THE CHANGING COMPETITIVE STRUCTURE OF THE CANADIAN ACCOUNTING MARKET
OVER A PERIOD OF LARGE FIRM MERGER ACTIVITY

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DEDICATION

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Miranda Charmain Lubbers
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ABSTRACT

My thesis studies the changing competitive structure of the Canadian auditing industry during the period 1987 to 1992. Two mergers took place over this period among four large Canadian accounting firms. I assess whether market power is likely to become a problem with already high, and possibly increasing levels of concentration in the audit industry.

Using data from several sources, I examine those characteristics that affect the likelihood that high concentration facilitates market power. I then apply the official standards (Merger Guidelines) for Canadian merger analysis to data on audit services. Because the Merger Guidelines expressly do not permit the authorities to oppose a merger merely on structural grounds, I supplement my structural analysis with a review of studies which examine whether audit fees are influenced upward by high concentration.

Overall, I found the industry more competitive in the post merger period.

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LIST OF ABBREVIATIONS:
CANADIAN ACCOUNTING FIRMS

aa	Arthur Anderson
ag	Auditor General of Alberta
ay	Arthur Young
be	Berger Blais Greene
bhhhp	Burrington, Heywood, Holms, Hills & Blair
bhp	Burrington, Heywood & Partners
cb	Collins Barrow
cbcg	Caron Belanger--Clarkson Gordon
cbey	Caron Belanger--Ernst & Young
cbmn	Collins Barrow--Maheu Noiseux
cfhc	Charette, Fortier, Hawey & Cie
cg	Clarkson Gordon
cl	Coopers & Lybrand
dc	Dunwoody & Co.
dfk	Dionne Forest Kirouac
dhs	Deloitte Haskins Sells
dt	Deloitte & Touche
dr	Doane Raymond
drp	Doane Raymond Pannell
dw	Dunwoody & Co.
ew	Ernst & Whinney
ey	Ernst & Young
g&co	Gavillier & Co
gw	Geo. A. Welch & Company
hda	Harel, Drouin & Associes

hel	Hillborn Ellis Grant
hh	Hyde Houghton
lctr	Lippman Leebosh April & Partners
lhlc	Langois, Hauck, Lettner & Co
lilly	Lilly, Johannesson, McWilliams, Pallone
lh	Laventhol & Horwath
ll	Lalibert Lanctot
llcl	Lalibert Lanctot--Coopers & Lybrand
lwga	Lipton, Wiseman, Greenspoon & Altbaum
mbbr	Mallette, Benoit, Boulanger, Rondeau & Associes
mhrgr	Miller, Hersh, Rabinovitch, Goldsmith & Rosenthal
mm	Malette Maheu
mn	Maheu Noiseux
mrr	Millard, Rouse & Rosebrugh
nh	Nemeth Hoymeyer & Thody
phpmt	Poissant Thibault--Peat Marwick Thorne
pkf	Pannell Kerr Forester
pmm	Peat Marwick Mitchell
pmt	Peat Marwick Thorne
pr	Poissant Richard
pw	Price Waterhouse
rcmp	Raymond, Chabot, Martin, Pare & Associes
rptr	Roleau Potvin Pellerin Gagnon
ruv	Richer, Usher & Vineberg
sb	Samson Belair
sbdt	Samson Belair --Deloitte Touche
sc	Steele & Co.

sic	Soberman, Isenbaum & Columby
skrbg	Starkman, Kraft, Rothman, Berger & Grill
slf	Schwartz Levitsky Feldman
thorne	Thorne Riddell
tr	Touche Ross
we	Wm. Eisenberg & Co.
zssl	Zittrer, Siblin, Stein, Levine

CHAPTER 1: INTRODUCTION

Merger talks and activity among firms in the accounting industry were at an all time high
in 1989. Discussions and rumors regarding proposed mergers for six of the top eight
international firms (commonly called the *'Big Eight')* abounded in financial circles.
When the dust cleared, four firms were involved in two mergers, creating the *'Big Six'*.
Yet until now, no large scale assessment has been made of the changed structural and
competitive dynamics of this industry in Canada.

Mergers of significantly large firms are subject to review under the Canadian
Competition Act and guided by the Merger Guidelines. The two mergers, between
Thorne Ernst & Whinney and Peat Marwick Mitchell & Co. to create Peat Marwick
Thorne, and between Deloitte Haskins & Sells and Touche Ross & Co. to create Deloitte
Touche, were examined and allowed to proceed by the Director of Investigation and
Research after a cursory two day review.

It is the accounting industry's importance to the overall health of the Canadian economy
as an independent assessor of financial details through the audit service which demands a
further examination of these merger cases. The potential for significant detrimental
effects, due to possible increases of market power in the newly merged firms, is too large
to ignore. These effects could include increased prices, loss of audit independence, and a
reduction in audit quality. I therefore review the mergers in this thesis, using Canada's

Merger Enforcement Guidelines (hereafter called the *Guidelines*) to determine whether the decision by the Director was appropriate ex post.

To make this determination, I examine the relevant characteristics of the audit market that affect the likelihood that high concentration facilitates market power. The purpose is to build up a picture of the potential for market power in the face of undoubted, and possibly rising concentration. Few studies of this type exist for Canada. especially as compared to the U.S. where the volume of information is large. For example, the literature in this area has examined: switching experience among auditors (Carpenter and Strawser, 1971) (Danos and Eichenseher, 1981, 1982, 1986), (Johnson and Lys. 1990), (McConnell, 1984); signalling by peer review (Bremser, 1986); specialization of auditors by industry category (Zeff and Fossum, 1967); low-ball pricing (Francis, 1984), (Francis and Simon, 1987) , (DeAngelo, 1981) ; reputation differentials (Shockley and Holt, 1983) ; direct quality measurement (Angellini, Hutton, Copeland. 1994); and transparency (Bruton 1989).

Furthermore, merger analysis (as directed in the Guidelines) requires a definition of market based on product and geographic dimensions. I therefore examine several characteristics of the auditing market for large client firms along these dimensions. This includes audit firm specialization in 41 different industry categories, the ratio of auditors to clients in these industry categories, client size, the effect of parent client's auditor choice on its subsidiary's auditor choice, the breakdown of auditor concentration by

province, a comparison of auditor concentration in regulated and non-regulated industries, and finally switching behavior. I also include information regarding the number of audit firms, size of audit firms based on employee numbers, payroll, income levels for professionals, and number of employed for the whole industry, not limiting this information to the large client market.

My thesis provides information not only about two merger instances, but examines the audit market for large client firms over a period of numerous changes. Some of these changes are endogenous to the market. For example, one major merger fell through while several smaller (yet significant) mergers advanced. Broader, exogenous changes such as increased globalization and an increased demand for services impact the whole economy. I explore these changes in the remainder of the introduction under the sub-sections: *Merger and Identity Changes; The Changing Variety of Accounting Services; The Service Economy; Global Economy, Canadian Autonomy, Consumer Welfare.*

MERGERS AND IDENTITY CHANGES

The Chairman of Price Waterhouse World Firm, Joseph E. Connor, and the Chief

Executive of Arthur Anderson, Lawrence A. Weinbach, stated jointly that merger

discussions were underway, and their proposed union was in the works:

> "to benefit from the continuing rapid globalization of the world economies, the
> accelerating pace of technological change, and the broad based need for new
> services and investments. These developments are creating a demand for
> increased worldwide professional and financial resources with which to serve
> clients' needs" (Jeffrey, 1989a).

The merger between Price Waterhouse and Arthur Anderson did not proceed. The

Bottom Line (Jeffrey, 1989a) reported that the potential for anti-competitive acts, and the

possible detrimental effects to the accounting profession and industry because of conflicts

of interest, caused American regulatory bodies to unofficially discourage the merger.[1] It

was suggested that without considerable changes to one or the other firm or both firms,

the merger would be challenged by the U.S. Government.[2] The merger discussions

between the Canadian affiliates of these firms ceased immediately.

At the same time, in Canada and abroad, two other high profile mergers in the

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[1]Reported rumors in financial circles suggested the Securities Exchange Commission (SEC)would not allow a merger that would create a firm that on one hand installed computer systems from IBM (Arthur Anderson), and on the other hand audited IBM (Price Waterhouse) (Jeffrey, 1989a).

[2]Minyard and Tabor (1991) also suggested that the proposed merger between Arthur Anderson and Price Waterhouse would not meet the approval of American antitrust regulators. They state that the role of the Federal Trade Commission (FTC) and the Congress is unknown in the breakdown of merger discussions between the two firms. They also state that two other large mergers did occur during the same period. The conflict of interest problems experienced by this merger, as explained above, may have been sufficient reason to block the merger.

accounting industry did proceed. Thorne Ernst & Whinney merged with Peat Marwick

Mitchell & Co. to create Peat Marwick Thorne, and Deloitte Haskins & Sells merged

with Touche Ross & Co. to create Deloitte Touche (Financial Post, April 12, 1990;

Director, Annual Report, 1990).[3]

The Director examined these mergers, and after the mandatory two-day examination

did not pursue further investigation and closed the files (Director, Annual Report,

1990).[4] This allowed the mergers to take place without further regulatory review.

In addition to the merger activity, several name and organizational changes have taken

place. Clarkson Gordon changed its name to Ernst & Young, taking on its international

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[3]In addition to these mergers many other smaller structural changes took place. They include:

- Wm Eisenberg broke up in 1989 among Arthur Anderson, Touche Ross, and Ernst & Whinney. (Jeffrey, 1989)
- Collins Barrow splits up and partners in the Toronto area merge with Ernst & Young; Quebec City with Peat Marwick Thorne; Thetford Mines to Raymond, Chabot, Martin, Pare & Associes/Doane Raymond; Granby with Samson Belair Deloitte Touche. (Jeffrey, May 15, 1990)
- Le Groupe Mallette merged with Maheu Noiseux. (Matusky, 1990)
- Laventhol & Horwath (Toronto and Vancouver) joined Price Waterhouse. (Jeffrey, August, 1990)
- Doane Raymond Associates and Pannell Kerr MacGillivray merged to create Doane Raymond Pannell Associates, keeping both pre-merger international affiliations (Grant Thornton and Pannell Kerr Forster). (Jeffrey, 1991)
- Thorne Riddell merged with Ernst & Whinney creating Thorne Ernst and Whinney. This was prior to the larger merger it was involved in 1989.

[4]Any merger or proposed merger that prevents of lessens, or is likely to prevent or lessen, competition substantially is reviewable by the Tribunal (Section 92(1) of The Competition Act). The focus of the Act is thus on the effect of the merger. To ensure that both the quantitative and qualitative aspects of a matter are considered, the Competition Act provides a list of factors which the Tribunal may consider in determining whether the merger prevents or lessens or is likely to prevent or lessen competition substantially.

Parties are encouraged to approach the Director early in the process to determine if there are potential competition concerns, and if so, to determine if they can be resolved without heavy legal cost. Parties are requested to provide information concerning the merger. In addition to the Director's staff, outside consultants may be employed to assist in the competition assessment of the proposed merger.

affiliate's name (Jeffrey, Peat, 1989). Very recently (July 3, 1996) The Globe and Mail

reported that another long established Canadian accounting firm, Peat Marwick

Thorne, changed its name to the name of its international affiliate, KPMG.

(Accounting, 1996). The worldwide affiliation operates under KPMG in many

countries.[5] According to the company, this change reflects the attempt to provide

seamless professional services under one name worldwide. The Canadian firm now

called KPMG has been in Canada since 1840, when it started as Macintosh Robinson

and Paterson in Montreal. Since this time over 90 Canadian accounting firms have

been absorbed into what is now recognized as KPMG.[6] [7]

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[5]KPMG is the world's largest accounting network servicing almost one-fifth of the world market. Servicing is based on overall fees. (Worldwide, 1992)

[6]KPMG (formerly KPMG Peat Marwick Thorne) is Canadian owned and managed. It has 4,800 employees across Canada. Its affiliate KPMG International, operates in 140 countries.

[7]The use of merger in the accounting industry is prevalent. Documented histories (such as *The History of the Firm: 1864-1964, Clarkson Gordon & Co.*, by A. J. Little [1964]) report significant merger activity by accounting firms. Arnett and Danos (1979) also provide evidence of the prevalence of mergers by accounting and auditing firms in the United States.

THE CHANGING VARIETY OF ACCOUNTING SERVICES

In addition to the structural changes occurring in the accounting industry, the make-up of

services that accounting firms provide has also undergone considerable change. Audit

(or attestation) was once the cornerstone of the accounting firm. Now, the bottom line of

the accounting firm is heavily dependent on other services. Wyatt (1984) lists the variety

and intent of services currently available:

> "Audit divisions in major firms are offering services such as internal control
> reviews, profitability studies, merger and acquisition assistance, litigation support,
> insurance claims development and review, bankruptcy and liquidation services....
> and.... An expanded scope of services for some firms includes actuarial services,
> plant layout, executive recruiting, acting as a broker or dealer in securities,
> investment banking, and retail outlets for computer software .... The future is
> likely to see an increase in accountant association with forecast or forward
> looking information" (p. 111).

The expanded scope of services throws the independence of the accounting firm into

question. Independence is considered by many to be important to the audit service. The

accounting profession mitigates agency costs[8] between owners, represented by

shareholders and other creditors, and managers. This role places their members in

positions of authority and trust. Any damage to that trust relationship causes hardship

to investors and other constituents with a stake in the business. In some cases, a poor

audit might damage a broader cross section of society, as happenened in the 1980's

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[8]"An agency relationship is a contract under which one or more principals engage another person as
their steward (Agent) to perform some service on their behalf, the performance of which requires the
delegation of some decision making authority to the steward." (Wallace, 1980, p.12) Agency costs are those
costs related to this relationship. They may be viewed by the principal to supervise the agent, and/or by the
agent to certify performance to the principles.

when Northlands and Canadian Commercial Banks collapsed (Canadian Auditors 1986).

After the failure of the Northland Bank and Canadian Commercial Bank (CCB), their auditors were chastised by the Estey Commission for failing in their duties as auditors. The following quote from the Estey Commission Report suggests, mildly, that experience may have prevented some of the problems encountered with the audits of these two banks:

> "As was the case with the auditors of CCB, Northland's auditors, as individuals, had never undertaken a bank audit before their engagement with this bank. They communicated with other offices within their firm where bank audits were performed to obtain information and to build up an experience base" (Canadian Auditors, 1986, p. 4).

It follows that many groups are concerned about the potential for erosion of quality in audit services. The increased variety of accounting firm services only pushes these concerns to the forefront. Possible conflicts of interest, and the impairment of independence affecting performance as accounting firms supply various services are serious concerns for regulators, clients, and users of audit information.

Understanding the structure of the accounting industry and profession, and the impact of the pivotal change currently affecting it, is one crucial step in determining if the often expressed concerns about accounting industry performance justify public policy intervention.

THE SERVICE ECONOMY

The increased role of service products[9] in the economy has left analysts grappling with

the issues of regulation, credentialization, and quality assessment. These problems are

not necessarily unique to the goods that the accounting industry and its professionals

provide. Many of these problems are endemic to service goods. Lessons learned from

the changes in the audit and accounting service market may have application to the

broad and growing range of services.

The pressure to compete and succeed has increased the pressure to provide more non-

audit services. Russel Palmer, the Dean of The Wharton School of Business,

University of Pennsylvania, makes a salient point about accounting firms and their

product mix.

> "Consulting will--and ought--to continue to play a major role. But it is
> important for accounting firms to remember that, in this area, they are
> competing in a different marketplace. Yes they are vying with one another.
> But, more significant, they are competing against nonaccounting firms that have
> been specializing in consulting for a long time. Accounting firms are not
> embracing consulting because they are necessarily best at it, although it is quite
> possible in certain areas they are or could be. What has forced many of them to
> turn to consulting for growth has been the maturation of the auditing business"
> (Palmer, 1989, p. 85-86).

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[9]Business services are one of the fastest growing segments of the Canadian economy. There are 84,394 companies in this sector as of March 1994, with 90% of them having revenues under $2 million annually, and two-thirds having fewer than five employees (Harris, 1995) See GRAPH 1 (again). The fastest growing segment has been computer services.

GLOBAL ECONOMY, CANADIAN AUTONOMY, CONSUMER WELFARE

These mergers, potential mergers, and domestic firm absorption into their worldwide

affiliates' identity raise a number of public policy issues. The influence of international

forces on the Canadian industry call into question the independence and power of

Canadian regulators in a global economy. The mergers in this industry are only the tip

of the iceberg. With the continuing globalization of the world's economies, are

Canadian regulators able to make decisions that are beneficial to [most] Canadians

despite bigger pressures? Specifically, in direct reference to the issue in my thesis, was

the Director influenced to allow massive mergers in the Canadian accounting industry

because of parallel U.S. mergers or, did he act out of a conviction that the mergers

failed to substantially lessen competition in Canada.

The regulatory framework by which policy analysts and others assess change is placed

under the microscope. After all, it is the ability to deal with change and deal with it

effectively, which determines a country's --or a firm's-- competitive advantage.

Impeding change because of outdated domestic policy mandates is not productive. It

hinders growth and development of firms and industries within a country, and on a global

scale.

The increasingly international scope of accounting also raises public policy issues.

George Addy, the then Director of Investigation and Research, Competition Bureau

states,

"The trend towards internationalization of competition law activities is definitely growing and evolving. We will be devoting time and focusing resources on developing the tools we need to continue to deal effectively in that area, especially in cross-border issues" (Director, Annual Report, 1996, p.36).

Canada has entered into trade agreements with her major trading partners. Accountants, along with other professionals, now have increased freedom of movement within the U.S. and Mexico.

In the U.S. and elsewhere, large accounting firms operate under the umbrella of worldwide affiliations. Canadian accounting firms are no exception. The example of KPMG changing its name in Canada to reflect its global partner is case in point. Similarly, as demonstrated by the name changes from Table 1 to Table 2, accounting firms are emphasizing their international scope. Additionally, Canadian accounting firms are more likely to be part of a worldwide affiliation.

The accounting industry is providing a broader range of services in addition to the audit. At the same time, the service industry on the whole is rapidly expanding. These two sources of growth demand that Canadian policies address not only a global economy but the resulting global firm. Large Canadian accounting firms, in addition to being under a global umbrella, service large international clients. An important question arises out of this situation. At what point, if any, does business grow beyond domestic borders and policies? Although this question is outside the scope of my thesis, I suggest that my review of the issues provides a framework for examining the

TABLE 1

Top 15* Accounting Firms' International Connections 1990	
Peat Marwick Thorne	Klynveld Peat Marwick Goerdeler (KPMG)
Deloitte & Touche	DRT International
Ernst & Young	Ernst & Young
Price Waterhouse	Price Waterhouse World Firm Limited
Coopers & Lybrand	Coopers & Lybrand
Doane Raymond Pannell	Grant Thornton International & Pannell Kerr Forster Worldwide
BDO Ward Mallette	BDO Binder
Arthur Anderson & Co	Arthur Anderson & Co
Dunwoody & Company	Dunwoody Robson McGladrey & Pullen
Collins Barrow	Moores Rowland International
Richter, Usher & Vineberg	Clark Kenneth Laventhal
Zittrer, Siblin, Stein, Levine	Summit International Associates, Inc.
Fuller Jenks Landau McKay & Partners	HLB International
Schwarz, Levitsky, Feldman	GMN International
Evancic Perrault Robertson	none
* Ranking based on firm revenue.	

Adapted From: *The Bottom Line*, April 1991.

TABLE 2

Top 15 Accounting Firms' International Connections 1995	
KPMG	Klynveld Peat Marwick Goerdeler (KPMG)
Deloitte & Touche	Deloitte Touche Tohmatsu International
Ernst & Young	Ernst & Young International
Price Waterhouse	Price Waterhouse World Firm Limited
Coopers & Lybrand	Coopers & Lybrand International
Doane Raymond Grant Thornton	Grant Thornton International
BDO Dunwoody	BDO Binder
Anderson Worldwide	Arthur Anderson & Co S.C.
Collins Barrow	Moores Rowland International
RSM Fuller Jenks Landau McKay & Partners	HLB International
Meyers Norris Penny & Co.	Associated Accounting Firms International
Schwarz, Levitsky, Feldman	GMN International
Evancic Perrault Robertson	Morison International
Soberman Isenbaum & Colomby	BKR International
Mintz & Partners	Nexia International

Adapted From: *The Bottom Line,* April 1996

role of services and the role of global firms *within* domestic borders and the difficult policy choices large mergers may create.

So far, some necessary changes have been made to Canada's Competition Act to address the increasing role of services in the economy and provide legislation with teeth. The inclusion of services as a reviewable product ensures that the Competition Act applies to the fastest growing segment of Canada's economy, of which accounting and auditing services are a part [See Graph 1]. After 25 years of trying to revise the anti-trust laws in Canada, comprehensive legislation, namely the Competition Act, finally passed in the House of Commons in 1986. The new legislation is likely to bring more Government scrutiny to mergers and other competition practices of firms (Mathewson, 1990). In the case of the two large mergers I examine, it is not clear if the new legislation provoked more scrutiny. I only examine if the decisions by the Director were appropriate.

The remainder of the thesis is structured in the following way. Chapters 2 and 3 review the government inquiries, accounting industry commissions, and audit fee, concentration and merger research. Chapter 4 reviews issues relevant to the Guidelines. The methodology is explained in Chapter 5, while my findings are integrated into a framework of market characteristics and presented in Chapter 6. Chapter 7 provides an summary of the results and Chapter 8 concludes the thesis.

Graph 1: Types of Business Services

% Distribution of Sevice Establishments

Employment Agencies (3.10%)
Advertising (6.60%)
Other (14.90%)
Computer Services (9.30%)
Accounting & Bookkeeping (12.40%)
Management Consultants (21.70%)
Lawyers & Notaries (15.90%)
Architects & Engineers (16.10%)
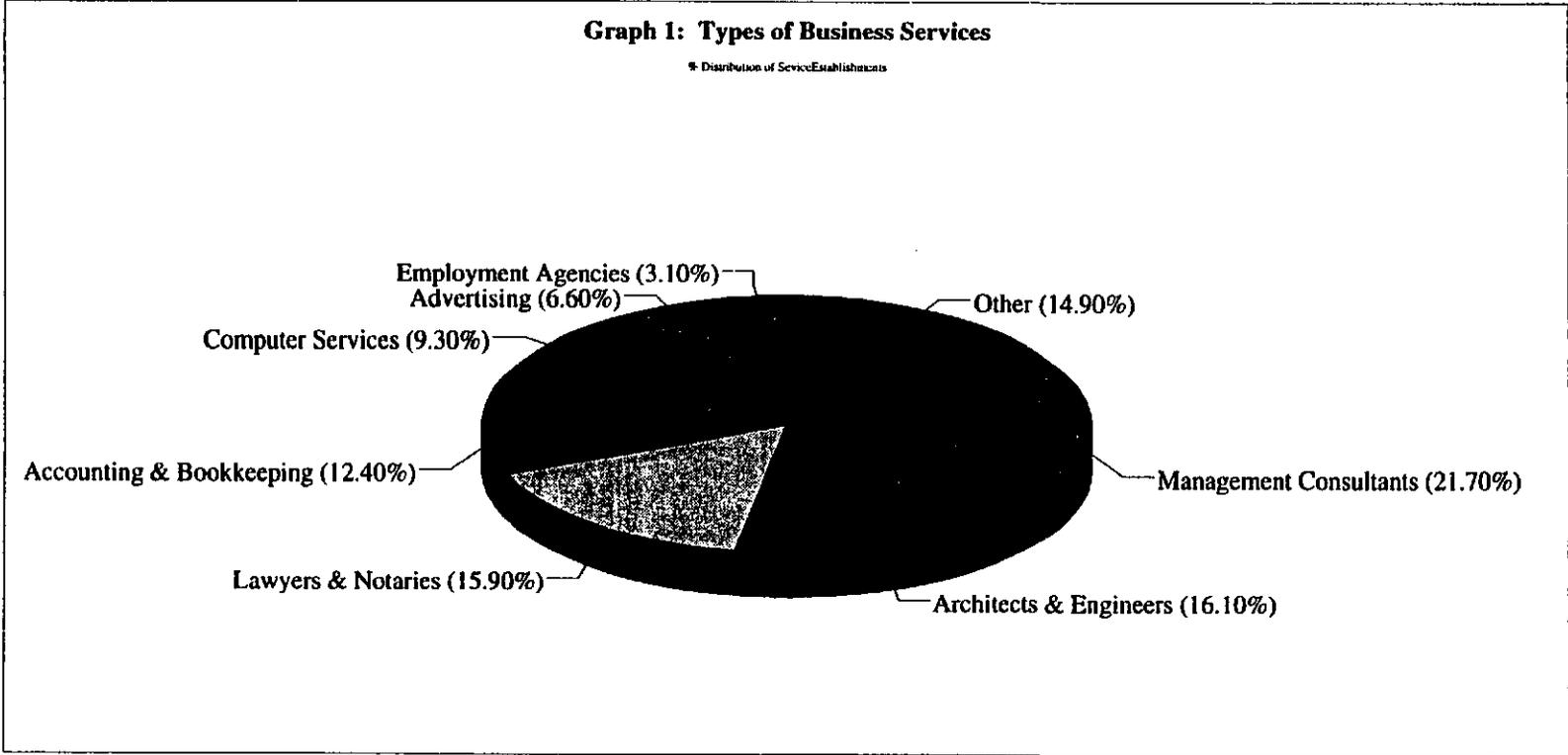
Adapted from Canadian Banker Magazine, May 1995

CHAPTER 2: HISTORY OF INFLUENTIAL GOVERNMENT AND INDUSTRY INQUIRIES

Although the merger provision of the Competition Act is a recent addition, political

interest has been focussed on the accounting industry and profession for some time. In

the sixties and seventies, the audit market for the largest client firms was already highly

concentrated[10]. Standard industrial organization thinking of the time took 'high

concentration' to mean that monopolistic or oligopolistic power was necessarily

exploited by a small number of large accounting firms.[11] Many argued that the

structure of the audit market would allow the few suppliers of the audit service to

explicitly or implicitly collude and influence standards, price, and the supply of audits

and qualified auditors, and that audit quality and auditor independence would be

jeopardized.

Evidence to support these claims was presented by several government studies. Formal

inquiries of the high concentration of the Big Eight[12] were first made in the United

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[10]This was established in both Canada and the U.S.

[11]Concentration is measured by either a 'concentration ratio' (CR4), which is the sum of the market shares of the top 4 or 8 (usually 4 or 8 is used, but other numbers may be useful) firms in a market, or the Herfindahl Index (HHI) which is the sum of the market shares squared of the firms in the market.

$$HHI = \sum_{i=1}^{N} \propto^2_i$$

Where n = the number of firms in the market, and $\propto$ = the market share.

[12] The 'Big Eight' has commonly been used as a term to name the largest accounting partnerships in the United States. The term now has worldwide implications. Since the merger activity the term 'Big Six' has replaced 'Big Eight'. At the time of this study, the Big Eight were: Arthur Andersen, Arthur Young, Coopers and Lybrand, Deloitte Haskins and Sells, Ernst & Whinney, Peat Marwick Mitchell, Price Waterhouse, and Touche Ross.

States (US. Senate, 1976). The Metcalf Committee, as it was commonly called, alleged

that the American Institute of Certified Public Accountants (AICPA), the Financial

Accounting Standards Board (FASB), and the profession itself were controlled by the

Big Eight. Evidence to support this allegation was that the Big Eight audited 92% of

the listings on the New York Stock Exchange, and 76% of the listings on the American

Stock Exchange. The study therefore relied on audit service concentration data solely to

determine that the accounting industry and profession were monopolized by the Big

Eight.[13] [14]

Another U.S. government Committee was studying the accounting industry at the same

time (United States, House of Representatives, 1976). A committee of the House of

Representatives, headed by Chairman Moss, suggested that the Security Exchange

Commission (SEC) should set both accounting principles and auditing standards.

The AICPA struck the Cohen Commission[15] in 1974 to investigate the scope and

organization of auditors' responsibilities. They suggested that competitive, rather than

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[13]The Committee also made recommendations. One of the recommendations most pertinent to the content of this thesis is that the Metcalf Committee suggested that Certified Public Accounting firms (CPA), divest themselves of all operations not relating to audit. (These operations are commonly called Management Advisory Services.)

[14]Spence (1979) reviewed the findings of the Metcalf Report and found it to be "one-sided and probably unfair". Further, he states, "The part I have difficulty with is the proposition that the Big Eight are out for themselves and their clients. This may be true, but it seems to me not to have been proved. The documentation of the increasing concentration is interesting, and a matter of concern." (Appendix, p. 2)

[15]The Commission's official name was, 'The Commission on Auditors' Responsibilities'.

collusive, pricing existed and recommended improving self-regulation of the profession, maintaining auditor independence, and broadening the audit function beyond the financial statements. The Commission also defined the responsibilities of the independent auditor.

The recommendations made in the U.S. eventually influenced the AICPA to eliminate restrictions on fee bidding, advertising, and direct solicitation of clients. Similar changes, with the exception of the direct solicitation of clients, were made by the Canadian Institute of Chartered Accountants (CICA) (Simunic and Stein, 1995).

These commissions were not precipitated by changes the industry and profession had experienced, but were politically motivated in order to satisfy the public that the government-- and the industry--were truly looking out for the good of the consumer. Since that flurry of political and regulatory examination and intervention, a significant volume of academic research has been dedicated to industrial organization issues pertinent to the accounting industry.

CHAPTER 3: DIRECTION OF RESEARCH ON THE ACCOUNTING INDUSTRY

The industry is typically studied in two ways, either through market structure or through

audit fees. The first looks into market structure and observes whether observable

indicators of inter-firm rivalry are consistent with monopoly or competition. For

example, one could examine whether clients use the same or different suppliers over time

(switching), or if suppliers try to specialize and create a niche market (specialization), or

if firms impede potential competitors from entering the market. This structural tradition

supplements direct market share and concentration measures by looking at relevant

characteristics of the audit market that affect the likelihood that high concentration

facilitates market power. The other way is to examine audit fees directly. In contrast

with the structural tradition, audit fee studies attempt to ascertain directly whether the

major firms charge higher fees and whether those increased fees can be attributed to

market power.

My thesis fits into the structural tradition because of the absence of data to examine the

second.[16] However, both approaches influence each other and documentation of

concentration is a starting place for studying potential market power. Therefore, I present

an extensive critical review of the literature in both traditions.

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[16]There is no legal requirement for audited firms, or auditors, to disclose fees in Canada. The U.S. has similar laws, but the U.K. Australia, New Zealand, and some Pacific Rim countries require fee disclosure. Studies on audit fees in the U.S. and Canada must use surveys, or other methods, to procure fee information from willing participants.

DIRECT STUDIES OF AUDIT FEES

Simunic (1980) published the classic paper in this genre, and his work has been frequently used as a model for later research, Unfortunately, however, there has been little improvement in methodology beyond Simunic's path-breaking paper. Controversy continues because studies in different times and places reach different conclusions about the relationship between auditor size and/or status and prices. I examine Simunic's paper later on in this chapter.

Studies that measure price relationships directly, collect data on auditor fees for a sample of clients. Each client's audit is characterized by descriptive accounting data. Bruton's (1989) study is typical of the genre. She reports that 91.3% of the variation in audit fees among clients is explained by a log-linear model incorporating the following independent variables: inventory, accounts receivable, current assets, long term assets, book rate of return, a dummy for whether the audit opinion was qualified or unqualified, year end and days to report. All but the last two variables were significantly different from zero, and had the correct sign. That is , the elasticity of audit fee in response to the change in the assets among clients is positive with respect to each independent variable except for firm risk (rate of return), for which it is negative[17].

The dependant variable in Bruton's analysis is the price of the audit and is typically measured by the ratio of fee revenue from the audit divided by the square root of the assets of the client firm. Sometimes, instead of the square root of assets, assets or

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[17]Bruton uses a different measure of firm risk (rate of return). It is converse to the investor definition of exposure wher a high rate of return is more risk. She states, " The risk associated with a high rate of return is systmatic risk which is different from audit risk." (p. 25)

revenues are used to scale fees. However, both Elliott and Korpi's (1978) and Simunic's (1980) papers, reported a strong linear relationship between the fee and the square root of assets over a wide range of assets.[18]

Clearly, asset size is not the sole measure of audit complexity. Two clients with the same assets may require different auditing effort. Additional independent variables in the pricing equation represent aspects of a firm's circumstances that a priori are thought to alter the complexity of the audit and affect the cost of the audit. For example, the excellent fit of Bruton's equation (1989), confirm that selected accounting measures capture the important elements of complexity that affect audit costs. The fit of Bruton's equation is surprisingly good since there are several theoretical considerations that are not well handled in most such studies. The most prominent of these issues is the role of the internal audit. Some authors observe that the internal audit is a substitute for external auditing while others find it a complement.[19] Therefore, if the relationship between internal and external audits cannot be established conclusively, one can have little confidence in the price equation that excludes an internal audit expense variable among the independent variables. Since that data is often unavailable to the researcher there

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[18]Simunic reports that asset size is a very significant determinant of the audit fee. His equasion was
$$FEE/ASSETS^{0.5} = b_0 + b_1 SUBS + b_2 DIVERS + b_3 FORGN + b_4 RECV + b_5 INV + b_6 PROFIT + b_7 LOSS + b_8 SUBJ + b_9 TIME + b_{10} AUDITOR + u$$

[19]Wallace (1984) and found that internal audit can replace and/or augment external audit, and therefore can reduce the overall cost of an audit. Chung and Lindsay (1988) found the internal audit to be a substitute for external audit, while Anderson and Zeghal (1994) found the internal audit to be a complement to the external audit. These last two studies are Canadian.

remain questions about what the coefficients of the price equation actually measure.[20]

Having established a price equation it is feasible to speak of the price of an audit as a linear equation of the square root of assets, other things being equal. The effectiveness of the equation is often examined by using it to predict the audit fee for audit cases left out of the sample.

However, even a perfect price equation is not sufficient to make any firm conclusions about the degree of an audit firm's market power. The price equation is an indirect measure of how the cost of audits vary with different characteristics of the firm being audited. However, since the analysis is not an engineering or activity-based study, it necessarily confounds several market characteristics, chief of which are the degree of market power, the extent and direction of economies of scale and scope, if any, and reputation effects and product differentiation. Market power is a feature of the marketplace, economies of scale and scope are characteristics of the production function, and reputation effects and product differentiation involve demand characteristics, signaling techniques and a host of agency and information asymmetry issues. However, all three of the above listed factors will influence observed prices in the market place, the single variable isolated in pricing studies.

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[20]Additional comments about Bruton's paper are made later on in the chapter.

Since the above factors operate simultaneously on price and cannot be observed directly, every statistical examination of audit pricing for the purpose of evaluating the presence, or otherwise, of market power simultaneously tests several other hypotheses and typically maintains several hypothesis as self-evident. Since market power is generally the public policy concern, the research strategy involves finding means of isolating the other factors.

It is Simunic's insight and strategy which makes him the paramount contributor to this field of research. His strategy involves separating the sample of client firms into large and small clients. He assumes that competition prevails for small clients. One rationale is that there is less concentration among auditors serving the smaller client segment of the business. Other rationales are that for the smaller client group the complexity of audits will be more homogeneous, and that the range of parties interested in the audit information will be lower.

In this separated small client sample (where competition is presumed) and with an estimated pricing equation, the researcher looks at how audit fees differ from the generic equation's forecast for several subsets of the sample. For example, by adding to the independent variables in the pricing equation a measure of the size of the audit firm, one measures how fee revenue fluctuates depending upon the size of the auditor. Simunic (1980) finds seven of the Big Eight's fees lower than non-Big Eight, while Francis (1982) found a price premium for Big Eight audits. Frances and Stokes (1985) examined this

discrepancy and surmised that smaller clients were paying premium fees to Big Eight auditors, but Big Eight fees were competitive overall.

Other researchers have examined audit fees in the Simunic tradition. Taffler and Ramalinggam (1982) and Francis (1984) found that large audit firms did charge higher fees for an audit. On the contrary, Firth (1985) found no statistically significant evidence of the larger auditing firms charging more for their services. Firth concluded there appeared to be no price premium for the major six auditing firms in New Zealand.[21]

If Simunic's hypothesis of competition in the market for small clients is assumed, then it is useful to examine the market circumstances that permit larger firms to charge higher prices to smaller clients. Moreover, since competition is presumed to prevail in the smaller client market, market power is eliminated as a factor. By elimination therefore, if prices increase with auditor size in the small firm sample, the researcher concludes that clients must be paying for a benefit that only the larger auditor offers. The extent of that quality differential is unclear however, because economies of scale and scope may prevail. In a competitive market economies of scale will push prices down as the audit firm expands. Most research has skirted the commingling of the effects of product differentiation and economies of scale on the price of the audit.

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[21]The New Zealand market for audit services only contained six of the eight Big Eight accounting firms.

DeAngelo (1981a) attacks the *'commingling'* issue by theorizing that auditor size is

positively related to auditor reputation and quality. She argues "that audit quality is not

independent of audit firm size, even when auditors initially possess identical

technological capabilities". (p.183) Further, auditors with more clients (hence larger)

have more to lose if they do not maintain audit quality.[22]

With start-up and transactions costs present, the auditor-client relationship is sometimes

considered a bilateral monopoly. There are strong incentives for both parties to remain

in the relationship to avoid the costs of terminating it. The auditor's insulation from

client switching gives the incumbent auditor the ability to earn quasi-rents. There

should be an inverse relationship between the magnitude of start-up/transactions costs

(hence, client-specific quasi-rents) and auditor turnover.[23] Following from this

suggestion, there is incentive to attract business using tactics such as lowballing. And

there is incentive to keep clients, even if this requires lowering the cost--and/or quality-

-of the audit.

The rational client will want to obtain a high quality audit to mitigate agency costs.

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[22]This supplants the assumption of homogeneous audit products across firms. DeAngelo's paper was motivated by the Derieux Committee Report (The AICPA Special Committee on Small and Medium Size Firms, 1980) which found that size is an "arbitrary yet overwhelming factor" in the client's criteria for choosing an auditor, and suggested educating the public to not use size as a selection factor for finding a CPA.

[23]Danos and Eichenseher (1982) argue that evidence that auditors in regulated industries maintain a tighter grip on their contracts may be proof of DeAngelo's theory because there is more specialized knowledge needed to audit regulated firms.

Thus the auditor has incentive to specialize to enhance audit quality and ensuring the audit is independent. This would require that the auditor have sufficient clientele (or in other words is large enough), that losing one client would not impair its ability to carry on business. DeAngelo asserts that the potential of losing several clients, because of being caught producing a poor quality audit for another client, acts as a 'collateral bond' or disincentive to cheat.

Before examining the issues of product differentiation and economies of scale in detail, recall that research findings assume that competition prevails for small clients. According to Simunic that analysis is a baseline which permits one to evaluate market power in the large client sample. In that sample, market power cannot be ruled out. However, from the small sample, the researcher reaches conclusions about product differentiation and economies of scale which are carried over to the analysis of the large sample.[24]

Simunic found that the market was competitive. Seven of the Big Eight auditors charged lower fees than small audit firms charged for similar audits (consistent with large-firm

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[24]Simunic found no evidence of market power in the large sample because there was no premium charged by the Big Eight firms. Although Simunic states the 90 percent of the large client category are serviced by Big Eight firms and therefore useful to test his hypothesis. His $125 million cutoff between small and large firms was arbitrary. Other researchers have used similar arbitrary cutoffs. In the case of Francis (1984), the cutoff created a contrary result to Simunic's. Francis and Stokes (1986) investigated these differing results attributing the size of the firms in the large and small categories as having an effect on the result for the Australian market.

economies of scale); however, there was no difference in fees between large and small audit firms after controlling for other client characteristics.

Anderson and Zeghal investigate the hypothesis that audit services are not homogeneous but are instead characterized by product differentiation among auditors using Canadian data. Product differentiation applied to auditing services means that firms offer different qualities of service, even though the inputs appear to be similar. If so, it should be no surprise to find that audit fees per unit of standardized service (measured here primarily by the assets of the audited firm but also measured by the square root of the assets) vary among firms. Using assets as a measure of size of the audit focuses attention on the size of the client as a measure of the scope of the auditor's task. Other dimensions of auditor output variation across audits are complexity and risk. Evidently, there are significant difficulties in establishing a standard output unit of audit service.

Product differentiation complicates the analysis as the value of the audit to the client will differ even if the audit effort appears the same. The possibility of product differentiation and the problems of determining a standard unit of output makes it awkward (although it is often done) to infer an absence of competition in the accounting services market from merely observing differential pricing.

Assets measure the size of the client firm, but assets fails to measure complexity. Complexity is measured here by "the number of operating industries, number of

subsidiaries and the proportion of assets in receivables and inventories." (Anderson and Zeghal, p. 196)

Product differentiation is measured by two proxies - the size of the auditor and the status as a Big Eight firm. The first measure is rationalized by DeAngelo's size hypothesis (described above). She argues that this quality difference is directly related to the size of the audit firm. DeAngelo's thesis, as articulated by the Anderson and Zeghal, suffers from an inherent circularity. She is said to argue that in a competitive market, persistent price differences must be due to quality differences. She observes that audit prices rise with the size of the firm and therefore infers that quality is also positively proportional to size. Though possible, size may also reflect larger market share and the market power of the large firms in a concentrated business. Therefore the DeAngelo's thesis may not be used as a joint assumption with a market power thesis. This is overcome by applying Simunic's strategy to restrict the analysis to the small client sample. In that sample, it is reasonable to assume that market power is absent.

There is necessarily some ambiguity here because the evidence on whether audit fees rise in proportion to the size of the auditor is not confirmed in all pricing studies. For example, Simunic found lower fees in the large audit sample. Moreover, if there are economies of scale in the audit delivery industry, larger firms would tend to grow bigger under price competition, with or without differential qualities.

To the extent that larger firms increase faster than smaller firms because of economies of scale, concentration will necessarily increase: and it is not clear how the dynamics introduced by economies of scale can be separated from DeAngelo's formulation of the quality dimension without having direct, instead of proxy, measures of quality.

The authors recognize these issues and assert that the economies of scale prevail among firms serving large clients, or those firms specializing in certain industries. They follow Simunic, and argue that service to the small client is assuredly competitive. Therefore they separate large and small client markets, even though all auditor firms may compete in both market segments. Their test is based on this market segmentation hypothesis, but as is explained below, their test does not inspire confidence in their conclusions.

In essence, Anderson and Zeghal juxtapose Klein and Leffler's (1981) and DeAngelo's hypotheses for product differentiation. Klein and Leffler's brand name hypothesis of quality differentiation is an application of the standard economic analysis of reputation. In that model, the firm invests in reputation either through substance or through advertising, in order to signal to the user the firm's commitment to quality (Dixit and Norman, 1978). The brand name hypothesis applied to accounting services explains the success of the Big Eight accounting firms at the expense of smaller and medium-sized firms, by the fact that these firms invest in brand name development. That investment includes hiring , apparently, the most competent employees, developing the best possible computer systems and training programs, and paying above standard salaries to

employees and partners. This high cost approach is said to build credibility, convincing

clients and users of audit information that the auditor can be trusted. That trust comes

from the realization that the reputable firm has a lot to lose from error or poor outcomes

that reduce its reputation capital. Since confidence in the credibility of the auditor is a

key quality dimension, especially for those firms seeking outside funding,[25] the reputation

model might explain why such firms switch to Big Eight audit firms despite the increased

fee.

The brand name hypothesis is also therefore an alternative for any 'conspiracy' or

'concentration' theory for price differentials and for the increasing shift of large firm

business to larger auditors.

Anderson and Zeghal obtained complete responses to a survey instrument and collected

additional data from 172 firms for the years 1980, 1982, and 1984.[26] This period is

described by the authors as an especially interesting one because at the time Canadian

authorities reduced restrictions on advertising and in some jurisdictions extended to

CGA's the right to undertake audits.

Their survey collected data from a sample of firms on the name of the auditor, the

external audit fee, and the dollar value of the costs incurred by the firm for the internal

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[25] As demonstrated in Teoh and Wong, (1993) and in Carpenter and Strawser (1971).

audit.[27] The sample was divided into large and small client firms at a break-off point of $100 million (Canadian) in total assets. A binary indicator (dummy) variable designated Big Eight and non-Big Eight auditor classifications.

Using multiple regression, Anderson and Zeghal determined that the independent variables with the most explanatory power in relation to the audit fee across groups were total assets (not the square root of total assets, as others have found), percentage of assets in receivables and inventory, and the number of subsidiaries in that order respectively.

Anderson and Zeghal argue that in their data the size variable is a metric for quality as in DeAngelo's analysis. Their argument is that the 'size of auditor' measure is a significant and positive determinant of auditor revenues among small clients (t=2.76) and is insignificant in the sample of large clients. But their argument must be considered weak, because it rests on an untested assumption that among large clients the reputation benefits of size just exactly offset the economies of scale that otherwise are available for large firms auditing large clients, but are unavailable for large firms auditing small clients. Their argument is therefore suspect, and is weak material from which to construct the 'size-quality' link and to reject the 'reputation' model.

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[27] The survey data was supplemented by additional information that was obtained from public sources. This information included: total assets, net income, accounts receivable, inventories, SIC, subsidiaries. Auditor revenues (from all sources) were also obtained.

The interesting finding here is that the Big Eight firms' actual fee structure seems to conform with their reputations in the industry as high fee firms or as aggressive price cutters. Therefore, the authors argue that the Big Eight group cannot be viewed as a proxy for 'reputation.' This seems more than a trifle cavalier. Of course, the reputation hypothesis would not assert common prices among the Big Eight firms, since reputations are not necessarily homogeneous within the group. The Big Eight reputation differential may nevertheless persist for the group and each firm in the group in comparison with non-Big Eight firms, which is a more intuitive way of stating the hypothesis.

An unaccountable weakness in the study is that the authors fail to distinguish between Quebec and other parts of Canada. In Quebec, some regional firms continue to maintain their reputations and to audit firms that are typically clients of the Big Eight firms elsewhere in Canada.

Nevertheless, the authors do seem to have identified that audit fees are aligned with the value of each Big Eight firm's reputation. Competition between Big Eight firms takes the form of competition for reputation (quality) rather than direct price competition.

As a side issue, Anderson and Zeghal observe that in their sample, expenditures on internal and external auditing services are positively correlated. Thus internal and external auditing appears to be complementary rather than substitutes, other things being equal. This is a highly counter-intuitive observation, and disagrees with Wallace's (1984,

1986) evidence for the U.S. market, and Chung and Lindsay's (1988) Canadian evidence. It seems more likely that "other things are not equal," and that the 'internal' audit measure is highly correlated with the business type and complexity of the client. For example, financial institutions likely spend more on internal audits than do firms in non-financial industries.

I present Bruton's (1989) study here in some detail because the research successfully distinguishes between two classes of auditors - Big Eight and others. She asserts that relying on a single price equation from a sample that includes both categories of firms misstates audit pricing behaviors. Bruton examined whether a single model applies for the pricing of audits for both the Big Eight and non-Big Eight . She also examined whether large non-Big Eight firms are better classified in the Big Eight group or in the others category.

Her sample consists of 328 client firms of which 205 used a Big Eight auditor and 123 used a non-Big Eight auditor. The data was collected from 1984 United Kingdom annual reports.[28] She estimated two regressions, one for Big Eight client firms and one for the non-Big Eight client firms. (p. 2) An F test (Chow test) indicates that the regressions from the two samples are from different populations.

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[28]The use of U.K. data does not require the use of a survey to obtain audit fees. Disclosure of audit fees is required.

Bruton suggests there are two distinct markets for accounting services based on her price data. She found a significant difference between audit fees charged by the Big Eight and those charged by the non-Big Eight, and suggested that the Big Eight price premium other researchers found may have no relation to market power.

She also discovered that the difference in the audit fee charged has two components. The difference in the constant terms between the two equations reflects a difference in the fee charged by Big Eight compared to other firms and that is independent of the size of the clients. The coefficient of the independent variable, (assets) is a linear measure of the audit fee per unit of service. That price also differs between the two groups.

The fit of Bruton's equation is so amazingly good, one suspects she has uncovered a pricing algorithm used by the firms, rather than having measured the result of an equilibrium process that adjusts prices charged through trial, error and rivalry. If true, the analysis of fees in relation to size and quality (or other features) may not capture the way in which market power is maintained.

The transparent[29] nature of U.K. fee data may have a hand in her success. Recall, fee data is revealed in the U.K., and thereby provides information to all interested parties. The possibility of collusion is higher when prices (fees) are well known, and the detection of a

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[29]Clear and obtainable (to knowledgeable buyers and sellers) information is considered transparent.

cheater[30] is easier. Even Bruton suggests this possibility, but she touts product

differentiation as the most likely scenario because the Big Eight may have had a different

bundle of services with a different cost function than non-Big Eight auditors.

Relating back to the issue of price competition, Chung and Lindsay (1988) replicated

Simunic's (1980) study using Canadian data. Their data is from a survey answered by

228 firms. All firms were listed on either the Toronto or Montreal stock exchange on

December 31, 1980. The sample includes 107 large clients and 121 small clients based

on a dividing line of $100 million in total assets. Chung and Lindsay follow Simunic by

assuming competition exists in the market for small clients[31], and that internal audit is a

substitute for external audit.[32]

Importantly, Chung and Lindsay find strong evidence for a linear relationship between fee

revenues and the square root of assets. Chung and Lindsay found that client firm size

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[30]A cheater in this sense, is the firm or seller which wishes to maximize his own profit to the detriment of others in the oligopoly or cartel, by price cutting. A transparent market allows all parties to observe the price cutting.

[31]Simunic (1980) made the same assumption.

[32]They based this assumption on Simunic (1980) and Wallace (1984). Since then Wallace (1986) found more evidence of the substitutive nature of internal and external audit. In contrast, Anderson and Zeghal (1994) found a complimentary relationship using Canadian data.

(measured by the square root of total assets[33]) was a significant determinant of the external audit fee.

Their results confirm that variables measuring number and presence of subsidiaries, foreign activities, receivables and inventory are statistically significant determinants of auditor fees and with the expected signs. They also found no evidence of systematic differences in fees among auditing firms. On the face, because the mean fee per unit square root of asset varies from 11.24 for Price Waterhouse to 6.01 for Peat Marwick Mitchell, one would think the fees charged are different. However, the standard deviation of fees per unit audit for each [audit] firm across clients is very high. Therefore, the researchers rejected the hypothesis that large audit firms charge different fees.

Based on the small/large client categorization, Chung and Lindsay found that small clients are charged higher fees than are large clients, when contracting a Big Eight auditor.[34] They concluded that small clients were willing to pay a higher price to the Big Eight for their services. Large clients do not pay a premium for Big Eight audit services. Small clients must be paying for additional qualities that large audit firms provide, otherwise these clients would always choose small audit firms because of the price difference.

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[33]Elliot and Korpi (1978) found that audit fees are a linear function of the square root of assets or sales. Since then, most others have used this relation as a proxy for audit fees.

[34]This is consistent with Francis and Stokes (1985).

Palmrose (1986) tested for a systematic relation between audit firms size and audit fees.[35] The results indicate a positive relation between size and fees based on a Big Eight /non Big Eight dichotomy. Palmrose also tested for an association between audit fees and industry specialization of the auditor, but she failed to find a statistically significant result.

Her research also attempted to distinguish if the Big Eight price premium was a result of higher quality services or monopoly pricing by the largest suppliers. To distinguish between the two competing hypotheses, a research method similar to Simunic's (1980) was used that assumed pricing was competitive in the small client segment of the market. Prices across small and large clients were compared. The results were consistent with competition and the Big Eight having differentiated products. She also found diseconomies to large clients using non-Big Eight auditors. When large audit firms audit large clients fees are at their lowest, and when small audit firms audit small clients, fees are also at their lowest.

I wrap up this section with some remarks on audit fee data. Many studies on audits used audit fee data to infer the competitiveness of the market. Fee data does not provide a direct examination of auditor effort, or inputs. It only provides information about

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[35]Based on three hundred and sixty-one usable responses from her survey.

revenues, not information about expenses. For example, an audit may be produced by several different tiers of labor. Large audit firms can use this mechanism to lower costs and exploit economies of scale[36] by assigning the most appropriate labor, at the most effective cost, to the different activities that comprise the production of an audit.

Not only does audit fee data fail to provide information about labor inputs, observed audit fee differences may reflect variances in the nature of audit clients. Economies of scale accruing to a large audit firm is another possible reason for an observed fee difference, which also may be (more) apparent during a period of auditor restructuring. Higher audit quality may also induce higher fees.[37]

In addition, some basic methodological issues are at hand. As I have mentioned before, the disclosure of audit fees is not required in Canada or the U.S. Therefore, surveys and proxies are typically used to gather information about audit fees. Methodological difficulties with surveys are numerous and include non-response bias, interpretation errors and responses from inappropriate individuals. [38]

In addition to the difficulties inherent in using audit fee data, considerable obstacles are

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[36]Reductions in the average cost of a product in the long run, which result from an expanded level of output.

[37]O'Keefe, Simunic and Stein (1994) provide some insights to audit cost data, and discuss the inherent difficulties in using fee data to link observed differences in fees to costs.

[38]Simon (1969) thoroughly details the difficulties in using surveys.

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encountered in establishing the nature and characteristics of a service, and an audit in

particular. In the next section I will review the structural literature.

CONCENTRATION STUDIES

Zeff and Fossum (1967) published the seminal paper on the concentration of large U.S. public accounting firms.[39] [40] The study found that the Big Eight[41] performed 92.7% of audits based on number of audits and 94.8% based on percentage of revenues.

To understand the strengths and weaknesses of an audit firm's expertise, the researchers hypothesized that audit firms may audit the majority of firms in an industry. The client firms were sorted into industry categories. Zeff and Fossum found strong leader audit firms in many of the industry categories.[42] In those categories that did not have one particular leader, two or three firms enjoyed prominence. Zeff and Fossum found a high concentration of auditors in many categories. For example, in tobacco, three audit firms account for 95 percent of the aggregate revenues.

Dominance of an accounting firm in a category was attributed to the client firm's dominance in the category. Therefore, the client firm determined the auditor's apparent

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[39]Zeff and Fossum also outline the significant problems that this analysis encounters, such as size of sample, use of two or more accounting firms for one client firm, ranking of client firms based on revenues. They concede that the only weakness that they could control is the size of sample. They used a list of the top 500 industrials.

[40]Schiff and Fried (1976) and Rhode, Whitsell and Kelsey (1974) also published accounting firm concentration studies. These two papers are primarily an update of the Zeff and Fossum work.

[41]The Big Eight at the time of this study were: Arthur Anderson & Co.; Arthur Young & Company; Ernst & Ernst; Haskins & Sells; Lybrand, Ros Bros. & Montgomery; Peat, Marwick, Mitchell & Co.; Price Waterhouse & Co. ; and Touche, Ross, Bailey & Smart.

[42]Zeff and Fossum broke the data into 38 industry categories.

market power. This finding reflects the indivisibility of audits.

The baseline Canadian study on market concentration was performed by Shaw and Archibald as they extended Zeff and Fossum's (1967) study. Their sample contained 927 firms for fiscal 1968.[43] Each firm had issued securities publicly and had assets over $5 million. The data set included the firm, its auditor, its total assets, gross revenue, and net income. The data was classified by industry categories[44] and audit firm.

Auditors were ranked on the basis of total assets audited, for each industry and overall. In the overall analysis, 145 auditors were listed. Of these, 85 auditors had only one client in the sample. The top three auditors had 381 clients. Shaw and Archibald reported that Price Waterhouse audited a larger dollar value of assets than any other auditor, but Clarkson Gordon & Co. and Thorne, Gunn, Helliwell & Christenson each had a greater number of audits.

In the industry categories, Shaw and Archibald ranked the top ten firms in each of five industries. Of these 50 positions, only sixteen different auditors were ranked.

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[43]Only ordinal classifications were made, and no statistical comparison to the Zeff and Fossum study was attempted. Differences in the sampling method caused the authors to treat the data in this way. It was noted that large audit firms dominated the market.

[44]The industry categories were industrials, finance, public utilities, mines, and oils.

Furthermore, Shaw and Archibald reported that the top eight firms held 38 of those 50 positions. Additionally, each of these eight firms was present in at least four of the five industrial categories.

Shaw and Archibald compared their analysis with Zeff and Fossum's and report that the top audit firms held a similar percentage of the audits. The leading firm in both the U.S. and Canada was Price Waterhouse.

In 1968, 88.2 percent of the population of client firms was audited by the top eight Canadian audit firms. The top three audit firms held 67.8% of the audits based on number of audits, and 67.7% of the audits based on total assets.[45] The Canadian market was considered concentrated and was dominated by a few large audit firms.

Campbell and McNiel examine whether an increase in concentration[46] of auditors could be attributed to stochastic (random) forces instead of the more typically argued market power thesis. The stochastic model[47] states that if the rule of growth is proportional and stochastic, over time growth will favour large over small firms. The hypothesis does not

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[45]The CR4 is 73.7% based on audit numbers, and 73.7% based on total assets.

[46]Concentration is measured by concentration ratios for top four (CR4) and top eight (CR8) firms based on client firm size.

[47]The model is attributed to Gibrat, R. (1931). Les inegalites economiques. Paris. This was later introduced in the English language by M. Kalecki, "On the Gibrat Distribution," Econometrica, April 1945, p. 161-170. The computer simulation in Campbell and McNiel's paper was based on Gibrat's work.

help in any way to explain the initial size distribution of firms. Nor, is there any reason to argue that the dynamics of growth are driven by a constant growth rate (plus a random error: white noise). The model may have little direct intuitive appeal, but it seems to have considerable descriptive merit. Therefore, theorists have sought explanations for the strong empirical observation. For example, Demsetz argues that it confirms his view that large firms grow because of economies of scale.

Campbell and McNiel suggested that large audit firms may have had a cost advantage and created the high and increasing concentration of auditors for large clients in the U.S. More important, this is a true size based model rather than DeAngelo's which is a reputation[48] model in drag.

Campbell and McNiel simulate firm and industry dynamics to determine the growth rate and concentration of audit firms. They made their projections using growth rates based on annual rates of growth (or decay), mean and deviations of growth from the mean. The simulation forecasted concentration measures for the years 1964 to 2004[49], and actual data from 1964, 1971, and 1978 was compared to the projections.

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[48]Reputation models examine how a firm's reputation is formed (under various conditions). Further readings on reputation models include, Kreps and Wilson (1982), Milgrom and Roberts(1982), and Shapiro (1980, 1982, and 1983).

[49]The model predicts concentration figures in the 65 percent range (CR4) and 95 percent range (CR8) for years past 1978.

The simulation scenario projected large auditors increasing in size and small auditors declining in size. Yet, the simulation under-reports concentration when compared to the actual figures. Since their model captures only random forces, Campbell and McNiel suggest that the difference is due to non-random forces. Therefore, they concluded, stochastic and non-stochastic forces both contributed to the concentration of auditors.

The authors use a poor choice of words in distinguishing stochastic from non-stochastic forces. The stochastic model assumes a constant rate of growth with stochastic error. If the rate of growth is constant over time and with error, there will be a drift towards large firms growing faster than small ones. The reason for that is that when there is a stochastic up-tick, the constant rate of growth continues to expand it. With a random down-tick, the constant rate of growth is moderated. Over time, the up-ticks outgrow the down-ticks.

Campbell and McNeill find that the constant rate of growth with random variation fails to completely describe the historical data. Growth among large firms is systematically greater, meaning that a constant rate of growth model fails to describe history. Actual growth is greater than the model describes. But some other more complex growth model might still interact with random error to generate a different growth path.

Danos and Eichenseher (1982) suggest that the survival of suppliers in a market is

primarily a function of firm size. They base their theory on Stigler's[50] survivorship

approach to the detection of economies of scale. They determine if audit firm size and

industry specialization in regulated industries (as regulatory requirements[51] may create

scale economies in audit production) are related to maintaining market share.

They examined a sample of 1229 client firms in 33 industry categories at the beginning

and end of a seven year period (1972 - 1979) using ANOVA.[52] The square root of the

asset size of the client divided by the sum of the square roots of all client firms was

used to determine the market share of the auditor in each industry.   A four-firm

concentration ratio was calculated for each industry.

They report that economies of scale in the production of audits, and overall, non-

industry-specific scale effects in the production of audit services, existed. CPA firms

involved in regulated client industries maintained market share over time, while CPA

firms with very large market shares in non-regulated client industries experienced a

decline of their market shares over time.

"Changes in CPA firm market share were dependent on audit firm intra industry

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[50]Stigler, G.J. (1958, October). The economies of scale. Journal of Law and Economics, p. 54 -71. The 'Survivor' principle suggests that the existence of supplier economies of scale imply an optimal firm size in a competitive market. The profit maximizing firm will produce at the level of minimum long-run average cost, avoid incurring losses and tend to survive.

[51]Carpenter and Strawser (1971) stated that management looked to regulatory expertise in the choice of an auditor.

[52] They used a binary variable for regulated or non-regulated industries.

market shares, overall market shares and the regulatory nature of the client industry" (1982, p. 615).

Danos and Eichenseher found scale effects favoured large CPA firms, even if the auditor had a low market share in an industry. They suggest that clients may wish to engage auditors who do not deal with their competitors.[53] An alternative explanation, is risk mitigation by auditors.[54]

Danos and Eichenseher (1986) examined the issue of auditor switching and regulated and non-regulated industries. They report that competition among the Big Eight is increasing for non-regulated firms. I provide Canadian evidence supporting this theory in Chapter 6, under Specialization.

Taken together, the concentration studies demonstrate that there is high concentration in the audit market in the United States. Despite this fact, the market is considered to be competitive because there is little evidence of market power accruing to any or several auditors. The only evidence of market power seems to be for auditors in regulated industries, which may be due to the auditor's expertise (and sunk costs) in regulatory and filing requirements.

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[53]My thesis examines this issue using the auditor-client ratio.

[54]This theory is attributed to Simunic in Lindsay (1989). The theory suggests that auditors may want to lower their risk by dispersing their contracts over several industries, rather than holding all the audits in an industry.

MERGER STUDIES

After the merger activity which turned the Big Eight into the Big Six, three published

studies examined the effects or possible effects of these mergers. Two were based on U.S.

data and one examined the effects in the European Union.

The European Union wished to determine if the 'Big Six' acted as a cartel. In Belgium,

Italy, and the Netherlands, the Big Six audit almost 100% of the top 200 firms. High

concentration was also found in other EU member countries[55].

The EU study found little uniformity in audit fees from country to country, which

implied collusion was not likely. The researchers suggested that although the Big Six

dominated the European market for audit services that the group did not form a cartel.

More than half of the clients reported that over 80% of their spending on other services

went to their incumbent auditor. The Big Six used management consulting and tax

advice services (MAS) to replacing falling incomes from audit and accounting fees.

Audit firms were relying heavily on their audit clients for non-audit income. (Big Six,

1992)

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[55]This study was not available for inspection, despite numerous attempts to find an available copy. From my search, I found only two copies in existence, both of which were inaccessible. The purchase cost of the study exceeded $1500.00, which I declined to commit to. All the information contained herein is from news clippings, which were probably generated from news releases from the publisher. (*The Bottom Line, July 1992; Certified Accountant*)

Although the EU study apparently ruled out a cartel, the authors made suggestions that

the Big Six may have other opportunities to gain an unfair advantage. The first is the

possible lack of independence, as reported in the previous paragraph. The second is

what the clippings called a barrier to entry, where the Big Six impede entrance of

middle size accounting firms to lucrative consulting business. This should not be

considered a barrier to entry if the advantage is obtained through developing expertise

and having the size and ability to service the client. Rather, it is a competitive

advantage generated by earlier investment.

Several other researchers have used concentration as a means of examining the changing

audit market. It is often noted in concentration literature that the choice variable

employed to calculate the market share has an effect on the findings. Tomczyk and Read

(1989) found that total revenues produced lower market share ratios than using fees or fee

proxies. Unfortunately, the product mix of audit firms cannot be assumed to be constant

(over time or among firms), although for the majority of firms it is.[56] Therefore, using

total revenues as a measure of market share ignores many of the issues associated with

market share and market power. Although these authors suggest that a broadly based

concentration measure based only on audit firms' revenues may "be of interest to policy

makers" (p. 105), I suggest that very little is gleaned about the audit and accounting

industry from these measures.

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[56]*The Bottom Line* provides product mix breakdowns based on revenue. This information is released by the firms, and is not required. In recent years, the majority of large auditors have not revealed this information.

Wootton, Tonge and Wolk (1994) examined issues raised by the auditor merger activity

in the United States.[57] They examined the effects of the mergers on the concentration

of companies listed on either the NYSE, AMEX and OTC. Concentration ratios and

Herfindahl indices were calculated based on number of companies audited, the square

root of client revenues[58] and 'audit fees' (which are simply the auditor revenues using

the same method as Tomczyk and Read). [59]

Wootton, Tonge and Wolk report that Ernst & Young's merger gave the firm a slight

increase in market share, from a pre-merger combined market share of 18.4% to a post-

merger market share of 18.9% (based on number of audits). Its market share based on

(audit) firm revenues decreased from 22.7% to 21.2%. On the other hand, the merger

of Deloitte & Touche caused a decrease in market share based on number of audits

(15.9% to 15.3%) or client revenues (16.4% to 15.9%), but an increased market share

based on (audit) firm revenues (19.4% to 19.6%).

These researchers reported the new firms have increased their standing among the

major audit firms, while the industry appears to be better balanced among the players as

the market share has evened out. No concentration measures based on industries were

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[57]Copley (1993) examined the potential effects of the mergers on municipal audits. He examines the availability of auditors in several cities in the United States.

[58]The square root of client revenues was used to reduce bias imposed by large clients.

[59]The data consisted of 5,962 companies for fiscal year end 1988 and 5,777 companies for fiscal year end 1991.

reported.

To round out the background before I present my methods and results, I remain on the topic of merger in the next chapter and present issues specific to merger analysis. The Guidlines establish a framework upon which I build up a picture of the relevant market to determine if market power is present in the face of high concentration.

CHAPTER 4: MERGER ENFORCEMENT GUIDELINES

PART 1: Merger Definition

Section 91 of the Competition Act defines a merger as:

> *"...the acquisition or establishment, direct or indirect, by one or more persons, whether by purchase or lease of shares or assets, by amalgamation or by combination or otherwise of control over or significant interest in the whole or a part of a business of a competitor, supplier, customer or other person. "*

'Control' is defined in section 2(4) of the Act, and confines its interpretation to the owner's ability to appoint or elect directors by holding at least 50 percent of the voting shares. The Act does not define *'significant interest.'* The Bureau of Competition Policy[60] takes the position that significant interest is held "when one or more persons have the ability to materially influence the economic behaviour[61] of that business or a part of that business" (Director, 1991, p. 1).

The definition of 'significant interest' is important to the application of the Competition Act. If a transaction between two (or more) parties does not fall under the scope of section 91, it is "not subject to merger provisions of the Act" (Director, p. i).

There is little question that the transactions between Thorne Riddell and Peat, Marwick, Mitchell, and of Deloitte, Haskins, Sells and Touche Ross, to create Peat Marwick

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[60]Bureau of Competition Policy, Consumer and Corporate Affairs.

[61]Economic behaviour refers to decisions relating to the firm, such as production, distribution, investment , acquisitions or sales.)

Thorne and Deloitte Touche respectively, constituted mergers.[62]

> "Mergers are classified as either horizontal, vertical or conglomerate. Horizontal mergers are those between firms servicing the same market. Vertical mergers are those between firms which handle the same good at different stages in the production process; an example would be a merger between a forestry company and a lumberyard. Conglomerate mergers are those between companies whose product lines are not related. A merger between two large corporations with many product lines may have elements of all three kinds of merger" (Jackson & Poschmann, 1989, p. 4).

The mergers in question are horizontal.[63] [64] For the purposes of my thesis, I assume that the firms serviced the same market. In addition, I assume they provided the same services at the same stages of production, and that they had similar product lines. (For clarity, I will term the market under review the 'audit market.')

I am careful to admit the shortcomings of these assumptions. Throughout the next section, *Part 2*, I discuss these assumptions and the market definition in depth. I also provide evidence in *Chapter 6* that supports these assumptions.

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[62] Each was reviewed by the Bureau as a merger. The parties negotiated the merger. The worldwide affiliates proceeded with merger activity, prompting the Canadian structural changes. In addition, the media reported the high volume of merger activity in this industry.

[63] There is no reason to believe that the mergers under question would be considered vertical. This is not to rule out the possibility of such mergers in the future.

[64] Section 91 covers all three types of mergers.

PART 2: The Anticompetitive Threshold

The Competition Tribunal under section 92(1) of the Competition Act, may make an

order in respect of a merger where it finds "the merger prevents or lessens, or is likely to

prevent or lessen, competition substantially." (Director, p.3, emphasis added)

The ability to prevent or lessen competition is tied to the ability to exercise market power

--either on one's own, or with others. Therefore, the merger that comes under question is

the one that provides the merging firms more market power.

Market power is the ability of firms[65] to influence profitably any one or several aspects of

business such as quality, service, variety, advertising, innovation, price, or other

dimensions of competition (Director, 1991). Yet, the focus of any investigation is

generally only on the price dimension of competition. Market power is considered to be

established if the selling price would be five percent higher in a relevant market for a

sustained period, if the merger were to proceed.[66]

I think even under the simplest of situations the measurement of market power is fraught

with difficulties. Numerous problems arise with assumptions and conceptual definitions.

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[65]The use of 'firms', in the plural, is not in error. The facilitation of collusion is an important aspect of merger policy. (Collusion is an agreement [tacitly or otherwise] between firms to co-operate to their mutual benefit.) Historically, the emphasis was on the dominant firm. (Hovenkamp, 1991)

[66]The difficulties of price analysis in the accounting industry are numerous. Chapter 3 discusses these in more detail.

Stigler states that market definition "has remained an undeveloped area of economic research at either the theoretical or empirical level" (1982).

Hovenkamp (1991) addresses the problems inherent in defining market power, measuring it, and applying the concept to real world situations to make judgements. He asks three questions that poignantly outline the issue: "What is market power? When is market power excessive? How should market power be measured?" (p. 43).

The Merger Enforcement Guidelines answer the first question: Market power is the ability of firms to profitably influence any one or several aspects of business.[67] The difficulty arises from the interpretation and application of the definition.

"The policy maker must make some kind of assessment about how much market power is too much. Importantly, not only is there no objective answer to that question, but there is ample reason for thinking that the socially undesirable amount varies from one industry to another. In....industries subject to substantial scale economies we might wish to tolerate considerably more market power..." (Hovenkamp, p.45).

"Market power is excessive when it is not worth its costs" (Hovenkamp, p.45).

I quote the above statements to make several points about the difficulties market power

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[67]Brenner (1991) proposes (based on historical data) that the interpretation of market power, and what is too much market power, has the ability to interfere with innovation and progress. He sites cases of detrimental application of anti-trust laws in the United States to firms that had significant market power because of technological development.

assessment creates. Important considerations regarding the business environment are part and parcel of the assessment. But identifying what is socially desirable is more a question of politics than of economics. The involvement of government regulators, and, in the case of accounting, the professional bodies also impact market power.

If a country has several large influential firms controlling an industry (in other words exercising market power) there is potential for the misuse of influence. Large accounting firms have been accused of using their influence to direct the change in standard setting and to obtain unfair advantage in other policy matters. The Metcalf Committee (U.S. Senate, 1976) examined the high concentration of the Big Eight[68] and alleged this group of firms had market power. [69]

In the analysis of market power for merger cases, a considerable amount of emphasis has been placed on the Concentration Doctrine. This tenet asserts that the market share of a few leading firms is a significant measure of their market power. Empirical work by Bain (1951) and others claimed the evidence bore out the link between market share and market power.

According to the Concentration Doctrine, when a small number of leading firms together

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[68] The 'Big Eight' is commonly been used to name the largest accounting partnerships in the United States. The term now has worldwide implications.

[69] The Metcalf Committee relied solely on concentration data to determine that the accounting industry and profession were monopolized by the Big Eight.

has a high market share of a well defined market, the industry is necessarily oligopolistic (possibly monopolistic) and likely inefficient.

The allegations made by the Metcalf Committee, supported by evidence of high concentration and argued from the perspective of the Concentration Doctrine, suggested that audit firm concentration lead to high prices and abnormal profits in the industry.[70] By contrast, Eckbo (1990) observes that even if the correlation between industry concentration and industry profits is found to be positive, as it was by the Metcalf report, it fails to discriminate between the Concentration Doctrine and a competing hypothesis. This competing hypothesis according to Eckbo is that larger firms increase their market share because they are more efficient.[71] Schmalensee (1987) reminds us of the consensus view that horizontal mergers have only a small probability of raising prices and that many have positive efficiencies.

"High levels of concentration may be necessary for effective collusion but the empirical literature suggest that high concentration is certainly not sufficient" (p. 43).

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[70]*The Report of the Royal Commission on Corporate Concentration* (1978), restrains the use of the Concentration Doctrine, suggesting concentration is a necessary but not sufficient condition for anticompetitive acts in the market. The Report stresses the importance of market power, and reject the structural approach by stating, "In oligopolistic industries, however, the link between conduct or behavior and structure is no longer determinant. .... The essential difference among firms in monopolistic, oligopolistic and competitive industries is the discretion they have to behave anticompetitively. This varies with the degree of their market power."

[71]Demsetz (1974) is credited with this hypothesis.

Many economists have rejected the Concentration Doctrine on several grounds. The role of entry-barriers[72] to the Doctrine has eroded.[73] Traditionally, sunk costs and size were considered barriers to new entrants, and were considered to exist in the accounting industry. Meanwhile, current thinking suggests that in the accounting industry, the ability of suppliers to move into new market segments is generally not impeded, and neither is the ability of buyers to switch to other similar products. Moreover, large initial investments to establish a reputation for quality are not a barrier to entry (VonWeizsacker, 1980). They are a social mechanism for ensuring the supply of quality. These considerations magnify the complexity in the process of identifying the relevant market.

Considerations regarding the competitive threshold include the ability of a merger to lessen competition. This includes the ability of the new firm to raise prices unilaterally or to influence an increase in price. More commonly, a group of firms acts jointly to exploit shared market power. Of relevance to the accounting industry is the possibility of shirking to go unnoticed. An audit firm could use a non-price aspect of the audit relationship to shirk and therefore gain rent at the expense of his partners in collusion.[74]

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[72]Entry-barriers are factors which place new entrants to a disadvantage as compared to established firms within the industry. A more detailed discussion of the role of entry barriers is in Chapter 6.

[73]The Contestability School (Baumol, Panzar, and Willig, 1982) argue that entry barriers are rare. The usefulness of the contestable market theory to this analysis is limited, as accounting services are characteristically long term investments in people and reputation. A more detailed discussion of the role of entry barriers in the accounting industry follows.

[74]Economic rent is a payment to a factor in excess of what is necessary to keep it to its present employment. In this example, the accounting firm is using fewer inputs, therefore incurring lower costs. At
(continued...)

Or, the audit firm could shirk on the quality of the service, reducing its costs. The nature

of the service good allows for changes in quality to happen undetected. Therefore, if

collusion occurred, secret price cutting should be rampant (Stigler, 1964). The lack of

transparency in prices (with no required disclosure on audit fees), in addition to the

difficulty in defining and assessing the quality aspects of the audit good,[75] reduces the

probability that a group of firms in the industry will collude on price.[76] Further,

Stigler suggests that generally, "the price cut will often take the indirect form of

modifying some non-price dimension of the transaction." Some researchers have

identified lack of independence as a possible by-product of the production of other

services by auditors.

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[74](...continued)
the same time the firm's fee is constant. The increase in profit is rent, as the lower costs have provided the firm with excess payment.

[75]The introduction of Chapter 3 discusses this issue.

[76]Lowballing (using a lower than cost fee to attract a new client) in the industry is rampant (DeAngelo, 1982), and is considered a competitive reaction to obtain new clients.

LESSENING OR PREVENTING COMPETITION

Merger can lessen or prevent competition when a competitor is removed from the market.

The Metcalfe Committee, as did others, suggested that accounting firms may have

substantial market power in specific industry segments. Of course, merger activity may

assist this progression by concentrating more power into fewer hands. Furthermore,

some have suggested that auditors may use other services to flex their muscle. For

example,

> "When consumers value two somewhat related products or services differently,
> such as audit and managerial advisory services, but where these values are
> positively correlated with one another, the strategic bundling of the two services
> can have anti-competitive effects. If large, oligopolistic accounting firms tie their
> auditing services to their managerial advisory services, they can price the bundle
> at a relatively high price and sell only to those consumers who place a high value
> on both services. Smaller, more competitively organized auditing firms are then
> left to split the remaining market, which is highly populated with consumers who
> place little value on their services. This market separation technique may very
> well lead some firms to leave the market or possibly bar entry to potential auditing
> firms" (Shaw, 1991, p.15).

Thus by exploiting the cross-price elasticities of two services, a producer can earn greater

profit from bundling than from pricing and selling them separately. However, I have not

found any studies that support this anti-competitive view of the audit market. Nor does

the evidence presented in my thesis support this view.

However, definitive conclusions about competition in auditing are risky because a

suitable test of effective competition is difficult to construct from so intangible a service,

the price of which is unknown, and the limits of the market are changing and difficult to

pin down. The following chapter explores more of the unavoidable difficulties

encountered in assessing the competitive status of audit markets.

Part 3:   Market Definition

<u>Part 3: Market Definition</u>

THE UNIQUE DIFFICULTIES IN DETERMINING THE RELEVANT MARKET FOR ACCOUNTING
SERVICES

The specification of the relevant market (in product and geographic dimensions) is
pivotal to the adjudication and outcome of the merger analysis. Though boundaries
between businesses and industries are necessarily vague, the initial stage of merger
assessment is largely based on straightforward measures of market share and
concentration which have no meaning without a prior market definition. The Director's
Merger Guidelines are clear that a determination to oppose a merger cannot be based on
structural measures alone.

> "In merger analysis, relevant markets are defined by reference to actual and
> potential sources of competition that constrain the exercise of market power[77]"
> (Director, 1991, p. 7).

Nevertheless, the first stage of any merger analysis is to establish whether the proposed
merger falls within a safe harbour. A safe harbour refers to the market shares and
concentration levels under which a merger is presumed to be free of anti-competitive
effects. In short, a merger receives little attention if it is within the structural boundaries
defined in the Guidelines, which in turn depend on the definition of the relevant market.
The safe harbours are defined as a post-merger market share under 35% and an industry
concentration level under 65%.

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[77] Market power refers to the ability of firms to profitably influence price, quality, or other dimensions of
competition.

In Sections 92 and 93 of the Competition Act, the framework is laid out by which a merger (or proposed merger) ought to be examined. The key concept is about the definition of a relevant market. The relevant market is the smallest geographic area and smallest group of products[78] for which sellers, together, could profitably impose and sustain a significant price increase. The market under review is defined by examining the product and geographic dimensions of the good under question. The focus for market definition therefore is on the industry and not on the merging parties. The conceptual approach applied to market definition is typically called the "hypothetical monopolist" approach. The Bureau expands the number of firms to the point where if acting in unison the group would be able to sustain a 5 percent price increase for at least one year. Therefore a "bright line" for the purpose of defining a distinct market is a 'substantial' increase in prices expected to last at least one year.

After the market has been defined, it is in principle straightforward to define the market shares of each of the participants and to calculate the several structural measures - industry concentration both pre and post merger, and the market shares of the merging firms, pre and post merger.

The principle is relatively easy to apply in the analysis of a durable good market. The price of inputs would be well known and the price of the output generally transparent to the market or at least known to knowledgeable buyers. With respect to a similar

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[78] Usually this definition is useful in the context of a single homogeneous product.

analysis for a service like accounting, useful data is difficult to find, or is unavailable.

Service markets provide merger analysts with unique analytic problems, and the audit market is no exception. The nature of a service makes quantity and quality assessment difficult. This in turn makes price determination difficult. The lack of information in the public domain on price and quantity impedes analysts[79]. It is impossible to determine precisely a unit of audit service. For example in the case of audits, the wide variety of clients makes generalisations and assumptions regarding a unit of an audit problematic.

One of the primary problems in analysing a service good is the inability to judge its quality and hence determine what its price should be. Nelson (1970) concluded that information about a good has an influence on the price of the good. He classified two groups of product attributes based on how consumers learned about them. Search attributes are those that are experienced prior to the purchase. Observation, or a priori testing allows the consumer to ascertain the quality and attributes of the product prior to purchase. Experience attributes are those that only can be experienced after the purchase. After purchase, the evaluation of the good may be instantaneous, or over a period of time as with durable goods. A consumer's opinion of the good is created by experience.

In a later article, Darby and Karni (1973) extended the group of product attributes to

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[79]The availability of information in the public domain, or to experienced buyers is discussed in this chapter, under 'Transparency',

include credence attributes. Credence attributes belong to those goods whose quality

cannot be evaluated even after repeated purchases. Many goods in this category are in the

service sector, and require specialized knowledge, training and possibly accreditation to

provide, let alone assess. Goods with credence attributes include car repairs, medical

services, accounting services and audits.

Nagel (1984) states:

> "The importance of these classifications lies in their relationship to the cost of
> consumer information acquisition. Information about price itself can be obtained
> directly for all types of products. But as one moves from the search to the
> experience and on to the credence category, information about brands'
> differentiating attributes becomes more costly. The greater the cost of information,
> the less of it people try to obtain. Consequently, other things equal, consumers
> should choose to inform themselves about the differentiating characteristics of
> fewer brands, and inform themselves less completely, in categories with high
> costs of collecting such information." (p. S-4)

Information is expensive, but increasingly so for goods --or services-- that have credence

qualities.[80] Therefore, fewer firms may exist in the market, because users face high costs

and are unable to obtain information which in turn raises the costs to the firm of

establishing brand name and maintaining reputation[81]. As a consequence market

concentration[82] may be higher in industries characterised by credence attributes.

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[80]In fact the industry may have only asymmetrical information. Information may be impossible to get.
[81]The high costs of acquiring and maintaining reputation, is considered a 'barrier to entry' by some
economists. Some industrial organization economists suggested that the costs involved with establishing
and keeping a firm's reputation (ie. knowledge of business, advertising) impeded other firms from entering
the market. Most economists now agree that investments and sunk costs in reputation are the costs of
doing business, and should not be viewed as a mechanism of keeping competitors out of a market.
[82]Concentration is defined earlier in the introduction.

Additionally, according to Nelson, the price sensitivity of the consumer is dampened by

the lack of information available. It is more difficult for the buyer to make an accurate

assessment about price, so its use as a determining factor in product choice is lessened.

Nelson analysed the markets for search and experience goods and found that experience

good markets are significantly more concentrated than search good markets.[83] If this

analysis were extended to credence good markets like accounting services, one expects a

similar finding.

In many service industries the quality of the product is not observable[84]. Accounting

services are no different, although there is physical proof of an audit engagement as

evidenced by the auditor's report, or of a report from a management consultant. The

quality of those services is inferred from other factors, namely; credibility (which often is

proxied by the brand name of the audit firm), specialized training which would include

the accounting designations (and possibly professional development), peer review, firm

size, firm experience in the industry, and the number of audits to represent learning

effects. Any or all of these 'other' factors may be important to the client[85].

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[83] Nelson initially used experience and search goods as categories, rather than attributes. See Nelson (1978, 1980) for this change.

[84] This issue is discussed by Dopuch and Simunic (1980).

[85] This appears to be evidenced by the lack of switching encountered in the Canadian market in regulated industries, which I provide evidence for in the section on Specialization, under the subheading Regulated and Non-Regulated Industries. Danos and Eichenseher (1982) provide evidence for this in the U.S. audit market.

Another consequence of the high costs of information and information asymmetry[86], is

the use of brand names and reputation as a proxy for quality. As a consumer, it makes

little sense to attempt to obtain information at high cost when these other signals are able

to convey information at a lower search cost[87]. Because of the high costs of information

in a service industry (such as accounting) it would likely be concentrated, have

differentiated products and brand names would be an important commercial advantage.

Buyers of credence goods have problems evaluating the quality and quantity of the

service provided and therefore also determining whether the fee charged is reasonably

related to the cost of the service. The buyer of the service is always uncertain about

whether a lower fee represents lower costs of delivery or instead lower service quality.

Therefore, if an audit firm offers to undercut an incumbent, the buyer is forced to assess

the offer in terms of the potential reduction in quality. As quality is not transparent,

especially for a new (untested) auditor, it follows that switching will be resisted. As is

well known in economics, when quality is measured by price, a market equilibrium may

not exist (Diamond, 1987). In short, demand may respond upwards to a price increase in

the possibly mistaken belief that the price increase reflects higher service quality.

Therefore, price provides little information to the buyer.

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[86]Information asymmetry is a divergence from perfect information --an assumption in perfect competition models. In this industry, the asymmetry is the lack of information on the buyer side and the more complete information available to the supplier.

[87] A search cost is the cost attributed to finding information.

If the professional buyer of the service faces these dilemmas, the problem for the merger analyst is surely magnified. The merger analysts will find it difficult to apply a manufacturing product market definition to structure the analysis of a merger among accounting firms. Among the problems the analyst will face is how much of the accounting firms' activities should be included within the definition of the product market. Modern accounting firms are multi-product service suppliers.

Unfortunately, there is little additional information available in Canada about any of the accounting services other than for audits. Even the information on audits is meager. Yet, using information about audit services has become the means by which the bundle of accounting service is typically assessed.[88]

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[88]Zeff and Fossum (1967) used audit information in their seminal paper on the concentration of large U.S. public accounting firms. The Metcalf Committee (U.S. Senate, 1977) alleged large accounting firms impaired competition based on audit data.

THE PRODUCT DEFINITION

I define the product market to be comprised of all accounting service firms listed under

SIC 773[89]. At the initial level, I include all the revenues and expenses of the firm

regardless of the type of service provided. I separate auditing by basing market share on

the quantity of audit services measured by the square root of the assets of the audited

firm.[90]

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[89]Bruton (1989) provides evidence that large accounting firms constitute a separate market, whereas Zind and Zeghal (1989) suggest that these firms operate in a separate sub-market. I think that the difference between the use of 'market' by Bruton and of Zind and Zeghal's use of 'sub-market' may be a matter of semantics.

[90]To reiterate, the square root of the assets of the client firm is a linear proxy for the audit fee (Korpi and Elliot, 1979).

CHAPTER 5: METHODS

In this chapter I describe the data, present the methodology, and refer the reader to the more detailed tables in the appendices. I have broken the methodology into seven sections to better manage the large volume of data. They are: *Concentration, Number of Industry Categories Auditor Participates In, Auditor-Client Ratios, Parental Influence on Subsidiary Auditor Choice, Switching, Distribution of Audits based on Location of Client Firm Headquarters (by Province), Big Six Bank Auditor Concentration.*

The data was collected from several sources for several years. Documentation comes from three databases: The Globe and Mail's ranking of top 500 Non-Financial and top 100[91] Financial firms, by total assets, for 1987 and 1992; Special private data runs provided by Statistics Canada for SIC categories 773--Accounting and Bookkeeping Services, and 777--Management Consulting Services; and, data collected from The Bottom Line and The Financial Post 500.

The list of the top 500 and 100 were obtained from the Globe and Mail Technical Services. This list included the name of the firm, the auditor, and the total assets. Using the annual reports of each of these 1200 companies and other background information, I added the following information: head office location, primary SIC (Standard Industry Classification) number, and the parent or subsidiary(ies) of the firm.

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[91] This group contained SIC categories 60, 61, 62, and 63.

I then entered the information on a spreadsheet (Quattro Pro 6.0).

CONCENTRATION DATA

The data were arranged by auditor to determine how many audits were performed by

each auditor. Using the number of audits each auditor performed, divided by the

number of audits performed within each sample group (ie. the top 500 for 1987, the

top 500 for 1992, the top 100 financial for 1987, the top 100 financial for 1992),

percentages of audits performed by each auditor were calculated.[92]

Similarly, using the square root of the total assets for each client firm[93] another

'percentage of audits performed' calculation was made. The sum of the square roots of

assets for all the clients of each auditor was calculated within each sample group.

These sums were divided by the total sum of square roots of assets for the whole

sample group. This yielded a percentage of audit business based on probable audit

revenue (Simunic, 1980)

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[92]Some clients had two auditors. Two auditors are required by law for Schedule I banks. Other firms may have two auditor requirements imposed upon them by shareholders or other stakeholders in the company. In these cases, each audit firm was awarded one full audit. Therefore, although my samples are based on the top 500 and top 100 firms, the number of audits exceed the number of firms.

[93]To reiterate, Korpi and Elliot (1978) and Simunic (1980) determined that the square root of the size of the client firm was an accurate proxy for the audit price.

These two percentage calculations (herein called market share), based on either the number of audits or on the square root of assets, were used to calculate concentration statistics. Thus, two concentration statistics were generated for each sample group. The CR4, is the percent of business conducted by the top four [audit] firms; the Herfindahl Index (HHI) indicates both the concentration and market share of firms in a market.

The Herfindahl Index (HHI) is the sum of the percentage of market share squared, and in some cases is represented as the sum of market share (not in percentage form) squared. Either is acceptable, and my thesis uses the form that Eichenseher and Danos (1981) used, where 0<HHI>1.

The results are reported in the next chapter under Concentration. *Appendix 2* presents detailed tables of the results.

NUMBER OF INDUSTRY CATEGORIES EACH AUDIT FIRM PARTICIPATES IN

Using the industry information, a simple count was made of how many industry categories each audit firm participates in by performing an audit. In the case of merged firms (Thorne and PMM to PMT; DHS and TR to DT), or name changes (CG to EY), or affiliations (SB to SBDT), the information for these changed entities is contained on the same row for ease of comparison. This information comes from the top 500 samples, and

the maximum number of categories is 41.

The results are reported under *Specialzation* in the next chapter. *Appendix 6 and Table 14* present these results in table form.

AUDITOR-CLIENT RATIOS

The ratio of the number of auditors to clients (or more specifically audits) was calculated for each industry category. In simple terms, the number of auditors was divided by the total number of audits in each SIC category. This is a new measure created for this analysis. [94]

A t-test was performed to determine if there was a significant difference between the mean of the 1987 ratios and the 1992 ratios.

The results of this analysis is presented in the next chapter under *Auditor-Client ratio*. *Graph 11* presents the data ordered from smallest to largest value for each year. *Appendix 7* presents a table of the results.

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[94]If the ratio is equal to one, there is a different auditor for each audit. As the ratio approaches zero, either one auditor audits all (or most) or the clients, or there are few clients. The ratio catches dynamics of auditor specialization that both the CR4 and HHI miss. The ratio ignores client firm size, as do the concentration statistics based on the number of audits (as opposed to the square root of total assets data). The ratio is a complimentary measure to the concentration statistics as it indicates how many auditors are involved in a industry compared to the number of clients. The ratio is especially helpful in industry categories in which there are only a small number of client firms. Instead of focussing on the auditors, this ratio shifts some attention to the dynamics of the clients and the industry they participate in.

PARENT-SUBSIDIARY FIRM RELATIONSHIPS(1992) & COMPARISONS TO WHOLE DATA SET

Using the annual reports of the top 500 non-financial firms for 1992,[95] both parent and

subsidiary firms of the firms in my sample were recorded. All subsidiary firms were

pulled out of the data, and concentration (HHI) statistics were calculated and compared

to the originals using a t-test.

Although most of the parent-subsidiary groups were domestic, some Canadian firms

had internationally based parents. In these cases, the Canadian subsidiary was pulled

out of my database.

The subsidiaries were pulled out of the database regardless of which auditor they used.

A simple calculation of how many parent-subsidiary groups used the same auditor was

also performed.

The parent - subsidiary relationships of the client firms were based on ownership, and

was for the most part easy to determine. Investment in a firm by pension groups and

investment firms, did not constitute parental status.[96] The subsidiaries were pulled

from the data set, and the concentration statistics were performed on this subset of the

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[95]The 1987 data additional data sources were not sufficiently reliable for this part of the study. Therefore I performed the parental concentration only on the 1992 data.

[96]Although this influence does beg an interesting question, as to the influence of money and pension managers over auditor choice. Studies have examined the influence of bankers and lenders in the auditor choice.

original data. A t-test was performed to detemine if these two sample means were significantly different.

The results are reported in the next section under *Parent Influence on Audit Firm Choice. Appendix 8* presents tables of the results.

SWITCHING BETWEEN 1987 & 1992

The data were prepared in the following manner. A list of the firms that appeared in both samples was compiled by visually comparing both lists. The firms were then categorized by auditor for the 1987 year. This created a lists of clients for each auditor. The client's 1992 auditor was then written down beside the client. Totals for retained auditor, and new (switched) auditor were then calculated.

The merged firms were treated as the same firm from 1987 to 1992. Therefore, a change in auditor because of merger was not considered a switch and the data is 'controlled for' merger activity. For simplicity, the 1992 auditor name is used rather than the 1987 pre-merger names in the tables below.

The data does not reflect any changes made in the years between the two samples. It only examines the client's auditor in the year 1987 and in the year 1992, and determines if the client uses the same auditor in both, or if the client uses different auditors for each

year.

In addition, only the Top 500 samples were used in the preparation of this data.

Switching is mandatory for banks, therefore findings in the top 100 financial firm sample

may be due to regulatory and not other factors.

Using four measures of concentration[97] in each of 41 non-financial industries in 1987 and

1992, I found no significant difference in the means in the two years of data in three out

of four cases.

The section *Switching* in the next chapter presents the results. *Appendix 10* presents the

results of this section in tablular form.

The industries were categorized into regulated and non-regulated industries. *Appendix 13*

lists these categorizations. The number of switches in regulated industries was compared

to non-regulated industries. The results are reported in the next chapter under *Switching*.

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[97]The measures of concentration were the top four firms and the Herfindahl Index, calculated using two different measures of market share--the number of audits and the square root of assets of the client firms. Thus there are four measures of concentration. A fuller explanation of the concentration measures, and the market share measures follow.

BIG SIX BANKS' AUDITOR CONCENTRATION

The Bank Act Requires Schedule I Banks to retain two auditors each year, and substitute in a third auditor periodically. Therefore, the 'Big Six' banks retain 12 auditors yearly. This data represents the concentration of the auditors of Canada's largest banks, based on number of audits only. The percentage of audits is calculated by dividing the number of audits the auditor has by 12 (the total number of audits in the sector).

The 'Effect of Merger' table compares the 1987 and 1992 data. The 1987 data uses the sum of the merging firm's audits. In other words, the number of audits Thorne and PMM performed in 1987 are added up and listed under PMT in 1987. The sum could be considered a potential merger result. The sum is compared to the number of audits in 1992.

The results are reported in the section *Specialization* in the next chapter. Appendix 11 reports this result in tabular form.

DISTRIBUTION OF AUDITS BASED ON LOCATION OF CLIENT FIRM HEADQUARTERS (BY PROVINCE)

The number of audits each auditor performed in each province based on the client headquarters was noted. The percentage of audits performed by each auditor in each province was calculated by dividing the number of audits per auditor by the total number of audits in the province.

CHAPTER 6: MARKET CHARACTERISTICS

Recall to this point that I have been discussing the general issues and considerations in defining a market for competition analysis and then the difficulties experienced by the analyst in examining services and more specifically the audit services market.

Most economists agree that concentration increases the potential for cartelization by a group of leading firms. Yet they have rejected the simplistic notion that market power can be easily inferred from the level of concentration, the definition of the market and its size, and the existence of entry barriers. A broader analysis which evaluates various characteristics of the market is necessary for making a fair assessment.

BUYER CHARACTERISTICS

CLIENT SIZE

As discussed previously, the two group classification scheme of Big-Eight/ Six non-Big

Eight/Six has been used extensively in tests of product differentiation. This scheme is

justified on the basis of the large size difference between the largest Big Eight/Six firm

and the largest non-Big Eight/Six firm. In fact Simunic and Stein (1987) hypothesize

that,

> "The probability of a company using a Big Eight auditor increases with the size,
> complexity, and geographic dispersion of the company's operations" (p. 28).

I explore the characteristics of client firms --the buyer of the audit service-- in this

chapter.

The client firms in my sample are primarily audited by Big Eight/Six firms. The size of

the client firms used in my samples are reported in Table 4 below.

TABLE 4

Average Client Firm Size In My Sample	
1987-Non-financial Client Firms	$ 842,397,963.4
1992-Non-financial Client Firms	$ 1,166,187,350.8
1987 Financial Client Firms	$ 9,357,777,705.5
1992 Financial Client Firms	$ 14,024,636,403.5

The average client firm size for each of the auditors is reported below and in Graph 2.
The 1987 data is reported in Table 5 and the 1992 data is reported in Table 6. Even to the
naked eye, it is obvious that the Big Six/Eight firms have larger clients. Using a t-test, I
found that the Big Eight audit firms have significantly different (0.05%) clients than other
audit firms (1987 data) based on client size in total assets. The same test is also
significant (to 0.05%) for the Big Six audit firms as compared to other audit firms (1992
data).

Average Audit Client Size 1987 &1992
By Total Assets [Non-Financial Firms]
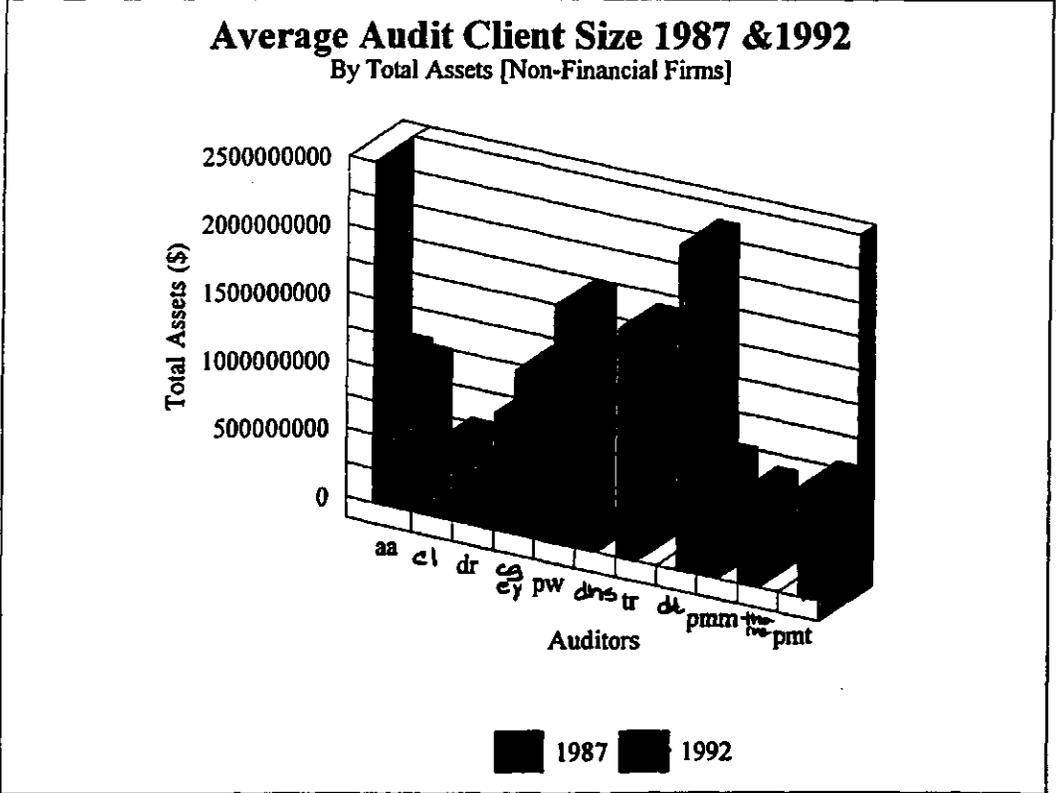
GRAPH 2

ABBREVIATIONS:
aa- Arthur Anderson
dr - Doane Raymond
ey - Ernst & Young
dhs - Deloitte Haskins Sells
dt - Deloitte & Touche
thorne - Thorne Riddell

cl - Coopers & Lybrand
cg - Clarkson Gordon
pw - Price Waterhouse
tr - Touche Ross
pmm - Peat MarwickMitchell
pmt - Peat Marwick Thorne

Table 5: 1987 Audit Firm's Client Average Total Assets	
Auditor	**Average TA ($)**
aa	1055958777
ay	503769466
cl	415127602
dr	346386274
dhs	99751332
cg/ey	857685975
pmm	767292331
pw	395071808
thorne	659340400
tr	1667133984
be	61052977
cb	320191333
cfhc	256608000
hh	7778464
lailbert	54112000
lc	71347000
mbbr	533165000
mn	126686666
pkf	52832000
pr	1285072666
rcmp	661664681
rptr	112129000
ruv	62421792
sb	338080731
zssl	115518000
bhhhb	5120700
dc	43631000
ew	57956000
fn	60868000
gc	199048000
gw	76376000
lctr	127964000
lh	146388848
lhl&	100388412
lwga	48974261
nh	66442559
sc	7138416
skrbg	43847000
we	473848666

Table 6: 1992 Audit Firm's Average Client Size (By Total Assets)	
Auditor	**Average TA ($)**
aa	1007000000
cl	534189572
dr	441239785
dt	2384000000
ey	1198000000
pmt	797587244
pw	1748000000
cbey	1063000000
dfk	56616693
dw	3760400
hda	47855484
hh	95673000
llcl	59451000
mgrgr	147226787
mm	479140000
phpmt	795377000
ptpmt	1338000000
rcmp	327958803
ruv	72714559
sbdt	255805356
ze	131619000
zssl	45551618
aud ab	1843000000
bhp	103066000
kd	5484500
lhlc	124050458
lilly john	50176000
mrr	36528000
pm	39290540
sic	278251000

SIZE AND ECONOMIES OF SCALE FOR BOTH CLIENTS AND AUDIT FIRMS

Recall that I examined the issues of size and economies of scale in the audit fee

liturature review. Despite a few conflicting studies, the audit fee research generally

suggests that there are economies of scale accruing to large audit firms.

Scale economies in the production of audit services can be achieved in a number of

areas. Arnett and Danos (1979) suggested that they could arise in recruiting

employees, developing both general and specialized audit and accounting expertise,

managing the CPA firm, marketing the firm's services, and providing for partners'

retirement. The client's size and location or type of industry may allow large auditors

to exploit economies of scale. Benston (1979) argued that the servicing of large,

geographically dispersed clients provided economies of scale to large national audit

firms. Eichenseher and Danos considered client industry-specific auditing and

accounting experts and hypothesized greater scale effects in 'regulated' industries which

I have also confirmed for Canada.

Eichenseher and Danos, in the following quote, relate scale economies and

specialization. This theory explains a finding (I report later in this chapter) that large

auditors are not specialists but generalists.

> "Underlying many of these possible sources of scale economies to the CPA firm
> is the lack of 'complete' markets for expertise-related inputs to the audit
> process. That is, an audit firm is typically unable to acquire from outside
> sources the expertise needed to service merely one specialized client. Instead, it

hires individuals with the required expertise who are capable of servicing many such clients. Hence, the costs and/or institutional prohibitions surrounding subcontracting across CPA firms drives many of the potential scale effects in the external auditing environment. This factor alone suggests that relatively larger firms should experience lower expertise-related production costs. In effect, the indivisibility condition creates a critical mass threshold for firms, with firms operating below a certain level of production having higher operating costs than firms which are large enough to exceed that threshold" (Danos & Eichenseher, 1982, p. 606).

In the 1970's, considerable growth in Big Eight auditors prompted the AICPA to study the displacement of smaller firms by larger firms for audit services. The AICPA's Special Committee on Small and Medium Size firms suggested that smaller firms produce the same level of quality audit, and that consumers should be made aware of that point. DeAngelo (1981, Size) countered by stating that the AICPA Committee's findings assume incorrectly that consumers perceive audit quality to be independent of auditor size. I restate it is difficult to link quality and size. I suggest that size, related economies of scale and scope, and product differentiation are significant contributors to the dominance of Big Six/Eight firms in the market.

"Structurally, the Big Eight firms are the dominant suppliers of audit services to large corporations, but the aggregate market share of these firms decreases significantly as the size of buyers decreases. This suggests that auditee-auditor pairing may be influenced by economies to auditor size" (Dopuch and Simunic, 1980).

INTERNAL AUDITING [98]

If there is an increase in the demand for auditing, managers can be expected to make a trade-off between allocating resources to internal vs. external audit based on the relative importance of expertise about a company's operations, independence and cost. Wallace (1984) found that internal audit can replace and/or augment external audit, and therefore can reduce the overall cost of an audit. Chung and Lindsay found the internal audit to be a substitute for external audit, whereas Anderson and Zeghal found the relationship to be complimentary.

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[98]Regulation has significant impacts on internal auditing. It has been suggested that the Foreign Corrupt Practices Act of 1977 (FCPA) in the U.S. caused the significant growth of dedicated internal auditing resources and salaries, as their growth was higher than the growth of the company. This growth was higher after the regulation (FCPA) went in place. The rate of internal audit salaries to external audit fees increased form 0.92 in 1974 to 1.24 in 1981.

PARENT INFLUENCE ON AUDIT FIRM CHOICE

The influence of the parent client firm on its subsidiaries' choice of auditor may be more significant than other factors, such as specialization. I wanted to ensure that this 'parental influence' did not confound my results on concentration by industry category. I examined if parents and their subsidiaries (in the same or other industrial category), who were included in my sample, shared the same auditor. I extended this analysis to international parent firms, to determine if the influence extended across borders.

Of the 125 parent-"subsidiary" pairs in the 1992 data, 97 pairs, or 77.6%, shared the same auditor. Virtually all international pairs shared the same auditor (only one exception). A t-test comparing the top 500's and the parent firm's industry concentrations (using the same 41 industry categories) was not significant to 0.05%. The details are reported in Appendix 8.

The Canadian market has many large conglomerate firms that own a large number of subsidiaries. The influence of the parent firm on the subsidiary's auditor choice is an often made observation, but one not explored in the literature. The impact of parent auditor choice on subsidiary auditor choice exists, but proves to be not significant when comparing concentration statistics.

HOW USERS APPLY INFORMATION

Despite all the discussion of product differentiation, quality and liability, there is evidence that this information is not well used. Hicks (1982) studied the impact of various auditor reports on users (commercial loan officers) and found that there was no significant difference in lending behaviour. The loan amounts and interest rates (risk factor) appeared to be determined independently of the information that the auditor's report contained, as there was no correlation between the reliability of the report and the amount and interest rate of the loan.

The lending officers perceived the reliability of unqualified, qualified "subject to", or qualified "except for", to be more reliable than statements accompanied by a review or adverse report[99]. Additionally, those financial statements accompanied by unqualified or qualified "subject to" were found to be significantly more reliable than statements without an auditor's report. Statements accompanied by an unqualified report were significantly more reliable than statements accompanied by a disclaimer.[100] [101]

Unfortunately, Hicks did not test for any brand name preferences.

Shockley and Holt (1993) examined the ability of bank executives to discriminate among

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[99]Unqualified reports are those that the auditor confirms are acceptable under GAAP. (In Canada unqualified reports do not attest to the truthfulness of the information, only its compliance with GAAP.) Qualified 'subject to' and 'except for' reports note exceptions, and areas of departure from GAAP. In an adverse report, the auditor states that the financial statements do not provide fair representation.

[100]The same auditing company name was used for all the reports, therefore it was not tested if there was any brand name or size preference for auditor engaged.

[101]Rymer ranked the auditor's report in the following manner: unqualified, qualified "except for", qualified "subject to", disclaimer, adverse, review.

Big Eight auditors using several qualitative attributes[102]. They found that this group can systematically differentiate among Big Eight auditors using attributes. Because these executives are likely involved in the decision process of which auditor to contract, Shockley and Holt suggested their ability to discriminate among them may bear out in the contracting process.

The issue of quality (product) differentitation within groups still eludes researchers. Even though users can discriminate between large auditors, this information does not impact creditor decision making. Taken together with Simunic and Stein's 1987 study of initial public offerings, it is reasonable to conclude that users of information may not pay attention to the particular auditor but sharply differentiate between Big Six and non-Big Six groups, and they [users] make decisions on that basis.

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[102]These attributes are: Prestigious, professional, expensive, competent, aggressive, conservative, independent, reliable, helpful, bureaucratic.

LITIGATION

Another surrogate for quality may be measured by legal activity against audit firms.

Palmrose (1988) reports that activities of independent auditors can be used as a proxy

for quality assessment by clients. Her results indicate that non-big Eight firms have

higher activity (measured by number of lawsuits) than Big Eight firms, and this

negatively correlates with quality rankings. She takes this as evidence for quality

differentiation in the services between these two groups.[103]   Again, little evidence for

quality differentials within groups is provided.

Although this correlation may be true, the probability of a lawsuit being launched is

related to the business climate. Palmrose (1987) reports that management fraud and

economic downturns have significant effects on the probability of proceedings being

launched against auditors.

Very little evidence has been compiled about the Canadian environment, although

media reports make it clear that Canada is not immune to proceedings against audit

firms. The Globe and Mail ($500-million, 1993) reported that over 4000 cases were

pending against American auditors. The number of cases in Canada is much smaller

but the rate is increasing significantly.

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[103]It has been suggested that plaintiffs may exploit the 'deep pockets' of large auditors. Although I have not seen any evidence, lawsuits against large auditors may be larger on average as compared to lawsuits against small auditors. This would correspond with Palmrose's finding, with fewer --but larger--lawsuits accruing to large auditors.

Competition between auditors for solid (i.e. less-risky) clients should increase under an environment of increasing litigation. In this way, auditors minimize their exposure to costly lawsuits. [104] This competition could take place under many forms. I suggest that any price cutting or non-price incentives to obtain these clients business is efficient behaviour. The reduction in potential lawsuits is a savings to the audit firm[105], and it will reduce its fee to a sustainable level for the risk exposure in the long run.

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[104]I am unaware of any evidence to support this claim. Recall that this theory based on client industry risk is attributed to Simunic by Leslie, as I reported earlier.
[105]Savings in both insurance costs, and/or legal costs.

TRANSPARENCY

As I mentioned previously in my thesis, Canadian law does not require disclosure of audit

fees, whereas in the U.K., Australia and elsewhere, this information is provided to the

public. The issue of whether or not transparent fee disclosure would be beneficial to the

welfare of consumers is contentious. There are pros and cons on both sides of the issue.

The next two cases provide some insight on transparency.

The first is about a bidding war for an audit in the U.K. which culminated in a lawsuit.

The incumbent auditor was not a Big Six firm, but was considered a large, solid

accounting firm based in London. The client put its audit out to tender, allowing the

incumbent to bid along with the Big Six firms. The last year's audit fee to the incumbent

auditor was £304,000. In response to the tender, the incumbent came in with a bid of

£250,000. Price Waterhouse won the contract with a bid of £160,000. The incumbent

firm brought the issue to the courts suggesting predatory pricing was being practiced.

The courts ruled against this allegation (Bruce, 1995).

Another accusation of predatory pricing was made in the United States against Price

Waterhouse. The firm was accused of giving away services of up to $25,000, although no

legal case was built against the firm[106] (Jeffrey, Audit Fee, 1991).

The use of fee information in the U.K. may have provided the winning auditor with

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[106]The details on these allegations were brief.

enough information to undercut the incumbent auditor. On the other hand, the lack of fee information may have made creating a legal case against Price Waterhouse in the U.S. impossible.

The role of experienced buyers is paramount to ensuring a client firm gets value for its auditing dollar. Nevertheless, collusion is more difficult to maintain with unknown prices. With the absence of fee disclosure in Canada, I would expect knowledgeable buyers and a lack of seller collusion, at least with respect to price.

SWITCHING

Switching between functionally interchangeable services may create transaction costs which the buyers may prefer to avoid. Examining the number of switches, and from whom, to whom the buyer moves gives some insight into these costs.

Additionally, the ability of the supplier to keep clients is examined. This is why switching data has been used in the examination of the independence of the auditor. Predatory pricing and using non-price incentives such as other products to keep clients have also been explored. (DeAngelo,1986; Johnson & Lys, 1990; Eischenseher & Danos, 1982, 1986) To my knowledge, I provide the first switching evidence on the Canadian market, and have found that very little switching of clients goes on among the large auditors (approximately 10 percent in five years). Please see *Appendix 10.*

Johnson and Lys examined if changes in clients' financing, investing, and operating characteristics are related to voluntary auditor switching. They suggested auditor switches are not isolated events, but are a result of other changes within the client firm. Of 603 audit switches from the years 1973 to 1982 they found switches from big Eight auditor to Big Eight auditor comprised 52.9 percent of the sample; from Other[107] to Big Eight, 26.2 percent; Big Eight to other, 12.9 percent; and, Other to Other, 8.0 percent.

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[107]Other is the same as a non-Big Eight auditor.

They reported that firms that switch auditors are less profitable[108] than those firms retaining their auditor. Overall there was an absence of abnormal returns on stock price, indicating auditor changes provide little information regarding the pricing of securities. Johnson and Lys reported that clients going from an 'other' to Big Eight auditor experienced positive abnormal returns over the sixty days preceding realignment. Switches in the other direction experienced negative abnormal returns.

I examined switching, controlling for merged audit firms. The data only examines the auditor in the year 1987 and in the year 1992 and determines if they are the same or if they are different -- in other words switched. Switches between 1987 and 1992 were not recorded. Only 10 percent of firms, or twenty five firms switched among Big Six/Eight auditors. As reported previously, of these 25 firms only 2 were from regulated industries. This confirms Eichenseher and Danos' finding for the Canadian market and suggests that auditors can recoup learning-by-doing costs in these industries.

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[108]Profitability as measured by returns on assets.

Table 7: Switching Data Among Big Six: Top 500 Firms					
Auditor 1992	# of audits 1992	# of audits 1987	# of clients audited in both years	number of clients lost	number of clients gained
aa	10	12	10	2	0
cl	41	39	37	2	4
dt	38	40	36	4	2
ey	47	48	43	5	4
pmt	66	66	58	8	8
pw	47	44	40	4	7
Totals	249	249	224	25	25

AUDITOR CHARACTERISTICS

AUDITOR SIZE

Using two sources of information, audit firm revenues and the payroll information from the special runs of Statistics Canada , I found that large firms' (with over 500 employees, which is the categorization Statistics Canada uses) ratio of payroll to total revenues is considerably smaller than mid-size firms (with between 100 and 499 employees). These results are consistent over both years. The largest firms devoted 29.5 % of revenues to payroll in 1989, and 31.1% in 1992. Mid-size firms on the other hand allocate nearly half of their revenue to payroll. In 1989, they used 48.9% and 48.2% in 1992.[109]

Since large firms dedicate less revenue to their payroll, they may be paying heavily for their brand name, larger corporate size, or the costs of being larger (even though this may prove to be efficient). The use of new and expensive technology may be a factor as well. I also would suggest that the difference in clients between large and other audit firms may introduce entirely different factors in the production of audits[110]. On the other hand, large audit firms may be reaping larger profits.

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[109]Partners' earnings may not be included in payroll information. Statistics Canada does state it uses regular, short , and overtime hours.

[110]This possibility emphasises the importance of, and suggests another research angle to, O'Keefe, Simunic, and Stein's (1994) examiniation of audit firm costs.

INDEPENDENCE

Wyatt suggests that small accounting firms must choose whether they really want to do attest (audit) work, as it is more suited to a large firm environment and is becoming more so with SEC regulatory overload, and standards overload. In addition, he challenges the hallmarks of the audit -independence and objectivity.

> "As competition is promoted, [via changes in internal professional regulations] questions are being raised by some whether independence and objectivity of the profession ought to be replaced by notions of competency and integrity" (Wyatt, 1989).

Small auditors are at greater risk of losing their independence.[111] Auditors need sufficient clientele, so that losing one client would not impair their ability to carry on business. It is possible that rational consumers requiring quality audits, will choose those auditors perceived to be relatively more independent. Therefore audit firm size may affect client choice in an enviroment that holds independence as a valued characteristic of an auditor.

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[111]An audit firm is considered indepedent (theoretically) if the probability of issuing an adverse report is equal to 1. DeAngelo (1980) provides an excellent review of the issues relating to independence.

OTHER SERVICES AUDITORS PROVIDE

Consulting arms at the Big Six have been growing at double digit rates, while auditing

growth rates are stagnant. (Bell, 1995) The percentage of consulting revenue has grown

to 60% of total revenues, while auditing has decreased to 40% of the total. This has

changed rapidly in a short span of just 10 years.

Anderson Consulting Canada is by far the leader in consulting services. In Canada, its

presence in audit is minimal, whereas its presence in consulting is significant. For

example in 1993, Anderson's revenue from information technology was $145 million,

only $7 million less than the other firms combined (Bell, 1995). See Table 8 below. In

addition I compare the product mix of two audit firms (Arthur Anderson and Deloitte &

Touche) in Graph 3. This graph demonstrates the variety of services while pointing out

how different firms are within the same market.

Product Mix of Two Accounting Firms

Revenue Split Among Products -1995

Artuthr Andersen (AA)

other (53.00%)
tax (11.00%)
accounting (36.00%)

Deloitte & Touche (DT)

other (27.00%)
tax (17.00%)
accounting (56.00%)
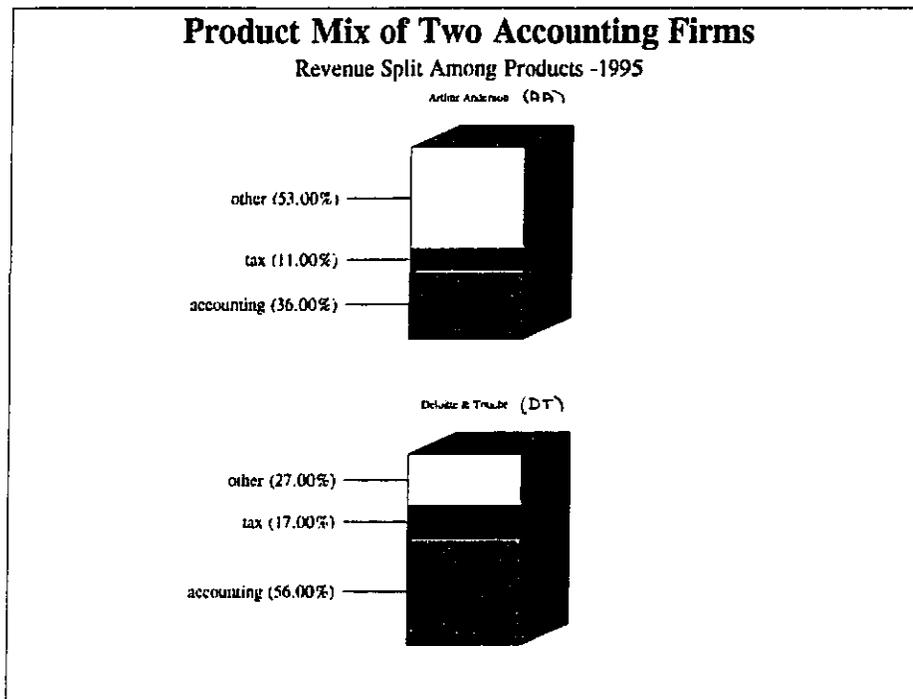
GRAPH 3

TABLE 8: BIG SIX CONSULTING PRACTICES					
Firm	1994 Revenues worldwide ($millionsUS)	Worldwide growth rate (%)	Number of consultants worldwide	Number of consultants in Canada	1994 Canadian revenues ($millionsCd)
Anderson	3452	20	27563	995	124
Ernst & Young	1181	14	7900	400	47 (1993)
Delotte& Touche	1061	21	7377	480	70
Coopers & Lybrand	1049	17	7388	495	65
KPMG	875	17	6779	380	70
Price Waterhouse	755	4	6700	280	36

Adapted from: CA Magazine, September 1995, p. 22

The Bottom Line (Millan, 1995) reported that some Quebec audit firms may be moving to specialize in certain industries to capitalize on 'value-added' services (i.e. non-audit products). Several accounting firms cited fierce competition as a reason to become more specialized in non-audit products and focussed on growth industries. Members of these firms stated that clients expect focussed expertise, not general knowledge, from their auditors. As an example, one Quebec firm --Malette Maheu-- entered into an formal association with Arthur Anderson to provide accounting, tax, and business advisory services.

Other firms approached specialization with some caution. These firms indicated that specialization created risks for the audit firm, as they too would be subject to ups and downs in the client industry. This coincides with Simunic's untested theory that audit firms may not want to expose themselves to undue risk by being too heavily concentrated in one or a few industries, and may be more of a concern for small audit firms.

GEOGRAPHIC DEFINITION OF THE PRODUCT MARKET

The geographic market is confined to Canada because of regulatory limitations on international auditing, and specialized national[112] knowledge. However, there are some problems for this portion of the market definition because of the special circumstances of Quebec which has a different legal code and business environment. Additionally, NAFTA provides for the international movement of accountants, which further blurs the border boundary. [113]

There appears to be some regional differences in auditor preference, which are not well documented in the Canadian studies, but that are relatively well known in business circles. These regional differences are documented here.

For example, the prevalence of mid-size audit firms in Quebec is unique. Mid-size auditors are declining significantly in other areas of the country, but are holding their own in Quebec. (Verification of this issue is included in this chapter, under 'Statistics Canada Information'.) Of course there may be many reasons for the maintenance of the Quebec mid-size market, despite the declines everywhere else. Here I provide evidence that changes in clients may be a driving force behind this issue.

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[112]This specialized knowledge includes Generally Accepted Accounting Principles(GAAP), Canadian Tax System, stock exchange requirements, and other regulatory requirements.

[113]Even though NAFTA has come into effect, allowing the 'free' movement of professionals, in practice there is still a barrier to entry. For example, Professionals must adhere to various residency rules in addition to passing the appropriate exams to practice in Mexico. (Millan, 1995)

I found that there is a significant difference between the means of the client firms[114] of the Quebec mid-size auditors and of the rest of the client firms in the samples. Of even more interest, is that there was a significant difference between the clients of the Quebec mid-size firms and other mid-size firms in 1987, but that this dissipated in the 1992 sample. This evidence coupled with the mean size of the clients suggests there have been interesting changes to the client makeup of mid-size audit firms.

The mean client size for a Quebec firm in 1987 was $270,577,354.00 and $327,973,707.00 in 1992. The mean client size for a mid-size firm in the rest of Canada was $104,142,276.00 in 1987 and $309,939,937 in 1992. The dramatic change in the client size of the rest of Canada group could be due to several factors. Either, this group is facing a large attrition of their small clients, driving up average client size (of the remaining firms); or, they are getting some new large clients.

I suggest that the evidence supports that the Quebec mid-size firms maintained their clientele, while mid-size auditors in the rest of Canada likely lost many bottom end clients. The drop in payroll for the rest of Canada firms (which is reported in the Statistics Canada chapter) indicates that these firms are not gaining new business.

Quebec clients have access to larger auditors through local mid-size audit firms because

---

[114] I used total assets in this calculation, as I am interested in the characteristic of the client firm, not of its audit fee. The t-test was significant to 0.05%.

Quebec audit firms have been strengthening their alliances, but not fully integrating, with large (Big Six) firms. These alliances have not been pursued to the same degree by other mid-size firms in other areas of the country. Political issues in Quebec may encourage this comparatively independent behaviour.

I also performed a breakdown of the top 500 clients by province. I found that the audits are well distributed among the large auditors in those provinces with a large number of client firms (Alberta, British Columbia, Ontario, and Quebec). Doane Raymond was well represented in the Nova Scotia and Newfoundland only, suggesting another regional bias not reported elsewhere. The details are reported in Appendix 9.

FOREIGN COMPETITION

The industry is confined to Canadian borders because of domestic regulations for audits and securities filing. Yet, the impact of international influence is felt by the industry and its clients. For example, I cited two cases in my introduction of the impact of the international accounting firm on its Canadian affiliates. The merger activity experienced in Canada is a result of international forces.

In addition to international audit industry influence, client firms influence auditor choice across borders. In the evidence presented in the section on Parent-Subsidiary relationships, Canadian subsidiaries of international firms often use the same auditor.

CHANGES IN THE INDUSTRY: STATISTICS CANADA INFORMATION

Statistics Canada data compliments the above analysis by providing business number and

payroll information for all sizes of firms in the accounting and bookkeeping industry and

management consulting services. The data compares 1989 and 1991. Some very strong

trends appear in this data.[115]

Overall, the accounting and bookkeeping services industry has experienced growth in

both the number of businesses and in payroll. The number of businesses increased by

eight percent, while payroll increased by 12 percent.

Significant changes occurred in several size categories. In the smallest size category,

firms with fewer than five employees, the number of firms increased 11 percent while the

payroll increased 40 percent. The Statistics Canada data breaks down the information

further by separating growing businesses from declining businesses (based on average

labour units, which are explained in Appendix 12). Small growing firms experienced a

78 percent increase in payroll over this three year period. Growing firms with 5-19

employees and 20-49 employees also experienced strong growth in payroll with 45 and

144 percent increases respectively.

Dramatic downturns were experienced by mid-size firms (100-499 employees). The

number of businesses decreased by 29 percent over the 1989-1991 interval. The payroll

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[115] Appendix 14 contains information about the data and how Statistics Canada manipulated it.

decreased by 44 percent over the same period. Please see Graph 4.

Interestingly, these trends were not experienced in Quebec to the same degree. The
number of businesses decreased by three, or by twenty percent. (Overall, eight mid-size
firms were lost.) At the same time, the payroll only decreased by 3.6 percent.

Large firms (500+ employees) remained relatively constant in number, only decreasing by
one. The payroll experienced an increase of 20.7 percent.

The information reveals that entry into the industry is easy, especially in the small
business category. Of all newly identified firms (there were 3,603), over 96 percent were
in the five or fewer employee category. There were no new firms identified in the 100-
499, or 500+ employee categories.

I note that similar trends in small and large firm growth are experienced overall in
Canada. Table 9 presents this information.

GRAPH 4

Accounting Businesses 1986-1991
Change in Payroll and # of Businesses

Percent Change

40

20

0

-20

-40

-60

small   midsize   large
Firm size category

payroll   businesses

TABLE 8
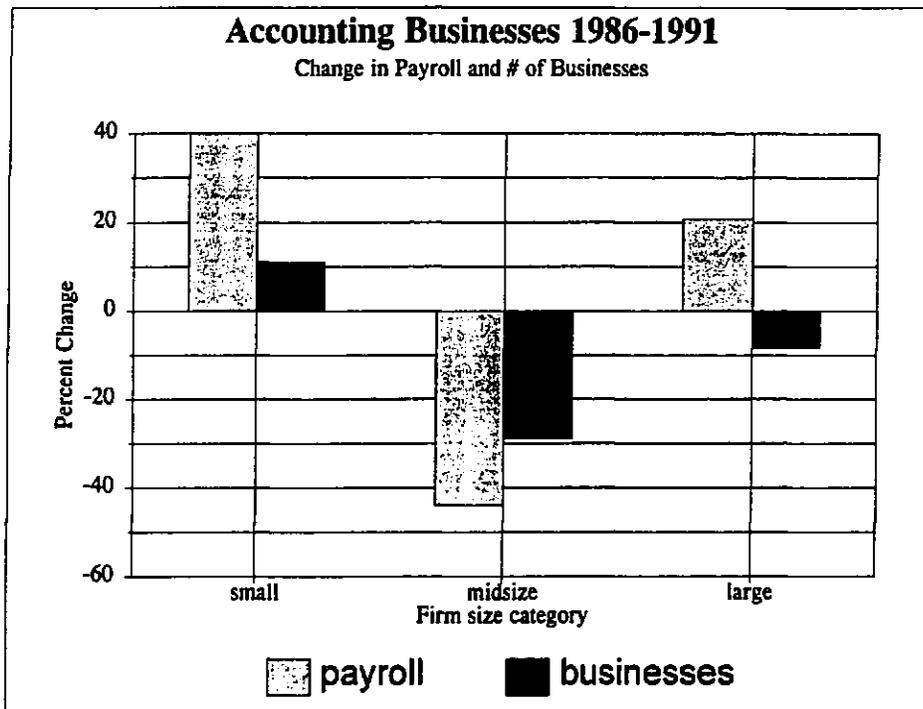
Concentration : Canadian Firms of All Industries

Changes in the Relative Shares of Financial Characteristics of Leading Enterprises (1975-1986)			
Ranking	**Sales**	**Assets**	**Profits**
Leading 25	+1.4	+5.9	+7.6
26 to 100	-2.0	-1.3	-3.8
101 to 500	-2.2	-4.1	-6.1
501 to 1000	-0.9	-3.1	-0.8
Remaining	+3.6	+0.8	+3.2

Source: W. Krause and J Lothian, Canadian Economic Observer, January 1989.

"This table may be interpreted in this way: the percentage of assets held by the top 25 firms in the Canadian economy increased by 5.9 percentage points between 1975 and 1986, going, in fact from nearly 29% to just over 35%. Some caution should be exercised in using this table because the share figures are affected by the business cycle. Whether one looks at sales, assets or profits, the same divergent picture emerges: both the largest 25 and the smallest firms (those ranked below 1000) have increased their shares of sales, assets, and profits, while the percentage shares of the firms ranked between 26 and 1000 have declined. How one reacts to this picture depends upon one's view of concentration. Concentration has grown at the top, but at the same time there has been a relative increase in the economic health of smaller firms. Any tendency towards concentration is not uniform and does not seem to have harmed the opportunities available for smaller firms." (Jackson and Poshmann, 1989)

The changes experienced in Management Consulting Services was similar overall, with a gain of 15 percent in businesses, and 12 percent in payroll. Small firms experienced the largest growth with a 22 percent increase in businesses and a 77 percent increase in payroll. Growing firms in this group yielded a growth in payroll of 187 percent. Similarly, growing firms in every category experienced large growth.

The difference between the two industry categories is that large firms in Management Consulting Services did not increase in payroll, whereas the mid-size category is holding steady-- not experiencing the same drastic declines as mid-size accounting firms.

EVALUATIVE CRITERIA

BARRIERS TO ENTRY AND SUNK COSTS

In this industry, there are three points where barriers to entry could be erected. One is at the professional level, the second is at the basic firm level (if a firm could enter the market at all), and the third is between different sizes or qualities of firms (can a firm within the market impede another firm in the market from competing?).

The Concentration Doctrine is meaningless unless one can find entry barriers into a market. Traditional barriers such as large capital requirements are no longer considered entry barriers. In fact, with the evolution of the Contestability school (Baumol, Panzar, and Willig, 1982), the concept of an entry barrier has diminished considerably. In fact, the one main remaining market barrier that appears to have some credibility left, is sunk costs or fixed, specialized investments with no alternative uses.[116]

Although sunk costs are normally thought of in the context of large buildings and machinery, it is more fruitful to think of sunk costs in this industry, as human capital investments. A significant amount of that burden is placed on the individual, because of the schooling requirements. (Although it could be argued that the education has alternative uses.) A secondary burden is placed on the large accounting firms who develop accountants through the articling process.

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[116]Sunk costs are considered to be an entry barrier because potential new entrants, would add capacity faster than the growth of demand, and would expect incumbent firms to lower prices to maintain the use of their sunk capacity. (Von Weizsacker, 1980; Fisher, McGowan and Greenwood, 1983; and Salop, 1986)

Even if there are sunk costs for the individual, there is little reason to believe that persons

are impeded from entering the industry.

> "There appear to be no real barriers to entry of individuals into the profession, ...
> In fact, the education and certification requirements which characterize auditing
> practice are consistent with a market in which quality uncertainty and information
> asymmetry exist" (Dopuch and Simunic, 1980).

Of course, the profession must maintain its level of competence, and thereby restrict entry

to those individuals who are not able to perform the required duties.

Using Statistics Canada data, from the 1986 and 1991 census, there appears to be little

evidence that there are significant barriers to entry into the accounting profession for

individuals. The category of 'Accountants, auditors, and other financial officers --1171',

experienced an increase in membership from 181,025 to 229,730 persons, for an increase

of 21.5 percent. As a comparison, the category of 'Bookkeepers and accounting clerks --

4131' experienced a mild increase of 3.4 percent, with a membership change from

386,700 to 399,820 persons. This suggests that educational requirements and

employment opportunities are not prohibitive and definitely not a barrier to entry,

especially if one accepts that it would be easier to enter employment in the bookkeeping

category by virtue of fewer educational requirements. If they were, the category

bookkeepers and clerks would grow at a faster rate than the accountants' category, if one

also assumes individuals would stay in the same line of business.[117] [118] [See Graph 5.]

---

[117]The most interesting piece of information that is revealed here is the superior growth in employment
opportunities for women in this industry (1171). Over the 1986-1991 period, the number of women
participating in this category increased 41.5 percent, while men experienced 8 percent growth. The number
of women and men in this category are almost equal, with 107,970 women and 121,760 men in 1991.

Some suggest that auditors are protected from broader competition because of the unique nature of the profession and their legislated mandate.

> "It also should not be forgotten that it is the licence to audit financial statements that makes CPAs and their firms unique" (Palmer, p. 86).

Palmer, does not suggest that these firms are protected from competing for their bread and butter work --audits, but he suggests that accounting firms are venturing into areas not traditionally serviced by accountants. He suggests further, that the sunk costs that accounting firms have put into their reputation, especially the Big Eight, have allowed them to make great strides outside of their traditional business line.

---

[117](...continued)
The other interesting, but well known fact, is that the number of women (337,185) in category 4131 far exceeds the number of men (62,640) in 1991. The growth is attributed to growth on the women's side. (Statistics Canada, The Nation: Occupation, 93-327)

[118]The income levels of category 1171(adjusted for 1990 dollars) were $39,490 (1980); $37,048 (1985); $37,382 (1990). The income levels of category 4131 (adjusted for 1990 dollars) were $18,452 (1980); $18,195 (1985); $20,000 (1990). (Statistics Canada, Population and Dwelling Characteristics, 93-116) See Graph 6.

Change in Numbers of Accountants
From 1986 to 1991

GRAPH 5

Income Levels of Accountants in Canada
In 1990 Dollars
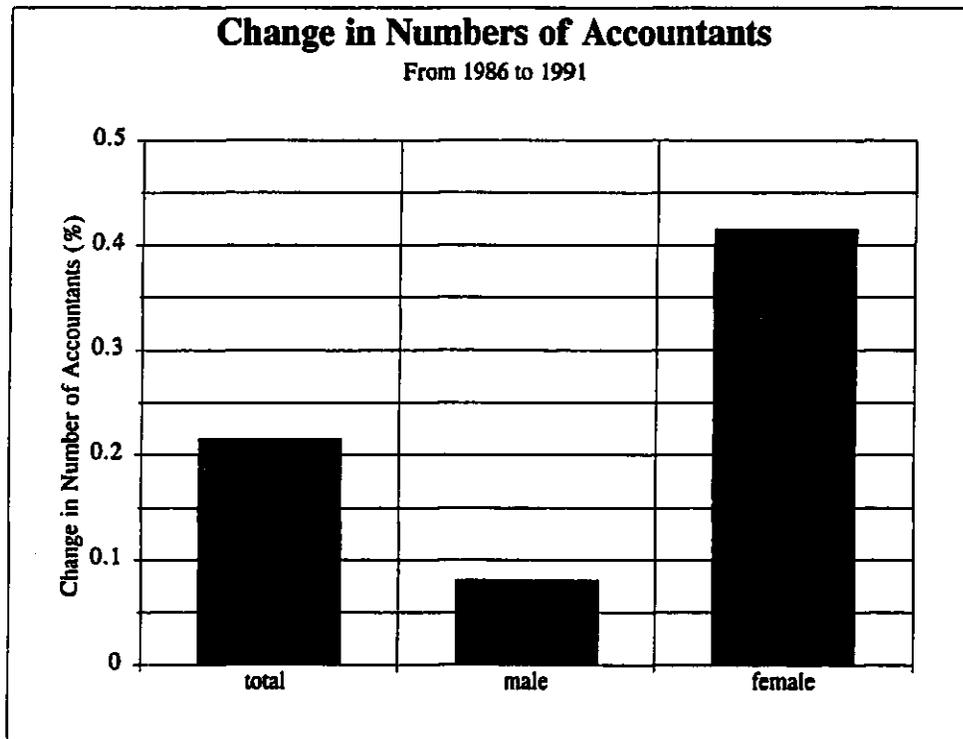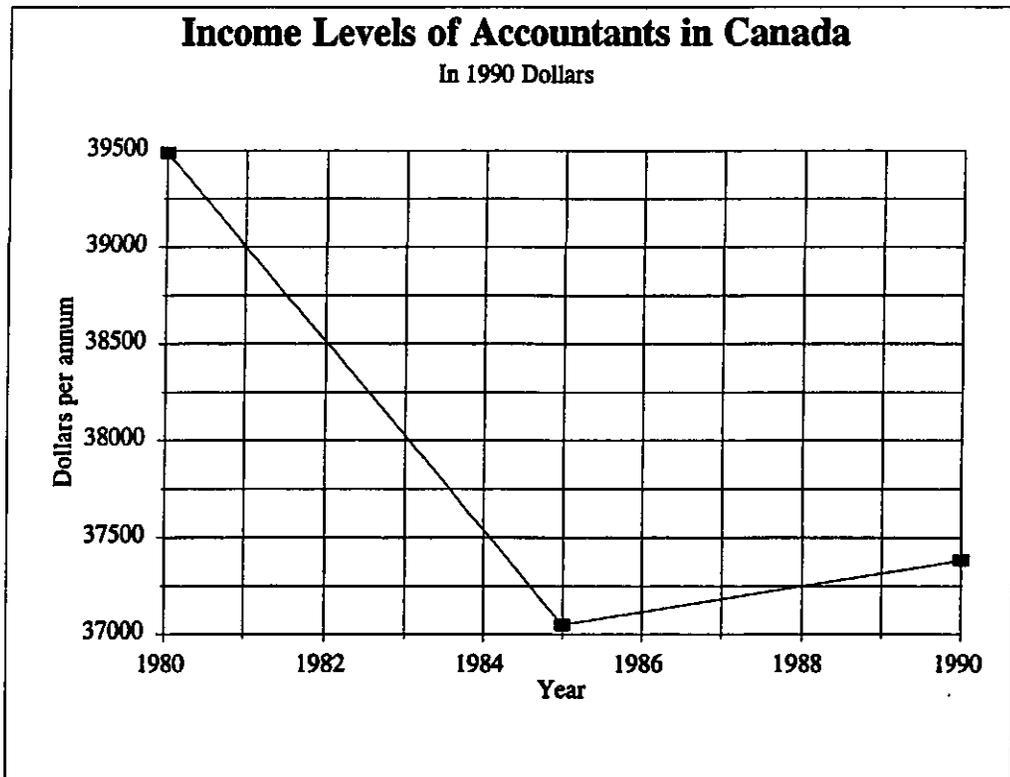
GRAPH 6

As mentioned previously in *Chapter 4*, Demsetz (1974) states that concentration increases whenever a better firm outperforms other firms. If this better performance leads to higher profits, more investment (sunk costs or otherwise), and faster growth, the issues of high concentration and of barriers to entry disappear, as they are simply by-products of superior performance.

It appears in Canada, that there are a small number of large accounting firms which have performed in a superior manner. They share the same legal rights as other accounting firms in the industry, but are larger, and serve a broader range of clients.

WHY AUDIT FIRMS USE MERGER: GAINS IN MARKET SHARE AND INDUSTRY CATEGORIES

Arnett and Danos (1979) report that mergers are generally considered as a means of reaping financial and economic benefits for audit firms. These benefits include expansion into a new geographic area, economies of scale attributed to centralizing operations, gaining a well known brand name, and access to better technology, methods and standards (quality improvement). These are hardly a surprize.

Of course, it is possible that the merger does not reap the benefits the firms expect. It is possible that the firms, now merged, lose an important client because of the new dynamics of the merged firm. For example, clients may feel threatened if their major competitor is suddenly audited by the same auditor.[119]

Tonge and Wootton and Copley (1993) both presented some data on potential effects of mergers in the United States. I have made similar calculations for the Canadian market. In addition, I have incorporated the actual-- or realized -- result of the mergers on market share, which was not presented by either of Tonge and Wootton or Copley. Following these data, I present information on the expansion of audit firms into new industry categories. Taken together, this information creates a picture of the effect of mergers.

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[119] The evidence in Appendix 4 supports this, as client firms within an industry appear to seek out different auditors than their competitors retain.

The combined market shares of Thorne Ernst Whinney, and Peat Marwick Mitchell using 1987 square root of assets data, is 22.8%. The merged firm, PMT, had an actual 1992 market share of 25% using square root of assets data. In 1987, Thorne Ernst Whinney performed audits in 23 of 41 SIC categories gaining clients in 3 new categories, while Peat Marwick Mitchell performed audits in 18 categories. PMT performed audits in 28 of 41 categories in 1992, gaining clients in 4 new categories.

The combined market shares of Deloitte Haskins Sells and Touche Ross using 1987 square root of assets data, is 23.5%. The merged firm, Deloitte Touche had an actual 1992 market share of 27% using square root of assets data. In 1987, Deloitte Haskins Sells performed audits in 13 of 41 SIC categories, while Touche Ross performed audits in 22 categories. Deloitte Touche performed audits in 27 of 41 categories in 1992. In both merger cases, the realized market share was higher than the added market share, suggesting that the merger allowed each new entity to pick up some new business.

CONCENTRATION

"Although information which demonstrates that market share or concentration will be high cannot provide a sufficient basis, in and of itself, to justify a conclusion that a merger is likely to prevent or lessen competition substantially, it is a necessary condition that must exist before such a finding can be made." (Director, p. 21)

The ability of firms to coordinate their efforts in the joint maximization of profits, is increased when a smaller number of firms exist in the market. In the case of audit firms, the concentration prior to the mergers exceeded reviewable levels. When a merger took place the threat of even higher concentration, which did materialize in the market overall (CR4 of 77.3), sends warning signals to policy analysts and others who are concerned with the production of audit and accounting services.

Overall, the top four firms accounted for 61.7 percent of the business in the financial sector in 1987. The concentration increased to 88.8 percent in 1992. The respective HH Indices are 0.1146 and 0.2097. This data is based on square root of assets data. The top four firms accounted for 62.7 percent of the top 500 firms in 1987 and 77.3 percent in 1992. The HHIs for 1987 and 1992 were 0.1208 and 0.1639.

To determine if there was a significant increase in concentration, I used the industry specific concentration measures (41 industry categories in non-financial sample plus the financial sample : both number of audits and square root of total assets data) in a t-test. There was no significant difference between the means of the 1987 and 1992 data using either of the square root of assets or audit data when reported as Herfindahl Indices.

When reported as CR4 measures, the square root of assets in a t-test over the two years yielded a significant difference ($\alpha = 0.05$), whereas the number of audits data was also nearly significant at this level. This confirms Wootton, Wolk and Tonge's finding that the type of measure may influence the result. All the concentration indices are reported in Appendices 4, 5, and 6.

The concentration in many industry segments is extremely high. But, the changes from pre-merger to post-merger stage were in-determinant in direction when analyzed on a case by case basis which confirms the statistical test reported above.

I note that there are differences in using number of audits and square root of assets as a measure of market share. This in turn affects the concentration ratios. If the relevant market contained an undifferentiated product, and the suppliers are operating at full capacity, any measure of market share should yield a relatively similar result. This market does not afford the analyst the luxury of straightforward analysis, especially if one considers the minimal amount of information available.

Nonetheless, the concentration levels are so high, that any measure of concentration would provide enough evidence to meet the necessary, yet not sufficient, requirement of high concentration for merger review.

COMPARING CANADIAN CONCENTRATION STUDIES TO MY FINDINGS

There are a small number of published studies on the Canadian audit market. Shaw and

Archibald (1970) provided the first set of information on the market, following up Zeff

and Fossum's U.S. study using Canadian data. Chung and Lindsay (1988), Zind and

Zeghal (1989), and Anderson and Zeghal (1994) performed audit fee studies (Simunic

replications) on the Canadian market. Here, I compare my findings with the information

they provided on the Canadian market in different time periods.

Overall

Shaw and Archibald report that in 1968 based on total assets audited Price Waterhouse

and Clarkson Gordon were strong leaders in the audit industry. At the time, the number

of audits appears to be well distributed among the top eight firms (with 409 audits split

up among eight audit firms), while 73 mid-size and small firms split the remaining 176

audits. A persistent trend in Canada which still plagues the firm, has been the absence of

Arthur Anderson from the top audit firm ranking --based on number of audits. In 1968,

AA did not make the top eight by number of audits (only auditing 9 firms), but auditing

large client firms as evidenced by the total assets it audited. In the United States at the

same time, AA was the fourth largest firm by both audits and assets. Tables 10 and 11

present two years of audit firm rankings.

TABLE 9 Canada's Top Accounting Firms--1987					
Auditor	Revenue ($'000s)	Professional Staff	Partners	Employees	Offices
1. Thorne Ernst & Whinney*	250,000	2,968	483	3,818	55
2. Clarkson Gordon	217,000	2,411	391	3,183	25
3. Deloitte Samson	176,566	2,267	328	2,968	56
4. Touche Ross	175,000	2,125	375	2,700	47
5. Coopers & Lybrand	170,900	1,908	265	2,571	21
6. Price Waterhouse	146,000	1,725	218	2,287	22
7. Peat Marwick	135,104	1,579	244	2,006	27
8. Doane Raymond Associates	119,800	1,601	298	2,036	96
9. Ward Mallette	89,000	1,333	233	1,563	76
10 Collins Barrow Maheu Noiseux	69,200	965	181	1,212	41

Rankings based on audit firm total revenue, as disclosed by the firm. * Estimated.

Adapted From: The Financial Post 500. Summer 1988.

TABLE 10 Canada's Top Accounting Firms—1992					
Auditor	Revenue (\$000s)	Professional Staff	Partners	Employees	Offices
1. Peat Marwick Thorne	483,429	3,956	720	5,173	71
2. Delotte & Touche	427,000	3,391	607	3,936	65
3. Ernst & Young	352,000	2,996	540	4,031	41
4. Coopers & Lybrand	257,780	1,917	430	2,327	26
5. Price Waterhouse	244,000	1,783	289	2,412	26
6. Doane Raymond Grant Thornton	212,000	1,963	419	2,552	112
7. BDO Dunwoody Ward Mallette	192,000*	1,983	422	2,534	120
8. Arthur Anderson & Co.	165,838	1,199	87	1,538	9
9. Richter, Usher & Vineberg	42,120	266	56	398	3
10. HLB Fuller Jenks Landau/MacKay	22,000*	234	52	252	12

Rankings based on audit firm total revenue, as disclosed by the firm. * Estimated.

Adapted From: The Financial Post 500. 1993.

Shaw and Archibald also list which of 25 industries each auditor participates in. Each of the top audit firms participate in a majority of these industries.

The number of audits each audit firm has in each industry category is not given, which means I cannot compare my auditor-client ratios with their data. But, I can surmise that each industry has at least several auditors, indicating that market power through industry specialization may have been elusive in 1968 as it is in 1992.

Chung and Lindsay report that in 1979 PMM was the largest auditor based on number of audits, while PW was number one based on assets. It appears that PW audited large client firms based on the average assets of the clients. Unfortunately no industry breakdown was performed by these researchers.

Zind and Zeghal report that in 1981 PW was the leader in both number of audits and total assets audited. Their rankings demonstrate a sharp demarcation between the top eight firms and the remaining firms based on number of audits and assets audited, but that the Canadian market is more appropriately called the Big Seven. Unfortunately no industry breakdown was performed by these researchers either.

Anderson and Zeghal used Zind and Zeghal's data, and updated it with further

information.[120] Anderson and Zeghal report that no firm audits more than 38% of the

observation in a particular industry, based on six broadly based industry categories.

(These categories are reported elsewhere in my thesis.) Unfortunately no information

about the market share of each auditor is presented on an industry basis. In addition,

Anderson and Zeghal present some regional information, such as 45 percent of their

observations were audited by Ontario firms.[121]

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[120]Their sample contained 75 firms for 1980, 136 firms for 1982, and 163 firms for 1984. The small sample size may have not allowed for fine industry breakdowns.

[121]Anderson and Zeghal used the location of the auditor as their location variable. My thesis uses the location of the client as the location variable.

In my sample the total assets audited by each of the large auditors is as follows:

TABLE 12

Total Assets Audited by each Auditor in Sample - 1987 Non-Financial Firms	
Auditor	Total Assets Audited ($)
AA	15839381660
AY	1511308400
CG	71187935927
CL	27813549364
DHS	10274385732
DR	1385545097
PMM	34528154912
PW	113780676396
Thorne	50109870466
TR	90025235186

TABLE 13

Total Assets Audited by each Auditor in Sample - 1992 Non-Financial Firms	
Auditor	Total Assets Audited ($)
AA	22154489677
CL	32051374350
DT	185969389114
EY	82694382936
PMT	93278417051
PW	145075326266
PMM	34528154912

I provide this information only as a comparison to the other studies. The average client

size tables, provide a better indication of the differences between auditors, and perhaps a

better ranking system than total assets audited. Market share information of each of the

top auditors is presented in Graphs 7 to 10.

Market Share of Auditors
1987 - Non-Financial Firms

GRAPH 7

Market Share of Auditors
1987 Financial Firms

GRAPH 8

Market Share of Auditors
1992 Non-financial Firms

GRAPH 9

Market Share of Auditors
1992 Financial firms
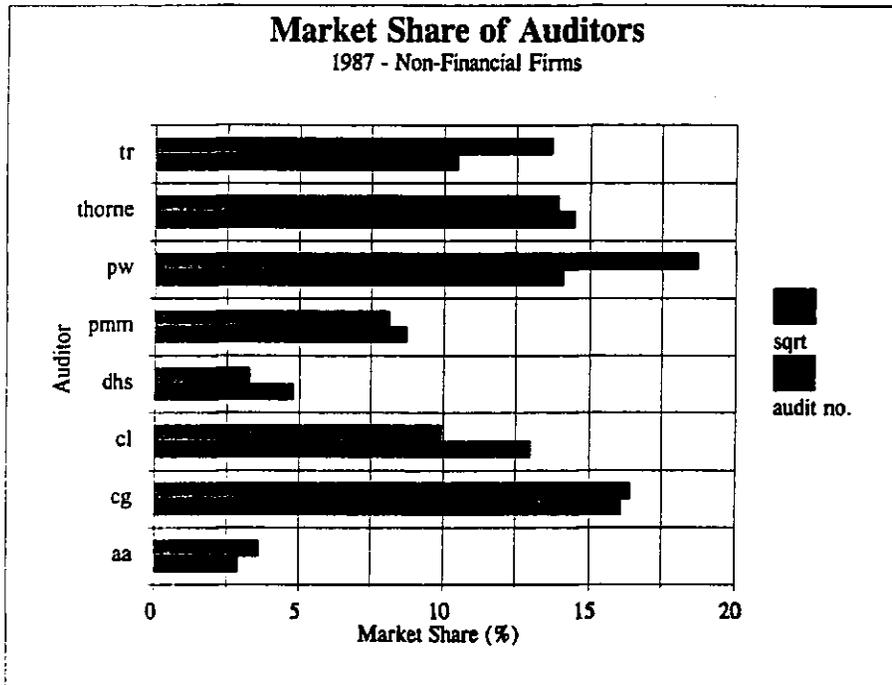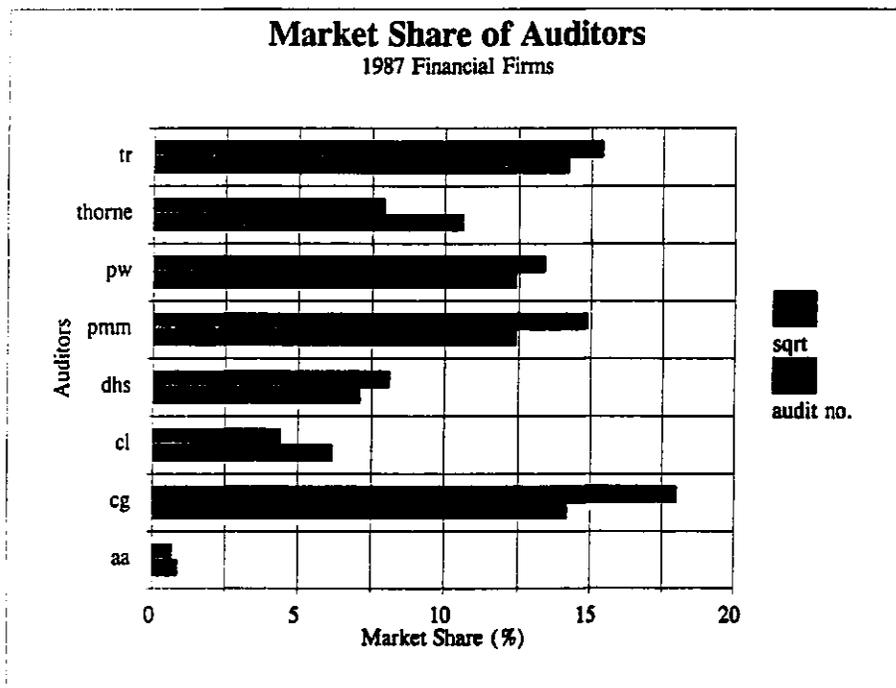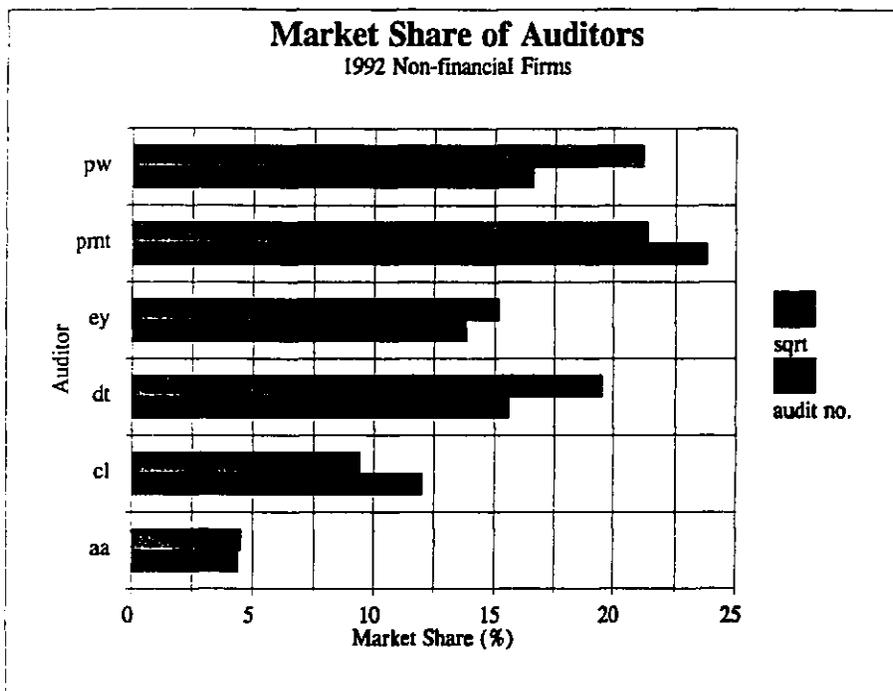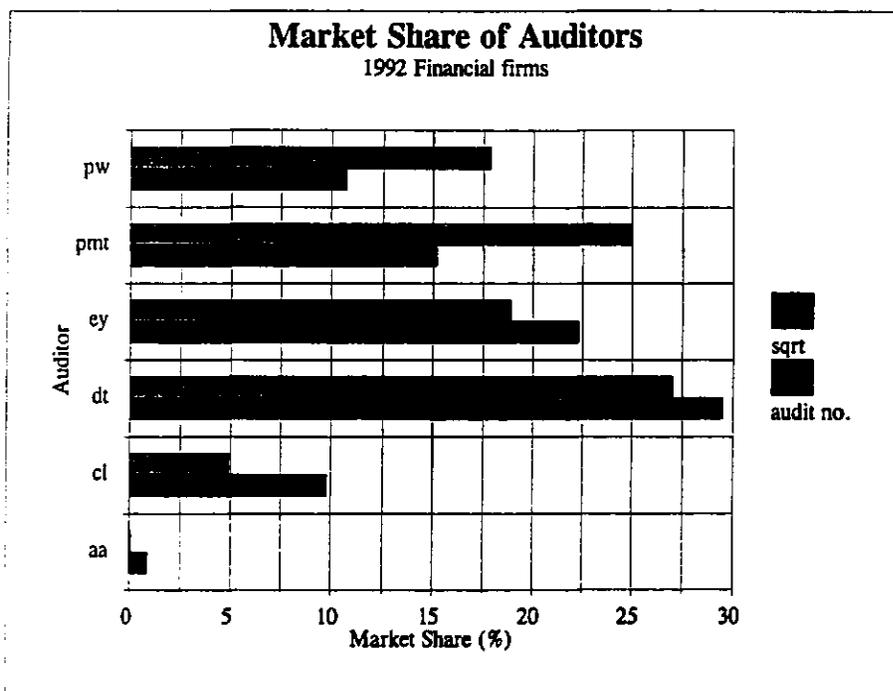
GRAPH 10

Industrials

Shaw and Archibald report that in 1968 Price Waterhouse was the dominant firm by assets audited, and Clarkson Gordon (now Ernst & Young) had the largest number of audits.

My research shows that in the construction industry there are two major auditors, DT, and PMT. Price Waterhouse holds approximately 11 percent of the business (on both measures), while EY has a negligible amount.

In the food manufacturing industries, four firms share most of the market. They are CL, EY, PMT, and PW. The market in 1992 was better diversified than it was in 1987, as there were only three main auditors serving the market at that time.

In textiles, the number of clients is small, but there are a variety of auditors among them, with only one auditor holding more than one audit. The market is less concentrated in 1992 than it was in 1987.

In furniture manufacturing, the five clients have retained five different auditors, suggesting that auditor specialization does not exist in this sector.

In printing and publishing, there are a wide variety of auditors. In fact, based on square root of assets data, six of seven auditors each have at least 10 percent of the market.

In chemicals, there are three dominating auditors (DT, PMT, and PW), and three lesser auditors. This is one sector where the measure of the market share is influential, as the market share of the client firms influences the market share of the auditors.

In rubber and plastics manufacturing, there appears to be some auditor specialization, as one firm has maintained and increased its market share through the merger. Yet, there are three other auditors with at least 10 percent market share.

In the stone, glass and clay products, the market is evenly divided among four auditors. Similarly in machinery, the market is divided among four strong competitors.

Eight auditors service the electrical and electronic machinery manufacturing sector. Firms that merged have held on to their market share.

In transportation equipment manufacturing, EY has maintained market share holding the largest firms in the industry as clients.

In the transportation sectors, the audits are divided among auditors, as very few auditors hold more than one audit in each sector. Several forces may be acting to create this scenario. These industries are highly competitive, and clients may wish to use auditors that are not involved with any of their competitors. Additionally, these industries are highly regulated and have been found by Eichenseher and Danos to resist switching. The

auditors may be pouring in extra resources into these audits, to maintain their competitive advantage.

In communications, a quickly growing and changing industry, DT is the primary auditor with 32 percent of the audits and 52 percent of the market based on square root of assets. Prior to its merger, DT had a significant portion of the business in this sector. Since then it has gained clients. There are seven other auditors in the industry, with three having more than 10 percent market share.

Wholesale and Retail Trade

In the wholesale--durable market, there are a wide variety of auditors. Deloitte Touche gained its market share considerably over the merger period. In the non-durable market, PMT maintained its strong hold on the market from 1987 to 1992, but there are six other auditors in the market.

In the retail --general merchandise market, the auditors are well dispersed, with one audit apiece. The same situation exists in the retail-food, apparel, furniture, eating establishments, and miscellaneous markets.

Utilities

Shaw and Archibald report that in 1968 Clarkson Gordon [Ernst & Young] were the leading auditors in the sector of publicly and privately owned utilities.

My results show that the utilities industry is served primarily by four auditors, which divide the market up evenly. It is less concentrated in 1992 than in 1987, based on a Herfindahl index.

Mines

Shaw and Archibald report that in 1968 Thorne, Gunn, Helliwell & Christenson, a forefather of current day KPMG Peat Marwick Thorne, had a significant portion of this market.

My findings indicate that the mining and refining sector is served by four strong competitors, CL, EY, PMT, and PW who together hold about eighty percent of the market.

Oil

Shaw and Archibald report that in 1968 Clarkson Gordon [Ernst & Young] audited the most by assets, but that by number of audits CG shared top billing with Peat Marwick & Mitchell [KPMG], Price Waterhouse, and Thorne, Gunn, Helliwell & Christenson [KPMG].

My study finds that resource based industries, such as oil and forestry, are dominated by Price Waterhouse when measured with either market share measure (square root of assets

or number of audits).

Services

All industries under the service umbrella, are widely dispersed, with each client retaining

a different auditor. The sample size is small [but growing from 1987 to 1992], so I

decline to make any generalizations about the demand for and supply of audit services in

this sector. I do think though, that the supply and demand dynamics will be interesting to

follow as the service sector continues to grow.

Finance

Shaw and Archibald report that in 1968 PMM, CG, and PW shared top auditor billing.

Among holding companies, my findings indicate there are a large number of auditors, and

many of them have several audits. The largest change between 1987 client firm numbers

and 1992 client firm numbers exists in this category, which makes me hesitant to make

any conclusions about the audit market for this group of firms. I present a discussion of

concentration in this industry category in the next subsection, *Specialization.*

SPECIALIZATION

Specialization by an audit firm is examined by three measures in my thesis. First, I

report the concentration of an audit firm by industry categories. Second, I examine the

role of regulated client industries and how this affects audit firm specialization. This

examination also includes information about the Estey Commission, which commented

on the need for expertise and specialization in delivering audit services. I also present

data on concentration of audit firms for Big Six banks, which are considered to be a

special case because of industry specific regulations. Third, I report my findings on a

ratio created for this analysis, the Auditor-Client ratio. It presents information that has

previously been ignored in other studies of audit firm concentration.

SPECIALIZATION OR GENERALIZATION: GAINS IN INDUSTRY CATEGORIES

Mergers may allow audit firms to expand their operations by increasing the breadth, or

scope, of their operations. Mergers between two different firms, could create a diverse

(seemingly unspecialized[122]) firm. Therefore, I have examined the effects of merger

based on the number of industry categories each auditor is engaged in. The information

is presented in Table 14 below.

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[122]Although the new firm has a broader scope, this does not mean that it has lost its specialization. The sunk costs in specialization still remain with the firm, but from outward appearances may appear to be lost because of the increased size and scope of the firm.

Additionally, it is possible that the merger has allowed the auditor to gain a client in an entirely different industry category because the audit firm now has expertise (or sunk costs) in several areas, which the audit firm could not afford to invest in prior to the merger.

TABLE 14: Number of SIC Categories each Auditor has at least one Audit: 1987-1992			
Auditor	1987	1992	New Categories
aa	8	13	5
cg/ey	21	23	2
cl	20	19	-1
pw	17	24	7
rcmp	8	13	5
sb/sbdt	12	14	2
dhs	13	--**	--
tr	22	--	--
dt	--	27	3*
thorne	23	--	--
pmm	18	--	--
pmt	--	28	4*

*The new SIC categories for dt and pmt are those that neither of the predecessor firms were engaged in.
**The symbol '--' means that the firm did not exist that year.

Gains of business outside the combined firms may be due to several factors. If gains were only found in the merged firms, new business may be attracted to the increases in size and scope. If all firms had increased business, the industry on the whole may be experiencing some competitive changes. From the evidence above, it appears that audit firms are expanding in scope overall. The large merger activity may have been a way for the involved firms to enter other industry categories, but this did not appear to hinder other firms from entering other industry categories.

This evidence suggests that auditors are expanding their services across product lines, not specializing as expected. There is, although, some evidence to counter this finding.

As I mentioned the subsection on *Switching*, Eichenseher and Danos (1986) found that

over time, auditors in regulated industries maintained their market share compared to

auditors in non-regulated industries. I found that in my sample of firms that were

constant over time (see Appendix 10) that auditors in non-regulated industries were more

likely to be replaced. Of twenty-five switches, only two occurred in regulated industries.

If I use Eichenseher and Danos' reasoning, there is competition in the market for non-

regulated audits among large firms.

In general,

> "Markets are inherently dynamic as resources are re-allocated in response to
> new investment opportunities. Competitive pressures cause firms to specialize
> their productive skills and resources, which in turn leads to increased
> concentration whenever the resulting cost-advantage increases optimal firms
> size. In this view, the process of industry concentration is driven by 'healthy'
> competition, with some of the efficiency gains passed on to consumers. Thus,
> one can view the degree of industry concentration as an index of competition
> (through resource specialization) as well as of monopoly power, in which case a
> deconcentration policy forces a costly, suboptimal duplication of otherwise
> efficiently allocated corporate resources" (Eckbo, 1991).

Further,

> "Competition among auditors, both for the initial audit and at the recontracting
> interval, will govern the extent to which an incumbent auditor can benefit from
> learning-by-doing advantages" (DeAngelo, 1980).

The lack of switching in regulated markets suggests that the incumbent audit firm has

significant advantages due to the expertise it has gained by providing [an] audit in a

particular market. In non-regulated markets, audit firms jostling for audit contracts as

evidenced by the switching. Audit firms are also expanding the number of markets they

service. These three findings, taken in light of other research and the above quotes suggests to me that the Canadian market is competitive in non-regulated markets. In addition, regulated markets require some investment in acquiring expertise. It is unknown if rent accrues to audit firms in these regulated markets.

ESTEY: THE CASE FOR SPECIALIZATION

After the failure of the Northland Bank and Canadian Commercial Bank (CCB), their auditors were chastised by the Estey Commission for failing in their duties as auditors ("Canadian Auditors," 1986). The following quote from the Estey Commission Report suggests, mildly, that experience may have prevented some of the problems encountered with the audits of these two banks.

> "As was the case with the auditors of CCB, Northland's auditors, as individuals, had never undertaken a bank audit before their engagement with this bank. They communicated with other offices within their firm where bank audits were performed to obtain information and to build up an experience base" (Canadian Auditors, 1986, p. 4).

In a short 10 years, governments have moved from worrying about auditor concentration, to worrying about a lack of experience. Without some experience in an industry an auditor may produce a poor audit. To gain experience requires some persistent market share, although this does not necessarily imply that market share equates market power.

The statements by the Estey Commission emphasize the importance of Eichenseher and

Danos's and my finding of the persistence of market share in regulated industries. In some industries auditor experience may be of value, and policy analysists should be willing to concede market as a trade-off for improved quality.

Large banks in Canada are required to retain two auditors each fiscal year and switch auditors periodically. In the light of the Estey Commission findings which suggest that experience is of paramount importance to a proper audit, the legislation is an inefficient use of resources for banks that must take on an audit of which they must acquire new knowledge. The regulatory burden placed on the banking industry is considered to be high. Costs attributed to the regulations are passed on to the bank and therefore the consumer. Thereby, the consumer is paying for the inefficient use of audit.

I found that there is considerable concentration in auditing in the large Canadian banks with one firm auditing five of six banks. (As reported in Appendix 11.) I suggest given the regulations, the number of audit firms employed by the large banks should approach three. Evidence in 1992, suggests that this level is nearly being reached.

AUDITOR-CLIENT RATIO

To balance the concentration and specialization information I presented earlier in this chapter, I devised a ratio which gives some indication to the lack or prevalence of specialization of audit firms within an industry. It reports the number of auditors compared to client firms there are in each industry. These findings give further evidence to my claim that audit firms have little ability to exercise market power. In regulated industries, auditors seem to have greater persistence in keeping specific clients, yet the auditor-client ratios seem to be constant over time over all industry categories. The specific details are reported in Appendix 9.

To demonstrate the interesting dynamics of this ratio, I ordered the ratio from smallest to largest for each of 1987 and 1992 and graphed them. The considerable closeness of these two distributions is remarkable, suggesting that over time an equilibrium ratio of auditors to clients exists. In addition, it appears that clients will seek out audit firms that have nothing to do with their industry competitors. This suggests that there may be a limit on the amount of merger the audit market could withstand, as at some point clients may choose to engage mid-size audit firms to avoid using the same auditor as their competitors. These findings suggest that audit specialization is not as important as other factors to the majority of clients. Please see Graph 11.

Auditor-Client Ratios: 1987 & 1992
Ordered from Smallest to Largest Value

42 Industries

42 Industries
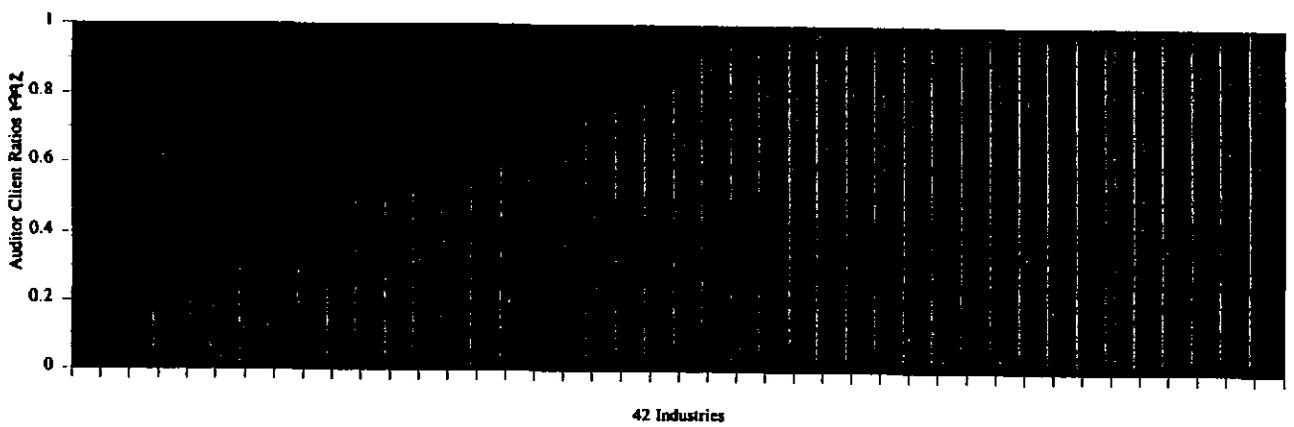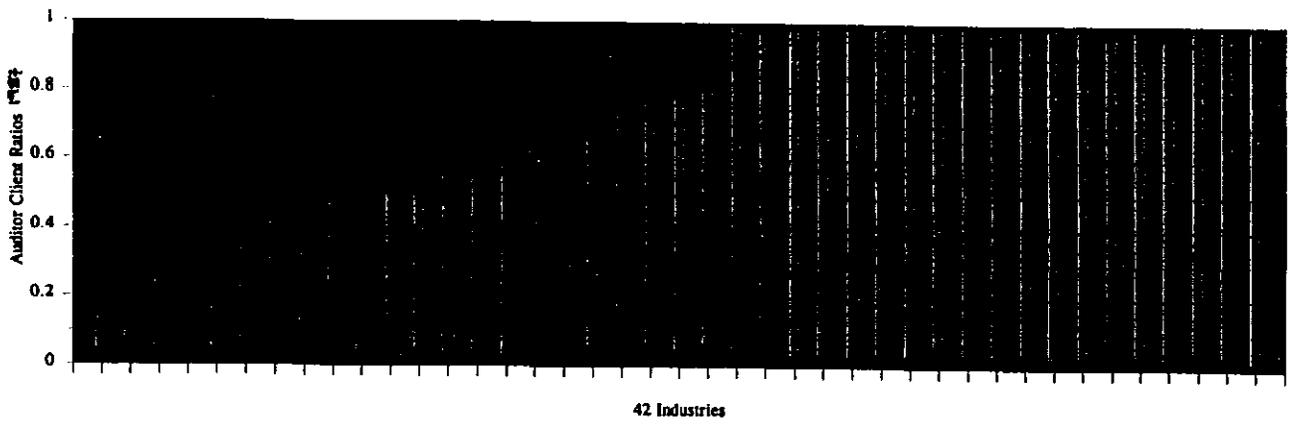
CHAPTER 7: SUMMARY OF FINDINGS

- The audit market is concentrated overall, with over 70% of audits in the non-financial sector and 75% of the audits in the financial sector being performed by the top four firms.

- The audit market reports extremely high concentration measures for industry categories.

- After a period of massive mergers, the concentration level increased overall. Based on a t-test using two different measures of market share and two different concentration measures in 41 non-financial industries, concentration did not differ significantly from the pre-merger levels.

- The high concentration of audit firms is largely due to a similar high concentration of client firms within those industry categories.

- Apparently, dominant audit firms generally handle one or two clients in an industry, of which one client is sufficiently large to create an illusion of market power.

- Within each industry group, a number of auditors each handle a small number of clients.

- Large audit firms' have significantly larger clients than other audit firms.

- Merged firms are not different from other firms on the basis of total audit firm revenue divided by total client fees (as measured by the sum of the square root of the client assets) over the 1987- 1992 period.

- Among client firms that are in each sample (1987 & 1992), only 10 percent of Big Eight clients switched to different auditors.

- Of the client firms that have switched, the majority were in non-regulated industries.

- The accounting profession, measured by employment levels, has experienced growth over 1986-1991.

- The majority of that growth is represented by women entering the industry.

- Income for individuals in this sector had dropped from 1980 to 1985, but has since levelled off.

- Small accounting firms experienced robust growth in both number of businesses (11 percent), and payroll (40 percent) in the period between 1986 and 1991.

- Large audit firms experienced an 20.7% increase in payroll.

- Mid-size audit firms are decreasing at a rapid rate, measured by number of firms and by payroll. This trend does not extend to Quebec, where mid-size firms are maintaining their presence.
- There are large differences between large and midsize firms based on the proportion of revenue used on payroll.
- Mid-size Quebec firms handle clients that are different in size than clients of large and other mid-size audit firms.
- Each province has a leading audit firm based on the number of audits performed, although in larger provinces several auditors are well represented in terms of market share.
- Parent and subsidiary firms retain the same auditor over 70 percent of the time.

CHAPTER 8: CONCLUSION

My thesis results point to the conclusion that the market for accounting services in Canada is competitive.

This analysis incorporated several databases *The Globe and Mail* top 500 Non-Financial and top 100 Financial firms ; Special private data runs provided by Statistics Canada for SIC categories 773--Accounting and Bookkeeping Services, and 777--Management Consulting Services; and, data collected from *The Bottom Line* and *The Financial Post 500*.

The industry is highly concentrated, and was so prior to the significant merger activity examined in the period between 1987 and 1992. Even if one were to accept the Concentration Doctrine, the evidence does not indicate that the changes in the market structure have increased the market power of the remaining firms.

In fact, there is more evidence to suggest that competition is increasing in the audit industry, based on the number of auditors operating in each industry segment, the growth in business in both the large and small industry segments, which indicate a lack of barriers to entry for firms into the industry.

There are also indications that clients have considerable power to make choices, which the suppliers must be subservient to. These indications include the prevalence of regional

preferences in auditor choice, the lack of specialization of auditors within each industry segment, and the influence of parent firms--even across international borders--in auditor choice.

The regional prevalence of mid-size firms is unique to Canada. Mid-size firms are in severe decline across the country, with the one exception of Quebec. These mid-size firms have affiliated themselves with national firms to provide a broader mix of products for their clients, and given the current political climate, it seems unlikely that this group of mid-size regional firms will disappear.

In addition, the industry specialization by auditors appears to be completely negligible in non-regulated industries. This is in contrast to the numerous claims of industry specialization by audit firms. What is demonstrated is the dominance of an auditor in an industry category is dependant on the method employed of generating the statistic. In other words, the finding of auditor industry specialization is most likely confounded with client firm dominance in an industry category.

In fact, based on the auditor-client ratios, it appears that client firms go out of their way to contract with auditors that do not already have a contract in the industry. This finding suggests that there is a limit to the level of specialization, and market power in an industry category. This finding also suggests that audit firms may not reap additional market share with additional merger activity.

The significant growth of small firms is an indication of healthy competition existing at the small server level. This growth may be attributed to various factors in the economy such as the growth in the service industry, significant downsizing by large corporations, the increased availability and price decline of technology, and minimal barriers to entry. The last reason, the low barrier to entry, is important to this study as it provides evidence of competition within the industry, especially for small auditors. This lends support to Simunic's (1980) assumption of competition for small client firm audits.

Concerns regarding the erosion of independence for audits because of the change in the product mix being offered by accounting firms, appears to have minimal weight in Canada. One firm, Arthur Anderson, has few audits but many other clients. It appears, although this is not confirmed, this firm has not relied on its audit work to obtain consulting, information technology and other contracts.

On the whole, there appears to be a difference in the clients that the large firms audit, as large client firms are more likely to contract large auditors in my sample. Mid-size audit firms' clients are significantly smaller than the large audit firms' clients.

One area of interest is the exceedingly high concentration of auditors for the Big Six banks, despite the regulatory requirement of auditor switching. If concentration does correlate with market power, which I do not accept to be the case anyway, the switching requirement should mitigate the market power. A more important issue is the

specialization of an auditor in this industry, the *only* substantial case in all the industries I examined. There may be reason to examine this issue in further depth (bank auditors have received considerable attention through the Estey Commission, which examined two bank failures) as the potential for big bank mergers is high in the very near future.

What may have to be considered in the future, if further mergers take place, is the role and ability of Canadian regulators to decide 'our own destiny' in the face of international changes. After all, it cannot be assumed that what is good for the international company or the country(ies) it operates in, is welfare enhancing in Canada. On the other hand, impeding Canadian firms from participating in strategic alliances worldwide may be more of a detriment and could prevent Canadian firms from being global competitors.

To restate Demsetz, if high market share is achieved through superior performance in open competition with other firms, the successful competitor should not be penalized for his success. My findings lead me to conclude that the accounting industry, and the merged audit firms, should be respected for their achievements.

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LIST OF APPENDICES

APPENDIX 1
Legend: Abbreviations

aa	Arthur Anderson
ag	Auditor General of Alberta
ay	Arthur Young
be	Berger Blais Greene
bhhhp	Burrington, Heywood, Holms, Hills & Blair
bhp	Burrington, Heywood & Partners
cb	Collins Barrow
cbcg	Caron Belanger--Clarkson Gordon
cbey	Caron Belanger--Ernst & Young
cbmn	Collins Barrow--Maheu Noiseux
cfhc	Charette, Fortier, Hawey & Cie
cg	Clarkson Gordon
cl	Coopers & Lybrand
dc	Dunwoody & Co.
dfk	Dionne Forest Kirouac
dhs	Deloitte Haskins Sells
dt	Deloitte & Touche
dr	Doane Raymond
drp	Doane Raymond Pannell
dw	Dunwoody & Co.
ew	Ernst & Whinney
ey	Ernst & Young
gc	Gaviller & Co
gw	Geo. A. Welch & Company
hda	Harel, Drouin & Associes

hel	Hillborn Ellis Grant
hh	Hyde Houghton
lctr	Lippman Leebosh April & Partners
lhlc	Langois, Hauck, Lettner & Co
lilly	Lilly, Johannesson, McWilliams, Pallone
lh	Laventhol & Horwath
ll	Lalibert Lanctot
llcl	Lalibert Lanctot--Coopers & Lybrand
lwga	Lipton, Wiseman, Greenspoon & Altbaum
mbbr	Mallette, Benoit, Boulanger, Rondeau & Associes
mhrgr	Miller, Hersh, Rabinovitch, Goldsmith & Rosenthal
mm	Malette Maheu
mn	Maheu Noiseux
mrr	Millard, Rouse & Rosebrugh
nh	Nemeth Hoymeyer & Thody
phpmt	Poissant Thibault--Peat Marwick Thorne
pkf	Pannell Kerr Forester
pmm	Peat Marwick Mitchell
pmt	Peat Marwick Thorne
pr	Poissant Richard
pw	Price Waterhouse
rcmp	Raymond, Chabot, Martin, Pare & Associes
rptr	Roleau Potvin Pellerom Gagnon
ruv	Richer, Usher & Vineberg
sb	Samson Belair
sbdt	Samson Belair --Deloitte Touche

sc	Steele & Co.
sic	Soberman, Isenbaum & Columby
skrbg	Starkman, Kraft, Rothman, Berger & Grill
slf	Schwartz Levitsky Feldman
thorne	Thorne Riddell
tr	Touche Ross
we	Wm. Eisenberg & Co.
zssl	Zittrer, Siblin, Stein, Levine

APPENDIX 2

**Data and Methodology on the Sample of Top 500 and Top 100 Financial Firms for
1987 and 1992: Overall Concentration Statistics**

METHODOLOGY

I compiled data for the top 500 non-financial firms and top 100 financial firms[1], based

on total assets, for 1987 and 1992. The list of the top 500 and 100 were obtained from

the Globe and Mail Technical Services. This list included the name of the firm, the

auditor, and the total assets.

Using the annual reports of each of these 1200 companies and other background

information, I added the following information: head office location, primary SIC

(Standard Industry Classification) number, and the parent or subsidiary(ies) of the firm.

I then entered the information on a spreadsheet (Quattro Pro 6.0).

The data were arranged by auditor to determine how many audits were performed by

each auditor. Using the number of audits each auditor performed, divided by the

number of audits performed within each sample group (ie. the top 500 for 1987, the

top 500 for 1992, the top 100 financial for 1987, the top 100 financial for 1992),

percentages of audits performed by each auditor were calculated.[2]

---

[1]

This group contained SIC categories 60, 61, 62, and 63.

[2]

Some clients had two auditors. Two auditors are required by law for Schedule I banks. Other firms may
have two auditor requirements imposed upon them by shareholders or other stakeholders in the company.

Similarly, using the square root of the total assets for each client firm[3] another

'percentage of audits performed' calculation was made. The sum of the square roots of

assets for all the clients of each auditor was calculated within each sample group.

These sums were divided by the total sum of square roots of assets for the whole

sample group. This yielded a percentage of audit business based on probable audit

revenue (Simunic, 1980)

These two percentage calculations (herein called market share), based on either the

number of audits or on the square root of assets, were used to calculate concentration

statistics. Thus, two concentration statistics were generated for each sample group.

The CR4, is the percent of business conducted by the top four [audit] firms; the

Herfindahl Index (HHI) indicates both the concentration and market share of firms in a

market.

The Herfindahl Index (HHI) is the sum of the percentage of market share squared, and in

some cases is represented as the sum of market share (not in percentage form) squared.

Either is acceptable, and my thesis uses the form that Eichenseher and Danos (1981) use

where $0<HI>1$. Its use in concentration studies is discussed in the body of my thesis.

Both concentration statistics for each subject group are reported below.

In these cases, each audit firm was awarded one full audit. Therefore, although my samples are based on
the top 500 and top 100 firms, the number of audits exceed the number of firms.

[3]Korpi and Elliot (1978) determined that the square root of the size of the client firm was an
accurate proxy for the audit price. A detailed account of the use of this proxy is contained in the
body of my thesis, under pricing studies.

DATA

Market Share --Top 500--1987			
Auditor	# of audits	% based on number of audits	% Based on Square Root of Assets
aa	15	2.9	3.6
ay	3	0.6	0.5
be	1	0.2	0.1
bhhhb	1	0.2	0
cb	3	0.6	0.1
cfhc	1	0.2	0.1
cg	83	16.1	16.4
cl	67	13.0	9.9
dc	1	0.2	0.1
dhs	25	4.8	3.3
dr	4	0.8	0.1
ew	1	0.2	0.1
gw	1	0.2	0.1
fn	1	0.2	0.1
gc	1	0.2	0.1
hh	1	0.2	0.1
ll	1	0.2	0.1
lc	1	0.2	0.1
lctr	1	0.2	0.1
lh	5	1.0	0.4
lhl	1	0.2	0.1
lwga	1	0.2	0.1
mbbr	1	0.2	0.2
mn	3	0.6	0.2
nh	1	0.2	0.1
pkf	1	0.2	0.1
pmm	45	8.7	8.1
pr	3	0.6	3.0
pw	73	14.1	18.7
rcmp	12	2.3	2.5
rptr	1	0.2	0.1
ruv	7	1.4	0.5
sb	16	3.1	2.2
sc	1	0.2	0.1

Market Share --Top 500--1987			
skrbg	1	0.2	0.1
thorne	75	14.5	13.9
tr	54	10.5	13.7
we	3	0.6	0.1
zssl	1	0.2	0.1

1987   Concentration Statistics --Square Root of Assets: CR4: 62.7   HHI: 0.1208
Data   Concentration Statistics --Number of Audits: CR4: 57.7 HHI: 0.1074

Market Share --Top 500--1992			
Auditor	# of audits	% based on number of audits	% based on Square Root of Assets
aa	22	4.4	4.5
bhp	1	0.2	0.09
cbey	3	0.6	0.6
cl	60	12	9.4
dfk	1	0.2	0.06
drp	5	1.0	0.7
dt	78	15.6	19.5
ey	69	13.8	15.2
hda	1	0.2	0.05
hh	1	0.2	0.08
lhlc	1	0.2	0.09
lilly	1	0.2	0.06
llcl	1	0.2	0.06
mhrgr	1	0.2	0.1
mm	3	0.6	0.55
sbdt	19	3.8	2.1
phpmt	1	0.2	0.24
pmt	119	23.8	21.4
pw	83	16.6	21.2
rcmp	20	4.0	2.3
ruv	5	1.0	0.3
sic	1	0.2	0.14
zssl	1	0.2	0.06
dw	1	0.2	0.05
kd	1	0.2	0.06
ze	2	0.4	0.2

1992 Concentration Statistics --Square Root of Assets CR4: 77.3% HHI: 0.1639
Data Concentration Statistics --Number of Audits CR4: 69.8% HHI: 0.1473

Market Share--Financial Firms--1987			
Auditor	# of audits	% based on number of audits	% based on Square Root of Assets
aa	1	0.9	.7
alta	1	0.9	.7
que	2	1.8	1.5
can	2	1.8	1.5
ay	1	0.9	.3
cg	16	14.2	18.0
cl	7	6.2	4.4
dhs	8	7.1	8.1
dr	2	1.8	1.7
ey	1	0.9	.7
llcl	1	0.9	1.0
mbra	1	0.9	.4
pkf	1	0.9	.4
pkmg	1	0.9	.3
pmm	14	12.4	14.9
pw	14	12.4	13.4
rcmp	5	4.4	3.9
rf	1	0.9	.4
sb	2	1.8	1
sic	1	0.9	.4
thorne	12	10.6	7.9
tr	16	14.2	15.4
g & co	2	1.8	2.1
pr	1	0.9	.6

1987   Concentration Statistics --Square Root of Assets: CR4: 61.7% HHI: 0.1145
Data   Concentration Statistics --Number of Audits: CR4: 53.2%   HHI: 0.0957

Market Share--Financial Firms--1992			
Auditor	# of audits	% of audits	MarketShare
aa	1	0.9	0.06
cl	11	9.8	4.9
dt	33	29.5	27.0
ey	25	22.3	18.9
gc	1	0.9	1.7
heg	2	1.8	0.3
llcl	1	0.9	1.6
pmt	17	15.2	25.0
pw	12	10.7	17.9
rcmp	6	5.4	5.4
slf	1	0.9	0.1
tr	1	0.9	0.2
sb	1	0.9	0.8

1992 Concentration Statistics --Square Root of Assets CR4: 88.8% HHI: 0.2097
Data Concentration Statistics --Number of Audits CR4: 77.7% HHI: 0.1847

APPENDIX 3

SIC Categories * :   **Top 500 Non-Financial Firms**

Forestry and Forest Products (SIC 8, 24,26)

Metal (SIC 10, 33, 34)

Oil and Gas (SIC 13, 29, 46, 55)

Construction, development and real estate (SIC 15, 16, 17, 65)

Food Manufacturing (SIC 20)

Tobacco (SIC 21)

Textile Mill Product Manufacturing(SIC 22)

Apparel Manufacturing (SIC 23)

Furniture and Fixture Manufacturing (SIC 25)

Printing and Publishing Manufacturing (SIC 27)

Chemical Manufacturing (SIC 28)

Rubber and Plastics Manufacturing (SIC 30)

Stone, Glass, Clay Product Manufacturing (SIC 32)

Machinery Manufacturing (SIC 35)

Electrical and Electronic Machinery Manufacturing (SIC 36)

Transportation Equipment Manufacturing (SIC 37)

Measuring, Analysing, Controlling Instruments Manufacturing (SIC 38)

Miscellaneous Manufacturing (SIC 39)

Railroad Transportation (SIC 40)

Interurban Transportation (SIC 41)

Motor Freight Transportation and Warehousing (SIC 42)

Water Transportation (SIC 44)

Air Transportation (SIC 45)

Transportation Services (SIC 47)

Communications (SIC 48)

SIC Categories* : **Top 500 Non-Financial Firms**

Utilities (SIC 49)

Wholesale Trade - Durables (SIC 50)

Wholesale Trade - Non-durables (SIC 51)

Retail - Building Supplies (SIC 52)

Retail - General Merchandise (SIC 53)

Retail - Food (SIC 54)

Retail - Apparel (SIC 56)

Retail - Furniture (SIC 57)

Retail - Eating and Drinking Places (SIC 58)

Retail - Miscellaneous (SIC 59)

Holding Companies (SIC 67)

Hotels (SIC 70)

Personal Services (SIC 72)

Business Services (SIC 73)

Motion Pictures (SIC 78)

Health Services (SIC 80)

* SIC's 60, 61, 62, 63 (Banking and Financial Services) are separate from this list. The sample of top 100 financial firms contained the 60,61,62,63 categories.

APPENDIX 4
CONCENTRATION DATA AND METHODOLOGY: BROKEN DOWN BY INDUSTRY
CATEGORY

METHODOLOGY

One thousand annual reports were examined to determine the primary industry category

for each of the top 500 non-financial [client] firms in 1987 and 1992. (These two

sample groups were discussed in Appendix 2.) Each [client] firm was placed in only

one Standard Industrial Classification (SIC) to ensure no overlap was encountered.

As I was recording this primary industry information, I also noted secondary industries

that the client firm participated in. The secondary industry information allowed me to

group SIC categories together. It was readily apparent from the client firms that many

firms in one category participated in several other industries, which often were

vertically integrated. Often, [client] firms that were considered to be competitors in an

industry, for example, oil and gas, listed different SIC categories as their primary

industry. This prompted me to group SIC categories based on client participation.

This grouping is noticeable in areas of forestry, oil and gas, metals, and construction

for example. Where firms did not organize themselves in a vertically integrated

fashion, I made no attempt to combine SIC categories.[1]

---

[1]

Many of the concentration studies list the assignment of client firms to an industry as a difficulty and likely downfall to their study. By examining the dynamics of the client, this technique of grouping SIC categories based on vertical integration of the client firms does not make artificial industry groupings. More importantly, the issue under examination is the specialization of the auditor in industry groups, and this technique provides a more direct test of specialization. This technique is novel to this study.

Client firms in each of the 1987 and 1992 data sets were classified in the same SIC category for each period, unless there was evidence that a reclassification was necessary due to [client] firm restructuring.

The data were arranged by auditor within each industry category to determine how many audits were performed by each auditor. The number of audits each auditor performed, divided by the number of audits performed within each industry group, yielded the percent of audits performed by each auditor in each industry category. [2]

Similarly, using the square root of the total assets for each client firm another 'percentage of audits performed' calculation was made. The sum of the square roots of assets for all the clients of each auditor was calculated within each industry group. These sums were divided by the total sum of square roots of assets for the whole industry group.

These two market share calculations, based on number of audits and on square root of assets, were used to calculate concentration statistics for each industry group. Thus, two alternative market share and two alternative concentration statistics were generated for each SIC category in the top 500 non-financial sample for each year [1987 & 1992]. As noted in Appendix 2, the CR4 represents the percent of business conducted by the

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[2] As noted in Appendix 2, some clients had two auditors. Each auditor was awarded one full audit for these calculations as well.

top four [audit] firms;   the Herfandahl Index (HHI) indicates both the concentration and market share of firms in a market. A t-test was performed to determine if there was a significant difference between the mean of the concentrations between 1987 and 1992.

Below is the information on each of the industry categories. The concentration statistics are reported in Appendix 5.

DATA
Forestry and Forest Products (SIC 8, 24,26)

1987

auditor	#of audits	% of audits	% of market
aa	1	3.7	3.1
cb	1	3.7	1.8
mn	1	3.7	1.8
cg	3	11.1	17.9
cl	4	14.8	9.7
dhs	1	3.7	4.4
ew	1	3.7	1.1
pmm	1	3.7	3.1
pw	4	14.8	22.4
rcmp	2	7.4	9.1
sb	2	7.4	5.6
thorne	5	18.5	16.6
tr	1	3.7	3.4

1992

auditor	#of audits	% of audits	% of market
aa	1	3.4	3.7
cl	4	13.8	14.9
dt	3	10.3	2.8
phpmt	1	3.4	3.5
pmt	6	20.7	17.6
pw	9	31.0	38.7
rcmp	2	6.9	7.3
sbdt	1	3.4	1.0
ey	2	6.9	16.9

Metal (SIC 10, 33, 34)

1987

auditor	#of audits	% of audits	% of market
aa	2	2.3	1
cg	19	21.8	26.3
cl	24	27.6	21.3
dhs	5	5.7	3.1
lh	1	1.1	.9
nh	1	1.1	.4
pfkj	1	1.1	.4
pmm	6	6.9	6.7
pw	9	10.3	16.9
rcmp	2	2.3	1.2
sb	1	1.1	.4
thorne	12	3.8	12.5
tr	4	4.6	9

1992

auditor	#of audits	% of audits	% of market
aa	3	3.8	1.8
cl	21	26.6	21.1
dt	5	6.3	8.8
ey	14	17.7	20.8
pmt	20	25.3	22.5
pw	12	15.2	22.3
rcmp	3	3.8	2.2
ruv	1	1.3	0.6

Oil and Gas (SIC 13, 29, 46, 55)

1987

auditor	#of audits	% of audits	% of market
aa	6	7.6	9.8
ay	1	1.3	.9
bhhhb	1	1.3	.4
cb	1	1.3	.4
cg	9	11.4	12.6
cl	8	10.1	6.7
dhs	4	5.1	2.8
pmm	7	8.9	8.3
pw	16	20.3	28.7
thorne	18	22.8	16.9
tr	6	7.6	6.6
rcmp	1	1.3	2.7
pw	1	1.3	3.1

1992

auditor	#of audits	% of audits	% of market
aa	7	8.6	13.7
cl	9	11.1	8.2
dt	12	14.8	11.9
ey	9	11.1	15.7
pmt	21	25.9	19.1
pw	21	25.9	31.9
bhp	1	1.2	0.6
sbdt	1	1.2	2.5

Construction, development and real estate (SIC 15, 16, 17, 65)

1987

auditor	#of audits	% of audits	% of market
ay	1	2.9	1.5
cg	5	14.7	9.3
cl	2	5.9	3.8
dhs	3	8.8	3.7
dr	2	5.9	3.6
lh	2	5.9	3.3
lwga	1	2.9	.9
pmm	5	14.7	23
pw	2	5.9	9.4
rcmp	1	2.9	1.1
thorne	3	8.8	6.0
tr	7	20.6	34.4

1992

auditor	#of audits	% of audits	% of market
ab	1	2.8	5.2
aa	1	2.8	1.3
dr	2	5.6	3.7
cl	2	5.6	2.3
dfk	1	2.8	0.9
dt	8	22.2	38.3
ey	2	5.6	3.4
pmt	10	27.8	28.7
sbdt	1	2.8	0.9
ptpmt	1	2.8	0.9
pw	4	11.1	11.4
zssl	1	2.8	0.8
rcmp	1	2.8	1.2
lilly	1	2.8	0.9

Food Manufacturing (SIC 20)

1987

auditor	#of audits	% of audits	% of market
cg	5	20	23.4
cl	6	24	25.2
pmm	2	8	5.0
pw	6	24	32.5
ruv	1	4	1.4
sb	1	4	1.6
thorne	3	12	9.6
tr	1	4	1.4

1992

auditor	#of audits	% of audits	% of market
cl	5	22.7	20.8
dt	1	4.5	1.2
ey	4	18.2	20.4
pmt	6	27.3	20.3
pw	4	18.2	31.4
rcmp	1	4.5	4.2
sbdt	1	4.5	1.7

Tobacco (SIC 21)

1987

auditor	#of audits	% of audits	% of market
dhs	1	50	75.7
pw	1	50	24.3

1992

auditor	#of audits	% of audits	% of market
cl	1	50	8.2
dt	1	50	91.8

Textile Mill Product Manufacturing(SIC 22)

1987

auditor	#of audits	% of audits	% of market
pmm	1	16.6	15.4
pw	3	50	38.2
tr	2	33.3	46.5

1992

auditor	#of audits	% of audits	% of market
cl	1	20	12.5
dt	1	20	40.5
pw	2	40	33.2
rcmp	1	20	13.8

Apparel Manufacturing (SIC 23)

1987

auditor	#of audits	% of audits	% of market
pw	1	33	24
tr	1	33	18
we	1	33	58

1992

auditor	#of audits	% of audits	% of market
dt	3	75	86.4
ze	1	25	13.6

Furniture and Fixture Manufacturing (SIC 25)
1987

auditor	#of audits	% of audits	% of market
pw	1	20	41.5
sb	1	20	13.9
skkbg	1	20	13.6
thorne	1	20	17.1
we	1	20	13.8

1992

auditor	#of audits	% of audits	% of market
kd	1	20	14.2
mhrgr	1	20	23.2
pmt	1	20	13.9
pw	1	20	35.6
rcmp	1	20	13.1

Printing and Publishing Manufacturing (SIC 27)
1987

auditor	#of audits	% of audits	% of market
aa	1	8.3	16.7
cg	3	25	19.8
cl	1	8.3	4.4
pw	1	8.3	14.1
prichard	1	8.3	10.3
sb	2	16.6	6.2
thorne	3	25	28.4

1992

auditor	#of audits	% of audits	% of market
cbey	1	7.1	1.7
cl	2	14.2	12.8
ey	4	28.6	24.1
pmt	3	21.4	26.3
ptpmt	1	7.1	12.5
pw	1	7.1	12.3
sbdt	2	14.2	10.3

Chemical Manufacturing (SIC 28)

1987

auditor	#of audits	% of audits	% of market
cg	1	12.5	4.6
cl	2	25	13.6
pmm	1	12.5	7.8
thorne	3	37.5	60.5
tr	1	12.5	13.5

1992

auditor	#of audits	% of audits	% of market
cl	1	9.1	2.1
dt	2	18.2	23.0
ey	1	9.1	4.2
pmt	4	36.4	26.8
pw	2	18.2	40.6
sbdt	1	9.1	3.4

Rubber and Plastics Manufacturing (SIC 30)

1987

auditor	#of audits	% of audits	% of market
cl	1	14.3	9.3
pmm	2	28.6	25.7
pw	2	28.6	40.3
gc	1	14.3	16.7
thorne	1	14.3	8

1992

auditor	#of audits	% of audits	% of market
cl	1	12.5	9.4
ey	1	12.5	20.5
pmt	4	50	48.0
sbdt	2	25	22.2

Stone, Glass, Clay Product Manufacturing (SIC 32)

1987

auditor	#of audits	% of audits	% of market
aa	1	20	15.9
pw	1	20	10.9
thorne	1	20	33.2
tr	2	40	40.0

1992

auditor	#of audits	% of audits	% of market
aa	1	25	15.0
dt	1	25	30.6
pmt	1	25	41.3
pw	1	25	13.0

Machinery Manufacturing (SIC 35)

1987

auditor	#of audits	% of audits	% of market
aa	1	10	10.3
cg	1	10	23.0
dhs	1	10	3.3
pmm	2	20	35.9
pw	2	20	8.1
tr	3	30	19.3

1992

auditor	#of audits	% of audits	% of market
cl	1	9.1	6.1
dt	3	27.3	20.9
ey	2	18.2	7.6
mrr	1	9.1	3.2
pmt	2	18.2	55.1
pw	2	18.2	7.2

Electrical and Electronic Machinery Manufacturing (SIC 36)

1987

auditor	#of audits	% of audits	% of market
be	1	5.3	1.8
cb	1	5.3	6.4
cg	4	21	17.8
cl	3	15.8	7.6
dhs	1	5.3	1.6
pmm	4	21	15.5
pw	1	5.3	4.1
ruv	1	5.3	1.8
thorne	1	5.3	2.1
tr	2	10.5	41.3

1992

auditor	#of audits	% of audits	% of market
cbey	1	7.1	17.4
cl	1	7.1	5.7
dr	1	7.1	2.1
dt	3	21.4	40.3
ey	3	21.4	12.3
pmt	3	21.4	13.0
pw	1	7.1	6.1
rcmp	1	7.1	3.0

Transportation Equipment Manufacturing (SIC 37)
1987

auditor	#of audits	% of audits	% of market
cg	3	42.9	70.6
cl	2	28.6	13.4
sb	1	14.3	8.5
tr	1	14.3	7.5

1992

auditor	#of audits	% of audits	% of market
dt	1	20	6.7
ey	3	60	80.9
sbdt	1	20	12.4

Measuring, Analysing, Controlling Instruments Manufacturing (SIC 38)

1987

auditor	#of audits	% of audits	% of market
cg	2	50	36.4
dhs	1	25	21.1
thorne	1	25	42.4

1992

auditor	#of audits	% of audits	% of market
ey	2	50	37.8
pw	1	25	52.5
rcmp	1	25	9.7

Miscellaneous Manufacturing (SIC 39)
1987

auditor	#of audits	% of audits	% of market
lctr	1	33	38.5
tr	2	66	61.5

1992

auditor	#of audits	% of audits	% of market
dt	1	33	25.9
pmt	2	66	74.1

Railroad Transportation (SIC 40)

1987

auditor	#of audits	% of audits	% of market
pw	1	50	78.3
cl	1	50	21.7

1992

auditor	#of audits	% of audits	% of market
cl	1	50	20.4
pw	1	50	79.6

Interurban Transportation (SIC 41)

1987

auditor	#of audits	% of audits	% of market
tr	1	100	100

1992

auditor	#of audits	% of audits	% of market
dt	1	100	100

Motor Freight Transportation and Warehousing (SIC 42)

1987

auditor	#of audits	% of audits	% of market
dhs	1	50	54.2
cl	1	50	45.8

1992

auditor	#of audits	% of audits	% of market
aa	1	20	9.8
cl	2	40	23.6
dt	1	20	51.5
rcmp	1	20	15.1

Water Transportation (SIC 44)

1987

auditor	#of audits	% of audits	% of market
dhs	1	50	71.8
sb	1	50	28.2

1992

auditor	#of audits	% of audits	% of market
dt	1	25	30.7
ey	1	25	23.0
pmt	1	25	34.0
sbdt	1	25	12.3

Air Transportation (SIC 45)

1987

auditor	#of audits	% of audits	% of market
dr	1	50	13.4
thorne	1	50	86.6

1992

auditor	#of audits	% of audits	% of market
aa	1	20	4.5
cbey	1	20	5.6
dr	1	20	10.0
pmt	1	20	33.3
pw	1	20	46.6

Transportation Services (SIC 47)

1987

auditor	#of audits	% of audits	% of market
cg	1	100	100

1992

auditor	#of audits	% of audits	% of market
dt	1	33	38.2
pmt	1	33	26.5
rcmp	1	33	35.3

Communications (SIC 48)

1987

auditor	#of audits	% of audits	% of market
aa	2	7.1	11.4
cg	7	25	19.0
dhs	2	7.1	3.4
mn	1	3.6	1.7
pmm	1	3.6	1.5
pw	3	10.7	6.1
sb	2	7.1	6.4
thorne	3	10.7	8.0
tr	5	17.9	38.1
cfhc	1	3.6	2.4
zssl	1	3.6	1.6

1992

auditor	#of audits	% of audits	% of market
cl	1	3.6	2.0
dt	9	32.1	52.1
sbdt	3	10.7	5.5
ey	5	17.9	11
pmt	5	17.9	13.7
pw	2	7.1	2.8
rcmp	1	3.6	0.7
aa	2	7.1	12.3

Utilities (SIC 49)

1987

auditor	#of audits	% of audits	% of market
cg	4	25	31.3
cl	1	6.3	7.5
pw	5	31.2	33
sb	1	6.3	5.7
pr	1	6.3	5.7
thorne	2	12.5	10.3
tr	2	12.5	6.6

1992

auditor	#of audits	% of audits	% of market
aa	1	4.3	1.8
dt	4	17.4	13.8
ey	6	26.1	36.0
pmt	5	21.7	24.1
pw	7	30.4	24.4

Wholesale Trade -Durables (SIC 50)

1987

auditor	#of audits	% of audits	% of market
aa	1	5	9
cl	2	10	17.7
hh	1	5	3.3
ll	1	5	2.7
pmm	3	15	11.5
pw	1	5	5.6
rcmp	3	15	13.6
rptr	1	5	3.9
tr	2	10	18
ruv	2	10	6.6
sb	1	5	3.7
thorne	2	10	8.1

1992

auditor	#of audits	% of audits	% of market
aa	1	4.5	8.4
cl	2	9.1	20.7
dt	6	27.3	33.1
hda	1	4.5	1.9
hh	1	4.5	2.6
pmt	5	22.7	16.0
pw	1	4.5	3.8
rcmp	3	13.6	8.1
ruv	1	4.5	3.2
sbdt	1	4.5	2.3

Wholesale Trade - Non-durables (SIC 51)

1987

auditor	#of audits	% of audits	% of market
cl	1	11.1	4.5
mbbr	1	11.1	10.9
mn	1	11.1	4.9
pw	1	11.1	8.8
sb	1	11.1	4.7
thorne	3	33.3	60.5
tr	1	11.1	5.7

1992

auditor	#of audits	% of audits	% of market
ey	1	7.7	4.9
mm	2	15.4	16.3
pmt	4	30.8	55.1
pw	2	15.4	10.0
rcmp	1	7.7	3.4
ruv	1	7.7	2.3
sbdt	2	15.4	8.0

Retail - Building Supplies (SIC 52)

1987

auditor	#of audits	% of audits	% of market
tr	1	100	100

1992

auditor	#of audits	% of audits	% of market
dt	2	50	56.1
llcl	1	25	11.2
mm	1	25	32.7

Retail - General Merchandise (SIC 53)

1987

auditor	#of audits	% of audits	% of market
cl	1	16.7	14.9
dhs	2	33.3	13.6
pmm	1	16.7	31.3
tr	1	16.7	26.6
we	1	16.7	13.5

1992

auditor	#of audits	% of audits	% of market
aa	1	20	19.7
dt	1	20	30.7
pmt	1	20	35.6
pw	1	20	9.7
ruv	1	20	4.3

Retail - Food (SIC 54)

1987

auditor	#of audits	% of audits	% of market
cl	1	14.3	18.7
cg	1	14.3	19.2
rcmp	1	14.3	19.2
dr	1	14.3	13.6
lhl	1	14.3	4.9
pmm	1	14.3	15.5
thorne	1	14.3	8.9

1992

auditor	#of audits	% of audits	% of market
drp	1	25	38.4
ey	1	25	10.8
lhlc	1	25	11.3
rcmp	1	25	39.6

Retail - Apparel (SIC 56)

1987

auditor	#of audits	% of audits	% of market
cl	1	20	31.8
lh	1	20	12.7
pmm	1	20	25.2
ruv	1	20	14.9
thorne	1	20	15.3

1992

auditor	#of audits	% of audits	% of market
pw	2	28.6	22.1
cl	1	14.3	29.8
dw	1	14.3	9.5
pmt	1	14.3	18.7
ruv	1	14.3	9.5
sbdt	1	14.3	10.4

Retail - Furniture (SIC 57)

1987

auditor	#of audits	% of audits	% of market
cg	1	50	58.6
ruv	1	50	41.4

1992

auditor	#of audits	% of audits	% of market
ey	1	33	37.7
pmt	1	33	27.9
sbdt	1	33	34.4

Retail - Eating and Drinking Places (SIC 58)

1987

auditor	#of audits	% of audits	% of market
cg	1	50	67.1
cl	1	50	32.9

1992

auditor	#of audits	% of audits	% of market
cl	1	50	41.2
ey	1	50	58.8

Retail - Miscellaneous (SIC 59)

1987

auditor	#of audits	% of audits	% of market
cg	1	50	
thorne	1	50	

1992

auditor	#of audits	% of audits	% of market
ey	1	50	12.4
pmt	1	50	87.6

Holding Companies (SIC 67)

1987

auditor	#of audits	% of audits	% of market
cg	6	15.4	8.9
fn	1	2.6	1.1
cl	1	2.6	1.0
dc	1	2.6	.9
dhs	2	5.1	3
lh	1	2.6	1.1
pmm	2	5.1	4.4
pw	8	20.5	40.5
rcmp	1	2.6	1.0
ruv	1	2.6	1.1
sb	1	2.6	5.2
pr	1	2.6	5.2
sc	1	2.6	1.2
thorne	6	15.4	8.5
tr	6	15.4	24

1992

auditor	#of audits	% of audits	% of market
dt	2	66	48.3
pw	1	33	51.7

Hotels (SIC 70)

1987

auditor	#of audits	% of audits	% of market
gw	1	33	28.6
pmm	1	33	45.8
rcmp	1	33	25.6

1992

auditor	#of audits	% of audits	% of market
cl	1	25	33.5
dt	1	25	17.2
pmt	1	25	37.0
rcmp	1	25	12.3

Personal Services (SIC 72)

1987

auditor	#of audits	% of audits	% of market
pmm	1	100	100

1992

auditor	#of audits	% of audits	% of market
ey	1	50	26.3
pmt	1	50	73.7

Business Services (SIC 73)

1987

auditor	#of audits	% of audits	% of market
cg	2	33.3	26.9
pmm	2	33.3	24.1
thorne	1	16.7	41.5
tr	1	16.7	7.5

1992

auditor	#of audits	% of audits	% of market
aa	1	10	4.0
dt	2	20	7.9
ey	1	10	12.7
pmt	4	40	18.2
pw	2	20	57.2

Motion Pictures (SIC 78)

1987

auditor	#of audits	% of audits	% of market
thorne	1	100	100

1992

auditor	#of audits	% of audits	% of market
aa	1	33	15.5
pmt	1	33	56.9
ze	1	33	27.6

Health Services (SIC 80)

1987

auditor	#of audits	% of audits	%of market
cg	1	100	100

1992

auditor	#of audits	% of audits	%of market
dt	1	20	11.3
ey	1	20	32.4
pmt	1	20	9.0
pw	1	20	25.6
sic	1	20	21.7

Data and Methodology on the Sample of Top 500 Non-Financial Firms for 1987
and 1992: Industry Concentration Data Summary

Concentration Ratio Top Four Firms (CR4) - By Number of Audits		
SIC Category	1987	1992
Forestry and Forest Products (SIC 8, 24,26)	59.2	75.8
Metal (SIC 10, 33, 34)	66.6	84.8
Oil and Gas (SIC 13, 29, 46, 55)	64.6	77.7
Construction, development and real estate(SIC 15, 16, 17, 65)	58.8	66.7
Food Manufacturing (SIC 20)	80.0	86.4
Tobacco (SIC 21)	100	100
Textile Mill Product Manufacturing(SIC 22)	100	100
Apparel Manufacturing (SIC 23)	100	100
Furniture and Fixture Manufacturing (SIC 25)	80.0	80.0
Printing and Publishing Manufacturing (SIC 27)	74.9	78.4
Chemical Manufacturing (SIC 28)	87.5	81.8
Rubber and Plastics Manufacturing (SIC 30)	85.7	100
Stone, Glass, Clay Product Manufacturing (SIC 32)	100	100
Machinery Manufacturing (SIC 35)	80.0	81.8
Electrical and Electronic Machinery Manufacturing (SIC 36)	68.3	71.3
Transportation Equipment Manufacturing (SIC 37)	100	100
Measuring, Analysing, Controlling Instruments Manufacturing (SIC 38)	100	100
Miscellaneous Manufacturing (SIC 39)	100	100
Railroad Transportation (SIC 40)	100	100
Interurban Transportation (SIC 41)	100	100
Motor Freight Transportation and Warehousing (SIC 42)	100	100
Water Transportation (SIC 44)	100	100

Concentration Ratio Top Four Firms (CR4) - By Number of Audits		
Air Transportation (SIC 45)	100	80
Transportation Services (SIC 47)	100	100
Communications (SIC 48)	64.3	78.6
Utilities (SIC 49)	81.1	95.7
Wholesale Trade - Durables (SIC 50)	50.0	72.7
Wholesale Trade - Non-durables (SIC 51)	66.6	77.0
Retail - Building Supplies (SIC 52)	100	100
Retail - General Merchandise (SIC 53)	83.3	80.0
Retail - Food (SIC 54)	57.2	100
Retail - Apparel (SIC 56)	80.0	71.4
Retail - Furniture (SIC 57)	100	100
Retail - Eating and Drinking Places (SIC 58)	100	100
Retail - Miscellaneous (SIC 59)	100	100
Holding Companies (SIC 67)	66.7	100
Hotels (SIC 70)	100	100
Personal Services (SIC 72)	100	100
Business Services (SIC 73)	100	90
Motion Pictures (SIC 78)	100	100
Health Services (SIC 80)	100	80

Herfindahl Index -- Number of Audits		
SIC Category	1987	1992
Forestry and Forest Products (SIC 8, 24,26)	0.1109	0.1816
Metal (SIC 10, 33, 34)	0.1474	0.1962
Oil and Gas (SIC 13, 29, 46, 55)	0.1393	0.1884
Construction, development and real estate(SIC 15, 16, 17, 65)	0.1176	0.1546
Food Manufacturing (SIC 20)	0.1808	0.1984
Tobacco (SIC 21)	0.5	0.5
Textile Mill Product Manufacturing(SIC 22)	0.3884	0.28
Apparel Manufacturing (SIC 23)	0.3267	0.625
Furniture and Fixture Manufacturing (SIC 25)	0.2	0.2
Printing and Publishing Manufacturing (SIC 27)	0.1801	0.1830
Chemical Manufacturing (SIC 28)	0.25	0.2236
Rubber and Plastics Manufacturing (SIC 30)	0.2249	0.3436
Stone, Glass, Clay Product Manufacturing (SIC 32)	0.28	0.25
Machinery Manufacturing (SIC 35)	0.2	0.1905
Electrical and Electronic Machinery Manufacturing (SIC 36)	0.1410	0.1626
Transportation Equipment Manufacturing (SIC 37)	0.3067	0.44
Measuring, Analysing, Controlling Instruments Manufacturing (SIC 38)	0.375	0.375
Miscellaneous Manufacturing (SIC 39)	0.5445	0.5445
Railroad Transportation (SIC 40)	0.5	0.5
Interurban Transportation (SIC 41)	1	1
Motor Freight Transportation and Warehousing (SIC 42)	0.5	0.28
Water Transportation (SIC 44)	0.5	0.25
Air Transportation (SIC 45)	0.5	0.2
Transportation Services (SIC 47)	1	0.3267
Communications (SIC 48)	0.1377	0.1912

Herfindahl Index -- Number of Audits		
Utilities (SIC 49)	0.2030	0.2398
Wholesale Trade - Durables (SIC 50)	0.1	0.1650
Wholesale Trade - Non-durables (SIC 51)	0.1848	0.1838
Retail - Building Supplies (SIC 52)	1	0.375
Retail - General Merchandise (SIC 53)	0.2224	0.2
Retail - Food (SIC 54)	0.1431	0.25
Retail - Apparel (SIC 56)	0.2	0.1840
Retail - Furniture (SIC 57)	0.5	0.3267
Retail - Eating and Drinking Places (SIC 58)	0.5	0.5
Retail - Miscellaneous (SIC 59)	0.5	0.5
Holding Companies (SIC 67)	0.1245	0.5445
Hotels (SIC 70)	0.3267	0.25
Personal Services (SIC 72)	1	0.5
Business Services (SIC 73)	0.2776	0.26
Motion Pictures (SIC 78)	1	0.3267
Health Services (SIC 80)	1	0.2

Concentration Ratio Top Four Firms (CR4) - By Square Root of Total Assets		
SIC Category	1987	1992
Forestry and Forest Products (SIC 8, 24,26)	66.6	88.1
Metal (SIC 10, 33, 34)	77.0	86.7
Oil and Gas (SIC 13, 29, 46, 55)	68.0	80.4
Construction, development and real estate(SIC 15, 16, 17, 65)	76.1	83.6
Food Manufacturing (SIC 20)	90.7	92.9
Tobacco (SIC 21)	100	100
Textile Mill Product Manufacturing(SIC 22)	100	100
Apparel Manufacturing (SIC 23)	100	100
Furniture and Fixture Manufacturing (SIC 25)	86.3	86.9
Printing and Publishing Manufacturing (SIC 27)	79.0	75.7
Chemical Manufacturing (SIC 28)	82.4	94.5
Rubber and Plastics Manufacturing (SIC 30)	92.0	100
Stone, Glass, Clay Product Manufacturing (SIC 32)	100	100
Machinery Manufacturing (SIC 35)	88.5	90.7
Electrical and Electronic Machinery Manufacturing (SIC 36)	82.2	83.0
Transportation Equipment Manufacturing (SIC 37)	100	100
Measuring, Analysing, Controlling Instruments Manufacturing (SIC 38)	100	100
Miscellaneous Manufacturing (SIC 39)	100	100
Railroad Transportation (SIC 40)	100	100
Interurban Transportation (SIC 41)	100	100
Motor Freight Transportation and Warehousing (SIC 42)	100	100
Water Transportation (SIC 44)	100	100
Air Transportation (SIC 45)	100	95.5
Transportation Services (SIC 47)	100	100

Concentration Ratio Top Four Firms (CR4) - By Square Root of Total Assets		
Communications (SIC 48)	76.5	89.1
Utilities (SIC 49)	82.1	98.2
Wholesale Trade - Durables (SIC 50)	60.8	78.2
Wholesale Trade - Non-durables (SIC 51)	85.9	89.4
Retail - Building Supplies (SIC 52)	100	100
Retail - General Merchandise (SIC 53)	86.4	95.7
Retail - Food (SIC 54)	72.6	100
Retail - Apparel (SIC 56)	87.2	81.0
Retail - Furniture (SIC 57)	100	100
Retail - Eating and Drinking Places (SIC 58)	100	100
Retail - Miscellaneous (SIC 59)	100	100
Holding Companies (SIC 67)	81.9	100
Hotels (SIC 70)	100	100
Personal Services (SIC 72)	100	100
Business Services (SIC 73)	100	96.0
Motion Pictures (SIC 78)	100	100
Health Services (SIC 80)	100	91.0

Herfindahl Index -- By Square Root of Total Assets		
SIC Category	1987	1992
Forestry and Forest Products (SIC 8, 24,26)	0.1366	0.2403
Metal (SIC 10, 33, 34)	0.1725	0.1967
Oil and Gas (SIC 13, 29, 46, 55)	0.1548	0.2032
Construction, development and real estate(SIC 15, 16, 17, 65)	0.1979	0.2481
Food Manufacturing (SIC 20)	0.2359	0.2268
Tobacco (SIC 21)	0.6325	0.8489
Textile Mill Product Manufacturing(SIC 22)	0.3852	0.3089
Apparel Manufacturing (SIC 23)	0.4262	0.7643
Furniture and Fixture Manufacturing (SIC 25)	0.2587	0.2374
Printing and Publishing Manufacturing (SIC 27)	0.1842	0.1852
Chemical Manufacturing (SIC 28)	0.4110	0.2925
Rubber and Plastics Manufacturing (SIC 30)	0.2714	0.3298
Stone, Glass, Clay Product Manufacturing (SIC 32)	0.3075	0.3041
Machinery Manufacturing (SIC 35)	0.2377	0.3626
Electrical and Electronic Machinery Manufacturing (SIC 36)	0.2392	0.2335
Transportation Equipment Manufacturing (SIC 37)	0.5296	0.6738
Measuring, Analysing, Controlling Instruments Manufacturing (SIC 38)	0.3574	0.4282
Miscellaneous Manufacturing (SIC 39)	0.5264	0.6161
Railroad Transportation (SIC 40)	0.6600	0.6748
Interurban Transportation (SIC 41)	1	1
Motor Freight Transportation and Warehousing (SIC 42)	0.5035	0.3536
Water Transportation (SIC 44)	0.5946	0.2778

Herfindahl Index -- By Square Root of Total Assets		
Air Transportation (SIC 45)	0.7677	0.3434
Transportation Services (SIC 47)	1	0.3407
Communications (SIC 48)	0.2118	0.3219
Utilities (SIC 49)	0.2335	0.2665
Wholesale Trade - Durables (SIC 50)	0.1226	0.1953
Wholesale Trade - Non-durables (SIC 51)	0.3959	0.3507
Retail - Building Supplies (SIC 52)	1	0.4341
Retail - General Merchandise (SIC 53)	0.2280	0.2709
Retail - Food (SIC 54)	0.1616	0.3282
Retail - Apparel (SIC 56)	0.2267	0.2015
Retail - Furniture (SIC 57)	0.5147	0.3383
Retail - Eating and Drinking Places (SIC 58)	0.5587	0.5155
Retail - Miscellaneous (SIC 59)	0.6072	0.7829
Holding Companies (SIC 67)	0.2457	0.5006
Hotels (SIC 70)	0.3267	0.25
Personal Services (SIC 72)	1	0.6126
Business Services (SIC 73)	0.3081	0.3841
Motion Pictures (SIC 78)	1	0.4243
Health Services (SIC 80)	1	0.2386

Data and Methodology on the Number of SIC Categories each Auditor Audits

METHODOLOGY

Using the industry information, a simple count of how many industry categories each

audit firm had an audit was made. In the case of merged firms (Thorne and PMM to

PMT; DHS and TR to DT), or name changes (CG to EY), or affiliations (SB to SBDT),

the information for these changed entities is contained on the same row for ease of

comparison. This information comes from the top 500 samples, and the maximum

number of categories is 41.

DATA

Total Number of Industry Categories each Auditor Audits			
Auditor	1987	1992	Changes
aa	8	13	5
cg/ey	21	23	2
cl	20	19	-1
pw	17	24	7
rcmp	8	13	5
sb/sbdt	12	14	2
dhs/dt	13	27	
tr/dt	22		3
thorne	23	28	
pmm	18		4

APPENDIX 7

Data and Methodology on Auditor Client Ratios

METHODOLOGY

The ratio of the number of auditors to clients (or more specifically audits) was calculated for each industry category. In simple terms, the number of auditors was divided by the total number of audits in each SIC category. This is a new measure created for this analysis.

If the ratio is equal to one, there is a different auditor for each audit. As the ratio approaches zero, either one auditor audits all (or most) or the clients, or there are few clients.

The ratio catches dynamics of auditor specialization that both the CR4 and HHI miss. The ratio ignores client firm size, as do the concentration statistics based on the number of audits (as opposed to the square root of total assets data). The ratio is a complimentary measure to the concentration statistics as it indicates how many auditors are involved in a industry compared to the number of clients. The ratio is especially helpful in industry categories in which there are only a small number of client firms. Instead of focussing on the auditors, this ratio shifts some attention to the dynamics of the clients and the industry they participate in.

A t-test was performed to determine if there is a significant difference between the mean of the ratios between 1987 and 1992.

DATA

Auditor--Client Ratio				
SIC Category	1987	%1987	1992	%1992
Forestry and Forest Products (SIC 8, 24,26)	13/27	0.48	9/29	0.31
Metal (SIC 1 0, 33, 34)	13/87	0.15	8/79	0.1
Oil and Gas (SIC 13, 29, 46, 55)	13/79	0.16	8/81	0.1
Construction, development and real estate(SIC 15, 16, 17, 65)	12/34	0.35	14/36	0.39
Food Manufacturing (SIC 20)	8/25	0.32	7/22	0.32
Tobacco (SIC 21)	2/2	1	2/2	1
Textile Mill Product Manufacturing(SIC 22)	3/6	0.5	4/5	0.8
Apparel Manufacturing (SIC 23)	3/3	1	2/4	0.5
Furniture and Fixture Manufacturing (SIC 25)	5/5	1	5/5	1
Printing and Publishing Manufacturing (SIC 27)	7/12	0.58	7/14	0.5
Chemical Manufacturing (SIC 28)	5/8	0.625	6/11	0.55
Rubber and Plastics Manufacturing (SIC 30)	5/7	0.71	4/8	0.5
Stone, Glass, Clay Product Manufacturing (SIC 32)	4/5	0.8	4/4	1
Machinery Manufacturing (SIC 35)	6/10	0.6	6/11	0.55
Electrical and Electronic Machinery Manufacturing (SIC 36)	10/19	0.53	8/14	0.57
Transportation Equipment Manufacturing (SIC 37)	4/7	0.57	3/5	0.6
Measuring, Analysing, Controlling Instruments Manufacturing (SIC 38)	3/4	0.75	3/4	0.75
Miscellaneous Manufacturing (SIC 39)	2/3	0.66	2/3	0.66
Railroad Transportation (SIC 40)	2/2	1	2/2	1
Interurban Transportation (SIC 41)	1/1	1	1/1	1

Auditor--Client Ratio				
Motor Freight Transportation and Warehousing (SIC 42)	2/2	1	4/5	0.8
Water Transportation (SIC 44)	2/2	1	4/4	1
Air Transportation (SIC 45)	2/2	1	5/5	1
Transportation Services (SIC 47)	1/1	1	3/3	1
Communications (SIC 48)	11/28	0.39	8/28	0.29
Utilities (SIC 49)	7/16	0.44	5/23	0.22
Wholesale Trade - Durables (SIC 50)	12/20	0.6	10/22	0.45
Wholesale Trade - Non-durables (SIC 51)	7/9	0.78	7/13	0.54
Retail - Building Supplies (SIC 52)	1/1	1	3/4	0.75
Retail - General Merchandise (SIC 53)	5/6	0.83	5/5	1
Retail - Food (SIC 54)	7/7	1	4/4	1
Retail - Apparel (SIC 56)	5/5	1	6/7	0.86
Retail - Furniture (SIC 57)	2/2	1	3/3	1
Retail - Eating and Drinking Places (SIC 58)	2/2	1	2/2	1
Retail - Miscellaneous (SIC 59)	2/2	1	2/2	1
Holding Companies (SIC 67)	15/39	0.38	2/3	0.67
Hotels (SIC 70)	3/3	1	4/4	1
Personal Services (SIC 72)	1/1	1	1/1	1
Business Services (SIC 73)	4/6	0.67	5/10	0.5
Motion Pictures (SIC 78)	1/1	1	3/3	1
Health Services (SIC 80)	1/1	1	5/5	1

APPENDIX 8

Parent-Subsidiary Firm Data and Methodology on the Sample of Top 500 Non-Financial Firms 1992: HHI Comparisons

METHODOLOGY

Using the annual reports of the top 500 non-financial firms for 1992,[1] both parent and

subsidiary firms of the firms in my sample were recorded. All subsidiary firms were

pulled out of the database (the database described in Appendix 2), and concentration

(HHI) statistics were calculated and compared to the originals.

Although most of the parent-subsidiary groups were domestic, some Canadian firms

had internationally based parents. In these cases, the Canadian subsidiary was pulled

out of my database.

The subsidiaries were pulled out of the database regardless of which auditor they

used. A simple calculation of how many parent-subsidiary groups used the same

auditor was also performed.

The parent - subsidiary relationships of the client firms were based on ownership, and

was for the most part easy to determine. Investment in a firm by pension groups and

investment firms, did not constitute parental status.[2] The subsidiaries were pulled

from the data set, and the concentration statistics were performed on this subset of the

original data.

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[1]

The 1987 data additional data sources were not sufficiently reliable for this part of the study. Therefore I performed the parental concentration only on the 1992 data.

[2]

Although this influence does beg an interesting question, as to the influence of money and pension managers over auditor choice. Studies have examined the influence of bankers and lenders in the auditor choice.

DATA

Comparing Parent to Regular Data (using HHI) --By Square Root of Total Assets		
SIC Category	1992	1992P
Forestry and Forest Products (SIC 8, 24,26)	0.2403	0.2112
Metal (SIC 10, 33, 34)	0.1967	0.2059
Oil and Gas (SIC 13, 29, 46, 55)	0.2032	0.1802
Construction, development and real estate(SIC 15, 16, 17, 65)	0.2481	0.2362
Food Manufacturing (SIC 20)	0.2268	0.2343
Tobacco (SIC 21)	0.8489	--
Textile Mill Product Manufacturing(SIC 22)	0.3089	0.3193
Apparel Manufacturing (SIC 23)	0.7643	0.7291
Furniture and Fixture Manufacturing (SIC 25)	0.2374	0.2374
Printing and Publishing Manufacturing (SIC 27)	0.1852	0.1785
Chemical Manufacturing (SIC 28)	0.2925	0.3059
Rubber and Plastics Manufacturing (SIC 30)	0.3298	0.3298
Stone, Glass, Clay Product Manufacturing (SIC 32)	0.3041	0.3041
Machinery Manufacturing (SIC 35)	0.3626	0.2603
Electrical and Electronic Machinery Manufacturing (SIC 36)	0.2335	0.2335
Transportation Equipment Manufacturing (SIC 37)	0.6738	0.6137
Measuring, Analysing, Controlling Instruments Manufacturing (SIC 38)	0.4282	0.4282
Miscellaneous Manufacturing (SIC 39)	0.6161	0.6161
Railroad Transportation (SIC 40)	0.6748	0.6748
Interurban Transportation (SIC 41)	1	--
Motor Freight Transportation and Warehousing (SIC 42)	0.3536	0.4225
Water Transportation (SIC 44)	0.2778	0.2778

Comparing Parent to Regular Data (using HHI) --By Square Root of Total Assets		
Air Transportation (SIC 45)	0.3434	0.3434
Transportation Services (SIC 47)	0.3407	0.3407
Communications (SIC 48)	0.3219	0.4298
Utilities (SIC 49)	0.2665	0.3065
Wholesale Trade - Durables (SIC 50)	0.1953	0.2178
Wholesale Trade - Non-durables (SIC 51)	0.3507	0.2406
Retail - Building Supplies (SIC 52)	0.4341	0.4341
Retail - General Merchandise (SIC 53)	0.2709	0.3678
Retail - Food (SIC 54)	0.3282	0.3282
Retail - Apparel (SIC 56)	0.2015	0.2015
Retail - Furniture (SIC 57)	0.3383	0.3383
Retail - Eating and Drinking Places (SIC 58)	0.5155	1
Retail - Miscellaneous (SIC 59)	0.7829	0.7829
Holding Companies (SIC 67)	0.5006	1
Hotels (SIC 70)	0.25	0.2937
Personal Services (SIC 72)	0.6126	0.6126
Business Services (SIC 73)	0.3841	0.3966
Motion Pictures (SIC 78)	0.4243	0.5395
Health Services (SIC 80)	0.2386	0.2386

-- indicates that there are no firms left in the industry category.

DISTRIBUTION OF AUDITS BASED ON LOCATION OF CLIENT FIRM HEADQUARTERS (BY PROVINCE)

METHODOLOGY

The client firm's headquarters were added to the data described in Appendix 2. The

number of audits each auditor performed in each province was noted, and the percentage

of audits performed by each auditor was calculated by dividing the number of audits per

auditor by the total number of audits in the province.

DATA
Province:

Alberta

Auditor	% of audits
aa	5.7
ab	1.0
bhp	1.0
cl	7.6
dt	17.1
ey	12.4
pmt	26.7
pw	28.6

British Columbia

aa	8.8
cl	21.1
dr	1.8
dt	14.0
ey	8.8
lilly	1.8
pmt	29.8
pw	14.0

Manitoba

cl	30
dt	40
pmt	10
pw	20

Newfoundland

dr	20
dt	60
pmt	20

Nova Scotia

cl	12.5
dr	37.5
ey	50

Ontario

aa	3.6
cl	13.8
dt	16.3
ey	19.9
pmt	29.1
pw	14.8
kd	.5
lhlc	.5
mrr	.5
ruv	.5
sic	.5

Prince Edward Island

ey	50
pw	50

Quebec

aa	2.7
cl	8.0
dt	8.9
ey	3.6
pmt	10.7
pw	11.6
dw	0.9
ze	1.8
cbey	2.7
dfk	0.9
hda	0.9
hh	0.9
llcl	0.9
mhrgr	0.9
mm	2.7
sbdt	17.0
ptpmt	2.7
rcmp	17.8
ruv	3.6
zssl	0.9

Saskatchewan

dt	50
ey	25
pmt	25

APPENDIX 10

Data on Clients changing auditor ('switching') over 1987-1992 period

METHODOLOGY

The data were prepared in the following manner. A list of the firms that appeared in both samples was compiled by visually comparing both lists. The firms were then categorized by auditor for the 1987 year. This created a lists of clients for each auditor. The client's 1992 auditor was then written down beside the client. Totals for retained auditor, and new (switched) auditor were then calculated.

The merged firms were treated as the same firm from 1987 to 1992. Therefore, a change in auditor because of merger was not considered a switch and the data is 'controlled for' merger activity. For simplicity, the 1992 auditor name is used rather than the 1987 pre-merger names in the tables below.

The data does not reflect any changes made in the years between the two samples. It only examines the client's auditor in the year 1987 and in the year 1992, and determines if the client uses the same auditor in both, or if the client uses different auditors for each year.

In addition, only the Top 500 samples were used in the preparation of this data. Switching is mandatory for banks, therefore findings in the top 100 financial firm sample may be due to regulatory and not other factors.

DATA

Table: Switching Data Among Big Six: Top 500 Firms					
Auditor 1992	# of audits 1992	# of audits 1987	# of clients audited in both years	number of clients lost	number of clients gained
aa	10	12	10	2	0
cl	41	39	37	2	4
dt	38	40	36	4	2
ey	47	48	43	5	4
pmt	66	66	58	8	8
pw	47	44	40	4	7
Totals	249	249	224	25	25

APPENDIX 11

Big Six Banks' Auditor Concentration

METHODOLOGY

The Bank Act Requires Schedule I Banks to retain two auditors each year, and substitute in a third auditor periodically. Therefore, the 'Big Six' banks retain 12 auditors yearly. This data represents the concentration of the auditors of Canada's largest banks, based on number of audits only. The percentage of audits is calculated by dividing the number of audits the auditor has by 12 (the total number of audits in the sector).

The 'Effect of Merger' table compares the 1987 and 1992 data. The 1987 data uses the sum of the merging firm's audits. In other words, the number of audits Thorne and PMM performed in 1987 are added up and listed under PMT in 1987. The sum could be considered a potential merger result. The sum is compared to the number of audits in 1992.

The gain/loss of only one audit is due to a bank using two auditors that were about to merge. The legal requirement to retain two auditors, forced this bank to obtain another auditor.

DATA

1987

Auditor	# of audits	% of audits
cg	2	16.7
tr	2	16.7
dhs	1	8.3
pmm	3	25
pw	2	16.7
thorne	1	8.3
rcmp	1	8.3

1992

Auditor	# of audits	% of audits
dt	2	16.7
ey	2	16.7
pmt	5	41.7
pw	2	16.7
rcmp	1	8.3

Effect of Merger

Auditor	Gain (loss)
dt	(1)
ey	0
pmt	1
pw	0
rcmp	0

APPENDIX 12

STATISTICS CANADA METHODOLOGY

"This report is one of the elements of Statistics Canada's Small Business Program.
....This report is a longitudinal assessment of T4 data that classifies business according to their life statuses based on an initial year and a terminal year. It displays the number of businesses, [and] total payroll of these business, calculated in average labour units (ALU's) for the initial year of the study and for the terminal year. In addition, the tables reflect the life status of those businesses which were continuously identified over the period covered (and further divided into those recording an increase in ALU's and those recording a decrease), those which were newly identified during the period and those which were no longer identified for each ALU size group.

COVERAGE
The report covers all employees who are issued T4 tax records. Employees earning less than $500 a year may be excluded as this is the cut off for mandatory issuance of T4 tax records.

DEFINITIONS

AVERAGE LABOUR UNITS (ALU'S)

Average labour units (ALU's) are calculated by dividing annual payroll (as reported to Revenue Canada through the T4 system) for each province a business operates in by an estimate of average annual earnings derived from Statistics Canada's Survey of Employment, Payrolls and Hours (SEPH) for the same three-digit industry, province and size group of the firm. These SEPH derived averaged annual earnings reflect the annual mix of workers and earnings (regular, short, and overtime hours) found in each particular province x three-digit 1980 SIC combination over the year. The ALU concept converts a firm's payroll synthetically into the amount of labour units this payroll would typically represent if its labour force were paid the average earnings of its industry in that province for a given firm size.

BUSINESS SIZE

Business size is calculated by the number of ALU's in a business. Businesses operating in more than one province are sized according to their ALU total across Canada. As well, these multi-provincial businesses are classified industrially independently for each province and at the Canada level. The assignment is based on the business's leading industry and can differ from province to province. Nationally, since the assignment is based on the leading industry across Canada, the provincial components may not add to their Canada total on an industry basis.

INDUSTRIAL CLASSIFICATION

Businesses that alter their major industry of activity over time are classified according to the latest 1980 SIC reported. The industrial classification is derived from Statistics Canada's Central Frame Database. This data base is a central repository of the names, addresses and various industrial characteristics of businesses in Canada. Its coverage is the universe of employers and hence the universe of business entities having paid employees."

Replicated from Statistics Canada, Employment Dynamics Business Size and Life Status: 1989-1992 (Sic 861 & 867), Small Business and Special Surveys Division.

APPENDIX 13

Regulated and Non-RegulatedSIC Categories
* indicates regulated SIC category

Forestry and Forest Products (SIC 8, 24,26)

Metal (SIC 10, 33, 34)

Oil and Gas (SIC 13, 29, 46, 55)

Construction, development and real estate(SIC 15, 16, 17, 65)

Food Manufacturing (SIC 20)

Tobacco (SIC 21)

Textile Mill Product Manufacturing(SIC 22)

Apparel Manufacturing (SIC 23)

Furniture and Fixture Manufacturing (SIC 25)

Printing and Publishing Manufacturing (SIC 27)

Chemical Manufacturing (SIC 28)

Rubber and Plastics Manufacturing (SIC 30)

Stone, Glass, Clay Product Manufacturing (SIC 32)

Machinery Manufacturing (SIC 35)

Electrical and Electronic Machinery Manufacturing (SIC 36)

Transportation Equipment Manufacturing (SIC 37)

Measuring, Analysing, Controlling Instruments Manufacturing (SIC 38)

Miscellaneous Manufacturing (SIC 39)

*Railroad Transportation (SIC 40)

*Interurban Transportation (SIC 41)

*Motor Freight Transportation and Warehousing (SIC 42)

*Water Transportation (SIC 44)

*Air Transportation (SIC 45)

*Transportation Services (SIC 47)

Regulated and Non-RegulatedSIC Categories

* indicates regulated SIC category

*Communications (SIC 48)

*Utilities (SIC 49)

Wholesale Trade - Durables (SIC 50)

Wholesale Trade - Non-durables (SIC 51)

Retail - Building Supplies (SIC 52)

Retail - General Merchandise (SIC 53)

Retail - Food (SIC 54)

Retail - Apparel (SIC 56)

Retail - Furniture (SIC 57)

Retail - Eating and Drinking Places (SIC 58)

Retail - Miscellaneous (SIC 59)

*Banks, Credit Unions, Trust Companies, Insurance Companies
(SIC 60, 61, 62, 63)

*Holding Companies (SIC 67)

Hotels (SIC 70)

Personal Services (SIC 72)

Business Services (SIC 73)

Motion Pictures (SIC 78)

Health Services (SIC 80)