada's 61 accounting programs in 1978-79. This indicates that only 29% of the full-time faculty is really "qualified academically" according to the recently developed doctorate criterion. The residue apparently languish somewhere along the continuum away from qualified toward part-time and they are too often relegated to a "second class citizen" status in academe. This unfortunate classification is probably unwarranted, especially since the percentage of total full-time faculty holding doctorates was still only 61 per cent in 1978-79. Statistics Canada provides the following information:[19]

> The absolute number as well as the percentage of full-time teaching staff holding a doctoral degree in 1978-79 was higher than in any other year since the implementation of the survey. The proportion with doctoral degrees has increased to 61.0% from 41.7% 21 years earlier, and the pattern is the same in all fields. The highest proportion of teachers holding doctorates was in the field of Mathematics and Physical Sciences (85.0%), although, in absolute numbers, the Social Sciences and Humanities each had more teachers with doctorates. One must keep in mind that for some fields such as Accounting, Law, Fine and Applied Arts, professional degrees are more prevalent than doctorates. It is expected that the overall percentage of teachers with Ph.D.'s will increase as the number of qualified candidates available for university teaching jobs is greater than it has been in the past.

In accounting, the number of qualified candidates has not been increasing. We have already reviewed Professor Beechy's conservative estimate that we will need an additional supply of about 177 doctorates to attain academic respectability in both curricula design and the 60% doctorate standard. This is a totally unrealistic standard. It requires a virtual army of doctorates and, as reported earlier, there are only 12 students in Canadian doctorate accounting programs volunteering to serve. Table 1 showed that there were only 132 doctorates in all commerce disciplines in 1978-79. Moreover, we cannot rely upon American universities to alleviate our doctorate supply problem. A reliable estimate of the faculty vacancies in the U.S. for 1979-80 was 1,054, to be filled by 116 new doctorates and 50 "all but dissertations", leaving an indicated total of unfilled positions of 888.[20]

In summary, it is unrealistic for Canadian universities to apply an unattainable standard, i.e. reserving all new career positions for doctorates in a drive toward the 60% university-wide trend, yet deny that unqualified instructors are staffing the accounting classrooms indefinitely until North American doctorate programs can significantly increase total output.

An accounting faculty oriented to coping merely seeks to survive, whereas a faculty staffed by a majority of instructors, who realistically are deemed to be qualified, can develop ambitious, long-run programs.

Universities must change their staffing practices. There are at least three alternatives which can be taken alone or in combination:

1. Relax on the 60% doctorate goal, especially the recent practice of reserving all career positions for doctorates only.

2. Cut-back the scale of university accounting programs from massive student enrolment toward the scale more appropriate for the number of doctorates available.

3. Change program objectives from academic education to professional education and practice-oriented training.

Each of these suggestions has a major short-run impact on university accounting education. However, significant concessions must be made until Canadian doctorate programs are viable and can provide a meaningful number of doctorates annually to staff accounting programs. They will not be viable until there are sufficient numbers of doctorates available to teach in Canadian doctorate programs and, of course, sufficient numbers of doctorate students are attracted to study accounting at Canadian universities. In the long, intervening period until a reliable supply of doctorates becomes available, decisions must be made on important alternatives to the unsatisfactory employment practices that have evolved to cope with the chronic shortage of accounting instructors with academic qualifications. In the short-run, each of the three suggested alternatives would have significant implementation problems. For alternative one, there would have to be a plan to ensure that non-doctorates joining the full-time professorial ranks have academic orientation and that they receive some formal training in the development of both research and teaching skills. It would be appropriate

for the CAAA to offer summer workshops in these academic subjects (and perhaps even a diploma course).[21] A program to assist accounting faculty recruits could also be extended to attract existing faculty members. All faculty members, therefore, would have access to training programs designed to encourage and protect the academic content of the curriculum.

In the long run, of course, the alternatives suggested above will not solve the underfunding problem. Accordingly, we can anticipate that university administrators will tolerate the status quo, thereby electing "none of the above" suggested short-run alternatives. I will now return to the approach taken at the outset, our existing full-time accounting professoriat must determine initiatives which can be undertaken by ourselves to improve the supply of qualified accounting professors. A few action-oriented initiatives with modest expectations will at least move us toward reducing our major problems. One initiative will be to discontinue the dysfunctional behaviour which I will continue to list.

d) Divisiveness between Ph.D.'s and non-Ph.D.'s

At numerous universities faculty members without doctorates have risen to the senior ranks and they often have tenure. They achieved this progress in spite of the usual university promotion and tenure system, presumably on the basis of merit rather than credentials. However, perhaps an even greater number of non-Ph.D.'s have not been able to overcome their credentials deficiency and they have been relegated to lower status in the university community. Without the doctorate, they are usually deemed to be ineligible for senior ranks and administrative posts. As discussed earlier, they are now being considered to be part-time instructors, precluded from joining the career ranks in academe. In the majority of situations, therefore, and especially in recent years, the doctorates have

assumed control of accounting programs.

The 97 accounting professors in Canada who hold doctorates have career positions and they must assume responsibility for leadership of their respective faculties. They must not tolerate "second class citizenry" on their faculties.[22] As long as these leaders are willing to cope with programs operating at the scale wherein they are outnumbered more than 2:1 (238 to 97) they must eliminate the notion that there are "unqualified full-time faculty members" and they must take a position against deans who evaluate accounting professors mainly on their ability to cope. They must change their attitudes away from neutrality regarding promotion and tenure of non-Ph.D's to advocacy when merited. If there is not a unified, collegial accounting faculty, potential recruits will not be attracted to join their ranks.[23] Some of these 97 doctorates might even recognize the potential of professional schools of accounting for bringing unity to accounting faculties.

e) Poor counselling of potential doctorate students.

Student counselling is an inter-personal activity that is subject to many differences in opinion. However faculty advice can have considerable impact on student career decisions especially when graduate study is being contemplated. Because there has been very limited detailed data available on doctorate study programs, especially in Canada, I suspect that faculty members inadvertently given uninformed advice. Most Canadian accounting faculty members have not undertaken doctorate programs personally in the past. It is difficult to acquire current information on the major aspects of doctorate programs, including quality factors such as curricula, faculty, students and facilities, and the costs and risks associated with program completion.[24]

In addition to giving advice without sufficient current information on doctorate programs, I regret that many well-meaning instructors give students poor advice on when to commence graduate study. Too many potential students are advised to obtain a professional accounting designation before proceeding to graduate school. This advice often comes directly from the part-time instructors with professional accounting designations who staff the first and second year undergraduate courses. The design of numerous accounting programs channels students toward professional accounting careers and these students do not receive much exposure to the attractions of alternative careers.

It usually requires two or three years of intensive study following undergraduate study to obtain the professional accounting certification. Students with university teaching potential, therefore, usually lose interest when it would require an additional three or four years of academic study following the professional study before qualifying for a university career position. Finally, this potential teacher loses even more interest when his/her professional salary would be sacrificed, and substantial doctoral study costs would be incurred, upon enrolment in graduate school.

The dysfunctional behaviour issue arises when accounting faculties, continuing to cope with resource constraints, advise potential students to take a "short cut" to university teaching, i.e. to accept a part-time faculty position before proceeding to graduate school. In most cases, this potential teacher will never take the last and essential step of enrolling in a doctorate program because (s)he can teach at a university without making the sacrifices required to complete doctorate study. Unfortunately, they are destined to join the large contingent of "unqualified, but teaching" instructors.[25]

Professor Beechy reports that the proportion of full-time faculty who possess a doctorate has increased from 6% in 1965-66 to 29% in 1978-79; whereas the proportion holding professional certification has decreased from 96% to 80%. He also finds that 69% of the faculty who possess a doctorate also hold a professional designation. Without question, these faculty members have excellent qualifications. However, if the potential teacher is faced with a trade-off, he is well advised to proceed directly to doctorate study rather than professional study, because the academic degree is the critical qualification. Professor Beechy also reports that in a sample of 81 of the 97 doctorates teaching accounting, 16, or 20%, of them held doctorates in fields other than accounting and 7 of these 16 did not possess a professional accounting certification.[26] Students with strong teaching interests should proceed directly to doctorate study. Canadian accounting faculties must ensure that there are appropriate doctorate study programs available for students who accept this advice.

III. PROBLEM RESOLUTION

1. Identifying and disclosing the positive aspects of academic careers

Earlier in my paper I was critical of our tendency to over-publicize the doom and gloom of academic accounting. I must ensure that the remaining sections accentuate the positive aspects of Canadian careers in academe. The benefits and rewards will be identified and then initiatives for promoting these positive aspects to attract faculty recruits will be suggested. Finally, details of one specific initiative , an action plan to improve recruiting efforts, will be presented. In light of our crisis with the supply of accounting professors, however, my conclusions cannot be very positive,

but at least they will be constructive.

Quality recruits will not be attracted to academic careers if the negative aspects, the problems, sacrifices and stresses, completely blanket the positive aspects. Surely most career teachers believe that the rewards of academic life outweight the well publicized punishments. The chronic excess of demand over supply of accounting professors shows no sign of abatement and, therefore, the fully qualified doctorate will receive many rewards and benefits upon joining Canadian faculties. They will also enjoy privileges not necessarily available to their colleagues who do not possess the scarce doctorate credential. Despite university-wide policies on some of these benefits, there is considerable latitude for full-time faculty supported by large numbers of part-time faculty and most accounting recruits will be able to enjoy these positive aspects in the foreseeable future.

A useful classification for these positive aspects is who, what, when and where they teach, (and research) and the other attractions of academic careers.

a) Who they teach

Qualified professors can influence the limiting of enrolments to realistic levels. If academic standards are used as criteria for enrolment limits, the academic quality of students should continue to increase given the continuing strong demand for accounting courses discussed earlier. Instructors should, therefore, be pleased to teach bright and motivated undergraduate students and masters students, where applicable. In addition, recruits with doctorates will be expected to work with the doctorates already on faculty in developing and expanding

our fledgling doctorate programs. They will share both the responsibilities and privileges of teaching doctorate students and the whole accounting program can expect the benefits of quality teaching and research assistance from interested doctorate students.

Another benefit is the opportunity to teach service courses, extension courses, professional development courses, etc. whenever a change in students is desired.

b) What they teach

Qualified professors are responsible for developing the curriculum. They have little difficulty in taking their choice of subject matter. They seldom have to share the research and theory oriented courses with the part-time instructors and they can easily introduce new subject matter, including courses with multi-discipline, international or non-profit dimensions. Moreover, they do not have to share graduate teaching opportunities with part-time instructors.

c) How they teach

Qualified professors are receiving every encouragement from the CAAA, AAA, CAUT and other support groups to experiment with pedogogy. The technology is available. For the next decade, there will be existing new teaching materials and methods to attract ambitious and innovative instructors. They can elect to teach by any standard method such as lecture, seminar, case or programmed instruction. They can elect to teach alone or with a team, in person or via correspondence, video tape, film or T.V. They can use mechanical or electronic teaching aids. The literature is full of ideas and funding for experimentation is not difficult to obtain.

d) When they teach

It seems that qualified professors enjoy increasing latitude in developing all dimensions of their work schedule. This includes choice of teaching terms, teaching days, teaching times (day/night) and reduced teaching loads due to research or administrative overloads, preference on teaching overloads, either for additional remuneration or to shift workloads between terms. Moreover, doctorates can usually receive leaves for research or teaching visitations upon request. Few other university disciplines offer such flexibility, but remember that there are only about 100 doctorates teaching accounting. Certainly few other professions offer as much work schedule flexibility.

e) Where they teach

Demand for qualified professors is high in almost every area of Canada and the United States. Therefore, accounting doctorates enjoy considerable mobility. They generally have more opportunities for visiting appointments, for almost any length of term than their colleagues in other disciplines. Many other professions offer travel opportunities but the very nature of academic work and the concept of academic freedom seems to allow relatively easier assimilation into the work environment.

f) Other advantages of academic careers

Membership in a community of scholars was sufficiently attractive to employ 31,545 full-time instructors in Canada during 1978-79 as indicated in Table 2. Many teaching recruits would enjoy true academic life where continuous development and application of the intellect are encouraged. Of course, I am refering here to a rather normative academic

community and I have already pointed out that full membership in such a community will be precluded as long as accounting faculties continue to cope with sub-standard staffing practices.

However, accounting professors with doctorates will be scarce for an indefinite period and upon joining the faculty they should expect the benefits listed above. I must emphasize that these benefits are interrelated with research benefits. With quality students, academic freedoms with pedagogy, flexible teaching schedules and workplace mobility, interested faculty should have excellent opportunities for undertaking research. This assumes, of course, that accounting faculties will not continue to cope with abnormal administrative and teaching workloads.

Obviously academic accounting careers offer attractive job security. The campus community also offers several fringe benefits in connection with social, cultural, athletic and health interests.

To sum up, the advantages of teaching careers seem to be more than competitive with many career alternatives.

g) Economic rewards

I cannot provide much positive evidence about salaries in the advantages section of this paper. The inadequacy of faculty salaries across Canada is well publicized[28]. A great deal of collaborating evidence seems to be available. The annual surveys of income and benefits of various professional accounting organizations usually indicate that members employed in government and education receive income and benefits substantially lower than members in public practice and industry. This helps explain why faculty recruiters cannot hire professional accountants even when the doctorate standard is set aside. However, a few observations are in order. Notwithstanding

the disturbing circumstantial evidence that accounting faculty salaries fall well below salaries in similar professions, the comparison is inappropriate for several reasons. First we simply do not have a reliable data base[29] on Canadian accounting faculty salaries and comparisons of estimates may be misleading. Second, we should not attempt to compare university salaries with salaries in industry or public accounting.[30] Given that the candidate wishes to teach at a university, a more relevant comparison would be to determine how university accounting salaries compare with salaries in other university disciplines.

Unfortunately, it has been traditional that teachers pursue academic careers mainly for non-economic reasons. As of October 1978, the total of 31,545 full-time teachers at Canadian universities indicates that, at least for the present, large numbers of professionals were willing to tolerate this apparent tradition. Professor Beechy's findings indicate that at least 335 accounting faculty members would be included in the 31,545 total.

Statistics Canada and various regional associations of professors[31] have reliable statistics on faculty salaries. Unfortunately, however, details on accounting salaries are not disclosed and, notwithstanding my reluctance to compare estimates, a few references will have to be made in order to compare accounting faculty salaries with those of other disciplines.

Analysis of Table 2 indicates that the 335 member accounting faculty represents about 23% of the total 1,451 members in faculties of

commerce and business administration. However, the accounting faculty has only about 1% of the aggregate 31, 545 member faculty. Within these limitations, perhaps the only reasonable inference that can be made from the data in Tables 2 and 3 is that despite the lower proportion

TABLE 2

SALARIES* BY RANK AND DISCIPLINE[32]

1978-79

ALL RANKS	FULL	ASSOCIATE	ASSISTANT	OTHER	TOTAL
NUMBER	27% 8,551	37% 11,754	25% 7,776	11% 3,464	100% 31,545
MEDIAN SALARIES	$39,100	$29,550	$23,300	N/A	$29,400
SOCIAL SCIENCE AND RELATED					
NUMBER	24% 1,831	37% 2,833	28% 2,130	11% 840	100% 7,634
MEDIAN SALARIES	$39,300	$29,350	$23,200	N/A	$28,400
COMMERCE, BUS. ADMIN.					
NUMBER	19% 275	31% 458	30% 433	20% 285	1,451
MEDIAN SALARIES	$39,900	$31,150	$24,100	N/A	$28,850

N/A: NOT AVAILABLE

* For Tables 2 and 3, the annual rate of salary as of October 1, 1978, including payment for administrative functions and other types of honoraria but excluding fringe benefits, overtime pay, compensation for extension courses, etc.

of doctorates and generally lower ranks, the commerce and business administration faculties, including accountants, appear to have salaries comparable with salaries in other disciplines. In fact, the commerce and business faculty receives generally higher median salaries in the doctorate category and at the full and associate professor ranks than salaries received by colleagues in many other disciplines. Although the overall median salaries are not competitive with salaries in the industry and public

TABLE 3

SALARIES* BY HIGHEST DEGREE EARNED[33]

	DOCTORATE	MASTERS	PROFESSIONAL	BACHELOR	OTHER	TOTAL
ALL DISCIPLINES						
NUMBER	61% 19,374	25% 7,717	6% 1,824	6% 1,985	2% 645	100% 31,545
MEDIAN SALARIES	$30,550	$26,450	$33,775	$26,050	$25,800	$29,400
SOCIAL SCIENCE AND RELATED						
NUMBER	62% 4,740	30% 2,280	52	6% 487	1% 75	100% 7,634
MEDIAN SALARIES	$29,700	$25,825	$29,125	$26,850	$22,400	$28,400
COMMERCE AND BUS. ADMIN.						
NUMBER	43% 628	45% 646	1	10% 146	2% 30	100% 1,451
MEDIAN SALARIES	$31,625	$26,925	N/A	$25,225	$23,025	$28,850

N/A: NOT AVAILABLE

accounting sectors, there is no indication in the limited data available that accounting instructors receive unfavourable salaries within academe. With regards to accounting instructors with doctorates, it is probable that they can expect above average initial salaries and perhaps even accelerated progress through the ranks due to market considerations.

With expanding enrolments the accounting faculty probably has more opportunity to earn salary supplements for teaching overloads compared to colleagues in other disciplines.

Furthermore, accounting faculties enjoy expanding opportunities to earn income away from campus including consulting in industry, government and professional accounting organizations. Several professional accounting organizations have expanding educational programs which have part-time teaching and research opportunities for accounting instructors, especially the 80% proportion reported by Professor Beechy to possess professional accounting designations.

In summary, university accounting careers have numerous attractions which should be disclosed. These career attractions include:

- satisfaction in working with an improving quality of students, including the promise of having doctorate students, where applicable;
- freedom to design the curriculum including expansion to new subject areas;
- encouragement to experiment with curriculum, design and teaching methods and materials;
- flexibility with teaching and research scheduling and mobility for teaching location;
- participation in scholarly activities with stimulating colleagues in the university community with computers, libraries and other resources available to support research;
- opportunities to engage in contract research;

- opportunities to supplement university salaries whenever desired;

- participation in cultural, athletic and health facilities on campus.

2. Initiative for alleviating the critical shortage of accounting professors

Since the beginning of this paper I have been arguing that our professoriat must take initiatives on academic matters that are reasonably within our control. A determined program of self-improvement will provide impetus for the collective effort that will be required eventually to bring any long-run solutions to our staffing problems.

In the foreseeable future there will be a critical shortage of doctorates and until we enhance the attractiveness of academic careers there can be no improvement in this deplorable situation.

The initiatives which we can undertake to attract recruits, with or without doctorates, include:

a) co-operating to reduce the dysfunctional behavior outlined earlier.

b) identifying and continuing to develop all positive aspects of academic careers and promoting the advantages to potential teachers.

c) supporting the development of doctorate programs at Canadian universities and encouraging students to enrol. This assumes, of course, that with increased demand, our doctorate programs will florish and perhaps even new programs will be introduced as long as high academic standards can prevail.

d) improving university practices in developing and training faculty, with or without doctorates, thereby enhancing opportunities for academic career advancement. For example, there must be programs to help instructors without doctorates to upgrade their research skills and their appreciation of the theoretical dimensions of accounting study. We should have a program to assist new doctorates, and non-doctorates if applicable, in teaching our doctorate programs. Regardless of the form

of these initiatives, they could help to attract new faculty and retain existing faculty.

e) developing reliable data bases to assist analysis of accounting education in Canada. For example, empirical data is essential for the development of position papers such as a lobby to correct underfunding.

f) improving our recruiting practices. The spectrum of countless Canadian universities competing directly for a handful of doctorates annually is ridiculously inefficient and ineffective.[34] A detailed proposal for an initiative to improve our approach to the employment market follows.

3. A detailed action plan for effective faculty recruitment

The CAAA should initiate a national program to improve both the efficiency and the effectiveness of university efforts to attract accounting instructors. A CAAA committee should be established to administer this program.

a) A specific application--the recruiting brokerage

The CAAA committee could act as a broker for university administrators and persons interested in pursuing academic careers. One of the committee's first activities should be to build a data base for recruiting.

b) Develop the central data base

The data base for the recruiting program should include at least the following:

i) a standard description of each of the 61 undergraduate and graduate programs plus the Master of Science in Accounting programs at the University of British Columbia and the University of Saskatchewan, and the doctorate programs at UBC, The University of Western Ontario, and in Montreal (four universities jointly), which were all identified in Professor Beechy's study. Details would include information on courses, faculty members, costs and financial assistance, and the numbers, backgrounds and career destinations of students.

ii) a standard curriculum vitae for each faculty member listed in each program (of course this would be collected only with consent).

iii) a standard list of all teaching and/or research positions available with pertinent details.

iv) a "non-resident's kit" providing details on Canadian regions, immigration, income tax rates and conventions, cost of living, health care and other important matters of interest to non-residents.

v) an "acclimatization kit" on the major environmental factors in Canadian accounting, to indicate the orientation and perhaps the training that would be required for newcomers. Selected information would include corporate and tax law references, a brief on our economic and financial systems, an introduction to GAAP in Canada, and a listing of our important accounting literature.

vi) a "standard information kit"[35] about each campus and its local and provincial communities. Information could include: university policies, program brochures, employment opportunities for family, housing details, schooling availability including costs (and notice of free university tuition for family if applicable), local maps, features of climate, an overview of the professional accounting and business communities, and other useful information for employment decisions.

vii) a list of the sources of financial assistance available from major Canadian sources such as the CAAA, governments, universities, professional accounting firms and other professional accounting organizations, and industry. It is encouraging to note the recent expansion in the sources available. Details on these sources would include eligibility, terms of agreement, and application procedures.

c) Managing the data base and implementation considerations

The CAAA would require a staff to manage the data base and administer the brokerage. The participating universities would agree on matters of content, control over storage and access, and cost. For example, content could be broken down into regions and costs could be shared initially by a levy and then in accordance with user fees. If each program contributed an average of $1,000 at the outset, there

would be up to $66,000 available to staff the project and build the data base. Control considerations could be complex but the development and implementation of effective policies and procedures would not be insurmountable.

d) Dissemination of the data.

The CAAA could promote academic careers periodically at the annual meetings of the CAAA, AAA and professional accounting organizations. A recruiting presentation could be made regionally by a consortium of universities and the CAAA staff could help administer effective interview sessions on a shared cost basis.

Furthermore, a host of user charges for information outputs requested by university administrators, potential teachers or students, and other authorized users could be initiated to defray operation costs.

e) Benefits extended to other initiatives.

This specific self-help initiative requires commitment, determination and co-operation. In the past, both the request for full co-operation and the anticipation of shared trust in a major data base probably would have been discouraged by professional jealousy, inertia and indecision. Recently, however, Professor Beechy managed to obtain good co-operation from academic colleagues when he took the first step in building a current data base.

In addition to the primary purpose to recruit faculty, the data base could be used to facilitate other CAAA projects, including:

i) developing a study on accounting faculty salaries in relation to the market, workloads and other important factors.

ii) facilitating a forum for determining the need for professional schools of accounting and for evaluating alternative model school proposals.[36]

iii) determining the need for accreditation of Canadian university accounting programs.[37]

iv) developing accurate projections on undergraduate and graduate accounting enrolments and determining the implications for curricula and staffing. This could lead to the development of new criteria for the appointment, promotion, and tenure of accounting faculty.

v) encouraging shared teaching and research via faculty exchanges, student exchanges and exchanges with professional accountants and government officials.[38]

vi) determining the validity of the current practices by most Canadian graduate schools and professional accounting programs of using American aptitude tests, such as the Princeton tests and the AICPA's "American College Testing Program".

IV. CONCLUSIONS

I continue to be extremely concerned about the critical shortage of career teachers in Canadian university accounting programs. The underlying cause for this crisis which has been developing for about twenty years is the chronic underfunding of the universities by our governments across Canada. We will agree that no significant improvement in the supply of qualified professors can be achieved without substantial increases in government funding. However, that needed correction has been elusive despite widespread calls for action by all interested parties. We need to break this crisis down, therefore, and act where we can on the lesser elements than government underfunding.

At least we can attempt to reduce the crisis at the faculty level where, due to continuously expanding enrolments, we have a measure of control. We can discourage our deans if they attempt to mis-allocate funds from accounting programs to other programs. These practices have caused the "too few teaching too little to too many" syndrome which we must eliminate.

First I listed several types of our dysfunctional behaviour and urged my colleagues to take initiatives to eliminate the syndrome. Several initiatives

were suggested, including ways to replace our dysfunctional behavior and making a determined effort to identify the positive aspects of academic accounting careers and then promote them to attract students who are planning careers. If we attract the interest needed, these students will require a sufficient choice of doctorate accounting programs in Canada. A large increase in demand might finally result in some increases in the funding of our underdeveloped doctorate programs.

Some of the initiatives listed will help to alleviate our professorial supply problem during the long waiting period until we realize a measurable number of graduates from our doctorate programs. I presented a detailed initiative for the short-run; an action plan to improve our faculty recruiting practices. This plan should have impact on all university accounting instructors, including all current faculty, doctorates from outside Canada and potential teachers who are planning careers. This plan cannot be a panacea for the underfunding problem but it can bring encouraging results, especially since the suggested application can be extended easily and added benefits can be expected. Of course, if my proposal for a "recruiting brokerage" is unacceptable, I encourage you to develop better initiatives. We must have viable initiatives.

There has been a sense of urgency in my paper. We need immediate action to follow the impetus provided recently by Professor Beechy's study for our Association. We cannot allow another decade to lapse before we take another major step to alleviate our crisis. This, of course requires commitment and full co-operation from each of us.

I leave you with a major observation. In my opinion, an important matter that has not changed since 1967 is the apparent lack of relevancy of

an academic accounting association. I pointed out earlier that at the first Canadian Region (AAA) meeting my audience numbered only several dozen but that the professors greatly outnumbered attending members who were not career academics. Our CAAA membership list as of November 30, 1980 indicates that we have 534 members with about 204 university or college addresses, including about 167 university addresses. Even allowing for errors in counting, addressing and assuming identity via addresses, these numbers clearly indicate that the majority of the 335 full-time and 300 part-time university accounting instructors identified by Professor Beechy have not yet found the CAAA sufficiently relevant to become members.

Incidentally, I also pointed out at the beginning of this paper that the Canadian Region (AAA) did not fulfill its promise. Well, unless the accounting faculties in Canada can see that the CAAA is providing something not already available from their other academic groups, the CAUT, OCUFA, AAA, etc., and their professional accounting organizations, they are not likely to become members. Quite frankly, if more faculty members do not join, the Canadian Academic Accounting Association will be a misnomer.

Nevertheless, if we take the initiatives suggested in this paper we will work together toward solving our crisis with university accounting instructors. Action and results will make the CAAA relevant.

Footnotes

1. John R. E. Parker, A Study of Accountancy Education in Canadian Colleges and Universities, Unpublished MBA Thesis, University of Washington, Seattle, 1959.

2. Statistics Canada (41), pp. 18-19; 32-33.

3. Data has not been complete and there is difficulty in making comparisons. For example, Professor Beechy (6) examined data similar to that presented in Table 1, added additional data, and extended the analysis. He concluded that: "Using these rough estimates of accounting majors, it appears that the proportion of business/commerce/management undergraduates who are majoring in accounting has gone from about 14% to 33%. In absolute terms, accounting students have increased almost seven-fold in thirteen years. During the same period, the number of full-time Faculty has increased from 68 to 335, an almost five-fold increase. The disparity between the increase in students and the increase in faculty is reflected in the increased reliance on part-time faculty." (p. 59).

4. The Canadian Federation of Deans of Management and Administrative Studies is actively seeking to resolve major problems in funding accounting programs. The CAAA's Education Committee has recently expanded all activities, including its educational program outlined in the pre-conference pamphlet which contains papers written by committee members. Since introducing its university degree requirement, the Canadian Institute of Chartered Accountants (CICA) has shown an increasing interest in university accounting education. Considerable interest was demonstrated by both academics and professional accountants at the CICA Symposium (9) in 1979.

5. Thomas H. Beechy (6).

6. Ibid., p. 64.

7. Ibid., pp. 68-69.

8. Ultimately career academics must solve their own academic problems. Accordingly, we must resist our tendency to rely upon other interested parties, particularly professional accounting organizations, for leadership. There is good recent precedence. In only two years, Professor L. S. Rosen (36) issued his "grim report card"; Professor Daniel McDonald (29) challenged the CAAA to assemble a "factual data base" and Professor Thomas Beechy (6) delivered a wealth of data. Initiatives taken by academics can be effective.

9. There is collaborating evidence that the demand for accounting graduates will remain strong for the next several years. Accordingly, student enrolments in accounting courses will probably continue to increase through the 1980's. See R. Anderson (3), E. Harvey and K. Murthy (18), J. MacNeill and M. McInnes (28) and Statistics Canada (38).

10. Thomas Beechy (6), p. ii.

11. See Irvine Millie (32) for a recent expression of concern.

12. Some deans might feel even more tempted to allocate funds unfairly from accounting programs in the face of the "University Management Education and Research: A Developing Crisis", see Consultative Group (11). Several accounting faculties have been promoting professional schools of accountancy as a potential solution to chronic underfunding. See F. Rayburn and E. Bonfield (35) and J. Spiceland et al. (37) for American viewpoints on this alternative. The Institute of Chartered Accountants of British Columbia introduced a private professional school in 1980 and several Canadian universities are investigating professional schools not only for financial reasons but also for academic reasons. There is widespread interest but, to date, Canadian literature on this subject is rather sparse.

13. Thomas Beechy (6), Appendix D.

14. Professor John Parker (34) "tells it as it is" on the negative side but one suspects that he did not intend to develop any positive side.

15. We still have a data gap on the numbers of accounting professors who leave the universities annually and their reasons.

16. For purposes of this paper, the term part-time instructor includes any faculty position which is not a career or "tenure track" position, regardless of workload, rank or length of contract term. In the academic community, even continuously renewed limited term contracts are considered temporary or "part-time".

17. See John Brennan (8), especially p. 16 for development of this posture in the context of university accounting education.

18. James Edwards, et al (14) found, however, that 83% of responding departmental administrators felt that teaching skills received inadequate attention in doctoral programs.

19. Statistics Canada (39), p. 10, emphasis added.

20. Arthur Mehl and Lucille Lammers (30), p. 610. The authors also report (31), p. 3, that the indicated unfilled positions will be 712 for 1981-82 and 698 for 1980-81.

21. For an interesting analysis of the respective roles of professional accountants and academic accountants in preparing students to pursue research, see Robert Crandall (12). Some of his suggestions might be appropriate for these workshops.

22. See Joe Bolla, "An Inside View of University Teaching", CA magazine (September 1978), pp. 63-66 for testimony that this status exists.

23. Thomas Kida and Ronald Mannino (23), p. 493, found that in ranking 30 job selection variables, "compatibility with other faculty and criteria used for promotion and tenure were the top two choices of doctoral students"; base salary was ranked sixth.

24. For a condensed overview of Canada's three doctoral programs see Thomas Beechy (6), Appendix D. Good examples of the types of information that should be available to potential students are W. Andrews and P. McKenzie (4), J. Bennett (7), W. Crum (13) and J. Edwards, et al (14). Note, however, that it is difficult to keep this widespread information on American universities up to date.

25. Of course, completion of a masters degree program either before or after the professional accounting program is usually required for faculty positions, but in accordance with current standards, the result for anyone with credentials below the doctorate still will be the non-tenure track, or non-career, teaching position.

26. Thomas Beechy (6), p. 59, p. ii and p. 78. Note that his definition of full-time faculty does not necessarily agree with the definition that I have been developing for purposes of this paper.

27. See J. Amernic and R. Enns (2), R. Anderson (3), T. Beechy (6), J. Brennan (8), Collected Abstracts (10), Forum (15), D.B. Hope (22), W. Holder (21), R. Long (27) and The Accounting Review (quarterly).

28. The deterioration of academic salary levels, especially in relation to the increasing inflation rate, is a national problem that unfortunately is the underlying cause for the accelerating movement toward unionization of university faculties across Canada.

29. Lucille Lammers (24) provides an excellent example of the nature of data available on American accounting faculty salaries.

30. See Clifford Brown, Eugene Geiser and John Tedford, "A Note on Accounting Faculty Salaries", The Journal of Accountancy (February 1979), pp. 72-74 for disturbing reflections on "....how high can the opportunity costs climb and real beginning salaries fall before individuals otherwise considering academic careers will elect practice over an academic career?" (p. 73).

31. The Ontario Confederation of University Faculty Associations (OCUFA) has an impressive data base on salaries and economic benefits, by university, etc. See Forum (15).

32. Statistics Canada (40), Table 16, pp. 56-63.

33. Ibid., Table 19, pp. 68-71.

34. Each year dozens of Canadians descend upon the AAA's annual conference hoping to attract at least a few graduates from American universities. There are scores of advertisements in CAUT publications and professional accounting journals. Most efforts are in vain; there are very few net additions annually to the group of doctorates teaching in Canada.

35. Inputs could come from university calendars, CAUT (25), OCUFA (15), etc., governments and community agencies. The University of Waterloo publishes a tabloid which could be a model starting point. Its Policies and Committees contains the text of all of the university's major policies. Information on the university's programs to assist instructors and develop their careers could also be provided. For example, the University of Waterloo Teaching Resources Office's Program of Instructional Development and Distinguished Teacher Awards.

36. In addition to information provided in footnote 12, at least one Canadian university, the University of Waterloo, has developed a formal proposal to introduce a professional school in the near future.

37. Accreditation of university accounting programs has existed for decades in the U.S. and a major new program involving the AAA and the AICPA is currently under study. Although we appear to be a long way from accreditation in Canada, we could consider applying our proposed data base to the AAA model, see (1). For a brief indication of how we might benefit from accreditation see Jerome Bennett's (7) analysis involving accredited programs.

38. The Government of Canada has an active Executive Interchange Program, for example, I have been spending my sabbatical year with the Office of the Auditor General. The CAAA could act as a clearing house to facilitate several more university and government exchanges in the future. See also V. Bean and W. Mister (5) for a report on "A Partner in Residence Programs".

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ACCOUNTING AS AN ACADEMIC DISCIPLINE

George J. Murphy

Résumé

La formation comptable à l'université se caractérise par le rôle de second plan attribué aux "nouvelles connaissances" et à la trop grande importance accordée aux "connaissances actuelles". Sans une solide base de nouvelles connaissances, les praticiens de demain (c.-à-d. les étudiants d'aujourd'hui) risquent d'être insuffisamment préparés à résoudre les problèmes auxquels ils devront faire face. C'est dans cette perspective que l'auteur formule ses recommandations ayant trait à la formation comptable et aux relations entre les milieux de la recherche et de la pratique.

ACCOUNTING AS AN ACADEMIC DISCIPLINE

George J. Murphy*

This paper is concerned with what the expectations of an academic discipline at a university are, a description of how the discipline of accounting is handled at the university level, and some concluding comments suggesting that the accounting discipline should pay greater attention to the traditional university model.

Expectations of an Academic Discipline

The usual expectation of the handling of an academic discipline at the university level is that existing knowledge is not only passed on, but added to. It is expected that the current state of the discipline will be described but there is also the expectation that the university will provide the institutional arrangements whereby its faculty members will be encouraged in their efforts to move the discipline forward - to provide new knowledge. This new knowledge may take the form of new models and concepts, new empirical findings or simply a reorganizing or reinterpretation of existing models and existing empirical findings. Moreover this new knowledge, particularly for a social science, is traditionally placed in the context of the discipline's historical evolution so that the relationship between the discipline and the society from which it proceeds can be understood. The new knowledge and its history should then find its way into the

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*The author wishes to acknowledge the helpful comments of his colleagues on the CAAA Education Committee and of Professor W. D. Lindsay.

discipline's standard curriculum. It may not infrequently happen, particularly at points of transition, that the validity or generality of new knowledge may be contested. There still remains the expectation that the curriculum should expose the student to contending concepts, theories and findings. A student will be ill-equipped for the future if unaware of new knowledge and of the past and present conditions from which it evolved.

It is sometimes argued that the "usefulness" or "pragmatics" of a discipline, such as accounting, distinguish it from many other university-taught disciplines. This may not be a fruitful distinction since there is the expectation that all university disciplines - from aesthetic and philosophic to commercial - have useful and practical ends. The argument may indeed be put forward to absolve the discipline from the general university obligation to add to knowledge in the mistaken belief that the accounting profession does not need the traditional intellectual and academic university approach. Accounting as a university discipline however, is not unique in its close association with a profession nor is the difference one of kind rather than degree when we look for a professional counterpart for the disciplines of English, History or Economics. The closeness of counterpart professional activity may enlarge some of the university discipline's concerns but it does not reduce or alter the merit of the traditional university approach to that discipline. Indeed the approach that is expected of a university discipline when combined with the closeness of a counterpart profession should provide a tension that ensures that the discipline is addressing itself to problems which the profession will eventually encounter. What better single testimony to

its usefulness and its academic expectations!

A Description of Existing Accounting Pedagogy

While there will be differences in emphasis from one university to another, it is suggested that the description of the teaching of accounting that follows has some general validity. Comments are directed particularly toward the field of financial accounting.

Accounting has arduously developed over the last five centuries an extremely elegant (though incomplete!) method of recording, summarizing and portraying the financial activities of an enterprise. The symmetry and sophistication of the double-entry system, involving as it does the articulation of nominal and real accounts layered over with the accrual concept and culminating in financial statements that enable a relationship of income and wealth to be drawn, is a considerable achievement. Moreover, this double-entry model has been sufficiently general to accommodate and reflect every complex and unusual transaction that an enterprise can undertake. As a consequence of the sophistication of the double-entry system and the enormous complexity of enterprise transactions, the language of accounting has become very complicated. It is a language which, if all of its aspects are to be exposed, takes years to learn and indeed it is towards learning that language (the double-entry concept, the accounting cycle, the accrual concept, income statement, balance sheets, cash and funds flows, consolidations and particularly the enormous variety and complexity of an ever-changing GAAP) that virtually all of the financial accounting courses are directed. It is little wonder then, when so totally absorbed, that it is possible for an accounting major to be anything

more than technically skilled at applying a set of existing rules and therefore quite unmindful not only of the past which gave rise to those rules but also of the behavioural/economic consequences which these rules may have.

The present state of accounting theorizing and empirical research is of very recent vintage and its scientific record cannot yet be described as impressive. In the last twenty years, however, considerable and not unsuccessful effort has been devoted towards providing a background for accounting from such fields as economics, finance, communications, and systems as well as from information, decision and measurement theories. The student seems to be rarely exposed to this new knowledge. Sterling's (1973) suggestion that we teach existing accounting practices and that as a consequence the results of research can have little influence on students or practice remains valid.

If the suggestion that little attention is paid to new knowledge seems unfair, consider some of the evidence. Do the textbooks we use tend to go beyond GAAP? Did we teach general price level and current value accounting five years ago? Two years ago? Is mastery of the CICA Handbook a goal of the program? How systematically critical are we of GAAP? Do our students go on for graduate work? Would any other discipline have virtually ignored in its student curriculum, for almost twenty years, material that has been so pervasively influential in its own academic thought as Edwards's and Bell's work? Are the few classes that are offered at the graduate level truly graduate classes or are they substitutes for undergraduate classes largely designed for professional acceptance? Is it at all likely that our students have

sufficient new knowledge to influence the profession once they are established in their career? Why is it that professional practitioners acting as sessional lecturers seem so completely substitutable in the teaching of most of our courses?

Some Recommendations

A comparison of expectations and accomplishments suggests that our university accounting programs have paid insufficient attention to new knowledge. As a consequence new members of the profession are ill-equipped to respond to the demands that are being and will be placed on the profession. To have pragmatic and useful ends and to serve a profession are not unworthy goals of an academic discipline. However we are not likely performing that task well without a strong emphasis on and positive attitude towards new knowledge. In an attempt to redirect our emphasis the following suggestions are offered.

1. Consider teaching new knowledge throughout all accounting courses and particularly at the introductory level. Texts are beginning to appear that would accommodate this treatment. It may well be that this suggestion will be complementary to Crandall's (1980) recommendations that students who are intellectually stimulated in the early courses may later pursue a career in research. Our shortage of academics may indeed stem from our failure to provide examples of a thorough-going academic approach!
2. Consider devoting at least modest attention in our courses to placing our present state of development in an historical context. We cannot appreciate the present without being aware

of the past and if we are interested in "change" and the circumstances that give rise to "change," our evidence is necessarily historical.

3. Consider reducing the emphasis that is currently placed on all the minutiae of accrual accounting and "legal accounting" (Zeff, 1979) that is so characteristic of many financial accounting courses. Do students really need to be drilled in the entries relating to forfeited shares or the amortizing (often incorrectly based!) of bond discount or premium? Must every possible transaction be gone over and examined in detail? Is there not a great deal of the handling of this minutiae which can be viewed as a simple extension of the accrual concept to be aided if necessary in later professional practice by reference to an accounting handbook? Should we not expect that some of the language of accounting could be picked up during professional work experience? And what of the emphasis on "legal accounting?" Must all the ever-changing and often short-lived recommendations of the CICA, FASB and SEC be taught? Is it not obvious what has been given up on our concentration on minutiae and "legal accounting?"
4. Support and encourage graduate education (this is to be distinguished from, but not to disparage, the undergraduate level work that is often undertaken at the graduate level in MBA programs). It is truly remarkable how little attention is paid to graduate accounting education in Canada. Accounting is enormously rich in its academic potential - but very few university resources are devoted towards developing this

potential at the graduate level. Leadership in other professions is frequently accompanied (influenced) by graduate credentials. The world of professional accounting practice is virtually bereft of this traditional enhancement.

5. Consider that it is the university that has the comparative advantage at developing and disseminating new knowledge and therefore it may well be that professionally organized activity must somehow take up whatever slack that may exist in the transmission of existing knowledge.

6. Inform the profession that it is appropriate to modify the current emphasis of university accounting instruction. Remind the profession that in serving immediate needs by over-emphasizing existing knowledge, the university may be foregoing its obligation to equip the profession to handle future problems.

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CAAA 1981 Conference

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A SIMULATION ANALYSIS OF THE EFFECT OF COST VARIATIONS ON INVESTIGATION DECISIONS

When controlling the operation of a production process, a manager will likely find that the actual cost incurred deviates from the expected cost (or standard production cost if a standard cost system is used). The cost deviation could be the result of random fluctuations in the process which requires no action on the part of the manager or alternatively, it could be a signal that the production process is not operating as designed. The manager's task in this situation is to decide whether to investigate the production process.

The manager could subjectively (based on past experience) decide when to investigate, or he could develop a decision rule to standardize the decision making process. A number of decision rules have been suggested for use when a manager is controlling a process that involves continuous (or at least repetitive) production of similar items. These rules include:

i) investigate all unfavourable deviations (regardless of size)

ii) investigate all deviations that exceed a predetermined size (frequently called a control chart approach) where size could be specified in dollars, percentage of expected cost, or standard deviations from the mean cost

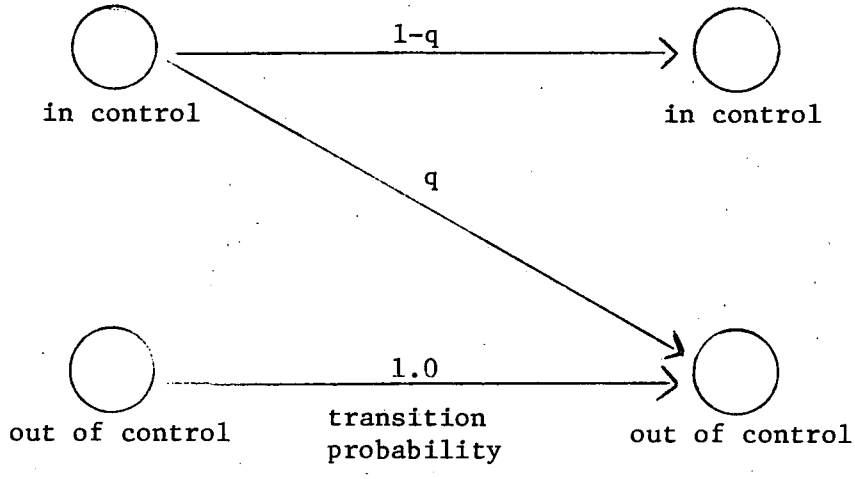
iii) investigate all deviations for which the expected benefit of investigating is greater than the expected cost. This decision rule considers the probability of the deviation being the result of an identifiable cause, the costs of investigating or not investigating and employs the basic concepts of statistical decision theory.

The expected cost decision rule is recommended in many textbooks and articles (Horngren, p. 849; Bierman and Dyckman, ch. 22; Dyckman, p. 218) since it considers the costs and benefits of each action. Magee compared the expected cost decision model to the other models and found that the model was superior to simpler rules that ignored investigation costs, (Magee, p. 537).

The Decision Model

The model assumes that the production process can be operating in one of two mutually exclusive states : in control or out of control. Over time, the process may change from one state to the other. The basic decision model assumes that there is some probability "q" that the production

process will shift from in control to out of control during a time period. The model also assumes that once in the out-of-control state, the process remains out of control until corrected.



The decision model assumes that each period, the manager may respond to a cost deviation by either investigating or not investigating the production process. The manager will consider the cost of each action in making a decision. There are three costs : C, the cost of conducting an investigation; M, the cost of correction (i.e. returning an out-of-control process to in control); and L, the present value of savings obtainable from investigation and correction when the activity is out of control. At the end of each time period, the manager observes the cost incurred in the process and subjectively determines the probability of being in each state. Using these probabilities and three costs, the manager calculates the expected cost of each action and chooses the action with lower cost.

Intent of Research

The decision model requires the manager to estimate the values of C, M, L and the probability of being in each state. Our research examines the sensitivity of the model to errors made in the estimates of these variables. It is important to consider the sensitivity of the decision rule as it will influence the usefulness of the rule. For example, if the model is shown to be sensitive to errors in the estimates, then the model should not be used when the manager is very uncertain about the true values of the variables.

Past experience can be used as an aid in estimating the values of C and M. (In a real process, there will be a range of possible costs for both C and M; we have treated C and M as constants representing the means of the distributions.)

The value of L will be more difficult to estimate as it is a function of future investigation decisions. Dynamic programming has been suggested as the appropriate method to determine L as it considers future events (Kaplan, p. 35). Magee suggested a simpler method to calculate L using the expected costs in each state and the expected time until the process goes out of control (Magee, p. 533). He has shown that use of this formula leads to only a minor increase in total costs in comparison to the more complex dynamic programming procedure.

The probability of being in a state at the end of the time period can be estimated by considering the probability of a transition taking place during the period and the state probabilities at the start of the period. This probability can be revised to take into consideration the observed cost of the production process by using Bayes Theorem. When using this revision technique to determine the probability of being in a state, the manager is forced to estimate "q".

Our research concentrated on the sensitivity of the model to errors in the estimates of C, M, and q. (With the use of Magee's formula, a value can be calculated for L.)

Method of Testing

A computer simulation was used to test the sensitivity of the model. The operation of a production process was simulated over a year with monthly state transitions, cost observations and investigation decisions. We also simulated semi-monthly and weekly time periods (within the year time frame) to ensure that results were consistent over longer time periods.

The state of the production process was determined at the beginning of each month using a random number generator and the transition probability. When the production process was in control, the monthly cost observation were drawn from a normal distribution with mean μ_1 and standard deviation σ_1. Similarly, when the process was out of control, cost observations were drawn from a normal distribution with mean μ_2 and standard deviation σ_2. During our research, we varied the amount of the overlap of the two distributions by varying the standard deviations to determine the impact on the model and its sensitivity. Increasing the overlap has the effect of making it more difficult to identify the state.

A set of base (actual) values for C, M and q were selected, the estimates for each variable set equal to the actual value and then the production process was simulated over a year. For each month, the state was determined and a cost generated. The state probabilities were then calculated and an investigation decision made using the estimates of C, M and q. The operating cost was recorded along with the cost of investigation and correction if applicable. The simulation was performed for 200 one-year (12 month) time periods and then the average yearly operating cost and total cost were determined. The computer simulation was repeated allowing the estimates of C, M and q to vary individually by $\pm$10%, $\pm$20%, $\pm$30%, and $\pm$40%

of the actual value to test the sensitivity of the model to each variable. We also tested various alternative base values for C, M and q.

A problem was encountered with the definition and calculation of L. The formula considers the expected operating cost in each state (μ_1, μ_2) and the expected time until the process goes out of control. For simulation purposes, the expected time is a function of the number of periods remaining in the year. Although this definition is appropriate when considering a fixed time horizon, it would not be realistic in a practical situation when a manager should take a long-run view. To obtain a long-run view, L was calculated using a constant year (i.e. 12 month) time horizon. Simulations were also performed allowing L to vary with the number of periods remaining in the year to determine the impact on the results.

Analysis of Results

The starting point for analysis was the simulation performed with an actual q = .20; $\sigma_1 = \sigma_2 = \$500$; μ_1 and μ_2 separated by 2σ; errors in estimate of $\pm$10% and L held constant (i.e. calculated with constant time horizon).

In general, it was found that it is better to estimate C high than to estimate it accurately (i.e. resulted in lower total costs). Estimating C low led to the highest costs. This trend held regardless of the size of the error and the (dollar) impact on total cost became larger as the % error increased from 10% to 40%. The trend became less consistent when the value of C plus the value of M exceeded 50% of L (i.e. C + M > 50% of L). When the overlap between cost distributions became smaller ($\sigma_1 = \sigma_2 = \$250$) the trend disappeared and any errors in estimates had little impact on total costs. When the overlap became larger ($\sigma_1 = \sigma_2 = \$750$), the trend became more consistent and the (dollar) impact on total cost became greater. When the actual value of q was increased to .30, the trend became less consistent. The trend held when the number of periods in a year was increased.

We did not anticipate these results prior to our simulation runs. It was expected that total costs would increase when an error was made in the estimate of a variable. The reason for a reduction in total costs centres on savings in the cost of investigation and correction. When C is estimated high, it has the effect of reducing the number of investigations conducted. This leads to higher operating costs since the production process is in the out-of-control state for more periods. Savings in the total cost of investigation and corrections are greater than the increase in operating costs leading to lower total cost.

It should be noted that the difference in total cost incurred when C is estimated accurately and total cost when an error occurs in the estimate of C is less than the standard deviation of the total cost. Although the trend in total cost is consistent over a range of values for the variables (as discussed earlier), the change in total cost is not statistically significant at high confidence levels. Future research will test a wider

range of values to determine if the differences are significant within a range.

In general, it was found that estimating the value of q low led to lower total cost than estimating accurately and estimating high led to the highest total cost. This trend held regardless of the size of the error with a greater impact as the % error increased from 10% to 40%. The trend held for semi-monthly and weekly time periods. The trend became marginally less consistent when C + M exceeded 50% of L. As with errors in C, when the overlap of the cost distributions was small, the trend disappeared (an error in estimate had little impact on total cost) and the trend became more consistent (with the impact on cost greater) as the overlap increased. When the actual value of q was set at .30, the trend became less consistent. Again it must be noted that although the trend in total cost is consistent over a range of values for the variables, the differences in total cost are not statistically significant at high confidence levels.

The reason that total costs are reduced when q is estimated low is the reduction in the number of investigations and corrections. Estimating q low acts to increase the calculated probability of being in control. This results in less investigations and the subsequent reduction in the cost of investigating more than compensates for the increase in operating costs from operating out of control more frequently.

Cost did not behave in a consistent manner when errors occurred in the estimates of M. For some combinations of the variables (C, M, q, σ, % error in estimate) it was better to estimate high and for other combinations, it was better to estimate low. There did not appear to be a trend to the combinations. For most combinations of the variables, the absolute effect on total cost (ignoring the sign of the effect) of an error in estimate was less for M than for C or q.

The simulations were also performed for the same combinations of C, M, q, σ and % error in estimates using the alternative method of calculating L. In this method, L varies with the number of periods remaining in the year. The same trends occurred for C, M, and q as discussed earlier although the dollar impact differed. The only notable difference was that the trends for C and q tended to break down more as C + M exceed 50% of L.

Conclusions

Our research to this stage indicates that for a wide range of values it is preferable to estimate the value of C high and the value of q low than to estimate the values of these variables accurately. An error in estimating M has limited impact on total costs and little consistency.

In the future we intend to continue this research to determine if the trends will continue over a wide range of values for the variables. We intend to consider larger errors in estimates and a wider range of values for the standard deviations of the cost distributions and the actual

probability of transition. We are also going to devote more study to the magnitude of the cost of an error.

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Canadian Academic Accounting Association
Halifax, May 1981

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TO A BRAVE NEW WORLD FOR PROFESSIONAL ACCOUNTING

Three separate and ostensibly unrelated events prompted this paper. The first was a piece in The Gazette of September 26, 1980 reporting on the election of Ray Harris as the new president of the Canadian Institute of Chartered Accountants (CICA) at its annual meeting held in Montreal. The second was the editorial in the September 1980 issue of CA Magazine discussing the situation of the Members of the C.A. profession working in Industry, Education and Government (MIEGS). The third was a seminar at the above CICA meeting on professional schools of accounting.

The detail in the Harris article emphasized that a major part of his job for the next year would be to fight off the challenge of two rival accounting groups, the Canadian Certified General Accountants Association (CGAs), in particular, and the Society of Management Accountants of Canada (RIAs). The aim and hope of the CGAs is, of course, to break the CAs' near-monopoly of public accounting. My initial reaction to this information was that it was a shame that a gentleman like Ray Harris has to waste his time in this kind of internecine warfare that could serve no useful purpose and could only hurt the public image of all three accounting groups. Further evidence of the seriousness of the confrontation, however, is contained in a recent letter from the Ordre des Comptables Agréés du Québec calling a special general meeting of its members. The purpose of this meeting is to vote an assessment to build up a war chest to combat an "advice from the Office des Professions to the minister responsible for the application of the law in respect of professionals". This "advice" sets up an auditors' licensing board and also contains some other ridiculous recommendations which ignore some of the realities of the situation, but it is felt that the whole controversy misses the one essential overriding factor. It is not a question of who should be permitted to practice as a public accountant but rather who or what is a professional accountant? An examination of the problem from this prospective would serve to remove a great deal of heat from the argument. As an example, one extreme position could be that only CAs should be considered as the professionals. If this was accepted then the other two groups could be dissolved and the problem of the challenge by the CGAs and RIAs resolved. But if there is general agreement that all three associations consist of professional accountants then a different solution must be sought. The main purpose of this paper is to address this dilemma and to offer some solutions.

We now look at the second of the three items mentioned previously, the editorial in CA Magazine. Here Nelson Luscombe outlines the frustrations of the non-practising CAs and examines some of the ways that the MIEGs may be placated. While it may be true that a CA is a CA, in reality, the practising and the non-practising CA often find themselves in a conflict situation. The MIEG preparing the financial statements for the auditor (the practising CA) is privy to a great deal of information, often controversial, that may not be in the best interests of his company to reveal. The two are on different sides of the fence. One CA in this position felt so strongly about the potential conflict that he was considering dropping the designation from his business card. After all, isn't this what the vaunted independence of the auditor is all about? This may be one of the reasons why the MIEGs feel left out of things. Or the reason may be that the CICA, from a historical perspective, have always seen themselves as auditors. While still permitting

those who have left practice to keep the designation, in reality, they are considered outside the fold, and until recently MIEGs were virtually ignored by the CICA. The original Montreal Association of Accountants did not even accept non-practising members! A reasonable conclusion seems to be that the CA in industry is not the same as the CA in practice. They will have passed the same examinations at some time in the past but the paths have diverged to the extent that the two are no longer compatible.

The RIAs, as a rule, have no pretensions in the external audit area, but they usually are required to complete auditing courses at a level similar to the CGAs. As may be expected, those courses are at a more elementary level than demanded for the CA. Where permitted by governing provincial legislation, some CGAs and RIAs do practice as auditors, but it is safe to say that none of them function in this capacity for any major business enterprise. The vast majority are employed in industry and government. While no survey has been made of the different positions held by CGAs and RIAs vis a vis MIEGs, it would seem that their interests are more in line with those of the MIEGs, than the MIEGs are with the practicing CAs.

Before examining the situation further, it should be emphasized at this point that there can be no doubt that, at present, the CA is the most highly trained accountant in Canada. A potential CA must have a recognized undergraduate degree. The CGA or RIA may often have a degree but it is not a prerequisite. Then, to earn his designation the CA must successfully complete many more courses, at continually higher levels, before he can write the uniform final examination (U.F.E.). As an example, the CA student at Concordia University is required to earn a Diploma in Accountancy after completing the Bachelor of Commerce, with a Major in Accountancy. The Diploma is a graduate program with a minimum of eight courses; it is a prerequisite to writing the U.F.E. Lastly, the CA student is required to fulfill a two to three year indentureship that can be easily regulated, since it must be spent with a practicing CA, and hence tends to be quite strenuous. Yet this does not denigrate the professionalism of either the CGAs or the RIAs. Although they do not need the degree, most reach the level of the Bachelor of Commerce, again with the Major in Accountancy. A study of the career opportunities section of most newspapers will reveal that many advertisements for accountants seek applicants with any of the three designations. The only exception is, in certain provinces, with public accounting firms, who only hire CAs or CA students.

One Profession

The obvious, though perhaps naive, answer to the tumult presently existing in the accounting profession is unification. Amalgamation of the three accounting bodies into one with a common designation has been discussed before but talks have always floundered for one reason or another. The attempt must be made again. Several compelling reasons make such an attempt necessary.

No other major profession has different levels of professionalism, one is either a doctor, an engineer, a lawyer or he is not of that profession. And he is recognized as such by the public. For accountants to be considered professional in the same sense as the others, there can be only one designation that indicates a minimum level of training. The level to be reached is

discussed later in the paper but is not pertinent at this stage of the discussion. One can assume for our purpose to be the equivalent of what can be called "general practitioner".

A second, more prosaic, advantage to a unified profession is simple economics. At present, there are three national offices, three regional offices in most provinces, three sets of uniform final examinations, three magazines and considerable redundancy in professional development and other areas. While consolidation will not eliminate two-thirds of these costs, substantial savings should result. By the same token, scarce resources in both people and money are being squandered in the vain rivalries mentioned earlier. These resources could be wiser spent in seeking workable solutions. Further, a unified profession with approximately 50,000 members, in rough figures, 31,000 CAs, 10,500 RIAs and 8,500 CGAs, would tend to have greater influence by speaking in one voice to the government.

Changes in the educational delivery system are seen as another most important advantage in the unified profession concept. This consideration is discussed below in conjunction with the level of study required.

However, there is a greater imperative that forces an immediate start in negotiations, that is, if some resolution is not forthcoming from the accounting bodies then one will be legislated by government. This can not be regarded with equanimity and time is running short in several jurisdictions. Hopefully, such discussions can be held simultaneously at both the national and provincial levels so that the results could be uniform across the country rather than the chaos that presently exists. This, however, may be too much to ask, given the present political climate in Canada, but maybe accountants should lead here also.

Specialization

A major hindrance to successful negotiation is seen in the different perceptions of the present status of members of the three accounting associations. Obviously the mere fact that all members have earned designations at one time or another does not qualify them to do all kinds of accounting at present. By the same token, most would have no desire to change their line of work nor would they, as professionals, have any pretensions that they were all-knowing. But there might be claims to expertise that does not, in reality, exist. To obviate possible difficulties in this area, it is suggested that unification be combined with a proposal for specialization. Accounting has become sufficiently specialized to allow for, at least, several fields of expertise. For example, there could be specialization in auditing, taxation, information systems, financial systems, financial management and internal auditing. This suggestion is also not unique. Related studies are presently being undertaken by the CICA and the Institute of Chartered Accountants of British Columbia. Although these studies are being made in the context of services by CAs to the public, it would seem that they would have considerable ramifications for a unified profession. The emphasis would shift from the present affiliation with an accounting organization to a more measurable and sensible area of expertise.

These two proposals, for unification and specialization, not only seem

logical but also seem to bear out the reality of the situation. Professional accountants, while they are members of one particular accounting association, also seem to feel a need for a particular peer group. As one example, the Financial Executives Institute, caters to the needs of accounting types in large business organizations, even though it is understood that 95% of its members are CAs. The Canadian Academic Accounting Association, formed several years ago, is concerned with the interests of accountants in academe. The Municipal Financial Officers Association provides a similar service for government accountants. To foster these diverse needs the "new" unified professional association is seen as an umbrella organization with separate divisions for each speciality. Each division would be represented on a central committee, but would also have its own organization.

For the transition period, all present holders of one of the three accounting designations would automatically receive the new designation. Insofar as the specialization is concerned, a grandfather clause could be used where, upon reasonable proof, a speciality designation would be granted. Alternatively, no speciality could be granted until there was proof by examination that expertise actually existed. It is realized that in this case, as with any transitional phase, injustices and/or errors are bound to occur, but this would be a small price to pay for a unified profession. Also clear is that none of the parties would be satisfied with these recommendations. The CAs would feel that they were losing their pre-eminence and would claim that the public would suffer. The CGAs would not be, automatically, permitted to audit and hence would not have fulfilled their ambitions. The RIAs, on their part, would lose that uniqueness on which they have built their success. No doubt, a myriad of other reasons can be found to show that unification of the profession is not for the best. Nobody would get everything desired, but the profession as a whole would benefit significantly thereby making the compromise worthwhile.

These suggestions are not seen as antithetical to the arguments of Irving Rosen (see CA Magazine, April, 1980) in his discussion of public accounting and the CGAs. Auditing will still be confined to a select group who are expert in their field and who would have the same training and bear the same responsibilities as the CA in practice does at present. What Rosen seems to have omitted in his analysis is that over 50% of CAs are not in public practice. Given the rate of issuance of handbook pronouncements and changes in practice, would he accept as an auditor a CA who has not practiced for several years? True, it is possible for non-practicing CAs to become au courant but this is not required and would, in effect, be requalifying. With a unified profession, only those qualified to audit, and as strongly regulated as at present, would be permitted to do so. Some restrictions could even be enforced that would allow a specialization to be cancelled if it was not used for a number of years or continuous requalification could be made mandatory. It should also be recognized that the present CGAs would not automatically be allowed to perform audits but they would at least be on the same footing as CAs. Since practitioners from all groups, CGAs, CAs and RIAs, would have to "prove" their competence, all complaints of "monopoly", "injustice" and "free competition" would automatically be eliminated.

Auditing standards could (and should) remain as high as they are today.

This would be of self-interest to all accountants, but it can even be argued that the standard-making procedure will be more efficient with a unified profession. Since this process is as much political as it is academic, greater participation from all accountants could very well enhance the decisions since more diverse opinions would be forthcoming and various pressure groups from different specialities would ensure complete airing of potential difficulties.

Education

One of the major benefits seen as developing from the merger proposal is related to the CICA seminar referred to in the opening paragraph. The speakers at this seminar discussed the trials, tribulations and modus operandi of their professional schools of accounting in the United States. (Although no such schools are available in Canada today, the University of Waterloo is currently in the throes of organizing such a program.)

As background to the discussion it is important to realize that most departments of Accountancy in Canada today are situated within the Faculty of Commerce & Administration, or a Faculty with a similar name pertaining to business. A few are in Arts Faculties, such as Economics, while some accounting courses are offered by various other departments in some institutions. For historic and, very often, legitimate reasons, Faculties of Business have traditionally been underfunded with portions of their allocations being used to support other parts of the university. Departments of Accountancy, usually with the heaviest enrollment in the Faculty of Business often do not get even the full share of their Faculty's budget. This is often due to their reliance on part-time lecturers since full-time professors are in very short supply. But at the same time the accounting departments are hamstrung by the rules, regulations, and (sometimes) obstructionism of the other departments. Course selection is constricted by the other disciplines, hiring practices and salary ranges must conform to the norm, while promotion and tenure policies are controlled by the Faculty rather than the department. The other faculty members do not appreciate the uniqueness and professionalism of accountancy, or maybe, would rather not.

With a unified profession of approximately 50,000 members, it would be possible to establish professional schools of accountancy as a separate faculty in universities across Canada. These would be akin to the schools of medicine, law, dentistry, etc. that are presently in existence. With their own budget and their own rules of behavior, these schools could attract both the required faculty and adequate financial resources. Large sums of money are spent at present for education by the three accounting bodies and the large accounting firms are said to spend a total of approximately $3,000,000. a year on training. Properly endowed and organized schools of accounting would be able to take over a great deal of this in-house training, as well as continuing education. At the same time, faculty which is in such short supply, would be developed. It is felt that the professionalism of these schools will attract the stars in practice, industry and government as is the case in law and medicine. A further possible benefit of professional schools is referred to by Mr. Harris in an interview with The Globe and Mail (September 26, 1980) wherein he sees them as an attraction for a greater and more qualified flow of new recruits to the profession. And last but not least, the professional school is seen as one possible answer to the syndrome expressed by L.S. Rosen

in "A Grim Report Card" (see CA Magazine, December 1977) concerning the high failure rate at the U.F.E. With the control of the curriculum and the standards of these schools, students would know soon enough whether they were in an appropriate field of study. A great deal of wasted time and talent would thus be eliminated.

From the economic perspective, there would be cost reductions with only one set of examinations at the qualifying level and only small groups of students writing each of the specialization examinations.

The establishment of a professional school of accountancy would not be a simple matter, mistakes and failures are to be expected and there is no guarantee for the final product. There is bound to be negative reactions from university administrators, from faculty (both within and without accounting departments) and even from the professional accountant. Even with the framework in place, curriculum matters would provide much room for disagreement. For example, do you prepare the student for the first job or for eventual partnership or for a position as a financial executive?

The program is seen as a baccalaureate with successful completion giving the student a B. Acc. (Bachelor of Accountancy). This academic exposure would be followed by a one-year indentureship during which students would be required to take additional, practically oriented courses culminating in a uniform final examination. Successful candidates would then be considered professional accountants at the general practitioner level. More highly motivated students or students with an inclination to a particular area could proceed towards a specialization by completing further courses in an equivalent of a Master's degree. Candidates could also change specialities by qualifying at different stages of their career.

A possible curriculum is shown in Table I. Courses are generally listed as three credits. A 3 credit course is defined as approximately 3 hours of instruction per week for one semester of 13 - 15 weeks plus appropriate homework assignments. Generally, a student on a full-time program is responsible for 15 credits per semester. This curriculum of 99 credits can be integrated quite easily into the 3 or 4 year undergraduate university system (depending on the provincial jurisdiction). In the 3-year system some of the courses could be taken at the collegial level, while in the 4-year system electives would be required to complete the program. No doubt, there will be vehement disagreement with the choice of material, depth of knowledge required and every other facet of this curriculum. But obviously this is only one possibility, with many alternatives and other combinations. It is being offered as the sacrificial lamb, to be roasted, but at least as a beginning to discussion.

Conclusion

The bickering between the professional accounting bodies must be brought to an end. No one gains from the political and acrimonious infighting and the profession as a whole loses in both scarce resources and public image. At the same time, education for the professional accounting career has great potential for improvement. In this paper several recommendations have been made that seem to address the problem areas. No doubt there will be differences of opinion, alternate solutions and new problems, but some enlightened thinking is required. Our leaders' time would be better spent in the pursuit

of statesmanlike answers to harsh realities, rather than in political activities that can only result in no-win confrontations.

Canadian accountants have always contributed to international accounting concerns in a greater proportion than warranted by their numbers and perceived influence. In this case again, the opportunity is at hand for the Canadian accountant to show the way to a brave new world for the accounting profession.

TABLE I

POSSIBLE CURRICULUM FOR PROFESSIONAL SCHOOL OF ACCOUNTANCY

MATHEMATICS (9 credits)

Intermediate algebra, introductory and advanced calculus and linear algebra

STATISTICS (6 credits)

Applications of statistics for decision-making for accounting and managerial purposes

OPERATIONS RESEARCH (3 credits)

Applications of operations research for accounting and managerial decision-making

ECONOMICS (6 credits)

Introduction to micro and macroeconomics

COMPUTERS, SYSTEMS AND CONTROLS (9 credits)

Introduction to computers and programming, systems analysis and synthesis, and computer controls

COMPOSITION (6 credits)

To develop skills in writing, research and documentation

FINANCE (6 credits)

Financial standards, structures and instruments, capital markets, cost of capital and capital expenditure decisions

MANAGEMENT (6 credits)

Foundations of behavior, theory and practice of management and organizational behavior

LAW (6 credits)

The body of law governing the relationships between businesses and between business and others

ACCOUNTANCY (42 credits)

1. INTRODUCTORY (6 credits)
   Mechanics of bookkeeping (computerized) and preparation of financial statements

2. INTERMEDIATE (6 credits)
   In depth study of theory and application of accounting for external reporting

3. ADVANCED (6 credits)
   Theoretical examination of current accounting thinking and special topics

4. MANAGERIAL (6 credits)
   The development of accounting information for control and decision-making in an enterprise

5. TAXATION (6 credits)
   Income and other taxes on persons and corporations

6. AUDITING (3 credits)
   Introduction to auditing theory with applications to internal and external audits

7. HISTORY (3 credits)
   An appreciation of the evolution of accounting

8. POLICY (6 credits)
   An integration of the curriculum through case study

T A B L E I

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ADVERSE SELECTION IN THE PUBLIC ACCOUNTING MARKET: THEORY AND EVIDENCE

It has been argued by Thornton (1979) that the informed public policy analysis of any social institution can usefully be divided, as a first approximation, into two parts: first, a consideration of purely institutional problems that arise because of the way the institution itself is designed, which would persist even if all of the individuals associated with the institution behaved perfectly rationally and identically; and second, a consideration of the purely personal problems that result from differences among the individuals who are directly associated with the institution or who are somehow affected by it. This paper addresses problems of the second sort. It is argued that most of the important personal problems facing the auditing institution arise because there are serious information asymmetries in the market for public accounting services: consequently, some of the techniques that have been employed in the literatures of information economics (Hirshleifer and Riley, 1979), moral hazard (Arrow, 1963), adverse selection (Akerlof, 1970) and agency theory (Jensen and Meckling, 1976) are useful in analysing the auditing institution and the various proposals that have been made for reforming it.

The paper is divided into four parts. Part I models the economic relationship between an individual auditor and her client. Part II derives the implications of the model at the level of the market for public accounting services. Part III presents some preliminary empirical evidence that appears to be consistent with the theory developed in the paper. Finally, part IV discusses some of the implications of the study. Though the theory is developed using a statutory audit engagement as a specific example in some parts of the paper, much of the analysis and discussion applies to other kinds of public accounting engagements in which the accountant lends credibility to financial information.

I. The Auditor - Client Relationship

The design feature that perhaps most significantly characterizes the auditing institution in the current regime in Western countries is that audits are directed toward a particular set of financial statements: the auditor does as much work as he feels he needs to do in order to express a standard opinion on that particular set of statements, and in so doing actually supplements the firm's internal control system. Information about the firm's internal control system itself is never reported to the users of the statements. Rather, the audit signal serves to inform users of the statements that the internal controls, along with the procedures that the auditor has undertaken, were adequate to justify the rendering of one of the auditor's standard professional opinions on the statements.

The decision problem that the auditor faces is how much work he must do to justify a certain opinion, given the state of the firm's internal controls.

In deciding how much work he must do to justify a particular opinion, the auditor will make recourse to the standards that have been established by his profession. These standards have been formulated, in theory, to protect the public interest, because the delivery of the audit service affects many people other than the client himself: it affects many users of public accounting information who have little or no direct contact with the firm or with its auditor. Generally, the professional standards specify some minimum amount of work that must be done to justify a given opinion. In Canada, these standards are codified, to some extent, in the CICA Handbook in a formal manner; but there are also a number of informal publications, such as Anderson (1977), that supplement the formal ones and supply certain rules of thumb that may act as guidelines for auditors to follow in specific circumstances. Both sorts of publications may be viewed as institutional information that is supplied to the professionals that operate within the institution. If it were possible to specify in such publications exactly what had to be done in each audit situation to render a given opinion, if all auditors followed these specifications to the letter, if all auditors interpreted and applied them in exactly the same way, and if all auditors were of equal ability, the auditing institution would have no personal problems: it would have only purely institutional problems. (One such problem is that business firms might collectively tend to overinvest in audits in short run audit signalling equilibria: see Thornton, 1978, ch. 4 or 1979). Such problems are <u>not</u> considered in the present paper, though in practice they exist in addition to the personal problems considered here .

Since it is costly for clients to meet professional standards, there exists a potential divergence of interest between clients and the public. Firms that wish to maximize their profits will desire the minimum possible amount of work by the auditor to support a given opinion, since they will wish to minimize the cost of the audit. The public, on the other hand, may wish the auditor to perform more costly, extensive procedures as a basis for justifying her opinion. The auditor, to some extent, stands as an intermediary between these two conflicting interests, and acts as an arbiter. The first personal problem that arises, then, is that different auditors may hold different views as to the appropriate amount of work that would strike a balance between the two interests. This problem would persist even if all auditors were equally informed as to the content of the professional literature. It results from the fact that different public accountants will simply hold different views of the world because of differences in their psychological make-up and educational backgrounds.

Differences in the application of professional standards by different auditors can also arise simply because some auditors are less well-informed than others as to the contents of the professional literature. These differences can perhaps be mitigated by professional development courses offered by the profession, whereas the personal differences alluded to in the preceding paragraph cannot.

Finally, auditors differ in their ability and in the effort that they are willing or able to put forth in meeting professional standards. These individual differences among auditors will cause the cost of an unqualified audit opinion on a particular set of financial statements to differ among auditors on the supply side of the public accounting market.

The actual cost of a given opinion may differ also because of individual differences among clients on the demand side. Certain clients may be more influential than others in persuading auditors to minimize the amount of work that they do in order to arrive at a given opinion. Another equally important difference among clients is that some may simply be better informed than others of the nature of the auditor's work and the steps that she must take in order to justify a standard audit opinion. Moonitz, for example, states:

> The subject matter of auditing standards and procedures is highly technical. As a result, laymen will ordinarily leave auditors alone to establish auditing standards, unless a scandal...develops. (Moonitz, 1974, p. 76)

It is logical to expect that some laymen will be better informed than others, and that some business firms will employ laymen who have more knowledge of public accounting than others: many of the Chartered Accountants in Canada are employed by business firms as financial officers (see CICA Handbook, introduction, p. 64); however, not all business firms employ managers with formal training in public accountancy.

To summarize, the auditor's personal problem may be stated as follows:
Given:

(a) the state of internal controls and the opinion requested by the client;
(b) the professional standards of auditing promulgated by both formal and informal professional sources;
(c) the degree of understanding that the auditor possesses of these standards and his opinion as to how they should be applied;
(d) the degree of understanding that the client possesses as to the relationship between the strength of internal controls and the extent of audit testing;
(e) the bargaining power of the client and the auditor, and the rates charged by auditors generally.

Required:

How much work must be done to justify the opinion requested, and what therefore, should be the cost of the service?

On the demand side, the client's personal problem may be viewed as whether to switch public accountants, given the information that he has concerning the five items listed above. For many firms, the alternative of not having an audit at all does not exist, since it is a statutory requirement. Of course, this statutory requirement may also be viewed as an institution which could be reformed in the long run: this possibility is not considered in the present paper, however.

Let S be the level of professional services, measured in chargeable hours", that an auditor believes he must supply in order to express an unqualified opinion on a client's financial statements, given the strength of internal control. Let P be the auditor's billing rate in dollars per chargeable hour. In his letter of engagement with the client, the auditor proposes some level of service, S, that will be required to render an unqualified opinion, and estimates the resulting

cost of the audit, PS. If the client perceives S to be too high or too low, she will refuse the proposal from this auditor and hire another one. The firm may feel that the diagnosis of the strength of internal controls is incorrect, and that a better diagnosis by another auditor will reveal stronger internal controls resulting in a lower cost for the unqualified opinion. The reason that this is rare, though, is that a new auditor would have to duplicate the work of the old one and incur high initial fixed costs in analysing (diagnosing) the controls. It is reasonable to suppose that the firm will tolerate some degree of error in the diagnosis and prescription of the incumbent auditor, because the incremental cost of a new diagnosis, prescription and audit by a new auditor is likely to be higher than the incremental cost of the prescription and audit by the old auditor, the old auditor's diagnosis fee now being a sunk cost to the client.

A related theme appears in the work of Darby and Karni (1973). There are many services for which joint diagnosis and repair are the norm, such as car repairs, medical services, and audits. It is generally far less costly to repair damage while the transmisssion, the belly, or the books are open to see what is wrong, than to put everything back together and go elsewhere for the actual repair. Milton Friedman (1962, ch. 9) points out that the opportunity that exists for fraudulent behaviour in such situations has traditionally been one of the most compelling rationales for occupational licensure.

The old auditor does not know precisely where the maximum and minimum acceptable limits of S are for the firm, but he is postulated to have in mind a probability distribution, F(S), which is the probability of losing the firm as a client at each proposed level of service, S.

Let S* be the level of service that would be desired by a client who was perfectly informed concerning the strength of internal control and the level of service that a competent auditor would have to perform in order to render an unqualified opinion. Then the auditor perceives a stochastic demand function for his services, as shown in figure 1, below:

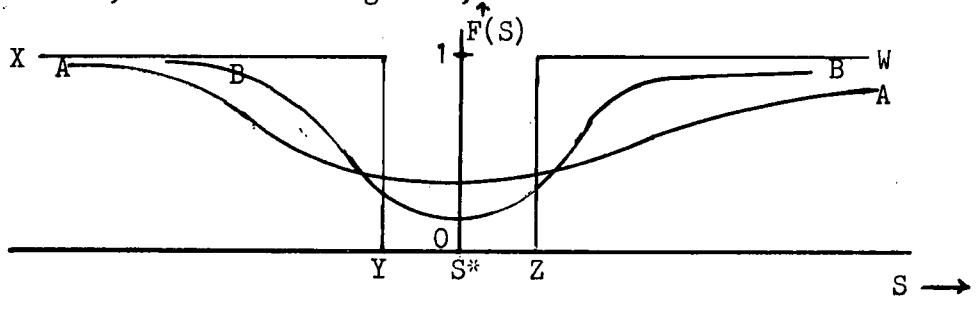

Figure 1

Stochastic Demand Function Perceived by an Auditor

A perfectly informed client would exhibit the demand function XYZW. He would tolerate some level of service other than S* only to the point where the fixed cost of switching auditors was outweighed by the future benefits of hiring a new auditor. A relatively uninformed client would present the auditor with the

stochastic demand function AA; a better-informed client would exhibit the curve BB. The view taken in figure 1 is that as the client becomes better-informed, his demand function approaches the "ideal" function depicted as XYZW, in which the probability of his switching auditors is zero when S is between Y and Z, and one when S is outside of this range.

The auditor's decision problem may now be represented formally as follows:

Let Z be the expected present value of the contribution margin that the auditor could earn from this client if his engagement proposal were acceptable to the client.

P be the price of audit services chargeable to the client per unit of service, S, where S is expressed in chargeable hours.

C(S) be the auditor's cost function for providing the level of service S.

k be the opportunity cost of capital to the auditor.

Then

$$Z = \frac{1}{k}\,[P \cdot S - C(S)][1 - F(S)] \qquad (1)$$

Note that no allowance is made in (1) for any repeat business: once rejected the auditor is never rehired. The discount rate, k, is introduced as if the stream of benefits to the auditor were a perpetuity, relecting the long-term association that has been empirically found to exist between auditors and their clients when the clients are not dissatisfied with the service they are receiving: see, for instance, Thornton, Lazar and Sievers (1978, ch.1).

The first order condition for the auditor is evidently

$$0 = \frac{\delta Z}{\delta S} = \frac{1}{k}\,[P - C'(S)][1 - F(S)] + \frac{1}{k}\,[PS - C(S)][-F'(S)]$$

Rearrangement of this expression gives:

$$[P - C'(S)][1 - F(S)] = [PS - C(S)]\,F'(S) \qquad (2)$$

The expected marginal return to selling the client more service (left side of (2)) is just equal to the marginal cost in terms of expected lost business (right side of (2)). This necessary condition can obtain at levels of service either above or below S*, depending on how well informed the client is, and on the perception by the auditor of the knowledgability of the client.

II The Market for Audits

The preceding section shows that an income maximizing auditor faces economic incentives to supply a level of service that may not be in his client's best interests. This may be viewed as a form of what Arrow (1963) has called, "moral hazard." A particularly interesting case is one in which the auditor has many clients in the service queue. Then the marginal cost of providing more service to a client is very high, since the public accountant could be servicing others instead. Generally, the degree of confidence that the auditor derives concerning the dollar value of a financial statement item increases with the square root of the number of substantive tests performed, so it may be more efficient for the auditor to spread his time between two clients than to concentrate on one. There-

fore, it will be likely that at $S = S^*$,

$$[P' - C'(S^*)][1 - F(S^*)] < [PS^* - C(S^*)]\, F'(S^*)$$

That is, the marginal returns to overserving a client are outweighed by the marginal costs of expected lost business. Therefore, the income maximizing level of service will be $S<S^*$. Quite probably, the auditor will wish to provide what he considers to be the minimum acceptable level of service that he believes to be required by his profession's standards. As was argued in part I of the paper, however, each auditor will have a somewhat different perception of what this minimum acceptable level of service actually is. As a result conditions in the market are ripe for the phenomenon of "adverse selection" to occur.

The phenomenon of adverse selection was described first by Akerlof (1970) as it related to the used car market. In that market, sellers know more than buyers about the conditon of used cars, and buyers tend to judge the quality of a used car by the average quality for a given make and year. Since all sellers receive the "average" price, Akerlof argues that sellers with inferior cars - "lemons" in the vernacular - will willingly offer them for sale. This will drive sellers with above average cars from the market and make the average quality of the remaining cars offered for sale lower. The process will repeat itself, potentially, until the market is ruined. In the market for audits, clients are often ignorant of the amount and quality work that various auditors will perform to justify an opinion: as in the used car market, there is an "information asymmetry" between the buyer and the seller. Therefore, it is possible that in a competitive market, auditors whose standards are below average will be able to charge clients the same price for a given opinion as auditors with high standards. This will drive auditors with high standards out of the market or force them to lower their standards to be competitive.

Adverse selection may also have the effect of driving practioners of auditing with high standards out of markets in which the perceptions of clients and users are imprecise and into markets where their perceptions are more precise, since their high standards are more likely then to be rewarded. Generally this will mean that practitioners with the highest standards will wish to serve large firms, since it is more likely that the specialists in financial management and directors of these firms will appreciate the significance of their procedures. These practitioners will still be treated as if they were average, but the average will be higher in this segment of the market. Even in this segment, it is still possible that the practitioners with the very highest standards will not be rewarded accordingly. Since the reservation prices of professional accountants are generally high, some may be motivated to leave the profession and work in industry.

It is important to note that adverse selection becomes an issue because the institution has been designed in a particular way. Whereas competition is normally regarded as an efficient allocator of goods and services, it could have the effect of merely minimizing standards in the current institutional regime, or of causing extraordinary segmentation in the market for public accounting services. Moreover, it is important to note that there is no question of the honesty of the individuals involved here: adverse selection and moral hazard

can occur even though every auditor is supplying what he truly believes to be the optimal level of service consistent with his understanding of professional standards.

III. Some Evidence on Market Segmentation

Research in process by Thornton, Poapst and Greeno (1981) reveals that small businesses generally do not employ sophisticated financial managers. In a sample of 300 small businesses interviewed across Canada, with median sales of approximately $1,000,000, it was found that only one in five had a full-time financial manager. Moreover, regardless of whether the person managing the firms' finances was full-time or not, only one in five firms employed a person with a recognized accounting designation. Only a third of the firms reported having a budget or financial plan. Larger firms generally employ much more expertise in accounting and financial management. Some very large firms even have internal audit departments. Therefore, on the demand side of the market for public accounting services, large clients are expected to be much better able to monitor the auditor and to detect non-optimal service levels, ($S \neq S^*$), though never perfectly.

To meet the demands of larger business clients, some very large public accounting firms have devloped to offer extremely sophisticated and specialized services to their clients. Table 1 utilizes the data base of Thornton, Lazar and Sievers (1978). It shows that less than 1% of the firms in Ontario employ about half of the CA's and CA students in that province who are engaged in public accounting. Table 2 demonstrates that large clients almost invariably choose large PA firms. Though large PA firms do service some small clients, the table shows that generally it is the small PA firms that service small business. Finally, table 3 shows that in large firms students receive much more intensive training in auditing than do students in small firms. As the accountant's career progresses, she spends gradually less time auditing, on average. This reflects the specialization that is commonly found in large firms by senior public accountants. In small firms, training in auditing is much less intense, and specialization by senior accountants much less common.

TABLE 1
ONTARIO PUBLIC ACCOUNTING MARKET
(890 of 1758 firms as of 1978).
SUPPLY-SIDE SEGMENTATION

Size of firm (# of CA's)	No. of firms	No. of CA's	% of gross fees from auditing	No. of students
1	58%	24%	19%	
2	25	24	26	
3			33	
4-5	16		38	50.2%
6-10			39	
11-25			49	
26-150	1	52	52	
Over 150			72	49.8%
	100%	100%	100%	100%

TABLE 2
ONTARIO
DEMAND-SIDE SEGMENTATION
OF THE MARKET FOR PUBLIC ACCTING

Size of firm # of CA's	% of fees earned from business clients with sales: <$1 million	$1-25 million	>$25 million	*Other clients
1	77	10	1	13
2	76	13	0	11
3	72	17	0	11
4-5	68	22	1	9
6-10	69	19	1	11
11-25	65	22	3	10
26-150	41	34	13	12
Over 150	20	31	42	7

* e.g., government, hospitals, individuals

TABLE 3
ONTARIO SUPPLY-SIDE

Size of firm (# of CA's)	Average proportion of chargeable hours billed for auditing (%) Student	CA for 0-6 yr.	CA for 6-10 yr.	CA for over 10 yrs.
Over 150	84	79	69	60
6-10	48	49	34	29
3	32	32	25	34
1	10	12	16	32

IV: Conclusions and Implications of the Study

The analysis and evidence presented in the paper show that the informational structure of the market for public accounting services has contributed to extraordinary segmentation on both the supply and the demand sides of the market. Because of this, some of the traditionally proposed market-supplied monitors may not be successful in ensuring that the level of service provided by public accountants is reasonably close to the level that would be demanded by perfectly informed clients.

In the absence of segmentation, one natural monitoring device would be the "bounty-hunter" system, in which expert buyers act, in effect, as monitors for less expert customers. Since most small PA firms appear to have few (if any) well-informed clients, this monitoring device will not generally work, however. Another market-supplied monitor that is common in other markets for services is the guarantee signal (double your money back if the service is not satisfactory, for instance). Unfortunately, it may be impossible to define the true cost of poor service performed by public accountants: certainly it is not just the explicit cost of the audit itself. Moreover, poor service may be difficult to identify, and there may be long time lags between the provision of the poor service and its consequences in terms of reduction in the cash flows accruing to the firm or to its constituents. A final market-supplied monitor is identified by Hirshleifer (1971): if the PA firm had common shares outstanding in the hands of the public, there would be an economic incentive for a shareholder who was knowledgable in public accounting to look for poor service, sell the stock short, then announce the poor service to the market. But, since accounting firms are all partnerships or sole proprietorships, this monitor cannot be expected to work either.

As a result, the accounting profession faces a very serious monitoring problem in the small firm - small client segment of the public accounting market. There is an alternative to intensifying monitoring activity, however. A similar or even superior result may be obtained by redesigning the institution to eliminate some of the personal problems discussed here. Unfortunately, space does not permit formal consideration of these devices in the present paper. Generally, they involve attempting to eliminate the information asymmetries, by changing the form of the public accountant's report. The interested reader is referred to Milburn (1980), Thornton (1979) and to the Cohen Commission Report (1978). A common theme in these works is that users of financial information and clients of PA firms must take more responsibility for understanding the procedures that are followed by public accountants, and must then make up their minds as to the credibility of the information to which the procedures were applied.

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STUDENTS' PERFORMANCE ON AND PREFERENCE FOR UNSTRUCTURED COURSE MATERIALS: THE IMPACT OF COGNITIVE COMPLEXITY

Introduction

Over the past dozen years, there have been many expressions of concern about the necessity for professional accountants to be able to adapt to a changing environment and changing circumstances. The Mackintosh report emphasized:

> "...the increase in the scope and complexity of the body of knowledge deemed essential for practitioners; the growing recognition of the necessity of a sufficiently broad education so that the practitioner is able to acquire new knowledge as it develops and apply it to new facts and problems" (Mackintosh, 1967; p. 13)

Similarly, the S.M.A. study, The Nature and Scope of Accounting (Society of Management Accountants, 1969), emphasized the importance of change in the accounting environment and thus in accounting itself, concluding:

> "The future of accounting would thus appear to offer tremendous challenges for all those who are in some way concerned with it. For theoreticians and researchers their challenge will be the development or expansion of accounting concepts and measures. For practitioners, their challenge will be the application of accounting developments to the real world situation" (p. 66).

More recently, the Adams report observed that:

> "The role of auditors is constantly evolving in response to changing public needs and expectations. ...recent developments seem to indicate a growing trend towards viewing them in a broader context as agents of social control, as third-party intermediaries in an accountability relationship between the management of an enterprise and the users of its financial information" (CICA, 1978; p. 39).

All of these views on the need for conceptualization and adaptability by accountants have led to exhortations to change the teaching approach in accounting courses accordingly. The Adams report called for revision of the education system for accountants in order to graduate accountants "who are capable of making the judgement decisions required of a professional" (CICA, 1978; p. 62). Mackintosh asserted that "formal education properly conceived does not give the student a quota of knowledge,... Fundamentally, the student learns how to learn" (Mackintosh, 1967; p. 15).

A number of critics of current accounting education have urged the adoption of less structured accounting course materials and a reduction in the highly-structured, procedural emphasis in accounting courses.

Rosen has long advocated the use of relatively unstructured case materials in accounting courses and has produced both a book of cases (Rosen, 1970) and a book on the analysis of cases (Rosen, 1975). DeCoster and Ramanathan (1974) argue that "future leaders in the accounting profession would come from those whose accounting education is largely characterized" by Perry's (1968) levels three and four, in which students recognize that there are many possible "answers," and that the answer depends on the setting and the perspective of the viewer. Such recognition depends on the use of unstructured learning materials; otherwise, the existence of multiple alternatives in multiple settings could not be made apparent to the student.

Despite the prevalence of calls for a conceptual approach in accounting courses and for the use of cases, the dominant practice in Canada still is to take a procedural approach. Beechy (1980) recently reported that two-thirds of the introductory accounting students in Canada are being taught from highly procedural texts, and that accounting procedures still have preference over users' information in course content.

However, Bentz (1974) has pointed out that it is not at all clear that a shift to a more conceptual approach is necessarily beneficial:

> "...Since the precise benefits of these developments are not always specified, it is difficult to determine if any particular change has resulted in any meaningful improvement in accounting education. Consequently, instructors are being asked to make changes for which the consequences are unclear" (p. 213).

The general problem is to demonstrate that the use of a conceptual and less-structured approach will result in students who are better suited to the challenges perceived by the professional accountancy bodies. The common assumption that the use of unstructured materials will foster better thinking by students is not necessarily valid. A student's ability to benefit from such materials must be taken into account, and his or her ability is affected by personality characteristics and by the student's level of cognitive complexity.

Personality Characteristics of Accountants

There has been a number of studies which have investigated the personality characteristics of accountants. Many of these studies, as summarized by Aranya, Meir and Bar-Ilan (1978), tend to support the stereotype of an accountant. However, it was not until the development of a systematic model of personality types by Holland (1973) that it was possible to characterize accountants in relation to other vocational groups.

According to Holland, the individual, by choosing an occupation, attempts to fulfill a way of life within the context of his or her work. This is an act that expresses a person's motivation, knowledge, personality and overall ability. This theory, which Holland and others corroborated by numerous studies, describes six types of individuals; Realistic,

Investigative, Artistic, Social, Enterprising and Conventional. To each of these six types corresponds a professional environment. "Before the choice of an occupation, the individual acquires information about various professions, creates a sterotype according to his preferences and tries to imagine just how well he would fit into this stereotype" (Aranya, et al, 1978; p. 140).

Holland categorizes accountants as being predominantly Conventional, a classification which is corroborated by Amernic, Aranya and Pollock (1979). Conventional types are characterized as preferring "activities that entail the explicit ordered, systematic manipulation of data,... and to an aversion to ambiguous, free, exploratory, or unsystemmatized activities" (Holland, 1973; p. 17). Aranya, et al. (1978) have found that accounting students also are predominantly conventional in personality type.

The results of this work on personality types indicate that (1) accountants in general tend strongly to prefer unambiguous, directed environments, and (2) students exhibiting these same characteristics currently tend to be attracted to the accounting profession.

Therefore, the dilemma arises that while leaders in the profession call for more flexibility and adaptability by accountants, both professional accountants and new students attracted to the profession tend to have an aversion to ambiguity. The challenge in accounting education is to attempt (1) to reduce the aversion to ambiguity of students who are predominately of the conventional personality type, and (2) to attract to accounting more students who are not averse to ambiguity.

Conceptual Level

Tolerance for ambiguity and an ability to handle complex and unstructured material are central to the concept of integrative complexity. The concept of integrative (or cognitive or conceptual) complexity is rooted in the work of Harvey, Hunt and Schroder (1961), and has been extensively developed since then. Essentially, the concept holds that "all people may be ordered along a continuum from concrete to abstract, depending on their ability to differentiate and integrate information" (Goldstein and Blackman, 1978; p. 136). Individuals who possess a high level of integrative complexity are able to locate relevant information in a highly complex environment and to integrate this information in highly complex ways.

Several measures for determining the position of a person on the concrete-abstract continuum have been developed. These measures attempt to appraise the level of development of a person's integrative complexity, and are commonly referred to as measures of conceptual level, or CL. Raphael, Moss, and Rosser (1979) provide evidence on the construct validity of conceptual level as a personality variable.

Hunt (1966; 1971; 1974) developed a learning model based on a match-mismatch hypothesis that while students with low CL function more effectively in highly structured learning situations, students with high CL function

advantageously in less structured and unstructured learning situations. Therefore, if the educational objective in university accounting courses is to maximize the achievement of each student, the Hunt model suggests that low-CL students should be matched with a highly-structured learning environment and structure slowly withdrawn, while high-CL students should be placed in a relatively unstructured environment (Amernic & Enns, 1979). Such an approach requires, of course, that a variety of learning environments be available and either that students' CLs are known or that each student is permitted to select his or her own environment.

On the other hand, if it is desirable to attract students to accounting who have a greater tolerance for ambiguity and therefore a higher CL, then the accounting courses should be structured so as to appeal to the abilities of high-CL individuals.

Previous Research

There have been many empirical studies on the CL construct and the educational matching model. Only one study has been conducted by an accounting educator, and the authors have found only one other that has been conducted on accounting students. Tuckman and Orefice (1973) classified 120 first year students in Introduction to Accounting at a community college into two categories: abstract-thinking and concrete thinking. The classification was based partially on the work by Hunt (1971) and defined a more concrete person as being categorical, black-white thinking, averse to ambiguity, and governed by external standards. An abstract person, on the other hand, was defined as being capable of utilizing many alternative interactive processes and being able to cope with situational change over time.

Tuckman and Orefice hypothesized that abstract students perform better in, and prefer, less structured learning situations while concrete students perform better in, and prefer, more structured learning situations. Their hypothesis was supported by the results in terms of preference:

> "Abstract students preferred...the most flexible procedures and liked least the less flexible procedure. Concrete students liked least one of the two flexible procedures" (p. 46).

However, the preference conclusion is weakened by the fact that Tuckman and Orefice tested preference by asking the students in each experimental group how they liked the educational approach to which they were exposed. Each student was exposed to only one alternative approach, and thus preferences were not directly measured; instead, the preference conclusion was reached by comparing like-dislike ratings among the different experimental groups.

Tuckman and Orefice were not able to demonstrate that abstract students performed better in less structured situations. The reason would

appear to be that the course content, which was the same under all four tested learning situations, was all essentially concrete in nature. In addition, the achievement instruments which were used to measure performance were "traditional" instruments which "measure only memory and associative processes (and) neglect high-order processes in the cognitive domain" (Tuckman and Orefice, 1973; p. 48). Given the nature of Tuckman and Orefice's performance measures, the outcome is consistent with Hunt's theory. Abstract students would have higher CL, but they still would be capable of performing well within a structured environment and thus should perform well on a test which requires only low CL, regardless of the learning environment.

The one accounting educator to report on an empirical study was Shute (1979), whose experiment was reported after the current research was under way. Shute used a concept of conceptual level which was based on a theory of cognitive development originally hypothesized by Inhelder and Piaget (1958). Inhelder and Piaget identified four levels of cognitive development in childhood and adolescence, of which the last two are concrete-operational and formal-operational. These two levels generally correspond to the concrete vs. abstract levels discussed by other learning theorists.

Shute undertook to determine the relationship between accounting students' CL (as measured under the Piaget approach) and their performance on concrete vs. abstract accounting examination questions. The research was conducted on 179 students in 12 sections of 8 different accounting courses. Shute's findings seem rather inconclusive.. On the one hand, he found that "there does not appear to be a consistent relationship between cognitive level and class performance" (Shute, 1979; p. 30), while on the other hand, he found that formal-operational (abstract) students performed better than concrete-operational students on both concrete and formal (abstract) exam questions (p. 31-33). A number of questions can be raised about Shute's study, including validity of the cognitive measure used, the lack of formal (abstract) exam questions, the appropriateness of the statistical measures used (especially the reliance on correlation), and the adequacy of the dichotomization of the exam questions.

More fundamental, however, is the fact that Shute made no attempt to measure anything other than reasoning levels. Apparently, all of the examination questions used were highly directed and tested only the application of different types of reasoning abilities in highly structured situations.

Thus, neither Tuckman and Orefice nor Shute addressed the relationship between accounting students' cognitive levels and their performance on and preference for unstructured course materials.

Research Hypotheses

This study will attempt to establish the relationships between students' CL and their preference for and performance on differing types of accounting course materials.

The formal hypotheses are as follows:

1: Students who score high in cognitive complexity will perform as well on structured, directed accounting performance measures as students who score low in cognitive complexity.

2: Students who score high in cognitive complexity will perform better on unstructured, less directed accounting performance measures than will students who score low in cognitive complexity.

3: Students who score high in cognitive complexity will prefer unstructured, less directed accounting course materials.

4: Students who score low in cognitive complexity will prefer structured, directed accounting course materials.

An example of a structured, directed performance measure or course material would be a problem which asks for a series of general journal entries to record a specific list of unambiguous transactions. An example of an unstructured, less directed performance measure or course material would be a short case which describes the nature of an enterprise's business and asks the student to identify the accounting problems inherent therein and to propose appropriate accounting policies.

It should be noted that the foregoing hypotheses distinguish between structure and direction on the one hand, and lack of structure and direction on the other. This distinction is quite different from the traditional procedural-vs.-conceptual dichotomy. Conceptual material can be highly structured and directed (e.g., "explain the concept of materiality"), while procedural material can be quite unstructured and non-directive (e.g., a "bookkeeping" problem which requires the student to figure out adjusting entries in situations not previously encountered). Low CL students can be expected to perform equally well on procedural and conceptual material, as long as the material is clear and unambiguous. Therefore the distinction must be between structure and less structure rather than between procedural and conceptual.

Methodology

The subjects for the research were 131 university students enrolled in a third-year introductory financial accounting course. The course is required for all students in the BBA program; in past years, 40% to 60% of the students have elected to be accounting majors. The course seemed to be a good choice for the experiment because students in past years had exhibited widely varying levels of tolerance of ambiguity, suggesting therefore that a

reasonably wide variation in CL would be present.

The course was taught in three sections of approximately equal size and similar structure (room, time of day, days of week) in Fall, 1980. Two of the sections were taught by one of the researchers; the third section was taught by a faculty member who was independent from the research.

Background information for control variables was obtained from the students by administering a questionnarie in the first week of classes. The questionnaire solicited information on (1) previous academic background and achievement, both high school and university, (2) previous exposure to accounting or bookkeeping in secondary or post-secondary education, and (3) work experience. It should be noted that past studies have been able to find only a weak correlation between intelligence and CL for university students (Goldstein and Blackman, 1978; pp. 159-160), and therefore no separate measure of intelligence (as a control variable) was attempted.

At the beginning of the second week of classes, the Paragraph Completion Test (PCT) was administered to the students in order to measure their CLs. The PCT was developed and refined by Hunt, et alia (1978), and is a semi-projective method in which "completion responses are considered to be thought samples which are scored according to how a person thinks" (Hunt, et al., 1978; p.2). PCT scores and their corresponding interpretation are shown in Table 1 (adapted from Hunt, et al, 1978, p. 4).

Each student's responses to the PCT were scored by three raters: each of the two primary researchers plus a research assistant who holds an M.A. in psychology. As an additional cross-check, a sample of responses was given for scoring to an expert scorer who has had considerable experience with the PCT, and her scores were used as a cross-check. This process enhances the validity of the measure and minimizes the effects of any systematic rater bias. An inter-rater reliability of 0.88 was achieved. In addition, subjects whose scores differed by more than 0.5 among the three scorers were discussed and re-scored.

Objectively-scored measures of CL, such as that developed by Tuckman (1966), were rejected because "none of them has proven satisfactory, partly because they are susceptible to faking and partly because they deal with content alone, not how a person thinks" (Hunt et. al., 1978; p. 2).

Student performance was measured by marks achieved on structured and less structured questions and cases on the two midterm examinations (administered in the fifth and ninth week of classes) and the final examination.

Student preference was determined by administering two preference questionnaires, one in the fourth week of classes (the week prior to the first midterm examination) and another in the last week of classes. The preference questionnaires were administered by the research assistant with assurances to the students that their individual responses would remain unknown to the instructor. This procedure was used in order to reduce possible bias which might exist if the students were tempted to give what they perceive

as being the "correct" answers in the eyes of the instructor.

The preference questionnaire consisted of three sections: (1) four questions to determine students' general attitudes towards structured vs. unstructured materials; (2) two examples of assignment or examination material, one of which was clearly more structured and directed than the other; and (3) four questions which forced students to state a preference for one example or the other. Thus the questionnaires required a clear statement of preference for the structured or unstructured example, rather than relative like or dislike, a weakness of the Tuckman and Orefice study.

The examples used in the preference questionnaries were not problems or cases on which the students were graded; the use of graded material may have caused preferences to be stated in terms of grade impact rather than in terms of perceived educational benefit. In the first questionnaire, the two exampes had both been discussed in previous classes, and therefore the students were well acquainted with them. In the second questionnaire, the students had not previously seen the two examples, but the students had just been studying the subject to which they pertained.

The use of two questionnaires provided a dual statement of preference for each student, and permits the detection of changes in preference in future research.

Analysis and Results

The CL scores for the 131 students ranged from a low of 0.6 to a high of 2.7, in a possible range of 0.0 to 3.0. The mean CL score was 1.8. Based on the CL scores, each student was assigned to one of three categories: high CL (CL score > 2.1), medium CL ($1.6 <$ CL score ≤ 2.1), or low CL (CL score ≤ 1.6). The category means were 2.3, 1.8 and 1.4, respectively. In order to provide a more clear cut test of the hypotheses, only the high (n=30) and low (n=50) groups were used in the data analysis.

To determine the significance of the students' background data (e.g., high school grades, GPA, prior exposure to accounting, etc.) t-tests were used to test for significant differences in composition of the two test groups. Only GPA differed between the two groups; the difference was just significant at the 10% level, although small.

The four research hypotheses were then tested by using both t-tests and analysis of covariance with cumulative GPA as the concomitant variable.[1]

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[1] See Baldwin (1980) for a discussion of including GPA as a concomitant variable.

The analysis of covariance results completely supported the t-test results.

Each of the three course examinations included one highly structured question and one unstructured question (case). The performance hypotheses (1 and 2) were tested by testing for significant differences in performance as between the high and low CL groups. The results are shown in Table 2. The results indicate that high and low CL students perform equally well on highly structured questions, while high CL students perform significantly better than low CL students on less structured questions. This difference in performance carried through to the final course grade; the mean grade for high CL students was 4.5 (on a 9-point scale) as compared to 3.1 for the low CL group.

As for the preference hypotheses (3 and 4), no significant difference was found between the high and low CL groups in their preference for structured vs. unstructured course materials. This result seems inconsistent with both CL theory and Tuckman and Orefice's results. However, it is quite possible that students had been convinced by the instructors prior to administration of the preference questionnaires as to the importance of being able to function in unstructured situations. This attitude is strongly reinforced by the textbook which was used in the course (Rosen and Granof) and by its accompanying Self Study Problems. Therefore, the preference responses are possibly biased by the learning environment in this experiment.

Implications

As was discussed at the onset of this paper, there have been increasing demands by the leaders of the accounting profession for educational approaches which emphasize professional decision-making in a realistic, unstructured environment. It seems from this study, as well as from prior research in other fields, that high CL students are better able to function in unstructured situations. Therefore, it follows that the students which we should be preparing for the profession should be those who are operating at a relatively high level of cognitive complexity.

Hunt's match-mismatch educational model calls for placing each student in the appropriate learning environment to correspond with his or her level of conceptual development. By gradually withdrawing structure, low CL students' conceptual development can be enhanced. However, as has been pointed out above, this approach is really not feasible in Canadian university accounting education today. We do not have the resources to devote to such multi-track approaches, even if we were able to reliably test students for CL level.

Instead, our approach must be to designing our courses in such a way that we attract high CL students and discourage those whose development does not seem appropriate to modern accounting. The results of this study corroborate those in other discipline fields which show that high CL students perform

comparatively well with unstructured material. The high CL group scored about 25% better on the cases (unstructured questions) than did the low CL group. Therefore, if unstructured materials are used in first courses, low CL students will tend to either opt out or be forced out of accounting programs due to low grades. We believe that the place to begin this process is in the introductory course. As the Beamer report (AICPA, 1969) stated:

> "...enrollments in the elementary accounting course greatly exceed the enrollments in subsequent courses. While we appreciate that some of the attrition in due to intentional screening out..., we are convinced that an even greater portion of the attrition is accounted for by those whose exposure to the first course is disenchanting"

because of the highly structured approach so often used.

The demand by students for accounting education is great. We are in the position of being able to encourage those students who seem suitable to a career in professional accounting while discouraging those who do not. The use of unstructured course materials in accounting courses is an excellent way of progressing towards this goal.

Table 1

PCT Scores and Characteristics of Individuals

Score *	General Characteristics **
0	(a) Reacts impulsively in negative, unsocialized manner. Aggressive. Self-centered. Resists control, OR
	(b) Defensive, withdraws. May ignore the situation or blame others.
1	Concerned with behaving in socially-acceptable way; polarized or dichotomous thinking or behaviour (right-wrong; good-bad). Sensitive to authority figures. Anxious for closure.
2	Open to others' ideas; evaluates alternatives, but no attempt made to integrate this evaluation with the solution or decision. Concerned with his own thoughts and feelings. Striving for independence. Reveals an increased tolerance for uncertainty.
3	Considers, weighs alternatives, then decides on solution, while showing concern for his own and others' feelings. Often seeks compromise. Secure in his independence; accepts responsibility.

* For each individual subject, a score of from 0 to 3 in steps of 0.5 is assigned for each of five "stems" (ie the subject's written response to "What I think about rules", "when I am criticized"; "When someone does not agree with me"; "When I am not sure"; "and when I am told what to do". The original PCT had a sixth stem - "What I think about parents" --- but it is no longer used because of its apparent lack of reliability and validity (Raphael,Moss, and Rosser, 1979). The score for the top three stems are averaged because of the "pole vault" principle: "if a person demonstrates a high level of conceptual thinking on a few responses, the person is not required to do so every time." (Hunt et al, 1978, P. 37).

** See Amernic and Enns (1979) for a further discussion of conceptual complexity.

Table 2

Performance on Structured vs. Unstructured Examination Questions in Relation to CL Scores

	Maximum Point Value	Mean Score		t-statistic
		High CL	Low CL	
High structure:				
Exam 1	33.0	28.2	27.3	0.94
Exam 2	22.0	13.3	12.3	0.70
Final exam	10.0	3.5	3.6	0.13
Low structure:				
Exam 1	35.0	24.3	19.1	4.34*
Exam 2	26.0	14.5	10.6	2.55*
Final exam	20.0	14.2	12.5	1.77**

* Significant at the 1% level

** Significant at the 10% level.

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INFORMATION SYSTEMS SKILLS AND PROFESSIONAL ACCOUNTANTS: A SURVEY

Abstract

This paper[1] reports on a recent survey of information system skills of professional accountants and articling students.[2] Survey results indicate that the typical respondent does not have a strong understanding of information and computer systems, but believes that this knowledge will be of higher usefulness in the future than at present. The paper concludes with some suggestions for continuing education of professional accountants through either nationally or provincially sponsored seminars in various areas of IS knowledge.

Introduction

The need for Information Systems (IS) competence for professional accountants has received substantial attention in the last decade. For example in September 1974 the CA Magazine devoted an entire issue to this topic. In North America the profession's interest in computers remains high, especially since the Equity Funding scandal in the U.S., and the subsequent publicity arising from the Cohen Commission and the Moss Congressional Investigations in that country. In Canada it is clear that the professional accountants' responsibilities to be knowledgeable in the IS area is increasing. In Quebec already, and now suggested for Ontario, is the peer review system to examine the auditing standards and procedures of firms. Part of this review process may be to assure that latest computer knowledge relevant to the profession has been disseminated. Recent additions of computer materials in the CICA's, CGA's and SMA's courses further support these views. It is the purpose of this article to examine the status of IS knowledge amongst one group of professional accountants (CGAs) and to make recommendations on IS education for accountants. The paper discusses the findings of the survey of CGA's and proposes some recommendations for improving the IS knowledge of accountants.

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[1] This paper is considerably shortened due to the page limitations of the Proceedings. If you are interested in obtaining a full report of the study please write to the authors.

[2] Financial and administration support for this study was provided by the Certified General Accountants' Association of Canada. Their support and especially the cooperation of R.C. Bell, CGA Research Advisor, is acknowledged.

Survey of I.S. Knowledge

A national survey of CGAs and CGA students was recently conducted for gathering data on the level of IS skills presently possessed by CGAs and students, and the perceived value of these skills now and in the future.

During 1978 and 1979 the authors developed a questionnaire for the survey. This questionnaire was pilot tested with the help of twenty-four CGA members of the Province of British Columbia. Based on the pilot results, the questionnaire was substantially revised. A basic problem encountered during the pilot survey was the lack of response by some CGA members who had little interaction with computerized information systems and therefore, little interest in taking the time necessary to complete the survey.

During the summer months of 1980 some 2,400 questionnaires were sent to randomly selected individuals out of a list of 27,378 CGA graduates and students. The survey response rate was approximately 15% with 183 graduates and 158 students responding.[3] A reason for the low response rate could be the fact that it took thirty minutes to complete the survey form; thus many CGA members might have felt it was too long to fill out. Some 25 percent of those who did respond had such a small amount of interaction with the computer that they didn't feel it was appropriate for them to fill out the survey, reducing our sample size to 234. Therefore, we speculate that most of the CGAs who received the survey did not return it thinking that due to their lack knowledge of and interaction with computer systems they would not contribute to the study.

The Skill Questions

The 1974 CA Magazine report proposed eight IS knowledge areas to outline the subject matter with which the professional accountant should be familiar. For analysis in this study, the authors merged two of these areas because of their similarity, ending up with the seven shown in Table I. (See next page.)

For each of these seven areas, a number of detailed, skill questions were generated, again using the proposals of the CA Magazine report. The twenty-six detailed questions which were generated and their relationships to the seven skill areas are shown in Appendix A. For each skill question, the respondents were asked to identify the level of skill they possessed (little or none, average, good) and the perceived value (little or none, some, high) of the skill both now and in the future.

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[3] An analysis of statistics showed that the sample size provides a 5% reliability error at the 95% confidence level. Thus the reader in making generalizations should realize that the statistics assume a ± 5% deviation from the data presented. See, e.g., Herbert Arkin, Handbook of Sampling for Auditing and Accounting, Vol. 1 - Methods, McGraw Hill Book Company, New York 1963 pp. 425-506.

TABLE I
Skill Areas of the Professional Accountant

	Skill Area	Description
1	Basics of EDP	Basics of computing hardware, data processing and data organization.
2	Computing Software	Programming languages and use of packaged programs.
3	Systems Analysis and Design	Investigation, analysis, design, implementation and maintenance of computerized systems.
4	Management of EDP	Resource planning, personnel administration, EDP standards, feasibility analysis, selection and implementation of systems.
5	Controls	Impact of computer processing on internal control; types of controls and standards.
6	Computer Applications	Range of computer applications.
7	Computer Auditing	Impact of EDP on the audit functions, evaluation and verification of EDP controls, auditing and the computer.

Analysis and Presentation of the Skill Data

The responses to the twenty-six skill questions were analyzed by grouping them into the seven IS knowledge areas shown in Table I and Appendix A. Furthermore, for the purpose of this analysis the respondents were grouped according to their choice of "primary functional responsibility" as proposed by the 1974 C.A. Magazine report ending up with three categories:

1. Users (131 respondents)
2. Managers (44 respondents): Includes data center intermediary, administrative manager, and financial manager groups.
3. Auditors/Consultants (59 respondents): Includes external auditor, external advisor or consultant, internal financial auditor, and internal management auditor groups.

The answers in each skill category for each respondent was converted to an aggregate low, medium or high score in the following manner.

The percentages in each category of Low, Medium and High were arrived at by aggregating the responses to the questions in each category. For each question the response was scored 1, 2, or 3 depending on whether the individual answered little or none (1), average (2), or good (3). The method of aggregation for each group of questions is as follows:

	Skill Category	No. of Questions in Category	Scores Low	Medium	High
1	Basics of Computing	3	3-4	5-7	8-9
2	Software	5	5-7	8-12	13-15
3	Systems Analysis & Design	4	4-5	6-10	11-12
4	Management	4	4-5	6-10	11-12
5	Controls	4	4-5	6-10	11-12
6	Computer Applications	3	3-4	5-7	8-9
7	Auditing	3	3-4	5-7	8-9
	Total Number of Questions	26			

As an example, category 1, Basics of Computing had 3 questions. An individual was ranked Low if he/she answered with either little or no skill (1) on all 3 questions, or with some skill level for 1 question (2), but little or none for the other 2 questions in the group.

This converted data was then subjected to a chi-square analysis to examine the differences between users, managers, and auditors/consultants. The statistical analysis and their interpretation is shown in Appendix B. Appendix C presents the data (in percentage form) used for the statistical analysis.

Discussion of Findings & Recommendations

In evaluating the findings of this study the reader is reminded that the questions on the level of skill understanding and perceived usefulness were self evaluative. The respondents did not answer any skill testing examinations, rather they provided their own perceptions of the level of skill possessed and its utility. This might have led to certain response biases, e.g. an individual who has little or no skills in a particular area might likewise state the area is of little value.[4] However, some conclusions from these responses seem warranted. Regardless of the CGA's position as user, manager or auditor/consultant, the respondents felt that the computer skills would be more important in the future. The second conclusion is that, in general, managers and auditors/consultants had higher skills and perceived them to be more useful than the user group. This result is hardly surprising, since it is a natural outcome of their greater involvement with computer systems. Third, some educational gaps were defined as a result of this analysis. It would appear that most respondents, regardless of category,may view with concern the gap between their present skill levels and their perception of the future usefulness of the skill. This is especially true of the user group. While their skills may now be adequate based on their perceptions of present usefulness of the skill to them, their skill levels will become indequate with respect to their perceptions of the future impact of computerized information processing on their working environment.

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[4] Correlation analyses between skill level and present usefulness showed a significant positive relationship. This close relationship is also evident from a perusual of the data in Appendix C.

The demographics data collected in this study indicated that most accountants in the survey group are classified as users of computerized information systems. A large portion, perhaps 25% have had very little exposure to computerized systems. It is expected, however, both by the authors and the survey respondents, that in the future skills in the computerized information systems area will be more important than it is today. As the advances in computing technology continues its rapid pace, more and more individuals in society will feel its impact. Professional accountants who have had a leading role in developing computer based business systems the past, can not avoid an increased involvement with such systems in the future. We therefore make the following recommendations for the education of professional accountants.

For the professional accountants we believe that continued education in information processing subjects either from the various provincial post graduate courses, or from universities and community colleges is essential. While in the U.S. some post graduate professional education is now mandatory for various state CPA boards, in Canada accountants themselves can recognize the need. Thus members in their provincial associations should be planning for various information systems courses to be included in their post graduate offerings. These courses should be differentiated to take into account the diverse needs of accountants who interface with information systems as users, managers, or auditor/consultants. Finally research of this nature should be conducted again within five years. We believe that the expectations of the respondents, that information processing skills will be more important in the future, are valid. A follow up study to determine the impact of information processing on the accounting profession seems warranted in light of present expectations.

APPENDIX A
Classification of the Individual Skill Questions

1. BASICS

The basics of computing hardware (input/output devices; central processing unit, secondary storage, etc.)

The various ways in which data can be processed (batch, on-line, real-time)

The elements of file organization methods (e.g., sequential, direct access) and types of files (e.g., transaction, master).

2. SOFTWARE

The basics of programming languages (e.g., COBOL, FORTRAN ASSEMBLER, etc.)

The uses and availability of preprogrammed software for specific applications (e.g., accounts receivable system)

Other software aids (e.g., compilers, utilities, operating systems).

The stages of program development necessary to turn a defined business problem into a fully coded and tested program.

Program documentation

3. SYSTEMS ANALYSIS AND DESIGN

Systems investigation and analysis (identification of the problem, objectives to be achieved, satisfying users' requirements)

Systems design (work required to transform a conceptual solution into a hardware/software data processing system)

Systems implementation (debugging process, testing of the sytem, conversion to new system etc.)

The post implementation activities (e.g., system review and evaluation, system revision and redesign)

4. MANAGEMENT

Resources planning in an EDP environment (e.g., acquisition of hardware and software)

Staff selection, training, supervision and assessment in an EDP facility

4. MANAGEMENT (cont'd)

The decision process required to involve an organization in EDP, either as a new user or in the extension of existing uses (cost/benefit studies, financial implications, feasibility studies, etc.)

The development of implementation plans for EDP systems (planning and scheduling of tasks, site preparation, coordination of tasks and personnel, staff training)

5. CONTROLS

The factors involved in providing an adequate control of computer resources (i.e., financial control, budgets, standards and procedures, cost allocation, and plans resulting in performance measurement)

The impact of computer processing on internal control (importance of computer control, relationship to conventional control)

The types of computer controls (preinstallation, organizational, development, operating, processing, documentation, and outside data centre controls)

The changes in processing control techniques required by multiple and remote users in an on-line access environment

6. COMPUTER APPLICATIONS

Potential computerized problem solving applications (e.g., financial analysis such as ROI, cash flow, amortization, modelling etc.)

The range of computing services available (e.g., service bureaus, time-sharing, commercial software packages, contract programming, etc.)

The appropriate role of a computer for a practitioner in serving his/her clients

7. AUDITING

The impact of computer data processing on audit approaches and on auditor participation in the computerization process

Evaluation and verification testing in a computer environment

Computer-assisted auditing techniques (automatic flowcharting, utility programs, tailored audit programs)

APPENDIX B

Statistical Summary (Chi-Square) of
Skill Differences Between Users, Managers, Auditor/Consultants
for Skill Level, Usefulness Now, Usefulness Future

Skill Category	Level of Significance	Discussion
1 Basics of EDP		
a Level	NS	Managers perceive higher present usefulness than either users or auditors/ consultants.
b Usefulness Now	.03	
c Usefulness Future	NS	
2 Computing Software		
a Level	.02	Managers have higher skills and perceived usefulness now than either users or auditors/consultants.
b Usefulness Now	.01	
c Usefulness Future	NS	
3. Systems Analysis/Design		
a Level	NS	Managers perceived the present usefulness as higher than either users or auditor/consultants.
b Usefulness Now	.03	
c Usefulness Future	NS	
4. Management of EDP		
a Level	.01	Managers had higher skills and perceived a higher level of usefulness at the present than either users or auditor/ consultants.
b Usefulness Now	.02	
c Usefulness Future	NS	
5. Controls		
a Level	.001	Managers and auditor/consultants had higher skills and perceived future usefulness than users.
b Usefulness Now	NS	
c Usefulness Future	.03	
6. Computer Applications		
a Level	.04	Users rated themselves as having lower skills than either managers or auditors/consultants.
b Usefulness Now	NS	
c Usefulness Future	NS	
7. Computer Auditing		
a Level	.001	Managers and auditor/consultants were higher than users in all categories.
b Usefulness Now	.002	
c Usefulness Future	.000	

		USERS			MANAGERS			AUDITORS/CONSULTANTS		
		Low	Med.	High	Low	Med.	High	Low	Med.	High
1	Basics of Electronic Data Processing									
	a Value Now	29.3	55.6	15.1	11.9	54.8	33.3	31.0	54.5	14.6
	b Future Value	9.0	56.0	35.0	7.3	46.4	46.4	7.5	46.3	46.3
	c Level of Skill	20.0	58.5	21.5	19.1	42.8	38.1	22.0	52.5	25.4
2	Software									
	a Value Now	74.0	20.0	6.0	45.2	35.7	19.0	64.9	27.8	7.5
	b Future Value	28.9	45.2	25.9	34.2	31.8	34.2	25.4	49.1	25.5
	c Level of Skill	73.6	18.4	8.0	46.5	34.5	21.0	67.3	18.9	13.8
3	Systems Analysis & Design									
	a Value Now	61.3	24.2	14.5	38.6	40.9	20.5	66.0	28.3	5.7
	b Future Value	34.7	38.8	26.4	25.6	41.9	32.6	28.8	44.2	26.9
	c Level of Skill	62.8	28.7	8.5	40.9	40.9	18.2	59.6	24.8	10.5
4	Management									
	a Value Now	64.2	25.2	10.6	41.2	37.2	20.9	69.2	26.9	3.8
	b Future Value	35.0	37.5	27.5	24.4	41.5	34.1	33.3	45.1	21.6
	c Level of Skill	72.7	21.9	5.5	44.2	37.2	18.6	64.9	29.8	5.3
5	Controls									
	a Value Now	42.7	38.6	18.5	27.9	37.2	34.9	32.0	43.4	24.4
	b Future Value	16.5	45.5	38.0	14.6	26.10	59.6	9.6	30.8	59.7
	c Level of Skill	55.9	36.5	7.8	27.3	43.2	29.6	39.6	34.5	25.9
6	Computer Applications									
	a Value Now	53.8	39.5	6.7	40.5	52.4	7.1	50.9	40.0	9.1
	b Future Value	21.9	57.0	21.1	12.5	72.5	15.0	20.0	49.1	30.9
	c Level of Skill	52.4	42.7	4.8	28.6	57.1	14.3	39.0	50.8	10.2
7	Auditing									
	a Value Now	57.3	39.2	5.6	39.6	41.9	18.6	30.9	47.2	21.8
	b Future Value	32.3	45.9	21.3	30.3	37.2	32.6	3.6	40.0	56.4
	c Level of Skill	63.7	33.0	3.2	45.5	43.1	11.3	36.9	45.6	17.6

Appendix C

(All figures are in percentages)

CAAA 1981 Conference
Dalhousie University
Halifax, Nova Scotia

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PUBLIC CHOICE OF CORPORATE ACCOUNTING STANDARDS*

Watts and Zimmerman (1979), in their discussion of the historical development of accounting theory, assert that

> ...the evidence is consistent with our hypothesis that much of accounting theory is the product of government intervention and that accounting theory satisfies the demand for excuses... Undoubtedly there are alternative theories which can also explain the timing of the accounting literature. The challenge is to those who would support those alternative theories to specify them and show that they are more consistent with the evidence than ours. (p.300).

In the present paper, we do not pick up that particular gauntlet: indeed, we agree with their assertion that their theory about accounting theories is superior to all opposing theories in the literature at present. Our concern is that it does not go far enough. Our objective is to present a meta-theory of accounting theories that derives the Watts and Zimmerman theory of the market for excuses as a particular consequence, yet is general enough to offer new insights into the financial accounting standard setting process and the development of theories used to justify the standards.

The motivation for the paper is that, in our opinion, the existing literature on standard setting examines only parts of the framework developed here. Though our model of the process is not complete, we maintain that it contains substantially more endogeneity than other models proposed to date, and consequently much more explanatory power.[1]

As a point of departure, we review briefly two theories of behavior that have, in our opinion, extremely important implications for deductive and empirical research in accounting: a theory of expectations equilibria and a theory of institutional information. Neither has received much attention in accounting literature to date.[2]

I. Theories of Expectations Equilibria and Institutional Information

Theories of expectations equilibria (henceforth, EE) appear to have developed independently in two major fields: socio-biology and macro-economics. Socio-biologists (e.g. Dawkins 1978) have used the theory of "evolutionary stable strategies" to explain the equilibrium ratios of numbers of species with certain traits that seem to persist. Equilibrium occurs in such a system when, on average, an organism's expectation of the probability of a certain sort of behavior by rivals is equal to the proportion of genes in the rival's gene-pool that foster such behavior. Macro-economists have used the theory of "rational expectations equilibria" to explain why the customary Keynesian remedies for inflation

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* We gratefully acknowledge the helpful comments of John Butterworth, John Waterhouse, Bob Scapens, Chris Robinson, and Brian Galvin. We must bear the responsibility for misinterpreting any of their excellent suggestions, however.

1. See, for instance, Beaver 1973; 1978; Bryant and Mahaney 1981; Demski 1973; Prakash and Rappaport 1977; Thornton 1979; and Watts and Zimmerman 1978; 1979.
2. Exceptions are papers by Thornton (1979) and by Bryant and Mahaney (1981), which do consider these theories, at least implicitly.

and unemployment seem not to be working (See Poole 1975 for a review of the literature). The explanation is that people make plans based on anticipated economic parameters (such as the rate of inflation) and on anticipated government policies directed at controlling them. If people generally form rational expectations concerning a government policy and its effect, they will simply arrange their affairs ex ante to neutralise the policy.

We maintain that expectations concerning the corporate accounting standard setting process are of paramount importance. People whose behavior is monitored by accounting data (e.g. managers, debtors, etc.) make contracts with one another using existing accounting standards and the expected changes in those standards as an information base that is verifiable by public accountants. They revise their expectations as information becomes available regarding the direction and possible extent of changes in the standards. As an example of what we mean by "direction and extent" of changes, consider pension accounting as an example. If pension accounting were under consideration by the standard setting body, one direction that could be taken by standard setters would be to increase the number of actuarial components of the firm's pension obligations that would be classified as liabilities. The extent of such a change would depend on such decisions as how much recognition were given to past service costs and whether the related charge were made to income or retained earnings. These changes would alter the way in which accounting information could be used in a variety of contracts between the firm and outsiders.

An EE occurs in our model when people's expectations concerning the direction and extent of changes in the accounting standards relevant to their situations are, on average, correct. Not everyone must have rational expectations concerning all accounting issues of the day in order for an EE to occur. It should be noted in passing that Hayek (1948) alludes to a similar idea: not everyone needs to know the price of every commodity for an equilibrium in the real goods market. As academics, for instance, we do not need to know the price of a Rolls when shopping for a car.

Theories of institutional information have a long and perhaps apocryphal pedigree. Individualist philosophers (represented most recently in the work of Hayek 1948 and Popper 1966) have all stressed at times the virtue of an arbitrary set of rules, constraints, or institutions (e.g. go on green, stop on red) to which individuals voluntarily submit, even though they know the rules are arbitrary and unenforceable. Veblen (1899) broadened the notion of institutions to include any widely practised custom, such as the forty-hour work week. Newman (1976) and Thornton (1979) discuss at length the concept of "institutional information" (II). The most important feature of such information is that it is voluntarily taken as given by individuals in the short run, even though each individual knows that the basis for the II must be arbitrary.[3] The II is then used by those individuals to forge contracts that govern their interaction with one another. Two broad classes of such contracts that have received considerable attention in the literature in the past five years are monitoring and bonding contracts directed at reducing agency costs (Jensen and Meckling 1976) and debt indentures that specify the rights and obligations of security holders and management concerning firms' risky operating cash flows[4] (Smith and Warner 1978).

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3. As Thornton (1979) points out, the only II that can be justified to each and every individual is II that is imposed upon them by a dictator. The paradox of such ultra-rationalism is that it can lead only to totalitarianism.
4. Some of these indentures can be viewed as Jensen-Meckling contracts too, though they are meant to specify what is to be done in case of contingencies not contemplated in the Jensen-Meckling framework, such as bankruptcy.

A central notion in any theory of institutional information is that it is more costly for individuals to reform or revise the existing set of II than to alter their behavior to conform with it. Recently, two explanations for this idea have developed independently in the law and economics literature on the one hand, and in the management accounting literature on the other, though neither specifically mentions II. Shavell (1980) addresses the question: Why are contracts incomplete in the sense that they do not specify what is to be done by the parties to contracts in every conceivable contingent future state of the world? The answer that is apparent from a review of previous literature in economics is that (a) it would be too costly to negotiate a complete contract, ex ante, because the number of payoff-relevant states is potentially infinite; and (b) it may be extremely costly or even impossible to verify that a state has occurred, ex post (Arrow 1974). Moreover, verification becomes more difficult as the states specified become more numerous. As a result, the law has specified certain standard remedies for breach (e.g. damages, specific performance) that may motivate the parties to contracts to behave almost as if they were complete. In the context of our model, these standard remedies may be viewed as II.

Demski and Feltham (1976) use the concept of completeness in a management accounting setting. A complete model is a decision model that would be used by a decision maker if specification and analysis of decision problems were costless. Such a model would specify unambiguously what the decision maker should do, given his or her tastes, beliefs and endowment, and given the alternative actions open to him or her. Because specification and analysis are costly, however, individuals necessarily rely on incomplete decision models just as contractors rely on incomplete contracts. Some arbitrary simplifications are made so that a model can specify a preferred action for the decision maker, though he or she may not in fact undertake that action: the output of an incomplete model is information that the decision maker may use to make a decision, though it may not actually be the decision.

The implication of these theories is that we do not observe complete contracts or complete decision models in either a managerial or financial accounting setting. Rather, the majority of contracts focus upon measured outcomes specified in terms of accounting numbers, where the numbers are derived according to a particular set of II at the time of the contract and expectations of changes in II over the life of the contract. Though completeness is sacrificed, rewards and penalties are relatively easy to assess ex post, and ex ante contracting costs are much lower than they would be if the parties had to bargain for and pay for a tailor-made information system as well as the terms of the contract. The role of both generally accepted accounting principles (GAAP) and generally accepted auditing standards (GAAS) in our framework is that they form a set of II that is used to deal with incompleteness in contracts and decision models in the capital market. In a managerial accounting context internal accounting policy manuals rather than GAAP serve as the appropriate II. Nonetheless, GAAP still influences management accounting procedures, by supplying certain fundamental rules such as matching and realization whose implementation can be audited by public accountants.

II. The Negotiation of II-Prices

The theories of EE and II are utilized in figure 1. At the centre of the diagram is management of business firms, who play a crucial role as conduits of II and establishers of EE, as will be explained below. We begin our analysis by adding an accounting profession to the picture, which arises initially to supply

an arbitrary set of II that can be used to reduce the costs of transacting both in the capital market and within firms. Any set of II with the same fineness (Ng 1978) will do as well as any other, initially. However, once contracts have been negotiated based on this II, any future changes in II may impact differently on different interest groups.

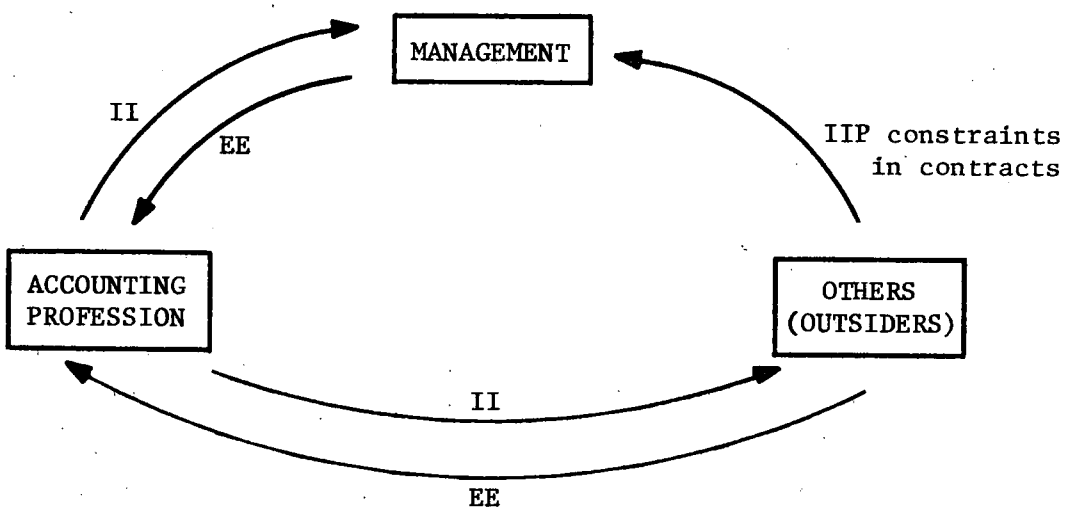

Figure 1: Institutional Information, Expectations Equilibria, and II-Prices.

The profession imposes arbitrary measurement and disclosure standards on managers, and managers voluntarily accept them initially, since they are aware of the benefits of II. Future changes in II do not come as a surprise to managers: they form expectations concerning the pronouncement process which depend not only on their understanding of the process, but also on their ability to influence it through the exposure draft process, service on professional committees, or their association with public accounting firms that can advocate their positions indirectly. We assume, however, that no single corporation is powerful enough to alter II specifically to suit its own contracting purposes: General Motors cannot write the CICA Handbook, even though it may have a significant influence upon some of its contents.

Management uses II (perhaps in modified form) in contracts such as management incentive contracts and bond covenants. The precise terms of such contracts will be adjusted to conform to the set of II currently in use and to management's expectations of how II may change in the future. Bond covenants, for example, often rely on audited accounting data in order to monitor many of the firm's production, investment and financing activities.[5] A bond covenant might contain a 2:1 debt/equity contraint based historic cost II or a 1:1 ratio based on current cost II. The point to note here is that the debt/equity constraint is a parameter that is specific to the II that is being used. It is determined as the competitive outcome of the bargaining that occurs between the firm and outsiders. It is an endogenously determined parameter, along with the interest rate on the bonds, the price of the firm's common stock, etc. In fact, it shares many, if not all the characteristics of price itself in Neo-classical economics. Because of this, we refer to these parameters as II-prices (IIP's). Readers who object to this label may use the term II-parameter whenever we refer to IIP without changing the thrust

5. See Smith and Warner (1978) or Thornton (1980) for a review of these covenants.

of our theory, however,

Generally, parties to contracts will find it easier to use the II currently in use in financial accounting handbooks than to negotiate both an information system and IIP's simultaneously. If very few bond indentures contain IIP's based on current value accounting, we maintain the reason is that the parties to the covenant can obtain much the same result merely by very carefully negotiating IIP's based on historic cost II.

In management incentive contracts, we suggest that the parties agree upon II; then, given the II, they negotiate an IIP relating management compensation to conditional outcomes measured in terms of the II (e.g. "5% of profits based on GAAP"). The IIP agreed upon will take into account not only the intentions and bargaining power of the parties, but also the attributes of II itself, such as the fineness of the partitioning of contingent states and the bias of the system. For example, if the chosen II understates depreciation relative to other possible measurement systems, the IIP will be lower than it would have been if one of these other systems had been used (e.g. "4% of profits" under the chosen system; "5%" under the other systems).

In his characterization of the principal-agent problem, Ng (1978) argues that the parties agree on a reward payment schedule and then agree upon a system to measure performance. This seems to fail to capture the simultaneity in the selection of the IIP along with the II. For instance, if II is coarser, favoring the agent ceteris paribus, the IIP may be lower, favoring the principal. Therefore, coarseness in II per se cannot be said to favor the agent. Similarly, upward bias in II cannot be said to favor the agent, since the upward bias could be counteracted by downward pressure on the IIP in the incentive contract.

An analogous though not identical idea finds expression in the Coase Theorem (Coase, 1960). One statement of this theorem is that no allocation of property rights among individuals will prevent an efficient allocation of resources. Individuals will simply take the rights as given, then establish market clearing prices by bargaining around them. Each allocation of rights will give a different equilibrium distribution of wealth among them, but all such distributions will be Pareto-efficient. Similarly, we suggest that, given the set of IIP's currently in existence, each change in II will give a different equilibrium allocation of wealth among those who have used the II for contracting. The reason is that each change in II alters the explicit constraints imposed by IIP's. This logically leads to a transfer of wealth, to transaction costs of renegotiation, or to the costs of "keeping two sets of books" (see Thornton, 1981 for a list of costs).

Except for the costs of learning the new rules, a single change in II should not affect the constraints imposed in future contracts, because contractors can adjust IIP's accordingly. But, if II changes too often, it will be used less in contracting than if it were more stable. This will impose higher costs of contracting on parties because they will have to bargain over many details of the information system to be used in the contract as well as the IIP's.

It follows that standard setters, by choosing one set of standards over another, are implicitly and perhaps even unconsciously choosing one wealth distribution over another. May and Sundem (1976) argue that because of this, standard setting can be best understood as a political process. In this political process interested parties can lobby in favor of or against particular standards and influence the "problem issues" placed on the agenda by the standard setting body. Not surprisingly, a recurring question by some authors (e.g. Rappaport 1977) is the issue of legitimacy of the standard setting body. In some respects in our framework the issue of legitimacy is determined by the acceptance of the II by the contracting parties. If the II promulgated by the standard setters is not

employed in contracts, then the institution itself may be replaced by an alternative institution whose II is accepted as a rational basis for reducing the costs of transacting. That is, the legitimacy of the institution is assessed primarily in terms of the demand for its outputs and its ability to satisfy this demand. In this context, the general acceptance of accounting principles becomes primus inter pares in the list of desirable attributes of II. Butterworth, Gibbins and King (1981) arrive at a very similar conclusion via a different route.

Market Forces and Accounting Standard Setting. Watts and Zimmerman (1979) hypothesize that a "market for excuses" exists in the promulgation of normative accounting theories. In our framework, their hypothesis is consistent with the simple observation that management and other parties with interests in II (because of the IIP's that constrain them), may demand justification or rationalization of existing II in order to preserve the integrity of their IIP's. The normative accounting theories, then, are endogenous to the system. Our model logically implies that when managers and others understand the theories used to derive II, they will be able to predict how II will be applied in non-standard situations not explicitly covered in accounting handbooks, and how II may be changed by the standard setting body in the future. It is this predictability that gives II its value for long term contracting.[6] We wish to emphasize here that, in our model, it is most definitely not the non-arbitrariness, the intrinsic "correctness", nor the "economic reality" of these normative accounting theories that makes the II based upon the theories useful or valuable, but their long-run endogeneity and logical consistency. II based on modern portfolio theory may be less valuable to managers than II based upon what appear to be totally arbitrary matching and realization theories, for the logic of portfolio theory may be largely exogenous to the concerns facing managers and the parties with whom they wish to contract at the level of the firm.

Similarly, the standard setting process can have profound effects on the expectations of users of II. If we compare the "family compact" sort of standard setting in Canada with the more open, participative process in the United States, we note that, whatever may be said of the processes themselves, there should be relatively fewer surprises in Canada, since the group that sets the standards is a homophilous one with easy-to-understand biases. The introduction of an economist into this group might result in a very grave upset in users' expectations for II. Paradoxically, standard setters who pursue (vainly) the notion of economic reality can imbue II with very desirable properties, because as long as users understand the accountants' theories, EE's are easily formed. The fact that many users find the theories somehow "intrinsically objectionable" is not relevant in our model.

We hasten to point out that our meta-theory is founded on the philosophical basis of instrumentalism.[7] II is seen merely as an instrument for facilitating economic interaction by allowing the low cost negotiation of IIP's. Normative accounting theories are just instruments for generating II and for helping individuals form EE's about how II might change in the future. In this context Thomas' (1969 and 1973) observations that allocations are arbitrary and incorrigible, based on deductive arguments alone, are irrelevant to our meta-theory. In an instrumentalist framework, allocations are meant not to partition reality, but to create arbitrary partitions that can be used by individuals in bargaining for

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6. Watts and Zimmerman (1979) discuss a "pedagogic demand" for normative accounting theories that partially fulfills this requirement. But without EE'S such theories can never be completely satisfactory.
7. Boland (1979) presents an excellent exposition of the use of instrumentalism in the history of economic thought by Milton Friedman, among others.

IIP's, which create a reality of their own.

Another outsider with whom the firm in figure 1 transacts is government. The government collects taxes based on sales and income, using II as the basis for defining these items. Then, based on the II, a tax rate is established to levy sufficient revenues to accomplish the government's fiscal objectives. The tax rate in our framework is viewed as merely another IIP. If II changed, provisions of the tax law would be modified too, but in our model even the wording of the tax law itself may be viewed as merely a very complex IIP that is endogenous to the system.

Our framework also offers some insight into the familiar debate over whether accounting standards ought to be set by the government or by an independent profession. A traditional argument (Rappaport 1977) is that the government lacks the competence to establish accounting standards because of the complex nature of accounting itself as a subject. The profession possesses the competence, but not the social legitimacy to establish standards that alter the allocation of wealth in society. It is logical, therefore, for governments to delegate standard setting authority to the profession. We find this argument unsatisfactory, for the government has ample resources to purchase whatever expertise it needs. A complete explanation for the government's role in accounting standard setting lies in a subtle interpretation of the forces at work in our framework. First, the government is generally seen to alter not II, but IIP's such as tax rates, investment tax credits, allowable depreciation write-offs, etc. The reason is that the government realizes that if it were to alter II continually to accomplish its own objectives, it would be destroying the integrity of II in a wide range of human interaction totally unrelated to its own endeavors. Arguably, if II is seen to vary capriciously and unexpectedly, it will have no value whatever as a basis for establishing IIP's in bond covenants, incentive contracts and the like. Because governments are immune (at least, in the short run) to market pressures that could lead to an EE for corporate II, it is more efficient to leave standard setting to the private sector.

Second, government announcements of IIP's through budget speeches, proclamations, or legislation are almost invariably done quickly, at discrete intervals, in order to attempt to prevent insiders from capitalizing on their knowledge of the precise effect of government subsidies. Accounting standards, in contrast, are established only after painstaking exposure drafts on which all affected parties have ample opportunity to comment. This standard setting process has always recognized, at least implicitly, that during the process opportunities may arise for one interest group to profit at the expense of others. Again, because the government is immune to many market based influences, it logically eschews any formal association with the formation of specific accounting standards.

It appears that in well-disciplined auction markets such as the New York Stock Exchange, changes in II _per se_ have no measurable effect on security returns (see Foster 1978 for a review of research supporting this assertion). On the other hand, researchers have been able to detect changes in security returns that result _indirectly_ from changes in II. For instance, if a change in II upsets existing bond covenants, share prices may react (see for example Thornton 1981, Leftwich 1978). These reactions do not necessarily imply any inefficiency in the capital market: they may be simply the _efficient results_ of contracts predicated on a former EE whose meaning is changed later when uncertainty surrounding the pronouncement process is resolved, either once and for all or gradually, as the pronouncement process unfolds.

Prakash and Rappaport (1977) observe that sometimes managerial behavior seems to change when II changes. For example, new rules for accounting for foreign currency lead to increased amounts of hedging by financial managers. Shank, Dillard

and Murdock (1980), in particulr, do find evidence of such actions. Prakash and Rappaport explain such behavior as an "information inductance" effect: management hedges in the foreign exchange market in order to smooth the firm's reported earnings, to prevent a misconception by readers of financial statements that something unfavorable has happened to the firm. In our framework, however, these apparently dysfunctional hedging actions could in fact be based as logical maximizing behavior. All that is required for this to be so is that it be less costly to incur the real costs of hedging in the foreign exchange market than to incur the costs of renegotiating the relevant IIP's.

A final outsider in figure 1 that we shall discuss is an information intermediary, such as a rating agency. Often, managers voluntarily pay to have their firms rated in some way. Once ratings are established, they may be publicly available as institutional information (e.g. bond ratings) or may be sold privately (e.g. credit ratings). A question that arises is why this information is not provided in financial statements along with other II. One plausible answer is that financial statements do not provide a communication medium that is timely enough to disseminate this information efficiently. Another explanation is that rating signals summarize an extremely complex array of IIP's which would be too cumbersome to report in financial statements because of the sheer number of covenants in existence for most firms, and because of the lack of consistency in the IIP's relating to a particular kind of covenant across firms.

It has come to our attention that when bond covenants are being drafted it is common practice for representatives of rating agencies to be present at the negotiations, advising management of the trade-off between IIP's and the consequent rating that would be given to the firm's bonds for each set of IIP's. For instance, a bond might be rated Aaa if the times-interest-earned constraint were 10:1 based on II: but Aa if it were 5:1. Again, the IIP's are seen to have substantial endogeneity in the framework we propose.

III Equilibrium for the Accounting Profession

An EE for the profession involves rational expectations about the sort of II that it will be required to attest to in the foreseeable future. This, in turn, gives rise to a mandated education and training program for incoming students, continuing education for existing members of the profession, and the promulgation and enforcement of professional standards of conduct. Members must form expectations concerning the theory that can be used to guide accounting practice in situations in which professional judgment is required. Once again, the chief virtue of the theory in our framework is its very endogeneity, not its correspondence with some exogenous economic theory of the firm developed in another discipline such as Economics or Finance. The impetus for changing the theory is the observation by professional accountants that the IIP's are somehow failing to achieve efficient allocation, or that the II is so irrelevant to the needs of contracting parties as to make the IIP's ambiguous and difficult to negotiate.

The mechanism for changing II and the conceptual framework on which it is based is then required to be one that can balance the virtues of stability of II against its responsiveness to demands from various quarters to change it. For instance, one interest group may argue that II would better serve the needs of investors if it aided them in predicting future cash flows. Our framework makes clear that this interest group is a very small subset of users of II and there is no à priori reason to believe that it is the most important one. In fact, the theories that might logically provide guidance to the profession in implementing such disclosures are in large measure exogenous to the concerns of many other parties who have a direct interest in the firm and who have used the present set of II to negotiate IIP's.

The profession is indirectly responsible to users of its II through governments. In most jurisdictions, government gives a licence to a specific group or to specific groups of accountants to perform public accounting ("who does it") and decides on the definitions of II that is to be within the purview of the profession ("what they do"). By changing either the definition of public accounting or the scope of the licence, the government can alter II. This is especially true when there is more than one group of accountants who could be licensed. Consequently, an EE for the profession must involve rational expectations concerning government policy directed at the regulation of public accounting.

IV. Implications for Financial Accounting Standard Setting

In this section we review briefly some immediate applications of the framework and show that it has considerable explanatory power. The list of issues reviewed is far from exhaustive, and is meant only to illustrate how the framework may be applied.

1. The role of abstraction in obtaining agreement.

One of the conventional threads in the accounting literature is that accounting rules ought to be based on a set of postulates, few in number, on which everyone agrees.[8] Then, a deductive logical structure should be used to generate all of the specific rules of accounting. We suggest that the parsimony that is sometimes suggested in the establishment of the postulates is directed not so much at achieving elegance or rigor in accounting theory, but agreement, so that an EE is more easily achieved. The higher the level of abstraction in the postulates, the greater is the chance of obtaining consensus among the various interest groups as to the validity of the postulates. On the other hand, when the postulates at the foundation of the theory decline in number or specificity, the deductive structure of the theory logically generates a higher variance in the actual application of II, since different interpretations of the meaning of the postulates become reasonable in differen circumstances.

As the level of abstraction in the postulates increases, the incentive to use II in contracts declines, for contractors see the statement of postulates as non-operational. Because different interpretations of the postulates are possible, individuals will feel the need to specify more precisely the information base that is to be used in monitoring and bonding contracts. This increases the level of transaction costs in society. Moreover, the pedagogic demand for theories (Watts and Zimmerman, 1979) is for pegs on which to hang procedures in accounting, essentially. The higher the level of abstraction in the postulates, the lower their value in satisfying the pedagogic demand for theories in accounting, and the higher the cost of training accountants.

2. The role of time in establishing accounting standards. The longer the time involved in the establishment of a new standard, the more likely it is that individuals affected by the standard or affecting the standard process will be able to form rational expectations concerning the eventual form of the new II. This will also mean that they will have the time to alter their affairs so as to adapt to the change in standards in advance of the change.[9] For instance, if it took

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8. See, for example, Hendriksen (1977, chapters 1-3).
9. Foster (1978) points out the difficulty in defining "the" economic event caused by a change in accounting principles. Since expectations are continually being revised, such definition may be impossible, even though EE's can exist at each moment in time. It may be impossible to distinguish security price changes that are efficient results of prior EE's from those that are caused by random shocks.

20 years to establish a new standard relating to foreign currency accounting, and if multinational firms had ample opportunity to participate in the exposure draft process, we suggest that by the time the standard was put in place there would be no bond covenants whose meaning would be altered appreciably by the change, since over the twenty year period all new covenants would be negotiated taking the change into account. Unless firms had perpetual bonds outstanding, the change in standards would become less and less relevant as the discussion period became longer and longer.[10]

3. The agenda effect in standard setting. The variance rate of II depends jointly on the time allowed for discussion of a proposed change, and on the proportion of standards in the professional handbook whose possible change is being discussed. We define the variance rate of II as

$$\text{var (II)} = \lim_{\Delta t \to 0} \frac{\text{number of items being discussed}}{\text{time over which they are discussed and resolved.}}$$

Imagine a situation in which the standard setting body announces that all accounting principles in existence will be changed precisely five years from now, all at once, to conform with a new conceptual framework for accounting. Then II is useless except in very short term contracts (less than 5 years). We suggest that this effect helps to explain why standard changes are generally done piecemeal. We do not expect to see sweeping changes proposed of a wide variety of accounting principles on the same agenda. In the same vein, we do not expect to see a conceptual framework adopted quickly that departs radically from the one implicit in current standards, for such a change would not augur well for contracts with IIP's based upon the old conceptual structure.

If the proportion of standards on the agenda is held constant, then the variance rate of II depends on the time allowed for comment, lobbying and adaptation by the various interest groups, as was suggested above. When the time allowed is too short, individuals do not have time to form EE's. In the limit, as the time approaches zero (capricious changes, day by day in standards), the variance rate of II becomes so high that it is useless for contracting. On the other hand, as the time allowed approaches infinity, II lacks responsiveness to exogenous economic events such as new volatility in foreign exchange rates, double digit inflation, or the advent of new kinds of financial instruments that need to be accounted for. Then the variance rate becomes zero, but II again may become irrelevant for many kinds of contracts, since it may ignore some important contingent states of the world. That is, II may be perfectly predictable and understandable when it is perfectly stable, but the cost of this stability is irrelevance to many contractors and other users of accounting information. Thus, it is possible to imagine an optimal variance rate for II, or an optimal half-life for a professional handbook (this idea is developed by Thornton 1981b, ch.1).

4. Why are public accounting firms advocates of particular standards? One of the standard notions of the role of public accounting (henceforth PA) firms is that they must be independent of the standard setting process, and act merely as

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10. Note, too, that many contracts are in the nature of options, which logically entail the freedom to choose a time for exercising. For instance, stock options may be exercised by managers at times that would render a change in II irrelevant to them: it all depends on whether the managers have rational expectations of the standard setting process. If they do, they will exercise such options and negotiate IIP's to neutralize any changes in II that they feel will be detrimental to their interests.

arbiters of the use of the standards that are prescribed by the standard setting body. Yet, we observe examples of particular firms advocating specific standards: for instance, Arthur Andersen has advocated the successful efforts method of accounting for drilling and exploration costs; Deloitte, Haskins and Sells has supported full cost; Price Waterhouse has pressed for the adoption of price level accounting in preference to current cost accounting. The allegation has been made (e.g. by the Metcalf Committee) that large firms advocate standards that are on balance favorable to their clients. It is tempting to conclude that the firms are sensitive to the same IIP's as their clients: if a proposed change in II upsets the integrity of the IIP's in their clients' contracts, the firms would be expected to oppose it either openly or by pressing for the adoption of an alternative standard that is less inimical to those contracts.

We suggest that this analysis is too facile. Our hypothesis is that the advocacy of standards by particular PA firms plays the role of product differentiation in the market for public accounting services. The auditing profession is able to extract higher aggregate fees from clients when there is this product differentiation, for the same reason that product differentiation can lead to higher aggregate profits in the market for real goods.

This analysis implies that PA firms state their views on various accounting issues, and this statement provides information that serves to differentiate them from other PA firms. Clients then select a PA firm whose views suit them, given the IIP's that constrain them at the present time. Once this self-selection has occurred, the PA firms must get involved in the standard setting process in order to preserve the differentiation that they have instigated. This lobbying activity is expensive, and requires considerable expertise: we suggest that only the large PA firms can afford to rent the specialized skills required to perform it. When the volume of clients involved is large, there is a high return to activities that preserve the differentiation. Clients, for their part, stand to benefit from having a large firm as their advocate, since a large firm has resources at its disposal to mount a more persuasive campaign than a small one. Moreover, the advocacy activities of large PA firms do much to keep the differentiated product that they provide before the public, and this exposure increases their abilito attract new clients who wish to press for a particular interpretation of II.

5. Why do standard setters not openly admit that the process is political? Given the analysis in the paper, it seems obvious that the standard setting process is a political one that strives for acceptance of standards by several interest groups. Why, then, do standard setters persist in saying that they select accounting standards on the basis of accounting theory rather than the self-interest of people that provide input to the process? The Watts and Zimmerman (1979) explanation is that the theories serve as excuses for self-interest arguments that might seem to be socially unpalatable. We agree with this assessment, but feel that it stops considerably short of providing a complete explanation of why standard setting arguments are couched in terms of accounting theories such as matching and realization. We suggest, rather, that when standard setters state publicly that reform of II will be based on such theories, they eliminate an infinity of possible suggestions for the reform of II, with good reason: such statements serve to keep II more stable than it would be in the absence of this arbitrary discipline, and to facilitate the formation of an EE.

We conclude that even if standard setters are well aware that the standard setting process is a political one, they will quite rationally lie to everyone - including themselves if necessary - in order to preserve the stability of II. If everyone assumes that future changes in II will conform to the contraints of "economic reality" in terms of accrual accounting, EE's will form much more easily and more quickly than they would in the absence of this arbitrary discipline, and

II can be more valuable in a wide range of human interaction.

V. Conclusions

Our model of institutional information with expectations equilibria appears to offer interesting explanations of how financial accounting standards are determined and how changes in the standards affect users of accounting information. The model also shows promise in explaining many management accounting phenomena, though space in the present paper does not permit a full exposition of this extension.

We suggest that our model may aid also in the development of testable hypotheses in studies of the economic consequences of changes in accounting principles. This will involve very careful explicit consideration of how the parties involved in the change fit into the framework in figure 1: What IIP's existed at the time of the change and how will the new II alter their restrictiveness? How will the government use the new II in its fiscal policies and what will be the result for the cash flows accruing to the firm? To what extent were the theoretical underpinnings of the new II understood by the parties affected by the change or endogenous to the discussion of the change? Did the firms affected by the change have time to renegotiate their IIP's or to arrange their affairs so as to neutralize the effect of the change? When were the expectations of security holders concerning the change "rational"?

Only if these questions (among others) can be answered will economic consequences studies have interesting results. Even if they can be answered, however, it may still be impossible to distinguish between observed consequences that are due to "surprises" from the standard-setter on the one hand, and consequences that are the efficient results of the rational use of old II in incomplete contracts on the other hand. We believe that the construction of empirical studies based upon these considerations will be one of the most important methodological challenges facing accounting researchers in future years, with the most important implications for the public choice of corporate accounting standards.

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PRIVATE INTERESTS AND THE PUBLIC INTEREST

In its Rules of Procedure, the Financial Accounting Standards Board says that "no interest, personal or otherwise, will be placed before the public interest." [1973, p. 3]

A matter of current attention in the academic literature on financial reporting is whether rulemakers in the past may be said to have acted in the public interest, or (what is similar, but not quite the same) whether they have chosen rules which are in the public interest. One aspect of this is to consider whether rulemakers might be better described as acting in their own self-interest, rather than in the public interest. The related question has also been raised whether the concept of the public interest has any significance at all in the arena of financial reporting rulemaking -- beyond its obvious use as a rhetorical weapon in political debate.

The purpose of this paper is to show the dimensions of the public interest in financial reporting issues, and not to give a precise and detailed explication of "the public interest," which could be used as an operational criterion for choosing among alternative policies -- i.e., which would allow one to say "Policy A is to be adopted because it is more in the public interest than alternative policies."

Given that society does have a legitimate interest in financial reporting issues, the question arises as to what institutional structure (e.g. a private sector agency) best serves that interest. The present analysis lays the groundwork for consideration of this question.

The orientation of this study is to regard it as an obligation of a financial reporting rulemaker (such as the FASB) that the public interest be served through its activity. An immediate problem for such a theory of rule-making is that the concept of "the public interest" has often been used as a rhetorical tool, a "political football," in public policy debates. According to Dahl and Lindblom, the public interest

> "is usually left totally undefined. Rarely can it be read to mean the preferences of the greater number. Often enough a precise examination would show that it can mean nothing more than whatever happens to be the speaker's own view as to a desirable public policy. [1963, p. 501; quoted in Held, 1970, p. 9]

Skeptics in the field of financial reporting have focused, not without justification, on this kind of use of the concept of the public interest. For example, Watts and Zimmerman [1979a] claim that "normative" accounting theories are used to try to show that particular financial reporting alternatives are in the public interest, while the real reason for individual preference for the alternative is based on a special, i.e., individual, interest.

If "the public interest" were to serve as an operational criterion for the choice of financial reporting policies, it would have to be analyzed clearly and unambiguously, in such a way that it could serve as a concrete standard. It is doubtful that this is feasible. Therefore, if "the public interest" is to play any legitimate role (i.e., other than as a weapon) in a theory of financial reporting policymaking, it must be in some other way.

Since it will be assumed that there is a relationship of some sort between individual interests in financial reporting and the public interest in financial reporting, the strength of that relationship will be the focus of attention. The reason for this is that knowledge of individual interests in a specific situation should provide at least partial grounds for claiming that

something (e.g., an action or policy) is in the public interest. If knowledge of individual interests were not only a necessary, but a sufficient condition as well, for determining what is in the public interest, then, obviously, a policy-maker's task would be greatly simplified. This paper provides an explication of the concept of the public interest, and of individual interests, without considering in detail (for lack of space) the financial reporting domain itself.

The two kinds of interest are characterized by the following:

(1) x is in the interest of individual i, (or, I_{xi}), and

(2) x is in the public interest (P_x).

'I' stands for 'is in the (individual) interest of,' and x ranges over specific financial reporting policies which might be chosen by a rulemaker.[1]

Since financial reporting rules are normally chosen from among a set of alternatives, just as important as (1) and (2) are:

(3) x is more in the interest of individual i than is y, (I_{xyi}), and

(4) x is more in the public interest than is y (P_{xy}).

The question is, what is the logical relationship between (1) and (2), and between (3) and (4). Before considering this relationship, it is necessary to examine the concept of an individual interest per se.

For present purposes, two possible interpretations of (1) and (3) may be distinguished. [For a more complete account, see Held, 1970.] One is

(1') Individual i wants x.

Under this interpretation, i has an interest in x if and only if he or she

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[1] More generally, 'x' may stand for actions or courses of action, decisions, policies, or other consequences.

chooses or has chosen x when given the opportunity, or would choose x if given the opportunity. This is the sense of interest implicit in conventional micro-economic theory, where x would be characterized as a good to i. An economic good is such that an economic agent places a positive value on it, and if the quantity of the good is in question, would place a higher value on more of the good than less. [Hirshleifer, 1976, p. 57]

The analogous interpretation of (3) is

(3') Individual i wants x more than y.

The economic version of this is that Ii prefers x to y, and does or would choose x over y. The economic postulates of rationality serve to put constraints on the choices i makes.

According to (1') and (3'), i's stated or revealed wants are taken as conclusive of what is in i's interest. Again, in micro-economic theory, the principle of consumer sovereignty makes consumers' stated or revealed preferences conclusive -- the consumer is always the best judge of what is in his or her interest.

A stronger interpretation of interests results from relaxing this constraint. The stronger version of (1) is advanced by Held [1970, p. 24]:

(1'') A claim by or in behalf of individual i for x is asserted as justifiable.

(1'') is stronger than (1') in two ways. First, even if i wants x, x is not counted as being in i's interest unless he or someone is willing to claim that his or her desire for x can be defended as reasonable, i.e., that a case can be made by or on behalf of i for x to be chosen by whomever is in a position to choose. Second, it leaves open the possibility that x is not (is) in i's interest even if i does (not) want it. That is, it is possible, according

to (3''), to overrule i's stated or revealed wants in ascribing interests to him or her. Merit goods conform to this interpretation of interests. A merit good is something that satisfies a merit want; for merit wants, individuals' preferences are subject to "critical scrutiny." [Head, 1974, p. 215] Therefore, if x is a merit good, (1') is an inadequate explication of (1); (1'') is more adequate.

A further reason for rejecting (1') in favor of (1'') is the well-known preference revelation problems in collective choice theory. [See, e.g., Mueller, 1976] Under certain circumstances, it is advantageous for individuals to misrepresent their wants (or preferences). A policymaker, then, may be in a position to determine what individual's true wants and preferences are.

In addition, the stronger interpretation of interests is required in order to consider whether individuals have rights to particular goods. Then, according to (1''), individual i has an interest in x if i has a right to possess it, or to have it instituted, etc. For a claim that i has a right of the appropriate sort is one kind of claim envisaged by (1''). Claims concerning rights are an important aspect of financial reporting issues.

Similar points hold for

(3'') A claim by or on behalf of individual i for x rather than y is asserted as justifiable.

Still, there is a close relationship between (1') and (1'') (and between (3') and (3''), since in many cases, a statement like (1') will constitute a claim as required by (1''). Indeed, unless conflicting interests or conflicting

evidence concerning interests exists, i.e., ceteris paribus, (1') would be taken as a strong reason for saying that x is in the interest of i, and therefore that x should be done, instituted, or promulgated. [Held, 1970, p. 164; Harsanyi, 1976] But, as Held (ibid., p. 24] says,

> We often wish to assert that something is (or is not) in the interest of an individual or group interest, even if they are not (or are) demanding it, and even if problems of ascertaining the validity of such judgments are formidable. In order to refer to potential interests, we may have to refer to the interests which people have even though they are not aware of them.

Both of these kinds of claims are important to a policymaker, since, at the time a policy is being considered for adoption, individuals may not have stated or revealed a desire or preference for one of the policy alternatives. It is also well, at this point, to leave open the possibility that an individual may not know or correctly reveal what is in his "own best interest." [Churchman, 1962; Held, op. cit.] If either of these possibilities obtain with regard to financial reporting, then it may be an important task for a policymaker actively to seek to determine what are individual interests in the contents of corporate financial reports, quite apart from any consideration of the relation between individual interests and the public interest.

Since it is commonly held that the goal of a rulemaker is to promulgate policies which are in the public interest, or even which are most in the public interest, it is important to clarify what the public interest is. Especially important is to analyze the relations both among the interests of individuals, and between private interests and the public interest. For, if individual interests conflict, then not all of them can be served equally. At the same time, it is a basic precept that whatever public interest is, it has some definable relationship to the interests of the individuals who make up "the

public." That is, from a policymaker's point of view, the public interest is related to individual interests, some of which may coincide with the public interest. Thus, the public interest may be served by resolving conflicts among individual interests.

Ideally, one might wish for an adequate explication of the relationship between individual interests and the public interest in purely extensional terms, for if this were done, it would be possible to determine what is in the public interest merely by determining what is in individual interest.

A common conception of the public interest of this sort is the common interest view, according to which something is in the public interest only if it is in the interest of every individual. More formally,

(5) (i) $I_{xi} \longrightarrow P_x$,

where the arrow is truth-functional implication. That is, the truth of (1) for all i implies the truth of (2).

An attractive feature of (5) is that it provides a sufficient condition for an x to be in the public interest. It should also be noted that it depends solely on individual interests.

However, if x is not in every individual's interest then nothing follows from (5) as to what is in the public interest. In requiring unanimity, it presumes that there is no conflict between individual interests and the public interest. But, as the agency approach to corporate governance (e.g., Watts and Zimmerman, 1979a; Fama, 1980] and going back in the academic accounting literature at least to Paton and Littleton [1940], there is such a conflict between investors and managers of corporations. If it is allowed that there are such conflicts, the common interest view is incomplete -- it does not tell us, in all situations,

and based only on knowledge of individual interests, what is in the public interest.

The criterion of Pareto efficiency in economics, insofar as it is intended as an explication of what is in the public interest [See Watts and Zimmerman, 1979b, for an explicit example], is a common interest view of the public interest.

It may appear puzzling at first sight that economic analyses take the weak explication of individual interests (1'), and combine it with a strong explication of the relationship between individual interests and the public interest. But the reason is clear. By adopting (1'), many economists think they can avoid the necessity of making value judgments concerning people's wants. This underlies the assumption of consumer sovereignty, the assumption that economic transactions are voluntary (people engage in economic activity in ways that are best for them), and the notion that it is impossible to make interpersonal comparisons of utility. Likewise, by holding to the unanimity view (Pareto efficiency), outcomes are held to be in the public interest if and only if they are in each individual's interest. So, questions of equity -- situations in which one individual is made worse off at the expense of another -- are avoided.

Value judgments seem to be avoided by these moves. But the requirements of unanimity means that no individual's interest is advanced unless every individual's interest is either advanced or left intact. This implies a bias toward the status quo whenever a public policy question is under consideration. Furthermore, failure to address questions of equity -- either of initial distributions of goods, or among alternative Pareto-efficient equilibria --

reveals the limits of economic analysis to address public policy issues. As the equity aspects of these issues become more important, economic analyses become less adequate.

A logically weaker characterization of the relations between individual interests and the public interest are preponderance theories, whereby if x is in the interest of a preponderance of the members of society, then it is in the public interest. The size of the majority may range from a simple majority up to all but one individual. This relationship between individual interests and the public interest may be characterized as follows:

$$(6)\ (I_{x1} \,\&\, I_{x2} \,\&\, \ldots \,\&\, I_{xm} \,\&\, -I_{X,m+1} \,\&\, \ldots \,\&\, -I_{x,m+n}) \rightarrow P_x,$$

where $1 < n < m$, and $N = m+n$ is the number of members of the relevant population (e.g., voters, or more generally, the whole society).

Majority rule voting procedures are of this type. So also is cost-benefit analysis. On this latter approach, the costs and benefits are calculated for each individual, and summed (on the principle that each person's interests counts equally. Then the x is chosen which has the greatest excess of benefits over costs, or the highest benefit-cost ratio greater than one.

Preponderance theories are more adequate, since they allow individual interests to conflict with the public interest, and among themselves. Furthermore, since it does not require unamimity, it does not imply that the status quo is in the public interest whenever individual interests do conflict.

However, preponderance theories have at least two major problems. One is the size of the preponderance required, for an x to be in the public interest. In the case of voting schemes, sometimes a simple majority is sufficient; but

any specific choice needs to be justified. Second, it assumes that every individual's interest is to count the same. Again, sometimes we do let interests count equally, as when every voter is given a single vote. But even so, not everyone is given the right to vote, thus not counting their interest at all in deciding what is in the public interest. On the other hand, the concept of minority rights is closely related to majority rule. Rights are, in this context, guarantees that some individual interests outweigh others. Therefore, an x may not be in the public interest, even if it is the interest of a preponderance of individuals. Third, unless alternative x's are considered on a pairwise basis, there is no guarantee that one of them will be in the interest of a preponderance. Thus, preponderance theories are also incomplete.

Therefore, a still weaker characterization of the logical relationship between individual interests and the public interest is called for:

(7) $-(Ei)\ I_{x,i} \rightarrow -P_x$.

That is, we can say no more, logically, than that if an x is in no one's individual interest, then it is not in the public interest. This is obviously a very weak claim, which is only that there is some relationship between individual interests and the public interest. Here, again, there may be conflicts between individual interests and the public interest, and among individual interests. But, unlike (5) and (6), it does not propose to give a sufficient condition for something's being in the public interest. Thus, no formal technique of aggregating individual interests is postulated to determine what is in the public interest. Formula (7) does not preclude, for example, unanimity in some situations; but unanimity in all situations is too strong to be a general condition.

Clearly, if the concept of the public interest, as related to individual interests, has any importance at all, the relation is not a purely formal one. Additional, non-formal, conditions must be met, in order to be able justifiably to claim that something is in the public interest. The public interest, whatever it is, is in general (i.e., recognizing the possibility that unanimity is sometimes possible) more than the "sum" or aggregation of individual interests.

In situations where there is unanimity of individual interests, whatever is unanimously preferable is in the public interest. Therefore, any social institution serves the public interest, if it chooses (or would choose) a unanimously desirable or preferable alternative. If there are conflicts among individual interests, though, the public interest must conflict with at least some individual interests, and so cannot be the "sum" of individual interests.

In such cases, then, the public interest is served by an institution which provides acceptable resolutions of these conflicts. Since there is no formal relationship mapping individual interests into the public interest, in such a way as to provide a sufficient condition for an x's being in the public interest, some other approach is required. It would appear that if resolution of collective choice issues is to be more than arbitrary, and furthermore, not based on political or economic power, then a claim that x is in the public interest must be based on some set of general principles -- a theory of some sort. Then a better analysis of the concept of the public interest is

(2') x is in the public interest if and only if a claim for x by or in behalf of the public is asserted as justifiable.

As Held says, "Anyone asserting a public interest claim is asserting that a given action, decision, or policy ought to be effected or maintained by the policy; he is asserting that it is justifiable." [1970, p. 185]

Consonant with (7), individual interests are a necessary part of such a justification, but are not in general sufficient grounds for determining what is in the public interest. According to (2'), in any case where the common interest theory holds, sentences of the form of (1'') are sufficient justification.

Critics have pointed out the vagueness of the concept of the public interest, not without justification. No attempt has been made here to provide even the outlines of a concrete, operational criterion of the public interest, such as one might naively hope to use in deciding financial reporting issues.

Instead, it has been argued, the public interest is a function (though not in the mathematical sense) of individual interests. If there is unanimity among individuals with regard to their interests, then the public interest is the "sum" of individual interests. However, if individual interests conflict, then the public interest cannot be so defined. Issues in which there are conflicting individual interests are collective choice issues, since they cannot be resolved adequately by allowing individuals to act independently -- collective choice and action are required. In such cases, some social institution must exist to resolve the conflict. Or, at least, the only alternative is to preserve an undesirable status quo. In some cases, all individuals may be left better off by collective actions. But, sometimes, some individuals may be hurt for the benefit of others. In the latter situation, a re-distribution of resources may be required, in the name of serving the public interest.

It may be observed that the present discussion of the public interest does not directly aid in the choice of financial reporting policies. Instead, the general nature of the public interest -- as consisting in the evaluation of individual interests, and in the resolution of conflicts among individual interests -- has been examined. We thus have a better understanding of the dimensions of the problem of making public policy. But we have no grounds yet for saying whether particular public policy choices are in the public interest, since we have not yet considered what is to count as a justification of such choices.

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IMPACT OF DEFERRED TAXES ON NET INCOME

Introduction

In 1967, the CICA introduced the recommendations for comprehensive tax allocation procedures into the CICA Handbook, thereby virtually requiring that all public Canadian companies use comprehensive deferral-method tax allocation procedures for all instances in which the year of recognition of revenues and expenses for income tax determination differs from the year of recognition for financial accounting and reporting. In making these recommendations, the CICA took a position which was consistent with that of the Accounting Principles Board in the U.S.A. and with the positions of chartered accountants in England and Wales and in Australia.

Although comprehensive tax allocation has been required practice for more than a decade, its theoretical and practical significance has continued to be widely debated in the professional literature. Researchers such as Davidson (1958), Livingstone (1967) and Dewhirst (1972; 1975) discussed the theoretical aspects, while other researchers attempted to determine empirically the effect of comprehensive allocation, with particular attention to drawdown experience.

Most of the empirical research has been performed using U.S. companies. The first such study was that done by Price Waterhouse (1967), using data obtained from their clients. All other studies have used a computer data base of companies, usually COMPUSTAT. Davidson et al. (1977) and Lantz and Williams (1978) both performed cross-sectional studies of all companies on the COMPUSTAT tapes, while Cawsey, et al. (1973) replicated the Price Waterhouse study for Canadian companies, using a data base which was based on Financial Post data. The only known published longitudinal study was that of Dirksen and Chew (1980), using COMPUSTAT and a U.S. sample.

Three observations can be made about the previous empirical research. First, it has been largely U.S.-oriented. While there are many similarities between the U.S. and Canadian economic, tax and accounting environments, there also are many differences and conclusions reached about deferred taxes in the U.S. which are not necessarily applicable to Canada. Second, the studies have generally been very broad and have included a large cross-section of companies in the economy. No attempt to differentiate impact between different sectors of the economy has been made. Dirksen and Chew limited their sample to firms in industries with 25 or more companies, but no industry-by-industry analysis was reported. Third, little attention has been given to the impact of deferred taxes over time within a company, i.e., longitudinally.

Research Objectives

The current study was undertaken as the first segment of a longer-range study to determine the impact of comprehensive tax allocation procedures on Canadian companies. Since the research is somewhat exploratory, the research objectives are stated as questions rather than as formal hypotheses.

These questions are:

1. What has been the impact of comprehensive tax allocation on the measurement of net income in Canadian industries?

2. What has been the experience in Canadian industries with actual net reversals or drawdowns of accumulated deferred tax balances?

3. What has been the effect of comprehensive tax allocation on the variability of after-tax net income in Canadian companies?

The first two research questions provide a focus for a longitudinal study of Canadian companies grouped into relatively homogeneous industries. The use of industry classifications will permit the identification of systematic differences in the impact of tax allocation among industries. It is expected that substantial differences exist between industries in the type of transactions which lead to timing differences, and therefore the behavior of deferred taxes may vary considerably. For example, in industries where the primary cause for deferred taxes is depreciation-vs.-CCA, the allocation procedures inherent in both accounting and tax methods will tend to smooth out the impact of varying transaction levels (i.e., capital investment) from year to year. On the other hand, in industries where the primary differences are the result of differing points of revenue recognition, fluctuating business levels could cause much more variability in the behavior of deferred taxes.

The third research question addresses the issue of the effect of deferred taxes on the apparent variability of reported earnings. Both the Trueblood report (AICPA, 1973) and the FASB Statement of Financial Accounting Concepts No. 1 (FASB, 1978) stressed that one of the objectives of the users of financial statements is to predict the relative uncertainty of cash flows and hence of earnings. The standard measure of risk or uncertainty in earnings is their variability. Thus, as Stamp (1980) has pointed out,

> "...the adoption of accounting practices that help to smooth out fluctuation in periodic income measures will bias users into a belief that the risk attached to the company's operations is less than it really is." (p. 60).

Analysis

The study was based on the Canadian file of the 1978 version of the COMPUSTAT tapes. The Canadian file contains reported financial data on 373 publically-traded Canadian companies. The Canadian file is far less complete

than the U.S. files, both in terms of the detail offered for each year and in terms of the number of years of data available for each company. Nevertheless, there is sufficient data available to permit analysis.

A total of 293 companies were grouped into 24 industry classifications for analysis. Since many of the basic industrial classifications contain only one or two companies on the COMPUSTAT file, it was usually necessary to group several industries into a broader classification. For example, nine different types of retailers were grouped into a single retail industry.

The 293 companies had an average of 13.74 years of data on the tape, appreciably less than the 20 years of data for which there is provision on the tape, but quite sufficient in view of the fact that only 20% of the companies had begun using deferred taxes prior to the beginning of their history on the tape. There were 27 companies which have no indication of deferred taxes, presumably because there were no material timing differences. These 27 firms were eliminated from further analysis, leaving a sample of 266 companies which reported deferred taxes.

Overall, the deferred tax entry on the income statement was a credit in 20.4% of the cases. This result is very much in accord with other empirical studies. However, the breakdown by industry discloses substanial variation. The telephone companies and the gas and electric utilities have been using deferred tax accounting for the longest period, but have not experienced a single net drawdown in the 248 sample observations. Petroleum refining companies and real estate developers (although with a small sample of companies) display very few net credits, about 5% for each. On the other hand, radio and television broadcasters, textiles and apparel, and electrical and electronics manufacturers have net credits in about one-third of the years examined. These statistics only indicate the frequency of credits to expense; the relative size of the credits will be examined later in this analysis.

Impact on Net Income. For all 266 companies using deferred tax accounting, the ratio of total net deferred tax expense to total net income after taxes is 20.9%. If the individual ratios for all of the companies are averaged, the average ratio is 23.8%, suggesting that the relative impact of deferred tax expense on net income is somewhat larger for firms with smaller absolute net incomes than for firms with larger-than-average net incomes.

In total, the sample companies reported net income after taxes of $27,142,000,000 in those years which were affected by deferred tax expense. If deferred tax accounting had not been used, the aggregrate net income after taxes would have been $32,817,000,000. Therefore, the use of deferred taxes reduced the net income by 17.3% below what flow-through accounting would have reported.

Table 1 reports the impact of deferred taxes on an industry basis. In order to clarify the different measures used, the following mathematical notation may be used:

(1) for the impact on each company (j):

$$I_j = \frac{\sum_{i=1}^{m} (D_{ij} - C_{ij})}{\sum_{i=1}^{m} Y_{ij}}$$

where I_j = the impact of net deferred taxes on the after-tax net income of company j.

D_{ij} = a debit to tax expense for deferred taxes in year i for company j.

C_{ij} = a credit to tax expense for deferred taxes in year i for company j.

Y_{ij} = net income after taxes in year i for company j.

m = number of years deferred taxes were used in company j.

(2) for the average impact on the companies in an industry (k):

$$I_k^j = \sum_{j=1}^{n} I_j \div n$$

$$= \sum_{j=1}^{n} \frac{\sum_{i=1}^{m} (D_{ij} - C_{ij})}{\sum_{i=1}^{m} Y_{ij}} \div n$$

where I_k^j = the arithmetic mean of the impacts (I_j) of deferred taxes on after-tax net income for each of the companies in industry k.

n = number of companies using deferred tax accounting in industry k.

(3) for the overall impact on each industry (k):

$$I_k = \frac{\sum_{j=1}^{n} \sum_{i=1}^{m} (D_{ijk} - C_{ijk})}{\sum_{j=1}^{n} \sum_{i=1}^{m} Y_{ijk}}$$

Table 1 is arranged in descending order of overall impact on each industry. The first column shows the overall industry impact (I_k), while the second column shows the average impact on the companies in each industry (I_k^j). Obviously, the overall industry impact varies quite considerably from industry to industry, ranging from a low of 3.3% to a high of 68.5% of net income after taxes.

The differences between the first and second columns are caused by the relative size differences of companies with differing experience. For example, in petroleum refining, two companies experienced a 96% impact, but they account for less than 1% of the total income for the industry. One other company accounts for almost 42% of industry net income and therefore dominates the overall industry impact. Among electrical and electronics manufacturers, on the other hand, the dominant firm (47% of industry income) experienced a relatively high impact (27%) and pulled the overall industry impact up higher than the simple average of the 12 companies in the industry.

It might be argued that netting the expense credits against the debits understates the average annual impact of deferred tax expenses. Therefore, the third and fourth columns in Table 1 are computed by using only years in which the deferred tax is an increase (debit) in income tax expense. While the change from net to gross does cause some changes in ranking, especially among the companies in the middle of the ranking, the range of overall impacts does not change appreciably.

Drawdowns. The ratio of expense credits to expense debits for each industry is shown in Table 2. The first column is the overall impact in each industry, k,

$$\frac{\sum_{j=1}^{n}\sum_{i=1}^{m} C_{ijk}}{\sum_{j=1}^{n}\sum_{i=1}^{m} D_{ijk}}$$

while the second column is the arithmetic mean of the credit:debit ratio for each company in the industry:

$$\sum_{j=1}^{n} \frac{\sum_{i=1}^{m} C_{ijk}}{\sum_{i=1}^{m} D_{ijk}}$$

The second column is heavily influenced by occasional extremes for individual companies because the overall ratios are quite low. Therefore, the better measure of the industry impact would seem to be in the first column.

The ratio of expense credits to debits is not exactly the drawdown experience, since the ratio does not take beginning balances of deferred taxes into account. To determine the drawdown experience for each industry, the deferred taxes balances on the balance sheet at the beginning of the deferred tax data series for each company was added to the denominator of the credit:debit ratio. The resultant drawdown ratios are reported in the third column of Table 2.

For all 266 sample companies using deferred tax, the overall drawdown ratio was only 4.7%. Excluding opening balances yielded a credit:debit (C:D)

ratio of 5.3%. Table 2 shows that for 13 of the 24 industries, both the C:D ratio and the drawdown percentage were less than 5%.

However, a very interesting phenomenon is disclosed by comparing Table 2 with Table 1. There appears to be a negative correlation between the impact of deferred taxes on net income and the drawdown or C:D experience. The eight industries in which deferred tax expense is most important in measuring net income are also among the 13 industries with drawdowns of 5% or less. More precisely, C:D$\leq$5% when $I_k \geq 19.4\%$.

The remaining 16 industries appear to exhibit no relationship between impact on income and drawdown experience. The median income impact is 12%, and the median C:D experience is also 12%. The distribution around both medians appears to be random.

Smoothing. The methodology to answer the smoothing question was first to fit a trend line (straight line) to the annual net income after taxes and then to compute the standard deviation of reported earnings around the trend line. The second step was to convert the net income after tax figures to flow-through equivalents by adding the deferred tax expense for each year back into net income after tax. Then a new trend line was fitted to the flow-through net income and the standard deviation was computed. A comparison of the two standard deviations for each company would disclose whether earnings variability was increased by removing the impact of deferred tax expense from net income (Dascher and Malcom, 1970).

These testing procedures were applied to a sub-sample of 43 companies who had used deferred taxes for at least 10 years. The companies were chosen to reflect differing deferred tax experience and to represent a cross-sample of companies in the industries examined.

Of the 43 companies, 40 experienced more variation after removing the effect of deferred taxes, of which 24 had flow-through standard deviations more than double the standard deviations for reported earnings. Since it could be argued that the straight-line trend is a poor approximation of the actual trend, more detailed examination of only those firms for which both trend lines had an R^2 of 50% or above was made. Of the 21 firms thus examined, essentially the same results were obtained.

The strength of these results suggested that something was amiss, and therefore computer plots of the data were obtained. Examination of the plots immediately revealed that the change in standard deviations was strongly biased upwards by substantial upward revisions in the earnings variable; since earnings were much higher in the flow-through data, naturally the standard deviations were larger. Therefore, the standard deviations were deflated or standardized by dividing each standard deviation by the concurrent mean of net income. Then the standardized standard deviation for each company's flow-through net income was divided by the standardized standard deviation for reported net income. The results for the 9 companies for which a linear trend was most descriptive ($R^2 \geq 83\%$) is shown in Table 3. Seven of the nine still show greater variability for the flow-through data than for reported earnings.

Another factor which the data plots revealed was that for the 43 companies in all but one instance the revision of net income to exclude deferred tax

increased the slope of the fitted trend line; for 24 companies, the slope was more than doubled. This result clearly indicates that the apparent growth rate of earnings is affected as well as the apparent variability, thereby possibly affecting both the return and the risk components of investors' perceptions. The last column of Table 3 shows the ratio of slopes, flowthrough: reported, for the 9 sample companies reported therein. The increase in slope for all 9 of these companies also illustrates that deferred tax expense has had an increasing proportionate impact on reported earnings.

Conclusion

It is clear that the impact of comprehensive deferred tax accounting varies considerably from industry to industry in the Canadian economy. Industry net income after taxes would have been anywhere from 3% to almost 70% higher if flow-through accounting had been used. In addition, deferred tax accounting has muted both the apparent earnings growth rates and the apparent variability of earnings for those companies whose earnings are significantly affected by deferred taxes.

Drawdown experience also varies considerably among industries, rising from 0% to 34%, but overall, drawdowns are relatively minor at only 5% of deferred tax expense. Interestingly, the companies for which deferred taxes are the most important are also among the companies for which drawdowns are the lowest. The two industries for which deferred tax expense has amounted to about 50% of net income after tax are also the two industries in the sample which have never experienced a single drawdown. Conversely, the industries with the highest drawdown experience are among the industries wherein deferred taxes are not of great importance in determining net income.

In view of the complications of comprehensive deferred tax procedures, and in view of the past and potential misunderstanding of deferred tax amounts by lay readers of financial statements, the appropriateness of current procedures must be investigated. Perhaps it is time to consider partial instead of comprehensive tax allocation, as the Institute of Chartered Accountants in England and Wales has done (ICAEW, 1978). But before any conclusions about such changes can be reached, the exact nature of the timing differences in the different industries must be determined. Such a determination is the intent of the second phase of this research, to be carried out later in 1981.

TABLE 1

Deferred Tax Expense:

Relative Impact on Net Income, by Industry

Industry (n)[1]	Net Impact		Gross Impact	
	Overall	Average of Cos.	Overall	Average of Cos.
Real estate (5)	68.5%	69.1%	70.7%	71.0%
Electric & gas utilities (13)	52.5	52.7	52.5	52.7
Finance & banking (4)	47.9	27.1	52.1	31.0
Telephone (6)	33.7	41.5	33.7	41.5
Misc. non-metal mining (3)	33.2	41.7	36.7	43.1
Crude oil producers (26)	25.0	41.7	30.3	45.7
Paper & forest products (21)	23.7	23.9	25.6	30.1
Petroleum refining (12)	19.4	37.9	20.1	41.2
Textiles	19.1	27.6	27.5	29.0
Electrical & electronics mfrs. (12)	17.1	4.7	22.1	17.3
Chemicals (11)	16.9	16.3	26.0	22.7
Metal products (14)	16.9	14.3	20.4	17.4
Metals (11)	14.9	22.4	24.4	28.8
Misc. metal mining (13)	14.8	23.1	15.6	26.5
Food processors (16)	14.7	19.0	20.5	26.6
Lead & zinc mining (8)	13.4	12.0	15.4	15.1
Beverage producers (9)	12.3	8.8	12.4	19.6
Copper mining (15)	11.2	16.1	15.1	34.8
Investment companies (6)	9.2	8.1	12.9	11.6
Wholesale (24)	9.2	7.1	12.2	9.5
Printing & publishing (10)	8.1	11.5	8.7	15.0
Gold mining (20)	7.5	19.6	10.0	22.7
Retail (20)	6.2	15.0	8.7	12.9
Broadcasting (4)	3.3	6.8	6.5	10.5

1. n=sample size for each industry. All companies are publically traded.

TABLE 2

Deferred Tax Expense:

Relationship of Credits to Debits, by Industry

Industry	D.T. Crs. ÷ D.T. Drs. Overall	D.T. Crs. ÷ D.T. Drs. Average of Cos.	Drawdowns Overall
Broadcasting	34.2%	53.5%	31.8%
Textiles	27.3	42.8	26.4
Retail	22.1	28.5	19.0
Chemicals	21.2	52.5	17.8
Copper mining	19.4	19.4	18.9
Metals	18.4	18.4	13.9
Gold mining	14.0	29.8	12.3
Electrical & electronics	13.9	83.8	13.6
Food processors	11.8	15.5	10.8
Wholesale	9.5	34.0	8.9
Metal products	7.7	24.1	6.4
Lead & zinc mining	5.0	10.5	4.5
Crude oil	5.0	8.1	3.9
Investment companies	4.6	4.4	2.2
Paper & forest products	4.0	12.2	3.7
Misc. non-metal mining	3.6	1.6	3.4
Printing & publishing	2.7	22.0	2.5
Misc. metal mining	2.6	22.3	2.4
Beverage producers	1.0	17.3	0.9
Finance & banking	0.7	1.2	0.7
Petroleum refining	0.6	2.0	0.5
Real estate	0.4	0.4	0.3
Telephone	0.0	0.0	0.0
Electric & gas utilities	0.0	0.0	0.0

TABLE 3

Comparison of Trend Lines for Flow-through

vs. Reported Earnings

Co. Code	R^2		Variability index[1]	Slope ratio[2]
	Reported	Flow-thru		
115	.92	.93	1.18	2.05
158	.87	.83	1.33	1.44
160	.83	.88	1.40	3.49
167	.89	.91	1.18	1.76
191	.88	.92	.74	3.12
271	.90	.86	1.61	5.20
272	.93	.89	1.59	1.17
320	.97	.99	.57	8.55
343	.92	.94	2.14	2.83

1. Deflated std. dev. for flow-through NI ÷ deflated std. dev. for reported NI.

2. Slope for flow-through NI ÷ slope for reported NI.

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A COMPUTER SIMULATION FOR STUDYING ACCOUNTING INCOME MODELS

In considering which accounting models might be appropriate for external financial reporting, a number of issues need to be considered. Among these are the uses to which the various financial reports are to be put, the costs of collecting the data, and the materiality of the differences between the different models. Computer simulation can be a powerful tool for studying the latter issue, since it is far cheaper than a full preparation of financial reports for many companies for many years, and it allows one to study the effects of circumstances which have not arisen in the past (for example, the effects of prolonged periods of inflation at annual rates of 10% to 20%).

If a computer simulation program can cope with various accounting models, then the history of a real or fictitious company can be fed into the models to study the interpretations that they give of that history. This may lead to recognition that certain models give a poor description of economic reality (for example, by introducing large fluctuations into income which have no relevance for prediction of cash flows). Computer simulations may also disclose situations in which different models give very similar results for a particular type of company. Companies in this situation could then be permitted to use whichever model minimized costs, since both models would give the same benefits to statement users.

Computer simulation can also be used to study the effects of corporate accounting policies, such as the choice of depreciation rate for fixed assets. If a company has only one fixed asset, the income effect of depreciating the asset conservatively over less than the asset's actual useful life is obviously to understate income until the asset is fully depreciated and to overstate income thereafter. But when a company has many fixed assets of different sizes and lives and in different stages of depreciation, the income effect of conservative depreciation policies is less clear, and computer simulation can be a useful tool for studying this effect.

This report describes a computer simulation program which is now under development and presents some preliminary simulation results.

Capabilities of the Simulation Program

The program data comprises information about the accounting and economic environment (such as the accounting income model to be used, the inventory cost-flow assumption, and any relevant price indices), and separate information about transactions (such as the purchase of a fixed asset or the sales for one quarter). Keeping these data distinct makes it easy to alter the accounting model, for example, from one simulation run to the next.

Income models include both historical cost and various current value models. In current-value models. capital may be maintained in money, purchasing power, or productive capacity (and in the latter case the financing adjustment is available as proposed in the Current Cost Accounting Exposure Draft). Also, backlog depreciation may be expensed, treated as an adjustment to retained earnings, or netted against holding gains (the usual approach). Holding gains are disclosed separately from operating income, and the operating income of the enterprise is disclosed separately from the operating income attributable to common shareholders. General price-level restatement, with separate disclosure of purchasing-power gains and losses, is available for any model. (Since FASB Statement No. 33 requires both historical dollar and GPL-restated information, the simulation program must be run twice to generate all the data required by that pronouncement.)

Price level series available include historical series of general and specific prices, series exhibiting an arbitrary constant rate of increase or decrease in price levels, and synthetic series having similar properties to the historical series.

The program has several limitations. The most serious, and the most difficult to overcome, is that income taxes are entirely ignored. Other limitations are miscellaneous: there is no provision for writing down inventory to market value; preferred shares are always treated as non-monetary; only a limited number of fixed assets can be held at any one time; and so forth. Work is planned to overcome these limitations.

Simulation of a Model Company

The simulation program has been used to study the effects of depreciation policy and different accounting models for a company with a few large fixed assets. The model company was founded in 1920 and continued operating until 1978. The company is entirely equity-financed, and has no net monetary assets: all net cash receipts are paid out as dividends, and shares are issued when necessary to finance capital expenditures.

On January 1, 1920, and every ten years thereafter, the company purchased a building which lasted for twenty years and was then retired with no salvage value. (Thus, from 1930 onwards, the company owned two buildings.) The amount for which these buildings were acquired increased by 62.9% each decade (equivalent to 5% a year). This increase was partly due to increases in construction costs, but was also partly due to real growth. The first building cost $100,000 in 1920: the last cost $1,146,740 in 1970.

The company's net cash receipts were $10,000 in 1920 and also increased by 5% every year. Because all expenditures and receipts follow a simple pattern, it is possible to calculate the internal rate of return of the company's investments. This rate was about 4.1%.

Let us first consider the effect of depreciation policy in the context of the traditional model. If the buildings are depreciated on a straight-line

basis over twenty years, the resulting net income is shown in the upper series of curves in Figure 1. The curves are easily understood: during each decade, the cash receipts are increasing at 5% each year, while depreciation is constant. At the end of each decade, the older building is replaced by a much more expensive one, so that the depreciation expense increases abruptly to a new constant value for the next decade.

The lower series of curves in Figure 1 show the income pattern that would result if the buildings were depreciated over ten years rather than twenty years. One might suppose that the higher depreciation on one building would be offset by the fact that the other buiding is fully depreciated, but a little more thought shows why this is not so: it is the newer, more expensive, building which is being rapidly depreciated, and the depreciation charge for this is always greater than the average for the two buildings. We can conclude that under the conventional accounting model, for companies which are expanding (or for static companies in times of rising prices), depreciating assets too rapidly will understate income in a manner that may never be corrected.

Figure 2 displays the results for the model company under three accounting models which do not adjust for inflation. (The buildings are depreciated on a straight-line basis over twenty years.) The first is the conventional historical cost model, the curves being the same as the upper series of curves from Figure 1. The second is the current cost operating income of the company, obtained by taking depreciation expense on the current cost of the building. If there are no inventories and no net productive monetary items, this model gives the "current cost income of the enterprise" and the "current cost income attributable to shareholders" of the Current Cost Accounting Exposure Draft. For purposes of the illustration, the current cost of the buildings is assumed to be the historical cost adjusted by the U.S. Composite Construction Cost Index. The changes in this Index, which is shown in Figure 4, can be used to understand the differences between historical cost and current cost income. Costs fell in 1921 below the level of 1920, and remained below that level throughout the decade: the current cost income was more than historical cost income from 1921 to 1929. Costs fell rapidly in the early 1930s, but had returned to the level of January 1, 1930 by late in the decade: the current cost income was greater than the historical cost income in the early 1930s but became about equal towards the end of the decade. From 1940 onwards, costs rose rapidly with the only prolonged respite being from about 1956 to 1965. Even during this period, however, current cost income was far lower than historical cost income, because the historical cost model was depreciating buildings at the much lower costs prevailing in 1940 and 1950. In the 1970s, costs have been rising at unprecedented rates, and the annual increases in depreciation expense have outstripped the increases in revenues, resulting in rapidly increasing current cost losses.

If unrealized holding gains (net of backlog depreciation) are added back to the proposed Canadian model, a "full" current cost income is obtained. This is shown in the third (and extremely volatile) set of curves in Figure 2. Because this company's fixed assets are large in relation to its income, normal fluctuations of a few per cent in specific costs will cause very large

and erratic fluctuations in income reported by a full current cost model.

A major reason for computing enterprise income on an accrual basis is that this provides a better measure of the long-run earning power of the enterprise than does income computed on the cash basis. In the full current-cost model, we observe very large fluctuations in reported income which bear very little relation to the long-run earning power of the company. (Since the company buys a new building every decade, the average holding gain over a decade may be relevant in projecting long-run cash flows, but this average holding gain is subject to much smaller fluctuations.) Since inclusion of unrealized holding gains in income leads to income figures that appear to bear little relation to long-run earning power, the Accounting Research Committee may have been wise to exclude these gains from its income model.

Figure 3 shows the GPL-restated (1978 dollar) versions of the first two of the models which were displayed in Figure 2. When inflation rates are low, the historical cost curves have a similar appearance to the mixed-dollar historical cost curves. As inflation rates rise, however, the real annual increase in net cash receipts falls, and in conditions of severe inflation the real revenues may fall each year. Since the real purchasing power invested in a building is fixed. the real depreciation expense is constant throughout a decade. Consequently, after a prolonged period of high inflation the company may be suffering real losses although the mixed-dollar model reports a healthy profit. This occurred in the periods 1950-1955 and 1970-1978. Both of these periods suggest that the effects of inflation may lag the inflationary period that gives rise to them: prices had almost stabilized in 1950-1955 after strong inflation in the 1940s, and inflation had been severe for several years before the company began to experience real losses in 1970.

The second set of curves in Figure 3 show the income adjusted for inflation and for specific price changes as required by the FASB. For our company, this is the GPL-restated version of the Current Cost Exposure Draft model. The relation between these curves and the common-dollar historical cost curves can be understood from the inflation-adjusted index of construction costs in Figure 4. For example, real construction costs were lower throughout the 1960s than they had been on January 1, 1960 and the real current-cost income exceeds the historical-cost income throughout that decade.

The GPL-restated current cost model with holding gains included in income is just as volatile as the mixed-dollar model, with the spikes related to fluctuations in the real construction cost index rather than the nominal index. The results have not been shown in Fig. 3.

Simulation of Real Companies - The Problem of Obtaining Fixed Asset Data

Although model calculations are valuable for the insight they offer into the effects of one factor at a time on reported income, perhaps the principal value of a computer simulation can come from taking actual corporate histories and interpreting them through various income models. This can be done either by having access to the records of various corporations or by trying to

reconstruct the essential information from the published statements. I am attempting to follow the latter approach.

If we are to restate a company's published financial data to use another accounting model, we must first decide some things about the company's property, plant, and equipment: how much of each does the company have, how long has the company had it, and how fast is it being depreciated? To answer these questions we have rather little data. For Canadian companies, the COMPUSTAT data file supplies gross and net asset values, depreciation expense, and capital expenditures for each of the nineteen years 1960-1978. These seventy-six numbers are summaries of records of thousands of individual assets, and there must be many different sets of assets which would give rise to the same numbers. The problem would seem to be, not one of finding an asset schedule consistent with the published data, but rather one of selecting from among a vast number of mathematically possible schedules one which has some economic plausibility for the particular company.

The gross and net value of property, plant, and equipment, the depreciation expense, and the capital expenditures for any given year can easily be calculated if we know the detailed fixed asset ageing schedule for every year: that is, the gross historical cost of fixed assets owned during the year, broken down by both the age of the asset and its depreciation rate. The process can be reversed to give the detailed ageing schedules from the reported values by expressing it as a linear programming problem. For simplicity, we assume that all purchases and retirements occur on January 1 and that straight-line depreciation is taken until the assets are retired or fully depreciated. (Land and salvage values can be automatically taken care of by assigning them a depreciation rate of zero.)

Let us denote by $Q_t(n,r)$ the total gross historical cost of all assets owned during year t which were acquired n years earlier and are being depreciated at a rate r. A reasonable representation of a company's asset schedule will probably require more than one hundred such numbers for each year (say for depreciation rates of 0, 3%, 5%, 10%, and 25% and various asset lives for each rate). The gross asset value, net asset value, depreciation expense and capital expenditures on property, plant, and equipment for year t are then

$$G_t = \sum_n \sum_r Q_t(n,r)$$

$$N_t = \sum_{nr<1} \sum_r (1-r-nr) Q_t(n,r)$$

$$D_t = \sum_{nr<1} \sum_r r\, Q_t(n,r)$$

$$P_t = \sum_r Q_t(0,r)$$

The sums for N_t and D_t include only assets which are not yet fully depreciated, that is, for which the product of n and r is less than one. These equations show how the reported data could be computed if the ageing

schedule were known: if the reported data are known, however, these equations can be regarded as a set of constraint equations for the coefficients (four constraints for each year). Further constraints come from the fact that the company cannot acquire partly-aged assets, so that the value of six-year old assets held in 1981 must not be more than the value of five-year-old assets held in 1980. This can be expressed as

$$Q_{t+1}(n+1,r) \leq Q_t(n,r).$$

Finally, all the Q_t must be non-negative. With a suitable choice of an objective function, the problem of finding ageing schedules to fit the reported data of a company becomes a standard linear programming problem. Different objective functions will give different ageing schedules consistent with the same data, provided that the data are consistent with the simplifying assumptions made in the analysis (so that a feasible solution exists at all). The choice between alternative schedules will have to be based on judgements of plausibility or on additional information. The objective function

$$Z = \sum_n \sum_r nrQ_t(n,r)$$

will impose one kind of plausibility, since it favours ageing schedules in which assets are not much older than the periods over which they are written off.

At the time of writing, calculations along these lines are in progress but results are not yet available.

Conclusion

This paper has briefly described a computer simulation program capable of turning environment and transaction data for a company into financial statement information based on any of a wide variety of accounting income models. Calculations with a simple fictitious company suggest several tentative conclusions: that an over-conservative depreciation policy may lead to an understatement of income which continues indefinitely, under plausible economic conditions; that the effects of a bout of inflation on a company's real earnings may exhibit a lag of several years; and that models which include holding gains in income may give reported earnings which are far more volatile than the cash flows which earnings are supposed to help predict, while the volatility of earnings reported under FASB Statement No. 33 and the Canadian Current Cost Exposure Draft is far more modest.

A method of extracting transaction data relating to fixed assets from published financial data is proposed, but no results are yet available. Work is continuing on this approach.

The results pointed to in this paper suggest that the computer simulation program in a more complete form (specifically including income taxes), could be a very valuable tool in exploring the properties of various accounting income models.

Figure 1. Income under Conventional Model

———— Buildings Depreciated over 20 years.

-------- Buildings Depreciated over 10 years.

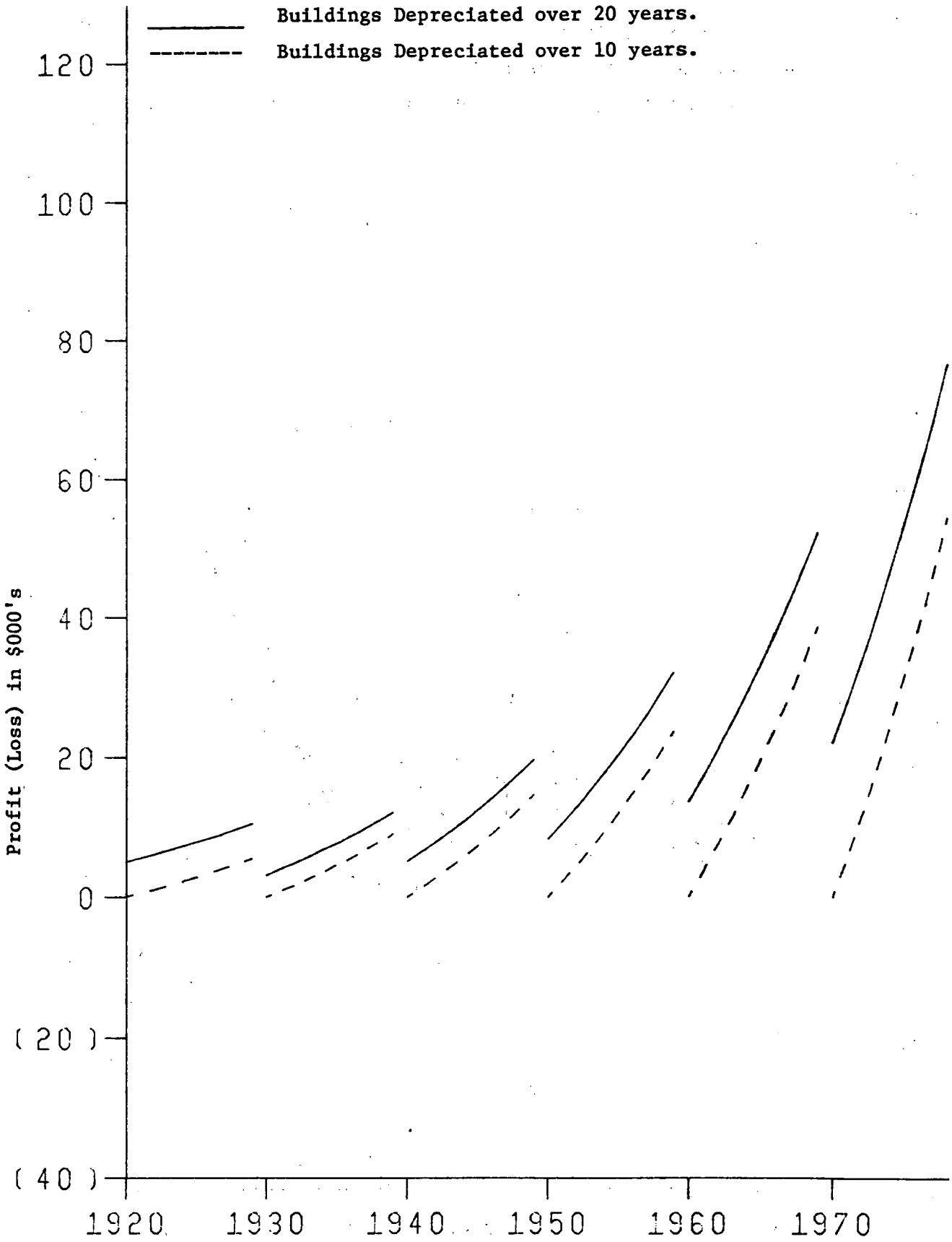


Figure 2. Income under Current Cost Models

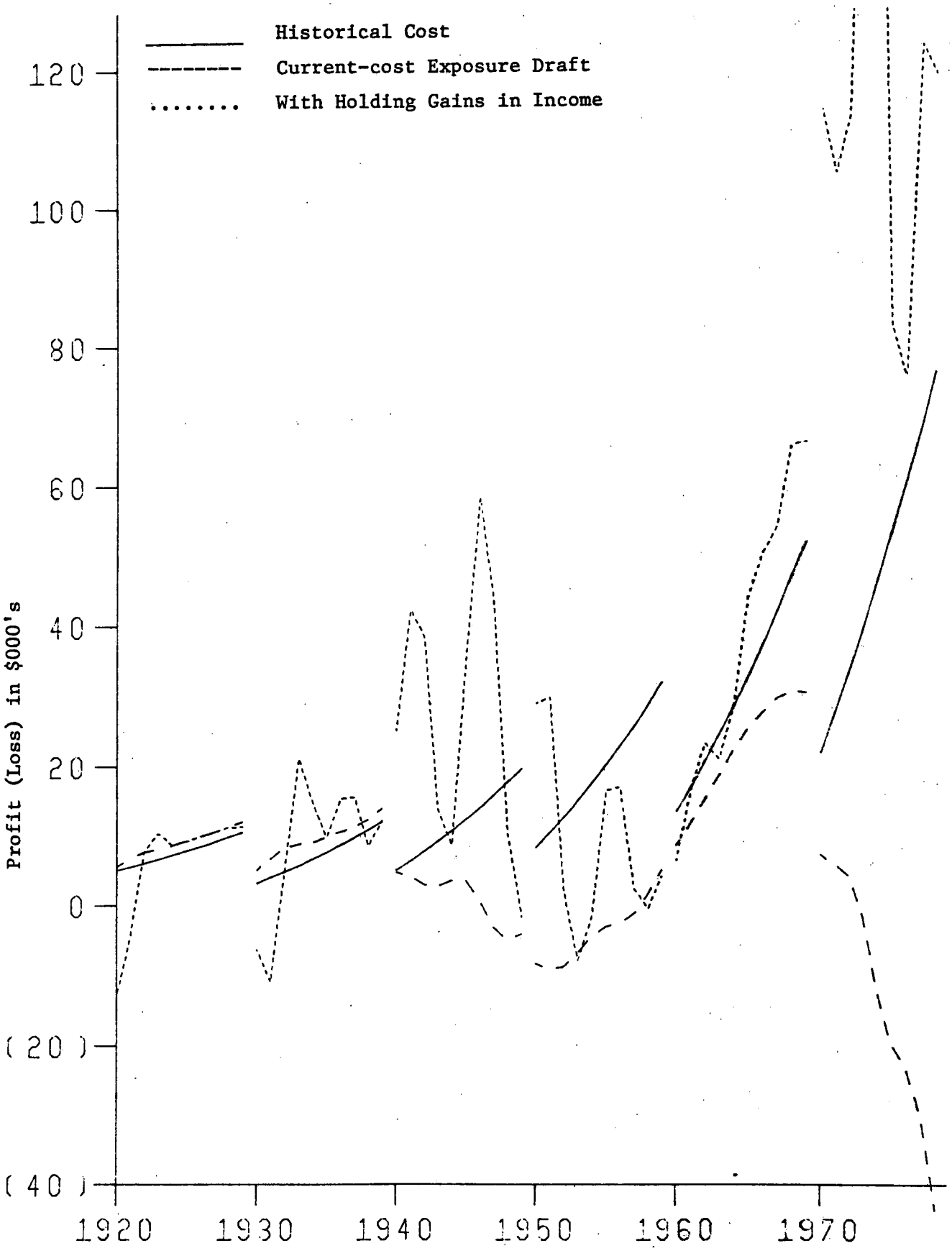


Figure 3. Income under GPL-restated Models

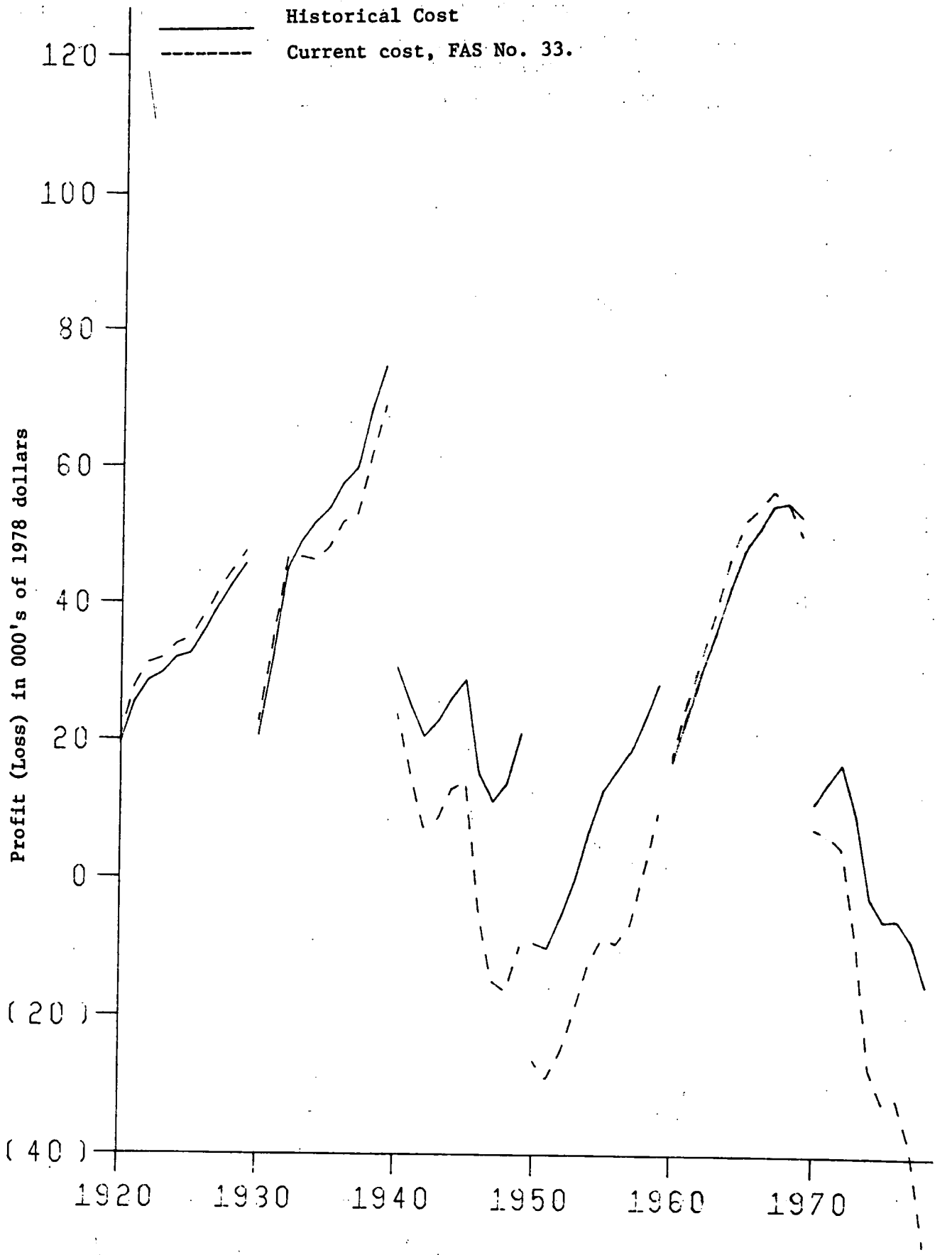
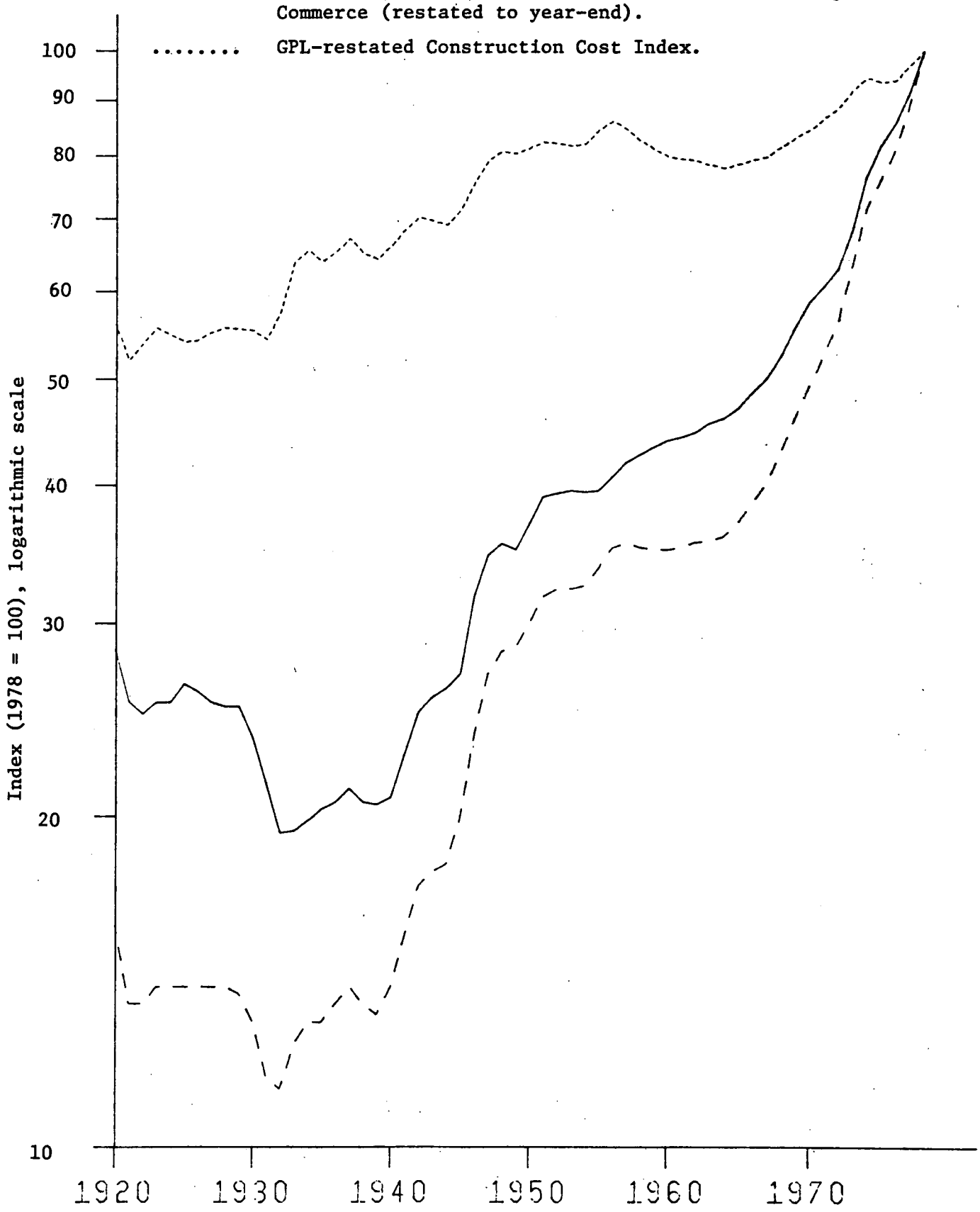


Figure 4. Price Level Indices, 1920-1978, as at end of year.

———— U.S. Consumer Price Index (CPI-U). Source : FAS No. 33.

-------- U.S. Composite Construction Cost Index. U.S. Dept. of Commerce (restated to year-end).

..... GPL-restated Construction Cost Index.



February, 1981

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"A Conceptual Model to Teach Certain Financial Statement Items"

Steve Zeff in an editorial to the Accounting Review has suggested that intermediate financial accounting as it is now taught neglects the theoretical aspects of our discipline. He believes. . .

> "Theory should come at the front, not only at the back of the curriculum. It should provide a framework within which students might endeavor to rationalize (if they can) and assess extant practice, and it should help them to be informed critics and interpreters of exposure drafts and pronouncements yet to come—and for other kinds of change" [Zeff, 1979, p. 593].

A major problem with the teaching of theory has been the failure of educators to link together the accounting concepts and principles in anything but a loose and random manner.

Much discussion and many attempts have been made in current intermediate and advanced texts to integrate more theory into the teaching of accounting. One of the drawbacks of such attempts has been the added confusion and complexity that is given to an already challenging discipline. Presented with the twofold problem of the desire to introduce more theory, while limiting the complexity of the subject to a manageable level, this teaching method that has been most helpful. The model allows the instructor to teach the current accounting form for a given situation, and to critically evaluate current practice while using a consistent theoretical approach.

This approach is less a model and more a way of presenting the discussion. That is, this model does not predict the correct journal entries. It is, then, not a model in the usual form. Rather it is a model of the issues, not the solutions. Students familiar with this model will be able to approach all accounting problems in a consistent, theoretically sound way. The model

has the potential to be evolutionary in nature; it provides a structure that will allow both the introductory and the advanced student to relate the theory to the form of accounting transactions. The model is generalizable to most financial accounting problems and consequently provides a structure for analysis invaluable to the professional accountant. While this model may not be universally applicable with respect to all accounting situations, it will provide the instructor with a consistent basis from which to work.

REPRESENTATION OF THE MODEL

Accounting measures the value of the economic benefits inherent in assets and economic costs in liabilities, etc. We then classify these events into functional groupings and change the valuations (e.g., depreciation) and/or functional groupings (e.g., work in process) by following a set of rules (i.e., Concepts and Principles). These changes are defined as accounting transactions. The first dimension in the model, represented by the columns of the matrix (see Exhibit One), divided into three unique stages of the account's functional life cycle—acquisition, utilization and disposal [Bedford, 1965].

Exhibit 1 Here

The second dimension of the model (the rows of the matrix) represent the measurement problems for the accountant—the physical attributes of the transaction (if any exist), the economic substance represented by the transaction, and finally the accounting implementation or form. Recognition, valuation, and form problems are central to all accounting issues.

Exhibit Two illustrates the role of Accounting Concepts and Principles in the discussion of accounting problems. Brief examples of the discussion that may be generated for Bond Liabilities, Inventories, and Fixed Assets are illustrated in Exhibits Three, Four and Five.

Exhibit 2 Here

THE CONCEPTUAL ISSUES INHERENT IN THE MODEL

Transactions can be examined on two levels: (1) the physical transaction that may actually occur, and (2) the economic value of these transactions. The entity concept defines the criteria for acquisition and disposal transactions. Periodicity requires additional utilization transactions. The allocation of the utilization over time is justified by the Going Concern concept. The functional life-cycle of an account is especially effective when discussing the matching principle, because the difference between cost and benefit at acquisition (where no recognition of expense or revenue occurs) can be clearly contrasted to utilization and disposal (where the matching principle gives rise to a profit or loss).

The measurement problems and the differences between tangible and intangible accounts are clearly demonstrated when the economic substance is evaluated with respect to the attributes of the physical flow of these accounts. Physical transactions are more easily and objectively measured than economic transactions. In most cases, however, there is a physical flow that parallels the economic transactions. From strictly a measurement point of view, if an adequate connection between the physical and the economic transaction can be made, it is possible to use the physical state as a surrogate for the economic state of the account. In cases where the economic substance does not have a direct relationship to the physical attributes, the measurement problem is more tenuous and less precise. Accounting estimates must then be used.

When measurement difficulties arise they can be related to the auditor's role, in the attest function, of providing objectively verifiable evidence to

support accounting transactions. Conservatism and Materiality establish the limits for the accounting form of the transaction. Transactions must meet the test of these principles, but should they be too restrictive, Full Disclosure is invoked for complete recognition of the transaction.

The objective of this teaching technique is to present the student with a model that asks, with equal validity, the same questions for all accounting issues. The student then has one reliable theoretical approach that will lead him/her to a logical analysis of the theoretical issues for the accounting form chosen.

ANALYSIS ISSUES

The Physical Flow—Operating Life Cycle

The teaching model, like the accounting model, is transaction based. The accounting form of a transaction depends upon certain realization and recognition criteria. The teaching model considers the types of physical events that meet the accountant's criteria for recognition. The physical flow aspects of the teaching model, then, are actually limited to physical events that meet accounting criteria for recognition. Three distinct types of physical events are considered: the acquisition of assets or incurrence of liabilities; the change in form (if applicable) or utilization of these assets (and/or servicing of liabilities); and the disposal of the assets (or liabilities). These three events are reflections of the operating life cycle of the particular class of accounting Asset or Liability accounts. At each of these stages in the life cycle, the accountant must consider what representation will be used for Financial Statement purposes.

The Economic Substance

The economic substance of an event is a valuation issue. The value of the assets and/or liabilities can change during their life cycles within the firm. The economic substance or valuation that is most meaningful to the firm is the expected value of 'the bundle of services' that are provided to the firm by its position with respect to the assets. Ultimately the firm must interact with the society so these valuations are expressed in cash or cash equivalents. The expected net value of the 'bundle of assets' is the value to the firm.

However, the value of the assets (liabilities) to society may not be the same as their value to the firm. The societal price of an asset will reflect the highest use of the asset in the society. This use may not be based on the same bundle of services anticipated by the firm because the same physical asset may have many different attributes, not all of which are relevant to each possible use.

A transaction, in pure economic terms, should occur between the firm and the society if the firm's value, net of transactions, is greater than the societal value for a purchase (or the firm's value is less than the societal value for a sale) of the asset. The transaction price represents the historical value of the asset (liability) at its most valued use to society at the time of the transaction. This discussion clearly points out the concept of economic substance as required by the auditors (S.A.S. #1).

This tracing of the physical activities, their recognition, etc., is of interest to the audit function—see the Statements of Auditing Standards, Section 320.13 to 320.25 [AICPA, 1979, pp. 244-246]—and the accounting attest function of societal value as reflected by objective valuations. The financial statements, then, are a reflection of societal value.

It is important, however, to point out the divergence of firm value from societal values and the economic assumptions about rational management behavior when these differences between firm value and societal value increase. This is also important to students so that they may appreciate the distinction between the role of managerial accounting (which considers firm value, budgeting, etc.) and financial reporting, which does not consider the value of Assets or Liabilities to the firm but rather to society.

By examining the fluctuations in economic substance reflected by using alternative valuation bases over the operating life of the asset (liability), the limitations of the accounting form of a transaction can be highlighted. The basic accounting form used in my examples is Historical Cost, with a few limited exceptions—inventories, marketable equity securities, etc., which are used when the substance and accounting form are materially different.

Connecting the Measurement Alternatives with the Attest Function

Finally, the model can be used to analyze the accounting form that coincides with the three stages of acquisition, use, and disposal. The accounting form used to represent the economic consequences of an acquisition transaction must consider the two elements of (1) physical flow, which may be used to determine when the transaction should be reported (the recognition problem); and (2) economic substance, which establishes value criteria. The accounting measure for the latter is societal cost represented by a market price expressed in terms of cash or cash equivalents. Thus, the initial accounting form, in most cases, is recognized when the title or physical possession passes at a historical market value expressed in monetary units.

The transaction that should be used to represent the change in the economic substance of the asset (liability) through utilization is less clear. In may cases the entire (or part of the) change doesn't result in a

direct transaction between the firm and society. Depreciation expenses for long-term assets or the amortization of a bond discount are examples of the more obscure indirect firm-societal transactions. But by applying the model presented in this paper, the implications, limitations, and incongruities of the subsequent accounting form may be highlighted for the student.

Consider an asset on the physical level; wear and tear may have deteriorated the asset so that the expected value of the bundle of services to be derived from it has been reduced. This influence from a measurement point of view is relatively unambiguous. The influence of age and physical use on the economic substance is, however, less clear. The original value to the company may have changed because of unanticipated changes in the company's plans or a change in the cost of alternative sources of identical 'bundles of services' in society (technological obsolescence). Thus the value to the firm or the society may have actually increased or (more commonly) decreased.

Because of the nebulous nature of the change in value of the asset to society, objectivity demands that we use the estimated decline in societal value based on historical estimates. This measurement can be modified by a systematic and rational revision of depreciation rates, the lower of cost or market rule, and the subsequent valuation allowance accounts when differences between economic substance and the original historical cost measurement are material.

Finally, the form of the accounting disposition can be related to the physical disposal (for recognition) and economic substance. The clear-cut transaction or disposal should generate an objective societal measure in cash or cash equivalents of the societal valuation of the 'bundle of services' left in the asset. The accounting form is simply to balance the reduction in the valuation accounts to the change in the cash or cash equivalents received for

the asset or liability exchanged. The rules for the recognition of ordinary versus extra-ordinary gains or losses on exchange at the end of the operating cycle, for example, can be explained within the framework of the model. Ordinary gains and losses are simply errors in utilization estimations while extraordinary gains or losses are unusual and infrequent, and therefore, less susceptible to estimation in the normal operations of the firm at the utilization stage.

CONCLUSION

The teaching model presented in this paper is not an all-inclusive model. It is merely a tool that will make it easier for the student to grasp some of the underlying concepts and principles of accounting in a holistic way. It should give the student a form or structure that will allow him/her to examine accounting problems within a theoretical framework that can be more or less applied again and again to each accounting issue. Because of the repetitive nature of this analysis, the model should allow the student to develop a theoretical perspective, while adding a minimum of additional complexity.

Exhibits 3, 4, & 5 Here

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Exhibit One

The Generalized Model

TRANSACTIONS / ISSUES	Acquisition - Purchase	Utilization - Use	Disposal - Sale
Physical Flow of economic transactions 'recognition problem'	Physical Transaction -legal transaction Asset for Asset Asset for Liability Asset for Equity Promises to Pay	'wear and tear' -depreciation increased utility -value added use cost (interest)	Asset for Asset Asset for Equity Asset for Liability
	'MATCHING' of economic substance (flow of value) to physical (objectively measurable verification) flow— transfer of 'value'		
Economic Substance of these physical activities -'valuation problem'	Market Value Historical Cost or cash equivalent of net present value Economic value to society	Value changes with market fluctuations and use (net of Value added (societal)	Exchange when NPV to firm less then to society.
Accounting Implementation Form* 'Form problem' and the accounting solution.	Historical Cost or equivalent interest (discount) rate 'costs in place'	Amortization Depreciation Matching 'systematic and rational'	measures of cash or cash equivalent, write-off old value accounts-plug Gain or Loss Ordinary versus extraordinary Gains and Losses.

*The form that the accounting model uses to represent the economic substance or value of the transactions.

Exhibit Two

Application of the Concepts and Principles

TRANSACTIONS / ISSUES	Acquisition - Purchase	Utilization - Use	Disposal - Sale
Physical Flow	← Entity concept – defines the principals in the transaction →		
	← Matching principle – each transaction represents a matching → of 'cost and benefit'		
Economic Substance		Going Concern and Periodicity Concepts – legitimizes and defines the timing for use transactions ↓	
	← Stable dollar concept – assumed as part of economic substance →		
Accounting Implementation Form	← Conservation – relates to the hardness* of the measurements →		
	← Materiality – sets a criteria for measurement precision →		
	← Full disclosure – allows the handling of soft* measurements →		

*For a discussion of the concepts of hardness and softness of measures in accounting, see Ijiri [1975, pp. 35-40].

Exhibit Three

The Model Applied to Bonds Payable

TRANSACTIONS / ISSUES	Acquisition	Utilization	Disposal
Physical (recognition issue)	Physical exchange of promises to pay cash or cash equivalents -recognition of transaction	debt servicing or financing	Pay off of terminal value or refinancing
Economic Substance (valuation issue)	Exchange at value to society at the time of the exchange Historical cost	Net present value of an annuity at current market rate adjusted for conversion costs.	Cash surrender or Net present value of refinancing issue
Accounting Form (Implementation issue)	entry Cash Bonds Payable	Amortize value at Historical Cost Market rate of annuity and terminal value	Equivalent Gain or Loss Extraordinary because it's unusual and infrequent. NOTE: more liable to occur because accounting form doesn't recognize the economic substance of the transaction in use by the society.

Exhibit Four

Inventories

TRANSACTIONS / ISSUES	Acquisition - Purchase	Utilization - Use	Disposal - Sale
Physical Flow of economic transactions 'recognition problem'	Physical transaction -legal transaction Asset for asset Asset for liability Asset for equity Promises to pay	Production -change in form Retail-storage distribution Chance in place and time	Physical transfer of title Asset for asset Asset for equity Asset for liability
Matching of economic substance to physical flow (transfer of value)			
Economic substance of these physical activities 'valuation problem'	Historical Cost equivalent of net present value to society	Production and/or retailing -value added by society's perception of greater relative utility	Exchange when expected net present value to the firm is less than to society
Accounting Implementation Form* 'The form problem' and the Accounting solution	Use cash or cash equivalents in exchange Inventories x A/P or cash x	'Cost in place' input fully absorbs all costs, transportation and storage costs 'lower of cost or market' Valuation allowance account x Change in N.I. x	Value exchanged cost or cash equivalents Cash or A/R x Cost of Goods Sold x

*The form that the accounting model uses to represent the economic substance or value of the transactions.

Exhibit Five

Fixed Assets

TRANSACTIONS / ISSUES	Acquisition - Purchase	Utilization - Use	Disposal - Sale
Physical flow of economic transactions 'recognition problem'	Acquisition transaction -legal transaction Asset for asset Asset for liability Asset for equity	'Wear and tear' physical change through 'use'	Disposal -scope, etc. Asset for asset Asset for equity Asset for liability
"MATCHING" of economic substance 'flow of value' to physical 'objectively measurable (verification)' flow			
Economic substance of these physical activities	Acquisition of a 'bundle of services' for Historical Cost or societal. Value of assets greater to the firm than society.	Decline in use remaining in 'bundle of services.' Value to the firm greater than to society. Value at (1) society value or (2) firm value?	Value to society greater than value to the firm
Accounting Implementation Form* Form problem and accounting solution	Cost in place Cash equivalent Historical Cost to society Asset x Cash, A/P, equity x	Estimate the proportional decline in 'value to society' w.r.t. historical cost, <u>not</u> current <u>or</u> replacement value Deprec. exp. x Allowance x use value to society	Cost or cash equivalents, any gain or loss in an estimation error of proportionate decline in society value. Cash or A/R x Allowance... x Asset (Historical Cost) x (gain or loss on sales)

*The form that the accounting model uses to represent the economic substance or value of the transaction.

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JOB SATISFACTION AMONG ACCOUNTANTS EMPLOYED IN DIFFERENT WORK ENVIRONMENTS

This study describes methodology and findings of an investigation utilizing the Porter need satisfaction index to measure satisfaction of 272 Canadian chartered accountants (CAs) employed in different work environments. Findings indicate differences in satisfaction between CAs in public and those not in public accounting practice; between CAs employed in different hierarchical positions; and between CAs employed in different frameworks.

An area that has yet to be investigated in the context of perceived need satisfaction are the different types of work environment of professional accountants. The purpose of this paper is to present the findings of a recently completed study of the attitudes and job satisfaction among Canadian chartered accountants. Our primary purpose is to compare job satisfaction of chartered accountants (CAs) employed in public accounting practice with the CAs working outside of public accounting practice. Our secondary aim is to compare job satisfaction of accountants in the various work environments within the two main categories. Hopefully the findings presented will provide needed insight into satisfaction derived from the various accounting positions and delineate areas where psychological rewards may be improved.

Previous Research Studies

Researchers dealing with the complexities in studying motivation have had the problem in identifying what exactly it is within an employee or his environment that affects his or her behavior. One of the best known theoretical frameworks employed for grouping motives and needs is the need hierarchy of Maslow (1). Five sets of needs -- psychological, safety, social, esteem and self-actualization -- are included in Maslows's model of motivation. He contends that human needs array themselves in a hierarchy of prepotency. As one need is satisfactorily fulfilled, it is replaced by another. For example, if physiological need category (requirement for food, clothing and shelter) is perceived as being adequately satisfied, management programs designed to further enhance need fulfillment and improve performance will not be effective. What is implied is that anyone attempting to create an environment that will motivate employees at work should be aware of the fact that human behavior is primarily directed toward satisfaction of unfulfilled needs.

The need hierarchy model was the basis for Porter's (2) extensive research designed to investigate the manner in which managers perceive the psychological characteristics of their jobs. Porter's research dealt with the relationship of need satisfaction to such items as job level (3), type of work (4), organization size (5) and line-staff position (6). Subsequent studies on need satisfaction have been concerned with managers in government agencies (7,8,9), unions (10) and health care environment (11,12).

A few studies have been directly concerned with job satisfaction of certified public accountants (CPAs) in the United States and of chartered accountants (CAs) in Canada. One study (13) compared the job satisfaction of CPAs in large and small accounting firms. The findings indicated top-level accountants in large firms to be relatively satisfied with self-actualization needs, whereas this need was relatively unsatisfied among accountants in smaller firms. Top-level CPAs employed by small firms, however, reported a high degree of satisfaction in the autonomy need category. Another study (14) compared the perceived need satisfaction of managers in large industrial organizations with that of accountants employed in large CPA firms. This study supported the results of earlier research which found the higher-level needs (autonomy and self-actualization) to be the most deficient. Carpenter and Strawser (15) employed the Porter instrument to measure the need satisfaction of academic accountants. They found that academic affiliation and, to a lesser extent, academic rank, do not appear to be a major determinant of the degree of satisfaction or dissatisfaction.

A search of the literature revealed two recent job satisfaction studies of CAs in Canada. In a large scale survey of chartered accountants (16) which examined several aspects of the CA and his or her work environment, two general findings were reported relative to overall satisfaction. First, as could be expected, partners and sole proprietors in public accounting practice were more satisfied than were their CA employees. Second, CAs not in public practice (government, manufacturing, finance and retail institutions) indicated very little difference in overall satisfaction among the four groups surveyed. The last study to be reviewed (17) investigated the relationship between hierarchical position and firm size with job satisfaction among CAs employed in public accounting firms. One of the findings confirmed the results of earlier research related to the effect of hierarchical position on job satisfaction which showed top-level accountants to be considerably more satisfied with their positions than were the middle-level accountants. The other major finding indicated a definite relationship between job satisfaction and the size of accounting firm. Accountants in large firms were more secure in their position than were their counterparts in smaller accounting firms. The opposite was true with the satisfaction of autonomy needs.

The cumulative research evidence discussed points to a number of tentative conclusions. First, higher-order needs (autonomy and self-actualization) seem to be the most critical areas of need fulfillment at all position levels within the accounting profession. Second, there appear to be sizeable differences in perceived need satisfaction when it is related to hierarchical position of the incumbents. The lower- and middle-level accountants in public accounting firms are generally more dissatisfied than top-level accountants. Third, there is a definite indication that size of the firm has an impact on need satisfaction of its members. Autonomy needs are more likely to be satisfied in smaller firms; security needs, on the other hand, are more likely to be fulfilled in large accounting firms.

With the exception of one study (18), the research concerned with job satisfaction to date focused primarily on accountants in public accounting practice. One group of accountants, however, that has been virtually ignored in these research efforts, is the professional accountant employed outside of public practice. This omission is surprising particularly in view of the fact that half of the chartered accountants in Canada are employed by government, industry, service industries and a number of other organizations outside of public accounting practice. The question of whether the findings reported above also apply to accountants outside of public practice remains unanswered due to lack of

empirical research data. This study is an attempt to redress this neglect by presenting the findings of a recent study of job satisfaction among accountants in different work environments. Specifically, answers to the following questions were sought:

1. Are there differences in perceived job satisfaction between CAs employed in public practice and CAs employed not in public practice?

2. Are there differences in perceived job satisfaction between partners and CA employees working in public accounting practice?

3. Are there differences in perceived job satisfaction among CAs employed in different work environments outside of public practice?

4. Are there differences in perceived job satisfaction among CAs in different job frameworks?

Research Method

Instrument

The data for the accountants were obtained by means of the Porter need satisfaction questionnaire. It consisted of 13 need items grouped into 5 need categories following the classification method used by Maslow, with two major exceptions. First, items related to the lower-order category (physiological needs) are omitted on the assumption that these needs are presumed to be adequately satisfied, and "autonomy" (a higher-order need category), was inserted in the hierarchical order between "esteem" and "self-actualization". The other change is the inclusion of "compensation" as a separate need item which was classified as a non-specific category. The individual need items are shown in Table 1 where they are listed in the order according to the need hierarchy model. In the questionnaire administered to the subjects, those items were arranged randomly. For purposes of comparison, the individual need items in their respective sections were added together to derive mean values for each need category. In a similar manner, a measure of total satisfaction was obtained by summing the category scores.

For each of the 13 items, respondents were asked to answer the following three questions: (a) How much of the characteristic is there now connected with your accounting position?; (b) How much of the characteristic do you think should be connected with your present position?; and (c) How important is this characteristic to you? Respondents answered each question by circling a number on a 7-point rating scale, where low numbers represented low or minimum amounts and high numbers represented high or maximum amounts. A need deficiency was scored for an item if an individual checked a higher scale number for Part b than for Part a. Thus, difference scores between Part b minus Part a ranged from -6 to +6, with the positive end of the scale indicating a deficiency in need satisfaction. The larger the difference between Part b and Part a, the greater is the need deficiency or dissatisfaction with any particular need item or category.

Procedure and Sample

The questionnaire was mailed to 526 chartered accountants (constituting the

total population) in one province in Western Canada during 1980. The names of the subjects were obtained from the directory of the provincial Institute of Chartered Accountants. Usable replies were received from 272 subjects, resulting in a 52 percent response rate. Background items were included in the questionnaire to permit classification of respondents on a number of variables.

Results and Discussion

Demographic information indicated that just over 50 percent of responding accountants were employed in public accounting practice. Partners and sole proprietors constituted the largest responding group, academic accountants the smallest. Almost half of the respondents had a tenure of 5 years or less, and 70 percent of them occupied their present position for 5 or less years. About two-thirds of the respondents were 39 years or under that age, and only 4 percent were females. Tables 1 to 4 present data comparing average need satisfaction scores for accountants in public and non public practice, and for CAs in different job frameworks in the two settings.

This section presents the results of analysis of the data for each question, and interprets the findings.

Question 1. Are there differences in perceived job satisfaction between accountants employed in public and those employed in non public practice? Average need satisfaction for the thirteen need items, five need categories, compensation and total satisfaction for the two groups are presented in Table 1.

An examination of the results shows that the need deficiencies for most of the items are larger for CAs employed in non public practice. However, the scores also indicate that for three of the items, the respondents perceived their positions as providing more satisfaction than that perceived by their counterparts in public practice. The items were: feeling of security (Item Ia), opportunity for friendship (Item IIb), and compensation (Item VIa). With respect to the remaining items, the opposite was true: CAs in public practice expressed greater satisfaction (i.e. smaller need deficiency) with ten of the thirteen items in the questionnaire. The least satisfying aspect of the CAs work in non public practice was related to higher-level need areas: two items each in the esteem (feeling of self-esteem and prestige outside the firm); autonomy (opportunity for independent thought and action, and authority in position); and self-actualization (growth and development, and feeling of accomplishment) need categories.

The findings indicate that, within accounting profession, those employed in public practice derive more need satisfaction from their positions for the higher-level needs than do those in non public practice. This might be expected since jobs in public practice seem to be much less structured compared with those in industry and government. This finding would seem to lend some support to the idea that bureaucratic characteristics have a negative influence on fulfillment of higher-level needs.

TABLE 1

AVERAGE NEED SATISFACTION SCORES OF CAs:
PUBLIC VS. NON-PUBLIC PRACTICE

Need Items and Categories	Public CAs (N=168)	Non-Public CAs (N=104)	Difference	Level of Significance*
I. Security Need				
a. Security in position	.196	.077	-.119	
(Average for category)	(.196)	(.077)	(-.119)	
II. Social Needs				
a. Opportunity to help people	.274	.442	.168	
b. Opportunity for friendship	.232	.204	-.028	
(Average for category)	(.253)	(.316)	(.063)	
III. Esteem Needs				
a. Feeling of self-esteem	.488	.740	.252	.03
b. Prestige within the firm	.361	.567	.206	
c. Prestige outside the firm	.476	.796	.320	.03
(Average for category)	(.442)	(.699)	(.257)	
IV. Autonomy Needs				
a. Opportunity for independent thought and action	.161	.490	.329	.001
b. Authority in position	.256	.529	.279	.02
c. Opportunity to participate in goal setting	.615	.769	.154	
(Average for category)	(.343)	(.596)	(.253)	(.01)
V. Self-Actualization Needs				
a. Growth and development	.497	1.096	.599	.001
b. Feeling of self-fulfillment	.768	1.010	.242	
c. Feeling of accomplishment	.701	1.125	.424	.001
(Average for category)	(.663)	(1.077)	(.414)	(.001)
VI. Other				
a. Compensation	.899	.651	-.248	
(Average for category)	(.899)	(.651)	(-.248)	
Total Satisfaction	.462	.567	.105	

* Only levels of significance below .05 are shown.
Note: The larger the mean score, the less the perceived satisfaction.

Question 2. Are there differences in perceived job satisfaction between partners and CA employees employed in public accounting practice? Table 2 compares the average need satisfaction scores between the two groups.

The results indicate that partners perceived greater satisfaction with twelve of the thirteen items in the questionnaire. "Security in Position" (Item Ia) was the only item with which they were less satisfied. Of the twelve remaining items where CA employees recorded higher need deficiency (lesser satisfaction), six items indicated statistically significant differences between the two groups, and most of these occurred in higher-level need categories. The greatest difference between reality and expectation occurred in autonomy need category where CA employees perceived lesser satisfaction with all three items (Item IVa, b and c) included in the questionnaire.

The essential finding relative to the second question is that level of position within public accounting practice hierarchy has a definite relation to perceived satisfaction of most of the items. It appears that there does exist a relationship between the opportunity to satisfy certain needs and the vertical location of position within the administrative structure of public accounting firms.

The results of the investigation do not show CA employees to be highly dissatisfied (when total satisfaction score is considered), but they do show them to be more dissatisfied than partners and sole proprietors. Dissatisfaction at the lower managerial level in public accounting practice represents increasing differences between what is expected and what is obtained from a given position. In this study, CA employees' expectations in all but one specific need area (Security) are much more divergent from their perceptions of reality than is the case for the top level officials. If the CA employees' situation is to be changed, it would seem that either they will have to change their expectations, or top management will have to change the opportunities for satisfaction among the lower-level accountants. The findings in the study suggest a definite area for improvement in enlarging the opportunities in higher-level needs related to autonomy and self-actualization.

TABLE 2

AVERAGE NEED SATISFACTION SCORES OF CAs IN PUBLIC PRACTICE
PARTNERS VS. CA EMPLOYEES

Need Items and Categories	Partners (N=119)	CA Employees (N=49)	Difference	Level of Significance*
I. Security Need				
a. Security in position	.269	.020	-.249	
(Average for category)	(.269)	(.020)	(-.249)	
II. Social Needs				
a. Opportunity to help people	.168	.531	.363	.05
b. Opportunity for friendship	.219	.265	.046	
(Average for category)	(.193)	(.398)	(.205)	
III. Esteem Needs				
a. Feeling of self-esteem	.395	.714	.319	
b. Prestige within the firm	.359	.367	.008	
c. Prestige outside the firm	.427	.592	.166	
(Average for category)	(.394)	(.558)	(.164)	
IV. Autonomy Needs				
a. Opportunity for independent thought and action	.076	.367	.291	.05
b. Authority in position	.143	.531	.388	.01
c. Opportunity to participate in goal setting	.470	.959	.489	.01
(Average for category)	(.228)	(.619)	(.391)	(.001)
V. Self-Actualization Needs				
a. Growth and development	.449	.612	.163	
b. Feeling of self-fulfillment	.698	.939	.241	
c. Feeling of accomplishment	.568	1.020	.452	.01
(Average for category)	(.571)	(.857)	(.286)	
VI. Other				
a. Compensation	.714	1.347	.633	.01
(Average for category)	(.714)	(1.347)	(.633)	(.01)
Total Satisfaction	.393	.633	.240	

* Only levels of significance below .05 are shown.
Note: The larger the mean score, the less is the satisfaction.

Question 3. Are there differences in perceived job satisfaction among CAs employed in different work environments outside of public practice? Table 3 presents the average need satisfaction for the thirteen need items, five need categories, compensation and total satisfaction for the three groups of accountants.

Although the total satisfaction scores are not significantly different for the three groups, they do indicate that CAs in industry are more satisfied with their position than CAs in government who, in turn, are more satisfied than CAs in education. With minor exceptions, the item scores in Table 3 show that the larger need deficiencies for all respondents occur in the higher-level needs namely, self-actualization and autonomy.

Analysis of the individual items shows four statistically significant differences in need perception among the three groups. CAs in government perceived greater dissatisfaction with the esteem need category (III) compared with CAs in industry (significant at .01 level) and with those in education (significant at .05 level). On the other hand, CAs in education viewed their opportunity for growth and development connected with their position (Item Va) to be much greater than their colleagues in the other two groups. The last significant difference among the groups occurred in compensation (Item VIa), where academic accountants expressed greater deficiency (less satisfaction) than their counterparts, especially when compared to CAs in industry (significant at .01 level).

TABLE 3

AVERAGE NEED SATISFACTION SCORES OF CAs IN NON PUBLIC PRACTICE: BY JOB FRAMEWORK

Need Items and Categories	Mean Value			Level of Significance*		
	Gov't N=32	Indy. (N=59)	Educ. (N=11)	Gov't vs. Indy.	Gov't Ed.	Indy. Ed.
I. Security Need						
a. Security in position	-.094	.153	.182			
(Average for category)	(-.094)	(.153)	(.182)			
II. Social Needs						
a. Opportunity to help people	.844	.220	.546			
b. Opportunity for friendship	.129	.220	.364			
(Average for category)	(.468)	(.220)	(.454)			
III. Esteem Needs						
a. Feeling of self-esteem	.875	.678	.636			
b. Prestige within the firm	.875	.458	.455			
c. Prestige outside the firm	1.406	.448	.727			
(Average for category)	(1.052)	(.523)	(.606)	(.01)	(.05)	
IV. Autonomy Needs						
a. Opportunity for independent thought and action	.750	.373	.455			
b. Authority in position	.688	.509	.273			
c. Opportunity to participate in goal setting	.938	.576	1.364			
(Average for category)	(.792)	(.486)	(.697)			
V. Self-Actualization Needs						
a. Growth and development	1.125	1.186	.636			.05
b. Feeling of self-fulfillment	1.156	.932	1.091			
c. Feeling of accomplishment	1.438	.864	1.727			
(Average for category)	(1.240)	(.994)	(1.152)			
VI. Other						
a. Compensation	.613	.458	1.727			.01
(Average for category)	(.613)	(.458)	(1.727)			
Total Satisfaction	.671	.472	.803			

* Only levels of significance below .05 are shown.

Note: The larger the mean score, the less the perceived satisfaction.

The comparison among the three groups of accountants in non public practice indicates that the higher-order needs seem to be more critical areas of need fulfillment deficiencies. All three groups perceived self-actualization (Category V) needs as the most deficient category. Accountants employed in government and industry perceived esteem needs (Category III) as the next most deficient area, while those in education ranked autonomy (Category IV) second in terms of deficiency.

It would seem reasonable to conclude that the three CA groups are not satisfied with the opportunities to fulfill their higher-level needs they think should be available from their jobs. This finding is in general agreement with Maslow's need hierarchy model, and is in accordance with research performed in different organizational settings.

Question 4 Are there differences in perceived job satisfaction among CAs in different job frameworks? To answer this question, mean scores for the five major need categories, compensation and total satisfaction for all CAs included in this study were ranked and categorized by job framework. The data are ranked according to the mean need deficiency for each of the need categories. The ranks range from 1 (the largest mean deficiency) to 5 (the smallest need deficiency).

Several similarities and differences can be observed from the data in the table. First, CA employees in public practice and CAs in education ranked the need categories in agreement with the theoretical model proposed by Porter and Maslow; i.e. they perceived the lower-level needs (security and social) as being well fulfilled, and the higher-level needs (self-actualization, autonomy and esteem) as being deficient. Second, although the rank order of the need categories by CAs in government and industry deviates slightly from the theoretical model, there is an agreement between the two groups in perceiving the esteem need category as the second most deficient aspect of their job; otherwise the rank order of these two groups is identical with the proposed model. Third, there is a great discrepancy between the rank order perceived by partners and sole proprietors in public practice and the theoretical model. The only area of agreement between the two lies in the area of self-actualization which ranks first in terms of deficiency. The rank order for the remaining four need categories differs from the model as well as from data reported for other managerial groups. Autonomy need category is a good example to point out the difference. Partners rank this need in 4th place in terms of deficiency, followed only by social need category. CAs in the remaining job frameworks perceived this need to be the 2nd or 3rd most deficient, preceeded only by self-actualization needs. Fourth, there is an agreement among CAs in all five job frameworks in ranking self-actualization need category as the most deficient aspect of their job. Previous research findings of perceived need satisfaction studying managers in different occupational settings have consistently found this area to be the most deficient area of satisfaction; the current research supports these results. Fifth, of the five groups studied, CAs in industry are most satisfied with their compensation followed by CAs in government and partners. The mean score for CA employees indicate relative dissatisfaction with this item, while CAs in education perceived compensation as the least satisfying aspect of their work. Finally, as may be seen in Table 4, partners and sole proprietors recorded the lowest score for total satisfaction: .393. In fact, partners and sole proprietors showed the least perceived need deficiency in all categories, except for security needs. They appeared, therefore, to be the CAs most satisfied with their jobs. Academic accountants, on the other hand, scored the highest - .803 - overall average perceived need deficiency. Of the remaining three groups, CAs in industry appeared somewhat more satisfied with their job than CA employees and CAs in government who scored roughly the same in overall satisfaction.

TABLE 4

RANK ORDER OF JOB SATISFACTION OF CAs
IN DIFFERENT JOB FRAMEWORKS

Need Category	Public Practice				Non-public Practice					
	Partners (N=119)		CA Employees (N=49)		CAs in Gov't (N=32)		CAs in Industry (N=59)		CAs in Education (N=11)	
	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean	Rank	Mean
Security	3	(.269)	5	(.020)	5	-(.094)	5	(.153)	5	(.182)
Social	5	(.193)	4	(.398)	4	(.468)	4	(.220)	4	(.454)
Esteem	2	(.394)	3	(.558)	2	(1.052)	2	(.523)	3	(.606)
Autonomy	4	(.228)	2	(.619)	3	(.792)	3	(.486)	2	(.697)
Self-Actualization	1	(.571)	1	(.857)	1	(1.240)	1	(.994)	1	(1.152)
Compensation		.714		1.347		.613		.458		1.727
Total Satisfaction		.393		.633		.671		.472		.803

Note: The larger the mean value, the less the perceived satisfaction.

Conclusion

This study is a step in the direction to provide research data so that perceived need satisfaction of CAs in the accounting work environment can be identified. Five need areas were selected for investigation. The effect of primary CA activities (public vs. non-public practice), hierarchical position level within public accounting firms, and the effect of different work environment of professional accountants, were related to need satisfaction. Perceptions regarding these needs were obtained from a questionnaire completed by 272 CAs employed in different job frameworks.

Following are the major conclusions of the study:

1. CAs employed in public practice were generally more satisfied with their work than their colleagues working outside of public practice.

2. The level of position within public acounting practice hierarchy appears to be an important factor in determining the degree of need satisfaction enjoyed in different positions.

3. The major need fulfillment deficiency for accountants employed in industry, government and education occurred in higher-order needs, especially in self-actualization.

4. Of the five job frameworks investigated, partners and sole proprietors in public accounting practice were the most satisfied group of professional accountants; those employed in education were the least satisfied.

What are the implications of this study? Perhaps most important is the fact that, while lower-order needs of CAs in different work environments seem to be relatively well fulfilled, their higher-order needs are not. The autonomy and self-actualization needs were two areas which were perceived by a large majority of respondents as most important and least satisfied. Consequently, the potential for improving both satisfaction and achievement must be sought through providing increased opportunity for autonomy and self-actualization.

Studies of the relationship between job attitudes and job performance suggest that greater need fulfillment in higher-order needs results in improved task performance. One study (19) reported that higher performance managers were more satisfied in all five need areas than were low performance managers. While the conclusions arising from studies in one setting may not necessarily be applicable to other settings, our findings lead one to speculate that need fulfillment and performance may well be related in accounting work environment.

Since motivation is derived from needs and attitudes, improved job satisfaction and better task performance becomes an achievable goal when the gap is reduced between expectations and reality. Improving the work environment for a professional accountant begins with investigating the specific needs which are not being satisfied and identifying typical issues and examples which illustrate that dissatisfaction. Without such information, top management in accounting work environment cannot develop programs which will bring expectations and reality into closer juxtaposition.

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INFLATION & THE DEMAND FOR PUBLIC UTILITY COST ALLOCATION*

Cost allocation for public utility rate regulation attracts more interest than one might expect.[1] Cost allocation has doubtful academic merit, (Zimmerman, 1979; Thomas, 1969, 1971, 1974) and it is the province of engineers, lawyers, and bureaucrats. Effort devoted to allocating utility costs illustrates Watts and Zimmerman's (1979) market for accounting models and also Zimmerman's (1979) demand for cost allocation in decentralized firms. We extend the Watts and Zimmerman and the Zimmerman analyses to allocation of accounting effort in rate regulation. We argue that cost allocation now attracts effort because under regulatory institutions, cost increases have disturbed once-satisfactory allocations, increased customers' potential gains from regulation, and made trying to allocate the utility's total income offer greater expected gains than trying to raise or lower it. We also note that utility cost-allocation affords greater scope for Watts & Zimmerman's wealth-transfer-seeking than their context of income-determination. Like theirs, our analysis is positive rather than normative, and presumes that customers, utilities, and other parties seek to increase wealth via government regulation. We posit the returns to regulatory intervention without and with inflation, and see where returns are likely to be greatest. We illustrate this with 'generic' cases for electric utilities and the recent B.C. Telephone rate case.

'Intervenors' are customers and others who have shown a sufficient material interest in the outcome to be made full parties with the company to the decision. We seek to explain why intervenors tend to concentrate on allocating the total amount between customers and services rather than on setting the total[2], on which the company and most other participants tend to concentrate. The company, assuming relatively inelastic demands, argues for higher rates and revenues.[3] Hundreds of others, the 'limited parties' who are mostly customers, demand lower rates -- and more service. Since rates are set to yield total revenues that equal total estimated costs, determining total cost is the regulatory counterpart of determining reported income. When Watts & Zimmerman (1979) illustrate regulatory accounting effort, they use 'rate level', or total cost issues.

Returns To Intervening in Rate Regulation and the Demand for Analysis

Watts and Zimmerman observe that government regulation offers the prospect of wealth transfers through the authority's power to compel payment or service at prescribed prices and conditions. They contend that this

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creates a demand, so as to strengthen claims for favourable wealth transfers, for theories of income determination for financial reporting.

Theories bring wealth flows as they influence cash flows. Theories affect reported income as they affect the choice of financial reporting standards, but affecting reported income can affect a firm's cash flow only through its imprecise and uncertain influence on government and investors. The effect of regulatory theorizing is much more certain.

Some of the proffered theories for regulatory accounting will get embodied in rates, whether the regulators chose the theories because they were persuasive or merely convenient. Theories and theorists are sought because embodied theories cause cash flows,[4] reduced only by non-zero price elasticities of demand. Thus theorists, as intervenors' expert witnesses, will compete to get their theories adopted.

Costs of intervening and legal requirements that intervenors show significant monetary interest tend to limit participation by customers to those who expect large payoffs, usually the largest customers. Groups of smaller customers and other parties who can share costs also take part in regulatory processes, as do agents, who act in behalf of smaller parties or hope to gain their support -- among these are politicians and environmental, anti-nuclear, consumer, and anti-poverty groups. Competitors and labour unions and other suppliers also appear.

The theorist and client face a shared payoff of: (Potential Cash Flow) (Chance of Adoption)(1 + Elasticity). The expert, attorney, and client presumably maximize this expected payoff by choosing the optimal claim. The price elasticity is effectively fixed unless services or customers can be reclassified or unless competition can be helped or hindered.

The expert must temper his claim on behalf of his client, since above a trivial level larger claims are less credible, convenient, and likely to be adopted so that no neo-Talmudic 'equal division' operates to reward extremity of claims. Claims are more plausible in some issues, particularly those that are material only to the intervenor, than in others. The expert must be consistent (Watts & Zimmerman, 1979, p. 287), and may act to maximize the present value of a sequence of claims. Some 'responsible position', or set of claims, would yield a prior expected optimum.

Regulation as an Institution to Share Out Gains Without Inflation

In essence, the regulator of such public utilities as electricity or telephone service shares out the value of a positive-sum game. That is, gains from economies of scale (Bonbright, 1961, p. 14) afford reason both to have a monopoly supplier and to fight over the gains. While these static rents make the value of the gain positive, we shall see below that regulatory accounting for inflation can make it quite large.

The existence of a positive sum does not logically require that a regulator[5] decide the sharing-out. The prospect of gains attracts competitive efforts to get at them, to the extent that the value of the expected incremental payoff exceeds the cost of incremental effort. Regulatory institutions are in place to mediate many of these claims. Legal standards (statutes, common law, and regulations) govern their sharing out, and the form is a legal proceeding at equity, which makes the use of such experts as cost-allocators efficient and effective. Parties and potential parties will have adapted, at least to the extent that legislative or judicial action does not offer lower transaction costs or higher net payoffs.

The formal working of the regulatory process is straightforward. To raise rates and increase revenues, the firm initiates a proceeding, and attempts to show that likely costs exceed revenues from present rates. To lower rates the authority initiates the proceeding and attempts to show the opposite. Based on evidence in the record, the regulator first determines total costs, which revenues would equal, for a test year. Agnich (1981) illustrates this 'rate level'. The regulator then assigns or 'spreads' responsibility for those costs to services, service increments or 'blocks', and customer groups; this allocation is the 'rate spread'. The authority may then set specific rates (the 'rate design') or direct the company to file rates to conform to the total revenues and cost spread.

The Value of the Gain Without Inflation

The first set of standards determines the value of the gain to be shared among customers. Formally, it begins with the accounting rule that sets the firm's projected revenues just equal to the 'revenue requirement' or total costs, which is expenses plus a fair return on the owners' contribution. That is:

(i) all operating expenses found reasonable under accounting rules and other standards of fairness, prudence, necessity, etc. Not all expenses that are accepted under the tax code or generally accepted accounting principles (G.A.A.P.) are 'reasonable' here. Some examples are charitable contributions and club memberships. This invites rate-level argument. To operating expenses are added

(ii) book depreciation of plant and equipment at original cost. Here the questions include the rate of depreciation and the treatment of plant not currently used. The firm and its owners also receive

(iii) a fair rate of return, the weighted average cost of book capital, on

(iv) the investment attributable to debt and equity investors. This last (iv) is the rate base, which equals net working capital plus plant and equipment at depreciated original cost.

This set of accounting standards governs the sharing-out between the firm (or its residual owners) and the customers, and thus the gains from economies of scale accrue to the customers.[6] So will gains from technical progress and holding gains from inflation, or relative and absolute price changes. Wealth transfers can occur between owners and customers at this point. The sum (i) + (ii on iv) + (iii times iv) is the revenue requirement, and, over expected output, gives the average rate or 'rate level'. Interest in the rate base (iv) is obvious, and the rate level has attracted great attention, (Watts & Zimmerman, 1979, e.g.).

Until fairly recently, in fact, setting the rate level attracted all the interest. Lowthian (1962) reports that typical cases ended with an order by the regulator that set the rate level, after which the companies set the detailed rates, without controversy, to yield the total revenues. Text books found the rate spread and cost allocation far less interesting than the revenue level -- in Pegrum (1959), by twenty pages to two. Something, -- inflation, we shall argue -- has disturbed an equilibrium and changed the relative interest.

The Less Precise Standard For Cost Allocation

The inter-customer standard, less precisely, requires that customers be treated fairly with respect to each other -- i.e., in sharing out the costs and gains. This is the issue of rate 'spread' (broad-brush sharing among user groups, as above) and of rate 'structure' (more detailed 'design'). Whereas statute law and common law tightly circumscribe the rate level, standards for individual rates and cost shares tend to go little beyond simple non-discrimination, or treating like users (however defined) alike.

Both 'cost' and 'value' arguments have been used to establish fairness. While an ideal market or regulator would reconcile the two, and allocate cost according to demand or value, (Hirshleifer, 1958, e.g.), regulatory institutions are not ideal. Electric rate-making gave more weight to assigned cost shares. Transport commissions, which used to regulate telephone service, sought to avoid discrimination in rates and services as to long-haul/short-haul, large-user/small-user, etc., and set rates according to 'value of service'. Value of service remains an important element in the judging fairness of telephone rates, and telephone service poses many more problems in allocating joint costs with relatively less information than electric service. Nonetheless, witnesses in both electric and telephone cases are more likely to be persuasive as to 'objective' cost allocation than as to subjective value of service. Thus experts seeking to shift cost shares among customers will tend to employ cost allocation rather than relative value.

Reconciling the Standards -- a Rate Structure Equilibrium

Customers take the production and sales decisions, and so in effect manage divisions of a widely decentralized firm. This ideal allocation would make customers goal-congruent profit centres and lead them towards the most efficient outcome overall. This is the claim for first-best, marginal-cost

pricing. It is also Zimmerman's (1979) claim for allocating to divisions the opportunity costs of their use of common facilities. When average book cost diverges from marginal cost, though, as it almost always does, the rate level standard prevents pricing all sales at marginal cost. In precluding first-best pricing, this invites allocation of the divergence and expands the scope and expected payoff for cost allocation arguments. We shall first set out the traditional results as a rate structure equilibrium, see how inflation affects them, and then see the scope for competitive intervention in the process.

Economies of scale made average and marginal costs diverge even in quiet, pre-inflationary times. Otherwise, and with neither technical progress nor secular relative price changes, average (unit) cost would stay constant. Then with sufficiently large demand, so that capacity would vary with demand, incremental cost would approximate both average and marginal cost as in the competitive equilibrium, and rates could be set on any of those bases.

The traditional case admits technical progress with significant relative price changes (cheaper capacity) but not inflation or price level increases. Ongoing investment embodied new economies of scale and technical progress, and left higher-unit-cost plant embedded in the rate base. Thus average book cost traditionally has exceeded marginal cost. Successful rate design had to attain a fairly stable equilibrium both as to efficiency, as is the usual textbook case, and as to equity. A successful rate design has to cover book costs and to charge near-marginal cost for incremental usage to realize the potential efficiencies, for inefficient results would tend to induce changes. The rates resulting from successful design must also not be seen to treat any substantial group of users unfairly enough to offer a positive net payoff to attempts to change it by political or judicial means. A variety of rate designs have served to assign materially lower-cost and higher-cost increments to classes of customers and increments or 'blocks' of customers' usage, though rapid inflation makes satisfactory equilibria harder to attain.

Effects of Inflation

Inflation raises both current and capital costs. While current expenses are passed through, incremental capital costs exceed average book levels -- by a factor of around three for electrical generation. This creates holding gains on existing debt and for usage consistent with existing plant. Under the rate level standard the holding gains, as well as the traditional rents accrue to customers who share or compete for them.

When rates for incremental usage do not at least equal incremental costs -- and for electricity and for local (non-toll) telephone calling they rarely do -- any plant replacement or addition implies dysfunctional expansion among customers (who set output) and results in large, negative cash flows. Those negative incremental cash flows tend to depress share prices below book value and bring a steady stream of inadequate rate increases. This gives customers a further potential payoff, as a negative payoff to try to avoid. In sum, a user's payoff is the rent from economies of scale and technical progress, plus holding gains (excess of incremental unit cost over book unit cost) less the excess of incremental unit costs over revenues of new plant.

Telephone companies suffer much less from inflation than electric ones do, for two reasons. The first is not only that there is no physical or financial analogue of generating plant (as customers generate what they transmit), but that electronic advances in switching and transmission reduce real, incremental unit costs. Secondly, services with positive contribution margins tend to be income-elastic. Those markets are mainly for equipment (telephones, P.B.X. switchboards, etc.) and intercity services (toll, wats, and private line). The positive margins attract competitors' and customers' attentions, though, to those markets. Indeed, competition rather than inflation may have changed the margins, upset the equilibrium, and induced allocation effort in the telephone industry.

Factors In Intervenors' Choice of Industries

We have posited that persons intervene to secure various payoffs, join to share fixed costs and pool influence, employ expert witnesses to do so, and with their witnesses choose their issues and approaches to maximize prior expected payoff. We now elaborate this and set out how the prior expected payoffs would differ between the electric and telephone industries, between rate level and rate structure issues, and among potential intervenors.

Because the electric industry offers more holding gains and incremental shortfalls than the telephone industry, it attracts more customers and customer representatives. Its greater environmental impacts draw more environmentalists, and its prospect of nuclear generation draws all the anti-nuclear activists. All competitors seek higher rates for the utility's services. The electric industry used to draw competing oil and gas suppliers; in some jurisdictions it still might. The telephone industry, though, draws most of the competitors. Telephone competitors offer, or seek to offer, equipment and intercity services, and often require regulatory approval.

Telephone competitors would redistribute the payoff to those who buy services from them. If the company were allowed to reduce rates to compete, then its buyers would also benefit, (Littlechild & Rousseau, 1975). Since competitors would enter high-margin markets, the lost margin would reduce the gain and make users of the utility's other services worse off, with a lower share of a smaller remaining payoff.[7]

Factors in Intervenors' Choice of Issues

Intervenors will tend to concentrate on rate structure or allocation issues because, we show here, these claims offer higher potential payoffs and chances of adoption, thus higher expected payoffs, than rate level claims. Rate level claims are unpromising partly because regulatory accounting has evolved long enough to become generally accepted and legally entrenched. Established rules define most current expenses (i), original-cost depreciation (ii), financing costs (the debt part of iii), and the rate base (iv). Claims are possible, and limited parties and regulatory staffs make them, in such symbolic but immaterial areas as perquisites and advertising expenses, return and depreciation of built-but-unused plant, and return on inventories.

Inflation-induced interest in regulation has largely bypassed rate level questions, except among limited-party protestants. In the B.C. Telephone case, the opposition caucus (N.D.P.) wrote to attack some of the company's evidence in support of the claim for a higher rate of return, and was ignored in the order (C.R.T.C., 1981). The provincial government intervened as a large customer objected to treating charitable contributions and membership dues as expenses and asked for slower implementation of higher depreciation charges already approved. Both were rejected (ibid, pp. 61-61) -- they affected the company and others more than they affected the intervenor. The question remains, why intervenors tend to ignore such material rate level issues. The general answer, developed below, is that allocation claims are more rewarding for reasons that depend on the intervenor's interests.

A user, or class of users, gets the entire payoff from favourable reallocation, but shares with other users or classes any drop he intervenes to cause in the rate level. The company vigorously opposes cuts in the rate level, while pure reallocation leaves the company indifferent and diffuses the effects among all other customers, few of whom find it worthwhile to object. Thus concentration and dispersal also induce specialization in allocation. So would every intervenor's undertaking, upon being allowed to take part, 'not unduly to burden the record nor broaden the issues', and greater credibility on his 'own' issues.

Customers seek to increase the quantity and quality of service or to lower their costs (rates). Argument for more service usually implies more capacity, which implies higher investment and rates to finance it, so that intervening customers tend to argue for lower rates rather than for more service. Furthermore, customers who intervene in their own behalf are large users or small groups of them (Watts & Zimmerman, 1979) so as to expect net gains from intervening. If tight cash flows led to tight capacity, that would constrain volumes or quality and leave the few large users vulnerable to redistribution of service, and to be perceived as having 'caused blackouts' would increase vulnerability. Intervening customers will thus seldom seek lower rate levels though they will seek lower rates. Thus we expect to find that they concentrate on cost allocation or rate structure, as that would best attain both high cash flows for the company and low rates for themselves.

Other intervenors will also tend to concentrate on cost allocation. Environmentalists and competitors have mixed interests as to cash flows and investment. They prefer that some projects not be built and others be built more expensively, to accommodate them. Anti-nuclear activists obviously oppose certain projects but have no necessary interest in the level of investment generally. Neither would intervenors working in behalf of smaller customers. None has any brief for shareholders' interest or other results of high cash flows, but none would likely have the standing and expertise to compete with the company's and authority's experts on rate of return nor find acquiring it worthwhile. All are interested in cost allocation and in particular rates, and would carry more weight on issues that affect their clients directly than on rate level issues.

Some Illustrations

The demand for allocation work will also tend to exceed that for rate level work because many contested cases do not concern a rate level. Telephone cases often concern services that attract competitors and share facilities, joint costs, and even joint revenues but do not explicitly concern the overall rate level. Bell's and B.C. Telephone's wrangles with the C.R.T.C. over customers' own equipment, and the unknown effects on utility costs and revenues, afford a current example.

Even a classic rate case like B.C. Telephone's recent one illustrates this concentration on allocation or rate structure. Among its 377 entrants, the case drew large customers (provincial government, as noted, hospitals, and hotels), the Consumers' Association of Canada, and the National Anti-Poverty Organization as intervenors, as well as the provincial opposition (N.D.P.) caucus and the employees' union -- B.C. Telephone was then undergoing a difficult labour negotiation. Of the intervenors only the provincial government addressed rate level issues, and its failure has been noted. The government did succeed in raising rates for some others' services, which would lower its rates by reducing the share of total costs that it and other large users pay.

Apparent appeals to value-of-service and non-discrimination showed attempts to reallocate cost responsibility away from intervenors, or regulatory gains to them. Intervenors claimed that the services they use are like those that others use at lower prices. The B.C. Health (hospitals) Association argued that service to hospital rooms is 'residential', and the B.C. Hotels Association argued that service to hotel rooms is residential. Both sought the lower cost share that value of service assigns to residential use, so as to pay the lower residential rates. The hotels' claim for residential status was rejected: because the hotels charge their customers' more for calls than B.C. Telephone charges them, their room telephone service was found to be commercial. The hospitals' claim, though, was accepted. (C.R.T.C., 1981, pp. 74-78.)[8]

'Generic' electric cases most strikingly illustrate this interest in allocating total cost, as they deal solely with principles applicable to all similar electric utilities, thus with rate structure, rather than with the level of revenues to be collected by any one firm. Ontario and every U.S. jurisdiction (state) will have convened a generic case to set cost alloction methods for electric service. These cases afford a field for competing cost-allocating models, and attract the usual company and authority witnesses. Just as ordinary rate cases do, they also draw consultants in behalf of such intervenors as large users and environmental, anti-nuclear, anti-poverty, and consumer activists. By addressing more than one company, generic cases lower intervenors' cost per company, increase the gross payoff, and invite customer coalitions -- they make the process more efficient. Thus they increase the demand for allocation effort that regulation created and that inflation revived by disturbing the traditional rate structure equilibrium.

NOTES

1. The demand for accounting analysis in litigation and tax investigations is well known. For all purposes, academics and other consultants supply their analysis competitively, subject only to such product differentiation as they might establish by results and reputation. (Watts & Zimmerman, 1979, p. 286 f.).

2. To date our evidence is largely impressions of the relative efforts intervenors devote to the level of rates and costs as against the allocation of those costs. The impressions come largely from the author's work as a witness for an authority's staff and for environmentalist intervenors. A convenient source of data for testing and development would be the Public Utilities Reporter, which reprints most major orders.

3. With relatively inelastic demands, raising rates raises revenues. For services subject to competition, particularly for some telephone services, this does not hold. For competitive services, with presumably elastic demands, competitors seek higher rates.

4. The prospect of real effects may also account for the rather more numerous efforts, such as this, devoted to regulated utility pricing than to, say, milk or taxis. That is, the prospect of real effects may increase the supply of expert analysis.

5. Nor is it logically necessary nor universal in practice that a single firm own the single system. Divided ownership of a coordinated system, though, induces competing claims among the owners. Sharing telephone long-distance revenues through (cost) separations and (net revenue) settlements among companies illustrates this, as does setting wholesale power rates to distributing agencies or companies. Apportioning costs and gains among parties to a divided system also affords scope for cost allocation effort.

6. Exceptions occur if demand increases while either costs are fixed in the short run or economies of scale predominate; then owners, or at any rate the firm, realize the gains. This exploits 'regulatory lag', until such 'excess' earnings trigger rate reductions.

7. In its Docket 20,003 the U.S. Federal Communication Commission found this effect too small to dissuade it from agreeing with the competitors.

8. Other successful claims were made by customers in the Vancouver suburbs, seeking to reduce their surcharges above Vancouver rates. Successful claims were material to the proponents but had small effects on the company and diffuse effects on other customers. This improves their chance of acceptance and characterizes allocation claims.

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A GENERAL APPROACH TO VARIANCE ANALYSIS

Introduction

Traditionally, in teaching variance analysis, we show our students how they can calculate price and quantity variances for variable costs, possibly adding to these items a mix and/or a yield variance. In addition, we may show students how they can derive a number of fixed cost variances and a variety of sales or contribution variances.

Two of the major problems which exist with this approach to variance analysis is that students must learn a number of specific formulas by which they can calculate each of these variances. Needless to say, they often find it difficult to remember and properly apply each of the formulas. Consequently, they may not be able to apply their knowledge of variances in solving specific problems. A more serious shortcoming, however, with the traditional approach is that students do not learn a general methodology which they could adapt to solve many different kinds of variance problems. Lacking a general approach, students are often unable to determine any variances other than those which they have learned and remembered.

The purpose of this paper is to set forth an explanation of a general technique by which variance analysis can be done, and to show the application of this technique to a specific example.

The method of calculating variances discussed in this paper gives exactly the same results as do the traditional methods discussed in cost and management accounting textbooks. However, unlike these methods, our methodology is easy to master and allows students to calculate a virtually unlimited number of variances, without memorization of any formulas. In fact, it enables them to compute a variance for any factor which is a determinant of the cost or revenue item being analysed and for which the actual and standard (or budget) figures can be obtained.

The basic procedure used in calculating variances is to compare the actual costs, sales, etc. which have been incurred by a firm to some standard or budget. After determining the difference between what was spent and what should have been spent or between what was received and what should have been received, the next step is to explain this total difference by means of a series of factors which, when taken together, add up to the total difference. The amount attributed to each factor is derived from mathematical equations.

In our methodology, the procedures by which a portion of the total variance is attributed to the individual variances has been formalized in such a way that (1) students can see how the methodology can be applied to many other situ-

ations beyond the ones discussed in the classroom, (2) students can be encouraged to analyze situations using as many different explanators or factors as they believe are pertinent, without being limited to "traditional" variances, and (3) students can confidently determine numerous variances and be assured that the sum of them will equal the total difference between actual and standard.

The essence of the suggested method for calculating variances will be set forth in the next few paragraphs. It begins with the development of an equation for each item for which one wants to calculate variances. Each equation must consist of a series of multiplications, the product of which must equal the total of the item for which variances are to be calculated. A number of such equations are presented in Figure 1:

Figure 1

Illustrative Equations for Variance Analysis

Total Labour Cost	=	wage rate x hours paid
Total Labour Cost (in a hospital setting)	=	wage rate x average hours per day x average days per patient x patients
Total Sales	=	selling price x foreign exchange factor x price level factor x sales mix factor x units sold

Once an equation for the particular item of cost or sales, or whatever is to be analyzed, has been developed, one arranges the factors in the equation into the order in which one wants to calculate the variances. Thus, if the first factor for which one wants to calculate a variance is price, one would put the unit price as the first factor in the equation. The next step is to prepare two versions of the equation. The first of these is the standard or budget equation, which substitutes the standard or budgeted figures for each factor in the equation. The product of all these factors must equal the total standard or budgeted amount. The second version contains the actual figures for each of the factors in the equation, and its product will, therefore, equal the total actual amount of the item being analyzed.

To calculate any given variance, one takes the difference between the actual and standard figures for the factor associated with the variance, and multiplies this by the standard amount of each factor for which a variance has previously been computed and by the actual amount of each factor for which a variance has not yet been computed. By following this procedure for each factor, taking them one at a time, the individual variances can be easily calculated and will add up to the total variance between standard and actual.

In short, one can visualize this procedure by thinking of the equation for the item being analyzed as having three "parts". The first part of the equation consists of the factors for which variances have already been calculated, the second part is the factor for which the variance is presently being calculated,

Figure II

Schematic of the Variance Calculation Procedure

Total cost, or sales, or whatever item is to be analyzed	=	Factor x Factor ...	x	Factor	x	... Factor x Factor		
		Part 1		Part 2		Part 3		
		Factors for which variances have already been calculated. These are at standard amounts.		The factor for which the variance is now being calculated. This is the difference between standard and actual amounts.		Factors for which variances have not yet been calculated. These are at actual amounts.		

while the third part of the equation consists of the factors for which variances have yet to be calculated. Amounts in the first part of the equation are at standard, the amount in the second part is the difference between standard and actual, and the amounts in the third part of the equation are at actual. All of the factors in the equation start in part 3 and are shifted, one at a time, through part 2 and into part 1. This procedure is illustrated in Figure II.

Since this general procedure for calculating variances involves a routine shifting of factors from one part of the equation to another as each factor is considered, the whole process of calculating variances can be easily computerized using this methodology.

Example of This Variance Analysis Technique

In order to demonstrate the techniques discussed in this paper, we have applied it to a sample situation in which the objective is to explain the difference between actual and budgeted sales, both expressed in terms of year-end dollars after adjustment for price level changes. In this example, we have assumed that all goods are being sold to customers in the United States for U.S. dollars. As a result of this, the foreign exchange rate between Canada and the United States, as well the price level, volume of goods sold, sales mix, and selling price, will influence the sales revenue. The equation for total sales could therefore be expressed as follows:

Total Sales = Selling Price x Exchange Rate x Price Level Factor x Total Units Sold x Mix Factor

For a multi-product firm, this equation could be applied to each of the products individually and the results summed, or weighted averages for the various factors could be calculated and substituted into the equation. If there are only a few products in a particular situation, the former approach is simpler and yields greater amounts of useful information for management.

The foreign exchange rate factor is in the equation to convert the U.S. dollars received to their Canadian equivalent at the time of sale. The price level factor is included in order to provide greater insight into the price variance by isolating the impact of inflation. In the equation, the price factor represents the change in the index from the time of sale to the end of the period.

The data on which our example is based appears in Figure III:

Figure III

Data for Example

Budgeted Data:

Product A: Sell 200 units at $6 each

Product B: Sell 200 units at $5 each

The expected foreign exchange rate was an average of $.80 Canadian equals $1.00 U.S. during the period.

The expected price level adjustment factor was an average of 1.20 for sales of both products A and B.

Actual Data:

Product A: 100 units sold at $5 each when the exchange rate was .85

Product B: 150 units sold at $6 each when the exchange rate was .90

The actual price level adjustment factor was 1.10 for sales of Product A and 1.30 for sales of Product B.

Based on the data which appears in Figure III, one can calculate the total budgeted sales ($2,112.00) and total actual sales ($1,520.50), both adjusted to reflect the end-of-period price level. The difference between these two amounts gives a total variance of $591.50, which is unfavourable, since it is below budget. This is the difference that we now have to account for.

After setting up the total sales equation and arranging its factors in the order in which we plan to compute the variances (see the equation presented above), we then substitute the budgeted and actual amounts into it. When we do this, we arrive at the following two equations:

Budgeted Sales = Product A: $6 x .80 x 1.20 x 400 x .5
+ Product B: $5 x .80 x 1.20 x 400 x .5

Actual Sales = Product A: $5 x .85 x 1.10 x 250 x .4
+ Product B: $6 x .90 x 1.30 x 250 x .6

We can now begin to apply the techniques discussed in this article to determine the reasons for the differences in the two sales figures. Because there are five factors in each of the equations, we will compute five variances for each product. We might call these variances a sales price variance, a foreign exchange rate variance, a price level variance, a volume variance, and a sales mix variance.

In calculating the first variance, the sales price variance, the first "part" of the equation (factors for which variances have already been calculated) has nothing in it; the second "part" of the equation (the factor for which the variance is presently being calculated) contains the prices; while the third "part" of the equation (factors for which variances have not yet been calculated) contains all of the other items, at the actual amounts. Our calculation of the price variance would therefore be as follows:

Product A: ($5-$6) x .85 x 1.10 x 250 x .4 = $ 93.50 unfavourable

Product B: ($6-$5) x .90 x 1.30 x 250 x .6 = $175.50 favourable

Total Price Variance = $82.00 favourable

In calculating the second variance, the exchange rate variance, the first part of the equation contains the price, at the budgeted amount; the second part of the equation contains the exchange rates; while the third part of the equation contains all of the other items. Our calculation of the exchange rate variance would therefore be as follows:

Product A: $6 x (.85 - .80) x 1.10 x 250 x .4 = $33.00 favourable

Product B: $5 x (.90 - .80) x 1.30 x 250 x .6 = $97.50 favourable

Total exchange rate variance = $130.50 favourable

The remaining variances are calculated in the same manner. The key thing to keep in mind is that any items in the first part of the equation (factors for which variances have previously been calculated) are carried at budgeted amounts, and any items in the third part of the equation (factors for which variances have yet to be calculated) are carried at actual amounts.

The calculations for determining the price level variance, the volume variance, and the sales mix variance, are illustrated below:

Price Level variance -

Product A: $6 x .80 x (1.10 - 1.20) X 250 x .4 = $48.00 unfavourable

Product B: $5 x .80 x (1.30 - 1.20) x 250 x .6 = $60.00 favourable

Total = $12.00 favourable

Volume (or Yield) variance -

Product A: $6 x .80 x 1.20 x (250 - 400) x .4 = $345.60 unfavourable

Product B: $5 x .80 x 1.20 x (250 - 400) x .6 = $432.00 unfavourable

Total = $777.60 unfavourable

Sales Mix variance -

Product A: $6 x .80 x 1.20 x 400 x (.4 - .5) = $230.40 unfavourable

Product B: $5 x .80 x 1.20 x 400 x (.6 - .5) = $192.00 favourable

Total = $38.40 unfavourable

In summary, the total unfavourable variance of $591.50 between budgeted and actual sales has been accounted for, as follows: $82.00 is attributable to favourable prices, $130.50 is attributable to favourable foreign exchange rates, and $12.00 is attributable to favourable timing of sales in relation to changes in the price level; these are offset by $777.60 attributable to an unfavourable reduction in volume, and $38.40 attributable to an unfavourable change in the sales mix.

Arranging the Order of Factors in the Equation

It should be noted that since the equation for total sales (or cost or whatever) consists of a series of multiplications, the various factors in the equation could be arranged in any sequence one desires, and still yield the same total. However, as with any approach to variance analysis, the order in which factors are standardized affects the amounts of the individual variances. Consequently, the sequence in which the factors are arranged in the equation is of some importance.

In the case of some variances, tradition dictates a particular order for standardizing factors. For example, the price factor is almost always standardized first; accordingly, price was made the first factor in our equation. Similarly, the mix variance is usually (although not always) calculated based upon standard volume; accordingly, mix was made the last factor in our equation, following volume.

In other cases, the most appropriate sequence for the factors in the equation will be a matter of judgement for the analyst. The discussion which follows may provide some guidance in this regard.

In selecting the order of factors in the equation for the purpose of calculating variances, one wants to keep in mind that the earlier an item appears in the equation, the sooner its amounts are converted to "standard". Thus, those items which tend to vary a great deal should probably be placed in a position which will eliminate their effects early in the calculation. This will prevent changes in these factors from having any major impact on the size of the other variances to be calculated.

This positioning of factors is especially important in situations in which certain factors are not very controllable by the people within the organization. Non-controllable factors should normally be put fairly early in the equation, so that they are standardized before the variances for controllable factors are computed.

In short, having examined the situation, one has to decide the order in which to calculate the variances; as a general rule, one can do this by standardizing for the non-controllable factors first, standardizing for those items which vary the most from period to period next, and then the other factors. Of course, there is no reason why one has to follow the procedures suggested here. The analyst must decide what is the most meaningful order for calculating the variances in the particular circumstances. Once this order is established, the factors in the equation can be arranged in the indicated sequence and the variances will be calculated in the same order.

Advantages of This Technique

First of all, it should be noted that if one were to calculate, say, price and efficiency variances for materials costs, the technique illustrated in this paper would produce exactly the same results as the traditional technique of using formulas for each of the variances. A major advantage of this approach, however, is that there is no need to either remember or refer to formulas; one needs only to be familiar with the general methodology of this approach, which can be applied to any situation.

Another major advantage of this technique is that one is not restricted to the traditional types of variances, but can calculate a variance for any factor which is a determinant of the amount being analyzed. The number of different variances which can be calculated is virtually infinite, limited only by the number of factors which the analyst includes when constructing the equation. Hence, this technique encourages innovative ways of examining the behaviour of costs and revenues, and rewards the analyst with greater insights and more meaningful variance figures.

For example, to examine labour costs, one might construct an equation such as

> Total labour cost = average rate per hour x labour mix factor x ratio of hours paid to hours worked x overtime factor x hours per unit x units per day x days worked in the period

and then calculate variances for labour rate, mix, idle time, overtime, productivity (or efficiency), activity (or volume), and days worked.

Concluding Remarks

The approach to variance analysis which has been set forth in this paper provides a generally applicable yet extremely simple technique for calculating not only the "traditional" types of variances, but also any other "special" variances which are appropriate in the circumstances and will enrich the analysis. Moreover, students and managers need not possess any particular mathematical abilities, nor remember (or refer to) any formulas. It allows them to develop their own variances and, in the process, their own insights to apply to the analysis and interpretation of operating results.