Accountants on the UK Boards of Directors and the Market for Accountancy and Audit Services

by

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DECLARATION

I hereby declare that this thesis is entirely my own work and includes nothing which is the outcome of work done in collaboration with others. I also declare that this thesis has not been submitted for a degree at another university.

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ABSTRACT

"Accountants on the UK boards of directors
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Several previous studies have provided empirical evidence concerning the pricing of audit services among different accountancy firms. These studies have examined the form of the auditor fee function by generally performing cross-sectional regressions of audit fees on a set of explanatory variables.

This study is the first to investigate whether an "alumni effect" prevails the UK audit market and whether any "alumni effect" influences the pricing of audit services. The "alumni effect" has been defined in this study as the association between the auditor of the company where the director/chartered accountant is currently employed and the accounting firm that the director/chartered accountant originally qualified with, as a chartered accountant. The study has constructed an alumni network by matching the current director of the UK public company with the accountancy firm s/he qualified with as chartered accountant. By doing this, the "alumni effect" variable has been created which is a non-price factor conjectured to translate into price effects.

The study provides a theoretical analysis and explanation of the "alumni effect" by combining several theories in microeconomics, organisational behaviour and socialisation of accountants. Using chi-square tests it provides evidence that an "alumni effect" does prevail the UK audit market for publicly traded companies. A classical regression model was constructed for the functional relationship between external audit fee and independent variables measuring the "alumni effect" and audit firm size. Other factors such as client size and complexity, client risk to fail, etc. are controlled for in the cross-sectional models.

The findings show that the "alumni effect" leads to higher audit fees when a finance director, chairman or/and chief executive is/are alumni of the incumbent auditor in the large companies segment of the audit market. The findings also indicate that when the audit firm size is partitioned into three classes then a price premium is revealed.

However, this premium is disappeared because of the existence of an alumni of the auditor on the boards of directors.

The results of this investigation indicate significant audit price differentials in the UK audit market when different factors hypothesised to affect audit fees are taken into consideration. In other words, the findings suggest that the structure in the market for audit services is more complex than the usually applied Big-Six/non-Big Six dichotomy and different explanations are provided.

ABBREVIATIONS

ICAEW	Institute of Chartered Accountants in England and Wales
ICAS	Institute of Chartered Accountants of Scotland
ACA	Associate chartered accountant of ICAEW
FCA	Fellow chartered accountant of ICAEW
CA	Chartered accountant of ICAS
CIMA	Chartered Institute of Management Accountants
AA	Arthur Andersen
EY	Ernst & Young
CL	Coopers & Lybrand
KPMG	KPMG Peat Marwick
PW	Price Waterhouse
TR	Touche Ross
BT	Baker Tilly
BDO	BDO Stoy Hayward
BW	Beavis Walker
BH	Binder Hamlyn
B	Blythens
BS	Burnett Swayne
CW	Clark Whitehill
GT	Grant Thornton
PRA	Page Robt. A. & Co
PKF	Pannell Kerr Forster
RR	Robson Rhodes
SG	Smailes Goldie
TM	Thomas May
FSHC	Firm-specific human capital
MAS	Management advisory services

CHAPTER I

INTRODUCTION

1.1. Introduction to the thesis

Amongst the major industrialised economies, the UK is distinguished by the prominent role played by professional chartered accountants in management, in corporate governance, in consultancy and in auditing. Professional accountancy has been the modal first employment destination for British undergraduates (at the 1987 peak, 1 in 10, of all undergraduates from whatever discipline), "but only because that is the most obvious, most prestigious and best remunerated way to prepare oneself with credentials for a general career in business or management" (Handy Report, 1987). This investment in training has resulted in approximately one in eight of UK directors being professionally qualified chartered accountants, compared to only one in twenty being professionally qualified engineers (the next most frequent professional background) (Anderson, 1994). Surveys reveal that over 90% of companies have a Finance Director and that 50% of the finance directors of the UK companies are members of the ICAEW and ICAS (Hussey and Jack, 1994; Olins and Steiner, 1997). The historically low output from the UK graduate business schools, by comparison, is reflected in the statistic that on average only 6% of Finance Directors are holders of an

MBA (Masters in Business Administration). UK boards of directors seem to be dominated by chartered accountants.

The major route to qualifying as a chartered accountant requires a number of years training in a professional practising office as an auditor. Chartered accountants have an allegiance to "the profession", and are "alumni" of the accountancy firm that provided their training. Prior to the 1970's student accountants were articled clerks, apprenticed to a principal, even paying a premium for the privilege of their employment. There is a well trodden path of qualified chartered accountants from the practising offices into industrial and commercial employment with their former audit clients[1]. For example, Anderson *et al* (1997) mention that more than 50% of ICAEW members are currently in various business positions, and Hussey and Jack (1994) report that of the directors who qualified as chartered accountants 28.7% did so with the incumbent auditor. Indeed some accountancy firms operate commercial services in the professional appointments, executive search and recruitment market. Further, Beattie and Fearnley (1998) and Hussey and Jack (1994) rank the personal chemistry between the finance director and the auditor as the most important. The connections and networks that professional accountancy offices have developed through the dominant positions that their former employees hold in Britain's boardrooms have never been researched. The aims of this study are to investigate the importance of such professional associations, particularly as it affects the market for accountancy services.

On the other hand, competition in the market for audit services, dealing with auditors switches, low balling, auditor appointment and independence, the impact of non-audit services, changes in audit fees, has been the subject of discussion and research in the last two decades. Over the same period there have been a number of attempts at modelling external audit fees. These models have provided explanations for the level and variability of audit fees. Many of the prior studies have as their primary focus the modelling of audit fees and the establishment of determinants which cause the

[1] For a dramatic illustration of this dimension consider the Prudential audit. In 1988 Mr Michael Lawrence, who was a partner in Price Waterhouse, joined the Prudential Assurances Company as the group Finance Director. In 1990, the Prudential, after 100 years with the same auditor, put its audit out to tender. Price Waterhouse won the contract to audit the Prudential. However, it emerged that Price Waterhouse bid 40% less than the incumbent auditors. This discount was not dissimilar from the prices offered by Price Waterhouse's unsuccessful competitors.

variability in audit fees. This literature is widely seen as rigorous. However, no previous work has examined the relationship between audit fee and non-price factors such as the one this study proposes, i.e. the relationship between audit fee and accountancy firm alumni. In other words, this study proposes to investigate the following issues: what are the links between accountancy firms and their former employees, and whether these links make a measurable difference to audit fees. Do alumni relations matter?

1.2. Significance and objectives of the study

The determinants of audit fees, therefore, is not a "new" topic for the researchers. Instead, it remains a hot topic. Research into the determinants of audit fees is now well established and focuses on examining whether there is evidence of competitive or uncompetitive practices within the audit market. Formal governmental inquiries about the competition in the audit market have also been taken place in many parts of the English-speaking world. The presence of such literature merely suggests that there is lack of knowledge about the operation of the market for audit services. The current study contributes to a greater understanding of that market in that it examines the underpinning variables which explain the variability of audit fees and moreover, examines some other variables which have never been addressed before as possible explanators of variability in audit fees.

The central focus of this study is, therefore, to examine:

- the distribution of UK chartered accountants-directors by accountancy firms;
- the factors associated with the level of audit fee;
- the magnitude of the association of those factors with the audit fee;
- an explanatory model of audit fee variability;
- whether an "alumni effect" prevails the UK audit market;
- the presence and extent of the "alumni effect" as it reflects on audit fees.

The **"alumni effect"** is defined in this study as *the association between the auditor of the CADRE's current employer and the CADRE's alma mater.* **CADRE** means *the* *director (executive or non-executive) of the UK public company who is simultaneously a qualified chartered accountant with the ICAEW.* **ALMA MATER** is *the ex-employer (i.e. qualifying accounting firm) of the CADRE.* These definitions will be used hereafter in the thesis.

1.3. Research hypotheses

Hypotheses 1 through 6 form a replication of previous work. This has been done in order to control for differences in the audit fees. Hypotheses 7 through 11 are used to test the main objectives of the study. The research hypotheses that are tested in this study are:

H1: for the large companies sub-sample, there will be no differential pricing of audit services between Big Six[2] *and non-Big Six accountancy firms.*

H2: for the small companies sub-sample, the Big Six charge lower audit fee than (or equal to) the non-Big Six firms.

H3: for the small companies sub-sample, the Big Six charge lower audit fee than (or equal to) the second-tier accountancy firms.

H4: for the small companies sub-sample, the Big Six charge lower audit fee than (or equal to) the local/regional accountancy firms.

H5: for the small companies sub-sample, the second-tier firms charge lower audit fee than (or equal to) the local/regional accountancy firms.

H6: the pricing of audit services is related to the pricing of non-audit services.

H7: for the large and small companies sub-sample, it makes no difference on audit fees when any director is an ex-employee of the auditor.

H8: for the large and small companies sub-sample, on average it makes no difference on audit fees when a ***non-executive director*** *is an ex-employee of the auditor.*

H9: for the large and small companies sub-sample, there is no audit fee difference when the ***chairman, chief executive or finance director*** *are an alumni of the auditor.*

[2] The Big-Six firms are Arthur Andersen, Coopers & Lybrand, Ernst & Young, KPMG, Price Waterhouse, and Touche Ross. They are listed here in alphabetical order.

H10: for the large and small companies sub-sample, the audit fee charged will not be lower or higher as the CADRE becomes older.

H11: there is no different relationship between audit and non-audit fee because of existence of auditor alumni.

1.4. Research methodology

For the literature reviews and description of the problem setting, the main research technique utilised is a familiarisation with the relevant literature, both in the auditing and economics areas. In the auditing area, this includes the large body of literature on the audit fees and audit market. In the economics area, this covers the large and distinct body of literature on the investments on human capital, internal organisation of accounting firms, employment policies and individual opportunism.

With regard to the data collection, the following steps are taken: The population that will be examined in this study consists of the publicly held corporations in the UK and their auditors for the period 1995/1996 and, thus, is homogeneous with respect to the last factor. The investigation will draw on publicly available information. The names of directors for quoted companies made available to us from the Price Waterhouse (PW) corporate register.

In brief[3], the alumni network is constructed as follows: The Directory of Members for the Institute of Chartered Accountants in England and Wales (ICAEW), and also for the Scottish Institute (ICAS) provide, in addition to a correspondence address for each member, the year of qualification. The examination pass lists for the year of qualification are published in the Accountant Magazine for the years prior to 1956, and directly from the ICAEW since 1956. They list, against the name of each successful candidate, the accountancy firm and the town in which the candidates received their professional training. By this means the network links between Directors and Accountancy Firms can be reconstructed. Prior to 1983, the examination

[3] Chapter IV offers a detailed description of the step-by-step laborious collection of the data concerning the accountancy firms alumni.

pass lists record, instead of the name of the accountancy firm, the name of the partner to whom the trainee chartered accountant was articled. The ICAEW Directory of Members needs to be consulted to give the accountancy firm for each partner. From these sources it was possible to research the professional background of the accountancy directors who qualified prior to 1983. The PW dataset identifies the auditors for each company, and One-Source or Datastream provides accounting data. With due diligence a dataset was constructed to provide survey evidence on the objectives of this study. A classical cross-sectional multiple regression model is used to test the research hypotheses of the study. This model has been widely used in prior audit fee studies. This study enjoys the benefit of a non-intrusive data collection approach to construct a unique dataset.

1.5. Major contribution of the thesis

The thesis makes contribution in the following areas:

i. The determinants of audit fees

The study incorporates the "alumni effect" variable in the determinants of the audit fees. To the author's knowledge, this is the first study to use the particular measure in the audit market analysis. From the proposed investigation, specific propositions about the market structure for audits are derived.

ii. The economics and sociological perceptions

This study brings together a number of different theories in microeconomics and sociology. To the author's knowledge, the combined application of those theories in the accounting literature has not been considered before. This study has sited the theory of the audit firm in human capital theory as well as the concepts of socialisation and alumni identification. The main proposition derived is that the accounting firm alumni have a predisposition to benefit their alma mater.

iii. Future considerations

The author has established that the non-price factors such as the alumni effect merit serious attention from the researchers of the audit market. The alumni effect may need to be taken into consideration when public policy makers and the accountancy profession consider changes in professional regulations and audit standards, and statutory audit requirements. Auditors and clients are symbiotic at a deeper level than mere buyers and sellers of services.

1.6. Structure of the thesis

In order for the study's objectives to be achieved, the thesis is broken down in the following manner: Chapter II and III include reviews of the literature in areas that are relevant to the study. Chapter II builds the formal theoretical analysis of the inclination of CADRE to favour their alma mater. Chapter III reviews the existing and relevant literature on the audit fee determinants and structure of audit market. Chapter IV provides a detailed explanation of the steps followed concerning the data collection and construction of the alumni network. Chapter V looks at the issue of the alumni effect for different definitions of CADRE and alma mater and whether the alumni effect prevails the audit market. The specific hypotheses proposed in this study are discussed in Chapter VI. In the same chapter, the explanatory variables are selected and defined. Chapter VII provides the descriptive statistics and Chapter VIII discusses the model specification. It also replicates the "basic" audit fee model. Testing the main hypotheses of the thesis is the principal subject of Chapter IX. Finally, Chapter X provides a summary, discussion of the audit fee differentials found in the study, conclusions, limitations of the thesis, and suggestions for further research.

CHAPTER II

THE THEORY
OF THE AUDIT FIRM

This chapter brings together a number of different theories in microeconomics, such as portfolio theory, agency theory, human capital theory, implicit contracts theory. It also draws on sociological and psychological literature. Each of these theories individually are familiar to economists and sociologists, nevertheless their combination produces a different theoretical framework on the principal concerns in this study. We investigate here the accountancy firms and their connections with their alumni. But the ultimate goal is to explain the predisposition of ex-employee accountant to favour his alma mater. In doing so, the importance of outplacement to the management and conduct of audit firms is theorised. Also, the internal organisation of accountancy firms, and especially the critical issue of profit division and risk-sharing, the investment in firm-specific human capital and the historical dominance of the up-or-out promotion policy as well as the auditor's client acceptance decision and engagement risk are analysed and offered as potential explanation of the audit firms' emphasis on outplacement of their employees. Finally, making use of the literature on the sociological field-based work, in organisational behaviour and on alumni of universities, the importance of the socialisation of accountants and their identification with the former firm is enhanced. Each of the above are discussed in depth in the sections that follow.

2.1. Internal organisation of accountancy firms

It is known from portfolio theory that by diversifying, investors' capital assets are of greater value. Also, portfolio theory argues that by diversifying a portfolio, an investor can eliminate all unsystematic risk (i.e. the risk associated with holding a particular asset) but not the systematic risk (i.e. the risk of events that will alter the value of all assets)[1].

For chartered accountants, their most important capital asset is their investment in human capital (more specifically in firm-specific human capital) and once we recognise this, portfolio theory's emphasis on diversification highlights a critical characteristic about this asset: it is very difficult to diversify an investment in human capital, and moreover, to eliminate the unsystematic risk through diversification. Large accountancy firms are a response to this difficulty. They provide an opportunity to achieve portfolio diversification gains for human capital.

The creation of a full-service accountancy firm - an agreement among accountants that each will make human capital investments in different specialties and that the returns to those investments will be *shared* on a predetermined basis[2] rather in accordance with actual outcomes - eliminates the employee's unsystematic risk (ie the risk associated with holding the particular capital asset, the investment in human capital) because it facilitates (succeeds) diversification of chartered accountants' human capital. Accountancy firms can be seen then as risk-sharing or insurance mechanisms (Land and Gordon, 1995). Therefore, the existence and organisation of the large

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[1] Detailed discussions of portfolio theory and models can be found in Fama & Miller (1972), Jensen (1972), Fama (1976) and other traditional financial theory textbooks.

[2] What precise formula should be applied for distributing partnership income, see Moldenhauer (1972), Reed (1979), and Farrell and Scotchmer (1988). See also Basile and Sandbach (1981) who introduce the profit centre concept to income distribution.

accountancy firms increase the value of chartered accountant's human capital investment, allow chartered accountants to take advantage of gains from diversification, and also, achieve specialisation (Alchian & Demsetz, 1972).

However, understanding the accountancy firm as a means of capturing the gains from diversification also requires understanding how it prevents self-interested behaviour from destroying these gains (Fama, 1980). In other words, we have to consider what could happen to a chartered accountant's view of the gains from diversification between the time he agrees to share his future income in order to benefit from diversification and the time when the agreement (i.e. income sharing) must be performed. The problem is apparent when a chartered accountant favoured by fate actually must share his earnings with a colleague in a less profitable specialty. At the time the two initially agree to share, the future is uncertain: both stand to gain from an agreement to pool their future earnings. The situation changes markedly, however, when the passage of time eliminates the uncertainty. At this point the winner (one who must share his good fortune with the loser) may refuse to comply with his original bargain: he no longer has anything to gain by sharing. The potential for individuals to pursue their own self-interest - in our setting, to thwart diversification - and the role of organisational structure as a means of constraining it (or as an effort to minimise the cost of holding the parties to the terms of their bargain) is the province of agency theory (Demsetz, 1983; Fama, 1980; Jensen, 1983; Jensen & Meckling, 1976; Monsen and Downs, 1965).

The selection of organisation structure, therefore, affects the level of gains from diversification as well as the level of agency costs. Producers benefit from lower costs, thus, incentives exist for organisations to adopt a form which most effectively reduces agency costs, and therefore, most effectively captures the gains available from cooperation. An accountancy firm whose organisational form minimises these agency costs will have a competitive advantage because it bears less risk than an undiversified accountancy firm, i.e. that firm that specialises in a single area. It need not charge a premium that takes the risk of obsolescence into account (this risk is eliminated through diversification). It is, therefore, able to underbid the competition in an auction by charging a lower unit price[3].

So far we combined two theories: the portfolio theory and the agency theory. The former identifies an important source of gains from diversification (cooperation) among chartered accountants, the latter highlights the barriers to capturing these gains and the methods by which these barriers can be partially, but never entirely, surmounted. Furthermore, both of the theories direct attention to precisely the same subject: the manner in which firm income is divided.

Diversification, the core recommendation of portfolio theory, is achievable only by means of an agreement specifying how future income will be shared. Agency theory, in turn, highlights the likelihood that those chartered accountants who turn out to be more successful than their peers will threaten to leave the firm unless they receive their real value - a demand for a quite different manner of dividing firm income. The method of dividing firm income, therefore, may determine whether an accountancy firm has successfully created an institutional structure that constrains *ex-post* opportunism.

The most significant constraint on grabbing and leaving in a sharing model[4] is the concept of firm-specific, as opposed to individual or general, capital. A sharing firm has the potential to create firm-specific capital more effectively than does a firm pursuing a marginal product approach[5].

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[3] See Jensen (1983) for a fruitful discussion on how particular organisation forms can achieve low cost control of agency problems and enable them to survive.

[4] See also Alchian & Demsetz (1972), Demsetz (1983) and McChesney (1982) for an explanation of why the so-called professional firms adopt the profit sharing model than the marginal product approach. Also, Van Lent (1999) for the drawbacks of the marginal product approach in the accountancy firms.

[5] Under the marginal product approach, no-one would have been willing to invest in a specialty that is not profitable, simply because the individuals' earnings are based on the assessment of their productivity. Thus, no FSHC would have been created.

2.2. Firm-Specific Human Capital (FSHC)

The firm-specific capital is defined as the capitalised value of the difference between firm's earnings as an ongoing institution and the combined value of the human capital of its individual employees (partners, managers and juniors), if this human capital were deployed outside the firm in its next most productive use. The value, therefore, of the firm-specific capital is larger than the combined value of the individual human capital, and consequently, the return on this capital is greater too. Also, firm-specific capital can be neither easily removed from the firm nor duplicated outside the firm.

However, the creation of firm-specific human capital depends upon whether the trainee chartered accountant is willing to exert effort or to shirk. It has been shown (Cantor, 1990), that intermediate-length, fixed wage contracts with known expiration dates can improve training investment and effort. If contracts are "too long"[6], the worker anticipates too little in the way of post-contract rewards and shirks during training (resulting in wasting firm's expenditure, and the worker's instantaneous productivity and market wage outside and inside the firm remaining constant for the rest of his/her career). In contrast, if contracts are "too short", the *ex-post* division of the quasi-rents provides inadequate investment incentives to the firm. An intermediate contract length then is desirable, because during its life, all the quasi-rents (i.e. the returns to firm-specific human capital) accrue to the firm, but the trainee put forth efforts because future quasi-rents can be appropriated after the contract expires[7]. But again, the trainee's willingness to exert effort will depend upon his expected return, ie his anticipated share of the future quasi-rents which in turn should be higher than its costs (Klein *et al,* 1978).

Accountancy firms offer intermediate-length contracts[8], an apprenticeship, which allows (1) their trainees to acquire firm-specific human capital and (2) the firms to capture all the rents during the life of the apprenticeship (this part is analysed in the

[6] Becker (1962) argues that "an effective long-term contract would insure firms against quits ....". See, also, Telser (1980), and Milgrom & Roberts (1992). However, noone has quantified in reality the length of those long-term, short-term or intermediate contracts. See also Klein *et al* (1978) for a discussion on how implicit and explicit long-term contracts prevent opportunistic behaviour from both the employee or the firm.

[7] In other words, the trainees in accountancy firms accept a lower wage during the apprenticeship period and expect a higher reward at contract expiration (or soon after). Lazear (1979; 1989) argues that these systems are employed by firms as bonding devices to induce worker honesty.

next section). Trainee chartered accountants exert effort to acquire firm-specific capital because they anticipate bargaining for some of the quasi-rents at contract expiration. This bargaining leads to an *ex-post* division of rents such that the trainee will receive a constant share (i.e. partnership). Knowing, therefore, the trainee chartered accountant that his/her effort to acquire firm-specific human capital will be rewarded after his/her contract expires, he/she is provided with the correct *ex ante* incentives to invest in firm-specific capital (Carmichael, 1983).

Let's now see how the organisational structure (i.e. sharing model) and the development of firm-specific human capital together control the potential for individual opportunism. The absence of firm-specific capital means that the *ex ante* sharing bargain is subject to *ex post* cheating[9]: more productive partners may claim, after the fact, a larger share than they are entitled to under the sharing bargain. However, the strength of their claim depends on whether they can earn a greater return on their individual capital in its next best deployment if they grab and leave the firm. But, following from the preceding paragraphs, the return on partners' individual capital is not greater than the return on firm-specific capital, and consequently, a threat of grabbing and leaving for more money is unrealistic and ineffective. Also, an accountancy firm that has created firm-specific capital provides returns on its assets (i.e. its clients) which are unavailable to individual chartered accountants if they left the firm. The creation, therefore, of firm-specific capital develops constraints on grabbing and leaving which means that the gains from diversification can be maximised and then an adoption of a sharing model is preferable[10].

By relying on profit sharing, accountancy firms are able to deter or reduce shirking too (Demsetz, 1983). "In artistic or professional work" (Alchian & Demsetz, 1972), team inputs are more cerebral than physical which means more costly to monitor, and therefore, according to Alchian & Demsetz, for that reason professional firms make greater use of profit sharing in reducing shirking (partners do share in profits and thus,

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[8] In contrast to Bartel & Borjas' (1981), and Mortensen's (1978) argument that there is a positive correlation between investment costs (specific training) and longer job tenures.

[9] Williamson's (1975; 1985) and Klein *et al* (1978) initial insights suggested exactly this. The decision to invest will be distorted by the anticipation of bargaining after the investment.

[10] Recall that diversification is eliminated by the marginal product approach. See also footnote 5 above.

have a greater incentive to increase profits and a smaller incentive to shirk)[11]. In other words, partners in accountancy firms that adopt the sharing in profits model have an incentive to curtail voluntarily the degree of shirking, simply because of their involvement in generating and sharing the firm's income (Demsetz, 1983; Carr and Mathewson, 1990; Kandel and Lazear, 1992). Moreover, exactly because production is done in teams which increases the difficulty of measuring directly the value of an individual's marginal product (McChesney, 1982), the sharing model is preferable.

Finally, accountancy firms create a constraint on shirking through some combination of selection of new trainees (many interviews, elite business school recruitment, training techniques, mentoring approach, and so on) and of socialisation (the social mechanisms which serve to instil the non-shirking values such as the concept of being a "professional", the recruiters' emphasis on producing *only* high quality work, the concept of producing a "professional" quality product without regard to economic reward, and so on). Screening or monitoring techniques, therefore, and even more "philosophia"[12] put an anti-shirking culture into trainee chartered accountants' mind and create a powerful internalised work ethic (Maister, 1985).

2.3. The Socialisation of Accountants

The role of socialisation of accountants in putting a constraint on shirking has been outlined at the end of the preceding section. This section examines in more detail the process of socialisation in accounting professional firms and how this professional socialisation influences the behaviour of professional accountants and their organisational identity. By elaborating on these issues, it is hoped to show that through socialisation accountants acquire "appropriate" forms of professional behaviour (Grey, 1998) as well as to highlight that social relations within the audit firms are regulated

[11] McChesney (1982) concludes that "it seems unlikely that profit sharing in law *[professional]* firms is primarily explained as a technique to reduce shirking" (emphasis added).
[12] Derived from the relevant Greek word which applies the basic concept or set of rules on how things are running inside an organisation. Other definitions could be given are firm structure, institutional loyalty, identity, or ideology.

and reproduced in such manner that being a professional in these firms seems to create an anti-shirking culture and specific organisational identity.

To qualify in the UK as a chartered accountant and become a professional, there are two formal requirements. First, it is necessary for trainees to pass the examinations set by the various Institutes of Chartered Accountants in the UK and, second, to undertake a minimum period of training within public practice. The acquisition and application of certain technical knowledge or expertise and, more particularly, the control and licensing of specialist knowledge or expertise - perhaps in the public interest - by the professional who subsequently is able to practice as an accountant, lawyer, etc. erects an effective barrier between him/her and the lay person who is disallowed from such occupational tasks (Johnson, 1972; Abbott, 1988). This knowledge is, *inter alia*, essential for professional success at both individual and institutional levels. But the period of public practice (mentioned above) should not be seen simply as a form of apprenticeship into the craft of accountancy and audit. Performing technical services to clients is only part of the experience and practice of becoming the professional person. Learning more broadly how to be a member of a certain profession is also very important. The process of adopting the values, norms and behaviours of the profession (and specific organisation) is vital for professional success too. This process that involves individuals learning to conform to prevalent social and cultural norms is termed socialisation. Demonstration of these characteristics permits group membership for the individual professional and acts as a sign of that group membership to those outside the profession. Consequently, an individual's incorporation of the values and norms of a profession into their identity and repertoire of behaviours (which norms and values are transmitted through the specific organisational culture) is just as vital to successfully becoming a professional as the formal education process and achievement of the professional qualification (Hanlon, 1994; Anderson-Gough *et al,* 1998).

The starting points for any analysis of organisational socialisation are the formal systems of recruiting, training, and rating and appraising trainees. Other aspects of the trainees' experience (such as mentoring, daily contact with colleagues, socialising[13], and early contact with clients) also impact on their socialisation. These formal systems and the nature and form of informal socialisation processes involve a "regulation of self". In other words, an individual becomes an entrepreneur of the self by using the techniques of self-management (Rose, 1989). Within the project of self-management, career has a particular role to play since it is a powerful "technology" in enabling the construction of, precisely, a project (Grey, 1994). In other words, an (occupational) career offers a relatively well-defined scenario within which individuals may develop, express and create themselves. Career offers a vehicle for the self to "become", according to Grey (1994). Further, work itself (including socialisation) is a part of the entrepreneurial project of the self: a place where the self may become that which it truly is or desires to be. It is this sense of a process of the achievement of self through work which is offered within organisations as career and which is expressed by individuals through career (Grey, 1994). In other words, the objective of "success" in career means individuals strive to demonstrate the "appropriate" types of professional behaviour.

Having identified the main vehicles of socialisation - namely, the recruitment process, training, rating and appraisal techniques, mentoring, and socialising - and how career shapes the behaviour and values of individuals, next the values and attitudes transmitted to the trainees through these vehicles of socialisation, especially as regards those relating to professionalism, are considered. According to the findings of Anderson-Gough *et al* (1998), the dominant understanding of being a professional learnt by trainee chartered accountants relates to codes of behaviour. It means that the trainees do not understand professional identity in terms of the possession of knowledge, nor in accreditation to practice, nor in terms of commitments to public service. The meanings of being a professional for the trainees themselves are that of appropriate dress (following the contemporary business attire) and appearance generally (hair, beards, make-up, jewellery, etc.). In addition, behaving seriously, soberly and enthusiastically (actually seeking work and looking busy) is a vital aspect of the demonstration of being professional and of commitment. Time management is

[13] Whilst socialising (in its everyday sense of informal leisure-time friendships) is certainly not the same as socialisation, it is nevertheless part of the socialisation process.

seen to reflect both trainees' "professionalism" and also their commitment to the firm. Time-keeping includes the willingness to work "after hours" (and, therefore, sacrificing personal time) as and when necessary or not to record all the hours worked at a particular client (Coffey, 1994). Passing the professional examinations is well understood by trainees formally as the process of becoming a professional, but is also integral to the possibility of advancement within the firm and securing external opportunities for exploiting the accountancy qualification (Anderson-Gough *et al,* 1998). Finally, another meaning of being professional for the trainees in Anderson-Gough *et al* (1998) study is the "art of impression management". In other words, the professional is a character that trainees are expected to stage or perform for their clients as well as their peers. It is a role that most trainees seem to have realised that they are "playing" rather than "being".

The accounting firm charged with the socialisation of the newcomer, therefore, teaches the trainee how to become a professional (via learning and internalising the formal and informal values and beliefs of its culture) and the trainee absorbs the values and traits presented to him/her. All cultures encourage some behaviour whilst discouraging other behaviour (Anderson-Gough *et al,* 1998). The norms of conduct and behaviours learnt in this formative period are likely to remain with the individual in years to come. Consequently, the focus on the need to learn to act in appropriate ways and to deploy appropriate rhetoric helps trainees to create a specific organisational identity (Iyer *et al,* 1997). Hence, the emphasis on socialisation and "fitting in" creates an identity not only for the firm but also for the individual members of the firm. This identity, for better or for worse, is readily identifiable to the outside world (Maister, 1985).

Finally, it seems the ideology within accountancy is changing. At the heart of this is the general move towards "commercialisation" or the "commercialised professional"; but it is also represented by other changes, for example innovation in services offered by the practices, the use of advertising, global expansion, creation of new products, and so on. In essence it means giving the client what s/he requires in as many different areas as possible. It means that today the emphasis is very firmly on being commercial and on performing a service for the customer rather than on being public spirited in behalf of either the public or the state (Hanlon, 1994). It appears that the professional qualities of the accountant are exercised for the benefit of the client (and not the public). Accountancy is now a fully fledged, profit orientated business. As it has been outlined above, an accountant's training is not really about developing technical expertise, although everyone recognises that this obviously is a factor, it has much more to do with becoming acceptable, trustworthy, commercially aware and so on. In short, the accountant's training and socialisation is centred in developing "business virtue" (Hanlon, 1994).

Thus, the idea of client service appears to have a paramount importance to the survival and success of the audit firms. The appropriate behaviours in terms of appearance, manner, presentation, self-conduct and so on (i.e. the processes of socialisation within the accountancy firms) are a vital part of giving good client service (and pursuing and achieving career success) and that failure in these respects may lead to loss of clients (and subsequent career failure). Provision of client service is elevated as perhaps the central value transmitted by socialisation. Professional (i.e. acceptable social and business) conduct centres upon behaviour towards the client. Hence, it is not surprising that the understanding of the "professional" from trainees is primarily in terms of behaviour, as Anderson-Gough *et al* (1998) study shows.

In sum, therefore, what is obvious from the above analysis is how the notion of professionalism refers to a mode of conducting oneself. Also, the meaning of being a professional becomes inextricably bound up with the culture of the firm, and the firm arrogates to itself a certain conception of what being a professional means (Grey, 1998). Finally, it appears that the trainees acquire and sustain an identity (and probably an allegiance to the audit firm) through espousing the corporate values to which they belong. By learning and accepting the "correct" behaviours and norms, non-shirking values are also instilled to trainees' mind.

2.4. The Up-or-Out System[14]

We have seen so far that chartered accountants increase their value of human capital investments and take advantage of gains from diversification by agreeing to share future earnings. We have also seen how the individual opportunism puts barriers to capturing these gains and how the creation of firm-specific human capital by the accountancy firms surmounts those barriers. Further, we have emphasised that the FSHC can only be created when a sharing model is adopted. Nevertheless, we have not showed yet why accountancy firm alumni have an inclination to favour their alma mater. Recall that the main objective of this chapter (and the thesis) is to explain this predisposition of alumni towards their ex-employer. However, this is where the up-or-out promotion policy comes into the discussion.

The existence of firm-specific human capital facilitates the selection/adoption of the up-or-out personnel policy employed by the accountancy firms[15]. An up-or-out rule means that those denied promotion must leave the organisation, even if they were successful at their current level in what they were doing.

At the time when the trainee chartered accountant is first hired, the trainee and the firm each face a different kind of uncertainty with respect to the trainee's career path. The firm is uncertain about who among the pool of trainees hired will come to possess the ability, knowledge and personal attributes thought necessary to partnership. However, the organisational response to the firm's uncertainty concerning how a new trainee will develop is an apprenticeship: a period between initial hiring and the partnership decision that gives the trainee chartered accountant the opportunity to demonstrate that he or she has acquired the required skills for which the firm is looking[16] (Cantor, 1982; MacDonald, 1980).

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[14] Recent research studies (e.g., Van Lent, 1999; Maister, 1982 and 1985) indicate that accountancy firms adopt an up-or-out promotion policy. There is also plenty of anecdotal evidence that audit firms employ such promotion policies (Milgrom and Roberts, 1992; Hanlon, 1994; Anderson-Gough *et al*, 1998). However, it is recognised here that the chartered accountancy qualification is widely perceived to offer a good general business qualification that is used for gaining entry into managerial posts in industry. In fact, the mobility that the audit training gives may be a trainee's preferred option from the outset.

[15] Baker *et al* (1988) in their analysis argue that "up-or-out systems work better in situations where the required human capital is general rather organisation-specific". We argue the firm specific human capital is not destroyed by the up-or-out policy and one presumption is the fact that the big accountancy firms employ thousands of trainees each year and in effect forcing the unsuccessful candidates for partnership to leave the firm creates no loss of firm specific human capital.

[16] Prescott and Visscher (1980) named the information about the employee's performance as organisation capital.

Also, the firm is uncertain about whether the trainee will behave opportunistically, once he or she has been paid to make the investment. Familiar human capital theory (Becker, 1962; Hashimoto, 1981) specifies that the firm as well as the trainee must pay for the trainee's investment in firm-specific human capital[17]. The problem for the firm, however, is to assure that, after it pays for the trainee's investment, it actually receives the returns. The solution to this uncertainty concerning trainee's ability to threat and quit after the investment has been made is a deferred compensation, a premium: the trainee chartered accountant actually receives the compensation for acquiring firm-specific human capital only as, or after, the firm reaps the benefit of it. In other words, the promise of partnership - in effect, the right to share in the future returns from firm-specific capital - is the compensation to those trainees who successfully acquire firm-specific human capital and also, serves as a constraint on trainee opportunism. This exactly potential future promotion to partner constrains the behaviour of non-partner from acting opportunistically (Van Lent, 1999).

However, in order the apprenticeship solution to the firm's uncertainty to be viable, another uncertainty must be eliminated: the trainee's uncertainty. Indeed, the trainee's uncertainty is created by the apprenticeship period itself; it arises from the firm's incentive to behave opportunistically in evaluating the trainee's performance and in reaching the partnership decision (Telser, 1980). At that time, the firm is making a substantial profit from the trainee's labour by buying the trainee's time at "wholesale" and selling it to the client at "retail" (Maister, 1982). Promoting the trainee to partner rather than continuing the trainee as an employee is costly to the firm; it diminishes the profits accruing to existing partners. At the same time, however, the trainee is in an unenviable position to insist that the firm keeps its promise, because during the apprenticeship period the trainee has made a substantial investment in firm-specific capital. Recall from the previous analysis that the firm-specific capital is worth significantly less in its best use in other organisations and puts constraints on grabbing and leaving. For the apprenticeship period, therefore, to be a viable response to the firm's uncertainty, the firm must have some bonding mechanism that will assure trainees at the time they are considered for partnership.

[17] See Donaldson and Eaton (1976; 1977) who argue that the investment in firm-specific human capital is not shared, since the firm reaps the benefit and gets the whole return on the investment (i.e. there is no shared return).

A structural technique or "credible commitment" (Williamson, 1975) which is created by the promise to treat the trainee fairly at the time of the partnership decision and which is self-enforcing through the very design of the relationship, is the up-or-out system.

To see this, recall precisely how the firm behaves opportunistically at the time of the partnership decision; it seeks to continue earning profits from the trainee's efforts by retaining as a trainee a chartered accountant who actually meets the partnership standards. By committing itself to fire anyone who is not made a partner, the firm effectively eliminates its incentive to undertake the very opportunistic behaviour that creates the trainee's uncertainty[18]. With the up-or-out system in place, the firm cannot manipulate the partnership decision so as to retain in some other capacity the services of a trainee whose performance really merits partnership (Kahn and Huberman, 1988).

Moreover, the up-or-out promotion policy provides incentives for the monitors (partners) as well as the employees (trainee chartered accountants and managers) to invest large amounts or resources in performance measurement and evaluation (Baker *et al*, 1988; Alchian & Demsetz, 1972; McChesney, 1982). In team-based firms such as the accountancy firms, worker A has incentives to monitor co-workers if the co-workers' performance affects worker A's compensation and *vice versa* (Kandel and Lazear, 1992; Van Lent, 1999).

In summary, then, the up-or-out system is an organisational, structural response to the dual (or two-sided) uncertainty confronting the accountancy firm and the trainee at the time the trainee is hired. It responds to the trainee's uncertainty by eliminating the incentive for the firm to cheat and by succeeding this, the up-or-out practice enhances

[18] Bartel & Borjas (1981), and Becker (1962) argue that the firm has a smaller incentive to lay off the employee and lowering the probability of separation when there are specific investment costs in human capital. In other words, the parties become locked into the existing relationship (Williamson, 1975; 1981). An argument quite opposite to our analysis. See also Waldman (1990) who argues that the up-or-out system is equally valid where the human capital is general rather than specific.

the viability of the apprenticeship period as a solution to the firm's uncertainty about the abilities of the pool of trainees it hires[19].

However, from the trainee's perspective, although the up-or-out system reduces the risk the firm will cheat on the partnership decision it increases the risk of investing in firm-specific human capital[20]. Therefore, in order for the up-or-out policy to be stable and because trainees are risk averse (i.e. do not want to lose their investment), the increase in risk that results from it must be ameliorated.

The firm's answer to this increased risk is that it offsets this increase in the risk of the trainee's investment by facilitating outplacement[21] and minimising firm-specificity. The accountancy firm does this by providing an external consolation prize: a successful and prestigious job position in industry, professional services or commerce through the networks of contacts that the accountancy firms have created during the years (Maister, 1985). Also, the accountancy firm minimises the negative implications of a trainee not making partner, or put differently, it overcomes the firm-specific character of the trainee's human capital by revealing the trainee's general abilities (such as general business skills, technical skills, good work habits, interpersonal skills, passing the accounting training programme and examinations, and so on)[22] and possibly by subsidising the whole process by offering an implicit promise to send them referral business. In addition, audit firms know that their employees are carriers of the firm's reputation as well as of the reputational goods afforded by qualification in a prestigious profession (such as the accountancy profession) which makes them attractive and mobile to move on into lucrative, high-paying jobs outside the professional practice areas.

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[19] In other words, the bilateral opportunistic bargaining problem pointed out by Klein *et al* (1978) is surmounted with the selection of the up-or-out policy.

[20] In other words, if a trainee fired (due to up-or-out policy) after he had partially paid for the investment in FSHC, then he would be unable to collect any return and, therefore, would suffer a capital loss (Becker, 1962; Weiss, 1986).

[21] In his analysis, Becker (1962) believes that "an employee who pays for specific training would suffer a loss being laid off because he could not find *an equally good job elsewhere*" (emphasis added). Obviously, Becker did not take into consideration the possibility for firms to facilitate outplacement.

[22] The training the trainee chartered accountant receives is not completely specific but indeed is a combination of general training as well as specific. In a survey contacted by Marxen (1996) who used structured telephoned interviews, alumni of the Big 6 referred to these general training abilities and skills when they were asked what they had gained during their Big 6 tenure. See also Eastman (1977) and Spence (1974).

Conclusively, then, with the up-or-out system in place, existing partners routinely earn the surplus value of the juniors without having to repay them when the apprenticeship period ends in the form of promotion (making them partners). The firm, too, willingly accepts the up-or-out system simply because it allows a significant degree of screening/sorting so that only the "best" stay in the firm and become partners[23]. On the other hand, the trainee chartered accountant have two types of incentive. First, there is the chance of success in the system's terms and becoming one of the "best". Second, even relative failure offers excellent cover opportunities and indeed these opportunities may be a trainee's preferred option from the outset. So the trainee has a double incentive to accept paying some of the cost and invest in FSHC, although he/she is aware of the high turnover rate (due to up-or-out policy). At first, return on this investment is recouped by the accountancy firm during the apprenticeship period, but the employee does receive high subsequent return on his investment through internal success or through being outplaced in a good position by his/her employer.

This kind of job separation described above makes both parties (i.e. the large accountancy firm - especially its partners - and the employees of these firms) better off by taking advantage of the benefits of institutional structure of the accountancy firms. This is consistent with the position taken by Becker *et al* (1977) and Barzel (1982) who argued that separations always occur when they are to the mutual benefit of both parties.

Accountancy firms' employees/alumni, therefore, receive return on their investment in human capital even when they are released by their employers. Through the use of alumni networks, accountancy firms outplace their employees in positions with their clients. The return on investment made by both the accountancy firm and the employee chartered accountant is not lost (due to up-or-out policy), although the time realisation of this return differs between these two investors. Accountancy firms receive a major part of their return during the apprenticeship period, while the employee auditor receives mainly his return later when outplaced (or becoming a

[23] Another useful explanation for the adoption of up-or-out system provided by Van Lent (1999) is that audit firms cannot afford an unlimited growth of their personnel. Thus, auditors who are not promoted would block the way up for juniors at lower levels of the firms. Consequently, they must leave the firm.

partner). The "failed partners", i.e. those auditors who are not promoted[24], are outplaced by the accountancy firms using effectively their alumni connections and contacts. As a direct result of this, there ought to be some form of "alumni effect". In other words, one looks an association between the auditor of the company where the "failed partner" has been outplaced, and the "failed partner's" alma mater. Although we predict an effect in the market for audit services due to existence of accountancy firms' alumni on the boards of directors of publicly traded companies, nevertheless, we cannot determine at this stage the sign of this effect.

However, the following two sections attempt to frame an initial answer to the above inquiry and specifically, establish the direction of the sign of the "alumni effect" by making use of the literature on the client acceptance decision and auditor's engagement risk, as well drawing on sociological and psychological research. Chapter V later investigates empirically the extent to which an "alumni effect" prevails in the UK audit market, and Chapter IX undertakes a statistical analysis of the direction of the sign of this effect, and its magnitude.

2.5. The client acceptance decision and auditor's engagement risk

The audit engagement process is complex and decisions are made by both the prospective client and proposing accounting firm. The selection of external auditors by companies has been extensively researched (Burton and Roberts, 1967; Chow and Rice, 1982; Eichenseher and Shields, 1983; McConnell, 1984; Simon and Francis, 1988; among others), but to date there are only a few studies of auditor's decision process in accepting a new client (Huss and Jacobs, 1991; Johnstone, 1998; Francis and Reynolds, 1998)[25].

Professional standards suggest that accountancy firms should establish procedures for making the client acceptance/continuance decision. However, professional standards

[24] Note, that the term CADRE has been used in the Chapter I for those directors who are simultaneously chartered accountants.
[25] These are the only published relevant papers on the client acceptance decision and auditor's engagement risk that I am aware of.

do not provide any guidance about how to actually make the decision, although the client acceptance decision is an increasingly important auditing task; Huss and Jacobs (1991, p. 20) specifically stated that "...the pre-engagement decision process is a - perhaps the most - critical step in the audit process".

On the other hand, audit partners' judgements may be affected by the fact that they are compensated based, in part, on the amount of revenue that is generated via new clients (Asare *et al*, 1994) as well as by the enormous competition between audit firms for new clients. As a result, partners' judgements may be less conservative, that is that client-related risks and the auditor engagement risk may be ignored or minimised in order for new clients to be recruited, or on the other hand, they may be more conservative due to audit firms' increased litigious operating environment. In any event an evaluation of the risks involved is a necessary consideration for auditors when they make auditing acceptance decisions (Simunic and Stein, 1990; Jones and Raghunandan, 1998).

Johnstone (1998) has examined the client acceptance decision. She developed a risk-based model where the client-related risks are evaluated and then the audit firm's risk of loss on the engagement is assessed. In other words, she found that auditors' evaluations of the (prospective) client's inherent and control risks affected their evaluations of the client's future financial prospects. These significant evaluations, in turn, affected auditors' evaluations of their firms' risk of loss on the engagement via lack of engagement profitability or future litigation. Johnstone concluded that auditors do use their evaluations of client-related risks and their own firms' risk of loss on the engagement to screen out undesirable clients. Huss and Jacobs (1991), Francis and Reynolds (1998), Jones and Raghunandan (1998), Pratt and Stice (1994), Hill *et al,* (1994) and Clarkson and Simunic (1994) have all reached similar conclusions, that is pre-engagement risks assessments are regarded as an important determinant in the engagement outcome.

In order for the auditor to form an overall evaluation of the riskiness of the client, three relevant and interrelated risks must be evaluated, according to Johnstone. These risks involve the client's business risk (i.e., the client's financial condition and industry membership), the audit risk (i.e., inherent risk, control risk), and the auditor's business risk (i.e., the likelihood that the auditor will suffer a loss from the engagement). For example, Jones and Raghunandan (1998) showed that there is significant reduction in the likelihood that Big-Six firms would audit clients who are in financial distress or are in high-tech industries, simply because these clients are perceived as having high litigation risks. In contrast, Francis and Reynolds (1998) provided evidence that there is an increase in the riskiness of the Big-Six clientele in their study of publicly held companies undertaken for the period 1976 and 1996.

Johnstone's paper (1998) concluded that audit partners do not use risk adaptation strategies (e.g., adjusting the audit fee, etc.) to mediate the effects of the client's business risk, audit risk, and auditor's business risk evaluations on the client acceptance decision. This is consistent with anecdotal evidence that auditors have difficulty shifting auditor's business risk to clients via certain risk adaptive behaviours (Arthur Andersen *et al.*, 1992; Morgan and Stocken, 1998). This finding implies that risk adaptation strategies are not appropriate for making an otherwise "unacceptable" client (due to extremely high client-related risks evaluations and consequent, audit firm's risk of loss on the engagement) more acceptable. As a result of auditors not using more active risk adaptation strategies, it would appear that the only other possible way of accepting an engagement, *ceteris paribus*, is by reducing the risks associated with client acceptance decision.

The theoretical analysis in the last section of this chapter has shown that the internal organisational structure of the accounting firms drives them to adopt some form of the up-or-out personnel policy as a response to the dual uncertainty the audit firm and the trainee chartered accountant are confronted with. However, remember that the up-or-out system risks destroying the investment in firm-specific human capital unless the auditing firm is able to reduce the risk of this investment. It does that by facilitating outplacement. In other words, we argued in the preceding section that the up-or-out system has been developed as a least bad alternative solution by the accounting firms as a result of the institutional structure of those firms.

In this section, we extend the reasoning behind the adoption of the bonding mechanism that this solution implies. We suggest that by enthusiastically working towards outplacing their alumni onto the fast track for promotion and ultimately into the boardrooms of existing (and prospective) clients, accountancy firms seek to meliorate the client-related risks and consequently the firm's risk on loss on the engagement. They succeed in doing so, we argue, because the appointment of their alumni into fast-track and seniority networks in major companies provides auditors with valuable information on management[26], and even more the presence of alumni on boards is likely to be regarded by auditors as a positive sign that the company is willing to set up strong and more reliable financial reporting systems which in turn lead to the expectation that auditors assess lower inherent (and control) risk(s).

Furthermore, as noted earlier, auditors do evaluate the client-related risks before they assess the audit firm's level of risk of loss on the engagement. Not only that, but, as we have suggested, auditors seek actually to reduce the risks associated with the client inquiry audit process. This is in accordance with prior research in auditing whereas auditors appear to be sensitive to the objectivity of the source, to the expertise (competence) of the source and to the communication style of the client. Joyce and Biddle (1981), Hirst (1994) and Reimers and Fennema (1999) all demonstrate that auditors assess information from the more objective source as more diagnostic than information received from a less objective source. In addition, previous studies have shown that auditors receiving an estimate or explanation from a source of high expertise (competence) are more confident in their own re-estimate than auditors receiving an estimate or explanation from a source of low expertise (competence) (Bamber, 1983; Rebele *et al*, 1988; Hirst, 1994; Anderson *et al*, 1994). Finally, Comunale *et al* (1999) explore auditors' judgements in the presence of differing levels of client presentation skills and their findings suggest that the communication style of the client influences auditors' judgements and assessments of client credibility. In other words, the outplacement of audit firm's alumni on the clients' (prospective or not) boardrooms enhances the perceived objectivity, expertise, competence and the

[26] Kaplan and Reckers (1984) found that management integrity was not a significant factor in the auditor's assessment of error likelihood. However, this research finding is regarded as unexpected, as the given firm's audit pre-engagement decision processes would presumably preclude affiliation with a client of highly questionable integrity, in most cases at least.

linguistic delivery style of clients' management which in turn leads the auditors to assess lower inherent risk.

The inherent and control risks mentioned above are two components of the audit risk model. The audit risk model specifies that audit risk is a function of three risk components: inherent risk (the likelihood that the environmental factors will produce a material misstatement before considering the quality of internal controls); control risk (the likelihood that the material misstatement will be not be prevented or detected by the internal control system); and detection risk (the likelihood that audit procedures will be ineffective in detecting a material error not previously detected by the internal control system). The higher the level of inherent risk, *ceteris paribus*, the more audit effort will be required to reduce detection risk to achieve a given level of audit risk.

In sum, audit firms facilitate outplacement because of their organisational structure, but they also exploit effectively this service in order to assist them in (using, producing) pre-engagement analyses prepared by them, making the client acceptance/continuance decision and "screening" out prospective undesirable clients. Auditors are expected to assess lower levels of inherent risk for companies with chartered accountants on their boards which, in turn, results in lower audit effort and auditors charging lower audit fees. This argument is consistent with previous studies on the role of outside directors on boards of directors which have shown that the presence of independent non-executive directors on corporate boards is expected to be associated with higher monitoring and lower agency costs which is likely to affect assessments of inherent risk and lower the audit fees (Byrd and Hickman, 1992; Forker, 1992; Brickley *et al.*, 1994; Chen and Jaggi, 1997; Gul *et al*, 1998).

Nevertheless, the next section tells us a different (though perhaps complementary) story from the foregoing analysis. Using the literature in organisational behaviour and on alumni of universities, what follows is an analysis of some reasons why alumni may develop personal commitment to a continued identification with, and predisposition to benefit, their past employer.

2.6. Accounting firm alumni identification with their ex-firm

As it has been outlined in the preceding sections, client service (as well as of course retention of existing client and acquisition of new clients) has a paramount importance for the survival and success of the audit firms. Accountants have been part of the "commercialised", private sector service class (Hanlon, 1994). On the other hand, development of career in the professional firms involves "networking" (Grey, 1994). The network of contacts becomes a primary significance since they represent selling opportunities. Accounting firms seem to recognise the marketing potential associated with their network of contacts and expend time and resources to develop it. Alumni (i.e., former colleagues) of these firms play an important role in this regard. Further, when the former employee retains an identification with the audit firm, this identification may help the firm to procure new business. What follows is an analysis of the above issues.

Accounting firms, especially the Big-Six firms, have a large number of alumni due to high levels of staff turnover. Prior research, however, focuses on documenting mainly the negative effects of accounting staff turnover, and understanding the cause of the high turnover in order to reduce its dysfunctional consequences (Dillard and Ferris, 1979; Bullen and Flamholtz, 1985; Rasch and Harrell, 1990; Gregson, 1992). On the other hand, there are some studies, e.g. Waller (1985), Iyer *et al* (1997) and Iyer (1998), which recognise that there can be mutual benefits from this turnover.

All recruits, while being trained and employed by the accountancy firm, inhabit an environment which is set up to develop a sense of *esprit de corps* within the firm and promote long-lasting loyalties with colleagues and supervisors. There is plenty of anecdotal evidence that trainee intakes retain links long after qualification, and that firms actively promote such loyalties through annual reunion events (Grey, 1994; Iyer *et al*, 1997; Anderson-Gough *et al*, 1998). In such ways alumni maintain their knowledge about the firm's services and its reliability. Therefore it is not surprising in sociological terms, that the accountancy firm alumni retain an identification with the firm, and that this identification may influence the former employee when s/he participates in hiring an accountancy firm or may direct business to the firm. Again here, available anecdotal evidence suggests that alumni do favour their former employer when they are in a position to choose or recommend an audit firm (Denney, 1983; Kotler and Bloom, 1984)

In the attempt to specify the nature of this identification more closely, Iyer *et al* (1997) have developed an experimentally testable model based on previous research in organisational behaviour and on alumni of educational institutions. Their model is concerned with the nature of the identification of accounting firm alumni with their former audit firm, and how this may affect alumni's subsequent inclination to benefit their former employer. The model, as developed and tested by Iyer *et al* (1997) and Iyer (1998), grows out of a broader theoretical framework which is concerned with the analysis of different processes of attitude change resulting from social influence[27]. The starting point of Kelman's (1959) theoretical analysis was the observation that changes in attitudes and actions produced by social influence may occur at different "levels". These differences in the nature or level of changes that take place correspond to differences in the process whereby the individual accepts influence (or conforms). In other words, the underlying processes in which an individual engages when he adopts induced behaviour may be different, even though the resulting overt behaviour may appear the same. Kelman has distinguished three different processes under which an individual can accept influence: compliance, identification and internalisation. In brief, *compliance* occurs when an individual adopts the induced behaviour (i.e., accepts influence) because he expects to achieve a favourable reaction from another person or group (and avoid specific punishment or disapproval by conforming), and not because he believes its content. *Identification* occurs when an individual accepts influence because he wants to establish or maintain a satisfying self-defining relationship to another person or a group. The individual adopts the induced behaviour because it is associated with the desired relationship. The individual derives strength and a sense of self-identity from his connection to another person or a social group. Finally, *internalisation* occurs when an individual accepts influence because the content of the induced behaviour is intrinsically rewarding. He adopts the induced behaviour because it is congruent with his value system. Further, according to Kelman, each process is characterised by a distinctive set of *antecedent* conditions

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[27] A detailed description of this framework and its features can be found in the work of Professor Kelman of Harvard University (1959).

under which influence takes the form of compliance, identification, or internalisation respectively. Similarly, each process is characterised by a distinctive set of *consequent* conditions.

Iyer *et al* (1997) proposed an experimental way of classifying how, for accountancy firm alumni, some form of identification may take place, mediating between a distinct set of antecedents and a distinct set of consequents. Their experiment relates the antecedents postulated for the identification process to the consequents postulated for that process (i.e., the conditions of performance of the induced response). Their model was adapted from a study of college alumni's identification with their alma mater undertaken by Mael and Ashforth (1992) and was designed to vary the antecedents of identification - defined as the organisational prestige, socialisation process, personnel policies (i.e., personnel recruiting and personnel counselling), alumni relations, tenure, time elapsed, mentor relationship and sentimentality - and to observe the effects of this variation on one of the consequents - the inclination to benefit the former employer.

The findings of Iyer *et al* (1997) indicate that some of the antecedents mentioned in the preceding paragraph (i.e., organisational prestige, socialisation process, mentor relationship and sentimentality) are positively related to accounting firm alumni's identification with their former audit firm, whilst others (i.e., personnel recruiting and time elapsed) are negatively associated to alumni's identification with their former firm. Personnel counselling, alumni relations and tenure are not significantly associated with alumni's identification, nevertheless they are proved to have a direct influence on alumni's inclination to benefit the alma mater. In addition, organisational prestige is also directly associated with alumni's predisposition to favour their former firm. Finally, identification is significantly positively related to inclination to benefit.

It has been shown in an earlier section that the processes of formal and informal socialisation within the accountancy firms influence the behaviour of professional accountants and their organisational identity. The study by Iyer *et al* (1997) has demonstrated the validity of this argument (i.e., as outlined above, the socialisation process is shown to foster organisational identification), but it has also revealed the importance of socialisation of accountants in the success of the audit firms. The returns to the firm from the efforts to facilitate socialisation continue (through established identification) after professional staff have left the firm.

Iyer *et al* (1997) work has indicated that alumni relations are positively related to accounting firm alumni's inclination to favour the alma mater, however they do not have a significant impact on the alumni's identification itself, perhaps because the alumni's identification is already established when the accountant is involved in a career move. In other words, what seems to happen is that an accountancy firm follows a production process in which trainees with a pre-existing background, ability and so on are recruited and evaluated for future long term retention. The trainees are then gradually trained and finally qualify as chartered accountants, and those who finish the process (and do not continue in employment with the firm) turn into alumni. The audit firm then pursues a second process in which (already achieved) alumni identification with the organisation is retained and enhanced by applying development effort to alumni.

For example, audit firms devote considerable resources to their alumni relations programmes in keeping track of their alumni, publishing alumni directories containing alumni's names and other personal details, emphasising job placement services for departing employees and maintaining formal and informal contacts with their alumni, through alumni directories, annual social events, picnics and gatherings, newsletters and continuing education programmes (such as periodic technical seminars). In addition, many of the audit firm alumni belong to an alma mater club even years after they have left the firm.

The fact, therefore, that accounting firms maintain communications with their alumni suggests that the firms believe that these alumni relations influence positively the alumni's identification with their alma mater, and that these efforts are still valuable and expected to benefit the firm. This is partially consistent with Iyer *et al* (1997) who found that one of the antecedents of identification - i.e., alumni relations - is significantly associated with alumni's tendency to benefit the former firm. Probably this positive association between alumni relations and inclination to benefit enhances the already established organisational identification and improves the strength of the bond forged between the organisation and its alumni (although no significant relationship between alumni relations and identification was advanced by Iyer *et al* (1997)). However, the above argument is in accordance with prior studies where organisational identification appears to increase when there is increased contact with an organisation (Dutton *et al*, 1994), when these contacts remind firm alumni of their connection to the organisation (Stern, 1988), and highlight the organisation's attractive attributes (Bruner, 1957; Baade and Sundberg, 1996). Increased, therefore, alumni's identification with their former accounting firm is likely to affect their willingness or inclination to benefit the audit firm when the opportunity arises.

Moreover, reading the social psychological research literature, one cannot fail to notice the use of congruent determinants of alumni identification with the ones mentioned in the foregoing analysis in order to predict monetary and non-monetary contributions to victims "in distress" (such as universities, sports teams, charities and so on). For example, Fisher and Wakefield (1998) used a similar model to Iyer *et al* (1997) to show a strong association between the strength of identification and the incidence of group-supportive behaviours for members of a two-group professional sports fans. Piliavin *et al* (1981) showed that one factor which increases the bystander's perception of similarity to a group is the common group membership which in turn increases the probability of helping behaviour. In other words, the stronger the relationship between an organisation and its members, the greater the willingness of individual members to engage in behaviours that support the group. Diamond and Kashyap (1997) used also a similar model to Iyer *et al* (1997) to find reciprocity and individual attachment (i.e., identification) as determinants of obligation to benefit the alma mater. Alumni are predicted to feel more obligated if they feel the alma mater has benefited them personally or professionally. Some may wish to repay the former firm for their success in life after professional qualification and outplacement, because they feel that their alma mater has taught them things which have been important in their personal and professional lives. Equity theory predicts that alumni benefit the alma mater to the degree their success derives from or is perceived as deriving from the alma mater (Adams, 1965; Walster and Piliavin, 1972). Others may feel most obligated to benefit the former firm because of their strong identification with the firm. Hunter *et al* (1999) reached similar conclusions in their study. Baade and Sundberg (1996) applied a log-linear regression model to explore what determines alumni giving. Their results indicate that both institutional characteristics as well as trainee (student) characteristics are correlated with alumni giving. Similarly, a logit regression model was used by Okunade and Berl (1997) to investigate the propensity of business school alumni to donate cash to the alma mater. Again, alumni identification with the business school under study is one of the factors that shapes alumni giving behaviours.

In sum, it seems that accountancy firm alumni are important assets for the firms. Today's trainee chartered accountants become tomorrow's alumni (unless they are retained and promoted to attain gradually the partnership level), and also may wind up as tomorrow's potential clients. Accountancy firm alumni are developed into valuable marketing contacts for the audit firms (Denney, 1983). The accountancy firms themselves do recognise the marketing potential associated with their alumni, and they expend time and resources to develop and maintain their links with alumni (Grey, 1994; Iyer *et al*, 1997; Iyer, 1998). Moreover, it is likely that the prestige of having trained with a specific audit firm, the socialisation received in this firm and the sustained development effort to alumni continue to colour the values and identification of some alumni. The degree of identification affects individuals' willingness to support groups, and certain antecedents have been experimentally proven to be important determinants of identification and inclination to benefit the alma mater. Consumers often communicate their identification with or support of an organisation through the purchase of an organisation insignia products (Tom and Elmer, 1994). Accountants may communicate their identification by feeling obligated to benefit their alma mater.

2.7. Summary and conclusions

We have put together in this chapter a range of explanations derived from economics, psychology and sociology to show why the alumni of the (mainly large) accounting firms may select to be associated with their "alma mater" (i.e. past employers) years after having been outplaced. The insights derived from these various sources can be summarised as follows:

From the *economics perspective*, the only significant input of the accounting firms is human capital but because the human capital is difficult to diversify, the need for risk-sharing is an important influence on organisational structure. Sharing of profits on a predetermined basis reduces the risk of individuals' human capital investment. Human capital, however, is susceptible to opportunism, and the development of firm-specific human capital protects the firms against some partners and non-partners grabbing, shirking, or leaving. The up-or-out personnel policy serves two dimensions: it protects employee accountants against the firm reneging on its promise of a fair partnership decision when the apprenticeship period ends; it, also, allows a significant degree of screening so that only those with high post-investment productivity will be retained. Nevertheless, as we have analysed in the preceding sections of this chapter, the up-or-out policy destroys the investment in firm-specific human capital unless the firm is able to reduce the risk of this investment. It does that by facilitating outplacement. Although the accounting firm has outplaced its alumni, they are still important assets for the audit firm. After the outplacement, the alumni become prospective customers of the audit firms and the accountancy firms do exploit their ability to manage their alumni asset in order to maximise the benefits derived from their alumni base.

From the economic rationale, the "failed partners" get return on their investment in human capital by being outplaced to an audit client. The ability to successfully use alumni connections and networks allows the return on investment not to be lost. This helps to reduce the likelihood of the alumni of accountancy firms being resentful towards their alma mater. Instead, we argued, it creates the "alumni effect" where there is an association between the accountancy firms' alumni and their alma mater.

Using an analysis drawing on information economics and auditor's engagement risk, it was shown that auditors evaluate the client-related risks and this in turn affects the level of audit fees charged by audit firms. By outplacing their alumni into the boardrooms of existing (and prospective) clients, accounting firms reduce the client-related risks, and as a result the firm's risk on loss on the engagement. The presence of audit firm alumni, therefore, into client management positions leads to expectation that the auditors assess lower levels of inherent and control risks which, in turn, results in lower audit effort and auditors charging lower audit fees.

Thereinafter, a more explicit cognisance of literatures which have looked into the wider context of accountancy training, professionalisation and identification was taken. From the *sociological perspective*, therefore, a number of antecedents were experimentally proven to be associated to the identification of audit firm alumni with their former firm. Moreover, identification itself affects alumni's propensity to favour the alma mater. One of the antecedents of identification was the process of socialisation in accounting firms. It was shown that through socialisation accountants acquire appropriate forms of professional behaviour and also an organisational identity and anti-shirking culture through espousing the corporate values to which they belong. Alumni relations also appear to be positively related to audit firm alumni's inclination to benefit the alma mater. Accountancy firms devote considerable resources to their alumni relations and they recognise the marketing potential associated with their alumni. For example, they organise annual reunion events, publish alumni directories and newsletters, etc. Thus, the degree of alumni identification with their former audit firm is likely to affect their willingness to support the alma mater.

Our primary concern was to develop a theoretical framework to provide insights into an unexplored social phenomenon - the association between accountancy firms' alumni and their alma mater. Practitioners are always far along in understanding and exploiting this phenomenon (as any other phenomenon or problem). We attempted to arrange things into "theories" but always the challenge exceeds our competence - if only because we are not fully embroiled in the rich detail that the practitioners cope with and understand (Wilson, 1983). However, we hope that the application of this body of theory to a real world institution will have the positive side effects of both extending the reach of the theory itself and helping to demonstrate its usefulness.

CHAPTER III

A LITERATURE REVIEW
OF THE
AUDIT FEE RESEARCH STUDIES

It is rarely the case that a whole research literature can be traced to a single origin, but that distinction belongs to Simunic's (1980) paper which was the first study to consider auditing from an industrial economics perspective. Prior to Simunic, audit research comprised two strands: the philosophy and public policy of auditing, e.g. ethics, independence, auditing standards, etc.; and the application of statistics to the auditing context. Subsequent to Simunic, a new strand has developed which explores the audit industry from an economics perspective and addresses issues such as: what is the nature of competition in the industry; is the market for audit services segmented; what are the determinants of switching; is the low-balling occurred on initial engagements justified; is risk adequately priced in audit fees. This new strand is sometimes referred to as audit market research or audit fee studies.

Having identified the importance for audit firms of their alumni from a human capital perspective in Chapter II, it is necessary to explore whether there are affects of alumni reflected in audit prices. As a prelude to this main investigation of the thesis, it is appropriate to review first the related prior literature. It should be clear at the outset of this review that no prior research has considered the role of accounting firm alumni in audit market. A number of other factors affecting the audit fee have been investigated as we discuss in this chapter. Given the seminal nature of Simunic's (1980) analysis, the review starts with an exposition and critique of his work.

3.1. Simunic's (1980) seminal study

The objective of Simunic's (1980) landmark research was to examine the principal determinants of prices of the financial audit services rendered to companies by the accounting firms. He identified as a possible price determinant the structure of the accounting services market, especially the exercise of monopoly power by the Big-Eight (now Big-Five)[1] audit firms. The purpose of his study, therefore, was to test whether price prevailed throughout the US market for the audits of publicly held companies, irrespective of the share of a market segment which is served by the Big-Eight firms.

Simunic first developed a positive economic model of the audit price (fees) formation process, and then based on this model, a general set of factors which may cause prices to vary across audit engagements and hypotheses concerning specific price determinants were formed and tested through collection and analysis of a sample cross-section of audit transactions.

Since the audit fee is a product of unit price, denoted by p, and the quantity of audit services demanded, denoted by q, cross-sectional differences in audit fees may stem from either price differences or quantity differences. The model was developed to help identifying likely determinants of audit demand or audit quantity[2], such that unit prices could be examined. Based on the normative, co-operative, auditee-auditor joint utility maximisation model of Demski & Swieringa (1974), Simunic considers the

[1] Note that the number of large dominated accountancy firms was eight during the 1980's. During the 1990's, the number of the large accountancy firms became six, today are five.

[2] For a fixed set of audit conditions, variations in the quantity of audit service rendered represent variations in audit quality.

external audit as a subsystem of an auditee's overall financial reporting system. In other words, the external audit is viewed as part of an overall financial reporting process designed to "authenticate" (Hirschleifer, 1973) the information disseminated by the auditee to third parties.

Auditee and external auditor are assumed to be jointly and severally liable to third parties for losses attributable to defective audited financial statements and, therefore, any actual losses incurred will be somehow divided between the two parties. The audit service is viewed as an economic good to the auditee, which has substitutes and complements in consumption. Consequently, the demanded quantity of auditing will result from equalisation of marginal private benefits and costs of the audit service. In other words, Simunic hypothesises that the amount of resources which the auditee will devote to the above mentioned "authentication", or else the audit benefits, are in the nature of a joint auditee-auditor expected third party liability loss avoidance (expected cost minimisation).

Simunic models audit pricing both in a competitive and non-competitive market setting, and also analyses the effects of audit production economies. Each of these three models are summarised in the next three sections.

3.1.1. The auditee's decision problem under competition

The decision problem of the auditee is expressed as an unconstrained minimisation of the expected total costs of its financial reporting system, denoted $E(T\tilde{C})$. In particular, demand for internal control and external audit services is modelled as the auditee's choice of the system design variables (a, q), such that the following function is minimised:

$$\min E(T\tilde{C}) = va + pq + E(\tilde{d} \mid a,q)(1 - E(\tilde{\theta})) \qquad \text{[Function 1]}$$

where:

a = the quantity of resources utilised by the auditee in operating its internal accounting control system. The value of (a) describes the quality of internal control;

q = the quantity of resources utilised by the auditor in a particular audit engagement. The value of (q) can be called the quality of a given audit;

v = the per-unit factor cost of internal control resources to the auditee;

p = the unit price of external audit services to the auditee, that is, the price per unit of (q) purchased by the auditee from the auditor. It will depend on the state of competition in the market for audit services;

$\tilde{d}$ = the discounted present value of possible future losses;

$E(\tilde{d}|a,q)$ = the expected present value of possible future losses which may arise from this period audited financial statements and which is conditional[3] on α and q;

$\tilde{\theta}$ = the *ex post* fraction of residual losses borne by the auditor;

$1-E(\tilde{\theta})$ = the auditee's expected share of losses.

Simunic does not explicitly model an internal control system and external audit production function, but assumes that resources are utilised efficiently so that α and q denote both inputs and corresponding unique quantities of output constructs.

The auditor's minimum supply (asking) price, p, per unit of q is the marginal cost. Thus, the minimum audit fee, which is the product (pq), for different levels of audit quantity will be equal to the expected incremental total cost, denoted $E(\tilde{C})$, or

$$pq = E(\tilde{C}) = cq + E(\tilde{d}|a,q)E(\tilde{\theta}) \qquad \text{[Function 2]}$$

where:

c = the per-unit cost of external audit resources to the auditor, including all opportunity costs and therefore a provision for a normal profit.

[3] Diminishing marginal benefits from internal control and external audit demand are assumed. In particular: $\partial E(\tilde{d})/\partial a < 0$, $\partial^2 E(\tilde{d})/\partial a^2 > 0$, $\partial E(\tilde{d})/\partial q < 0$, $\partial^2 E(\tilde{d})/\partial q^2 > 0$, $\partial^2 E(\tilde{d})/\partial a \partial q > 0$ are assumed to

For any profit maximising auditor $p \geq c$, or $pq \geq cq$. Since, by definition, the parameter c includes all costs of a unit of q including a normal return, when the market for audits is competitive, $p = c$, and the auditor's price/quality schedule under competition becomes the [Function 2].

The auditor's expected costs are, thus, a function of the auditee's financial reporting system. Therefore, by substitution to [Function 1], the auditee's decision problem can be re-specified as:

$$\min E(T\tilde{C}) = va + cq + E(\tilde{d}|a,q)E(\tilde{\theta}) + E(\tilde{d}|a,q)(1 - E(\tilde{\theta}))$$

which again reduces to:

$$\min E(T\tilde{C}) = va + cq + E(\tilde{d}|a,q) \qquad \text{[Function 3]}$$

As a result, the demanded quantities of internal control and external auditing will result from equalisation of marginal benefits and costs. Also, the expected incidence of third party liability has no effect upon the auditee's optimum utilisation of internal control and external audit resources. This is so because the auditee expects to incur all financial reporting system costs (including internal control and external audit) and so is indifferent to the cost form, whether the cost of internal control systems, external audit price, or expected discounted residual liability losses. Alternatively, the result follows from Coase (1960), who showed that, in the absence of transaction costs, a change in the assignment of legal liability for negative externalities does not affect the allocation of resources. The mechanism which leads to the result is the opportunity for a costless transaction through which external effects are internalised.

The necessary conditions for a minimum in the above [Function 3] are:

hold. A further assumption is that there is diminishing substitutability between α and q, or that: $d\alpha/dq<0$ and $d^2\alpha/dq^2>0$ holds.

$$\frac{\partial(T\tilde{C})}{\partial a} = \frac{\partial E(\tilde{d})}{\partial a} + v = 0, \qquad \text{or} \qquad -\frac{\partial E(\tilde{d})}{\partial a} = v$$

and

$$\frac{\partial(T\tilde{C})}{\partial q} = \frac{\partial E(\tilde{d})}{\partial q} + c = 0, \qquad \text{or} \qquad -\frac{\partial E(\tilde{d})}{\partial q} = c$$

Note, that when the market for audits is competitive, as it is assumed in this case, $p = c$.

These conditions require that auditee will demand quantities of a and q up to the point where the marginal reduction in expected liability losses is equal to the marginal cost of system resources to the auditee.

3.1.2. The auditee's decision problem in a non-competitive market

To model audit demand in a non-competitive market setting, Simunic assumed that a dominant subset of audit firms (i.e. the Big-Eight firms), through some form of collusion, agrees to limit price competition so as to introduce an element of monopoly profit, denoted by m, into the unit price, p.

Under monopoly $p = c + m$, and similar to [Function 2], the fee schedule of an auditor who is one of the Big-Eight and, therefore, part of the cartel, is then:

$$pq = E(\tilde{C}) = (c+m)q + E(\tilde{d}|a,q)E(\tilde{\theta})$$

and the auditee seeks to minimise the following objective function:

$$\min E(T\tilde{C}) = va + (c+m)q + E(\tilde{d}|a,q).$$

The necessary conditions for the minimisation become:

$$-\frac{\partial E(\tilde{d})}{\partial a} = v \qquad \text{and} \qquad -\frac{\partial E(\tilde{d})}{\partial q} = c + m.$$

The effects of monopolistic auditor behaviour are that the quantity of audit services demanded q decreases relative to the competitive case, and that the quantity of desired internal control resources a increases[4]. Furthermore, because of the diminishing substitutability between internal control (a) and external audit resources (q) in controlling liability losses, the desired quality level of the financial reporting system decreases, where quality is implicitly measured by the joint reduction in expected residual losses. In other words, monopoly leads to lower quality audits and a lower quality financial reporting system. As a result, the level of expected residual liability losses will be larger under monopoly pricing, and so will be the total financial reporting system costs.

Although monopolisation through collusion among the Big-Eight firms increases the unit price of external audit services p above the competitive level, the implication on the level of the audit fee pq is indeterminate (p increases, and q decreases)[5]. The direction of the change in audit fees depends upon the price elasticity of the demand for external auditing (which itself depends on the goodness of available substitutes). Inelastic demand would result in an increase in audit fees, whereas elastic demand in a decrease in audit fees.

3.1.3. The effects of auditor production economies

Simunic also theoretically addresses the effects of production economies on audit quantity demanded, unit prices and auditee financial reporting system costs. Assuming that there is competition among auditors who achieve such economies, the auditor client's necessary condition for the minimisation of expected costs with economies becomes:

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[4] This is so because reduction of q makes the value of $\partial E(\tilde{d})/\partial a$ more negative at any a, since $\partial^2 E(\tilde{d})/\partial a \partial q > 0$ holds.

[5] However, monopoly pricing increases the audit fee, pq, in the absence of external audit substitutes such as the services of internal auditors.

$$-\frac{\partial E(\tilde{d})}{\partial a} = v, \quad \text{and} \quad -\lambda\frac{\partial E(\tilde{d})}{\partial q} = c, \quad \text{or} \quad -\frac{\partial E(\tilde{d})}{\partial q} = \frac{c}{\lambda}$$

where:

λ = the relative efficiency of an auditor in reducing residual expected losses.

The characteristics of this solution are the reverse of the results under monopoly pricing. That is: (1) the quantity of external audit services demanded increases and the quantity of desired internal control decreases; (2) the unit price p decreases; (3) the sum of the auditee's observable total system costs ($va + pq$) decreases; and (4) as in the case of monopoly, the effect on audit fee pq is indeterminate and depends upon the elasticity of substitution between internal control (a) and external audit resources (q), i.e. it depends on the price elasticity of demand for external auditing.

3.2. The logic of the test for competition in the audit market

For the empirical test of competitive pricing, Simunic assumes that the sub-market for audits of smaller publicly traded companies is competitive (due to the large number of audit firms active in that market), and tests for the effects of increased Big-Eight concentration on prices charged to large clients[6]. Moreover, the research was designed under the assumption that different audit pricing for large and small auditees might be a result of (1) scale economies which can be exploited by large accounting firms, or (2) product differentiation[7]. In other words, he recognises that the Big-Eight firms can be a source of production economies, and also, that it is possible the Big-Eight auditors may sell a differentiated service for which clients are willing to pay a higher price. Simunic states that the market for audit services is thought of as a hedonic market (Rosen, 1974) in which differentiated products are not observed directly by the customer but rather are revealed by differences in observed prices which are associated with differences in observed product (audit) characteristics. A possible

[6] In effect, Simunic assumes that the large client segment of the audit market is not competitive. However, see Pearson and Trompeter (1994) for providing the counter-argument that high levels of concentration may not necessarily result in low levels of audit price competition.

source of differences in auditee utility and the principal differentiating characteristic of the audit service may simply be the identity of the supplier, and again it is the Big-Eight firms which enjoy visibility, brand-name recognition and reputation among buyers[8].

Table 3.2.A: Test for competition: interpretation of possible differences in average audit prices when quoted companies use Big-Eight or non-Big Eight auditors across market segments

Results for the "large" auditee segment	Results for the "small" auditee segment		
	$CRE\|8 > CRE\|\overline{8}$	$CRE\|8 = CRE\|\overline{8}$	$CRE\|8 < CRE\|\overline{8}$
$CRE\|8 > CRE\|\overline{8}$ *	**(1)**+ Competition with differentiated product (DPr) to the Big-Eight	**(2)** Monopoly pricing (MPr) by the Big-Eight	**(3)** MPr by the Big-Eight together with scale economies to the Big-Eight
$CRE\|8 = CRE\|\overline{8}$	**(4)** Competition with DPr to the Big-Eight together with diseconomies to non-Big Eight with large auditees	**(5)** Competition throughout the market without any scale economies to the Big-Eight	**(6)** MPr by the Big-Eight together with scale economies to the Big-Eight
$CRE\|8 < CRE\|\overline{8}$	**(7)** Competition with DPr to the Big-Eight together with diseconomies to non-Big Eight with large auditees	**(8)** Competition with diseconomies to non-Big Eight with large auditees	**(9)** Competition with scale economies to the Big-Eight

* $CRE|8$ denotes the average residual costs of auditees using a Big-Eight firm and $CRE|\overline{8}$ denotes the average residual costs of auditees using a non-Big Eight firm
\+ The numbers 1-9 (in bold and underline) denote the 9 different scenarios (*have been added to original table to simplify subsequent discussion*)

Source: Simunic (1980)

Simunic collected relevant data through a survey of a sample of publicly held companies which were stratified by auditee size. In particular, a questionnaire, sent to 1,207 companies, yielded 397 usable responses directly from quoted industrial and commercial companies. Also, the sample was stratified by auditor group (Big-Eight versus non-Big Eight audit firms). To test the hypothesis that price competition prevails throughout the market for the audits of publicly held companies it was necessary to control for differences in the quantity of audit service purchased, q, and internal control quantity, α. A number of control variables were chosen in

[7] Product differentiation refers to audits of different quality. For a fruitful discussion of the relationship between auditor size and audit quality, see DeAngelo (1981b). Also the footnote 14 below.

correspondence of the audit pricing model[9]. Simunic computed and compared the cost residuals for both the small (defined as sales less than US$125million) and large auditee segment (defined as sales more than US$125million). Cost residual was defined in Simunic's study as the audit cost not explained by the control variables. Differences in the average cost residuals between auditees using Big-Eight and those using non-Big Eight auditors were interpreted using the following Table 3.2.A. Simunic found no significant differences in cost residuals, and hence in audit prices; he showed that the audit fee determinants in the small and the large auditee segment are homogeneous in the US audit market. This result was interpreted by Simunic as being consistent with the competitive market structure scenario and no certain scale economies or product differentiation to the Big-Eight firms (scenario 5, in the Table 3.2.A).

3.3. Patterns in the pricing of audits

Simunic's (1980) stimulating work has been expanded by other researchers using similar cross-sectional methodologies and testing models and hypotheses in a number of alternative audit markets (see Table 3.3.A below). As in Simunic's study, cross-sectional multiple regression models are developed relating external audit fees to auditee firm characteristics. These studies have gathered survey data for the dependent variable (audit fee), and for a number of auditor and firm-specific independent variables. Auditor-related variables have been considered as important test variables, whereas auditee-related variables have often been merely regarded as control variables for audit effort or audit quantity. Appendix I gives an overview of the hypothesised explanatory variables for most studies under review, indicating which variables were found to be significant and giving the sign of their coefficients. Table 3.4.A in section 3.4 below provides an brief outlook of the popular independent variables across

[8] Note, however, that a general definition of audit quality has not yet evolved. For a discussion of this issue, see Moizer (1993), Sutton and Lampe (1990). See also Chapter X for a discussion of product differentiation explanation.

[9] Simunic made a distinction between control variables for differences in liability loss exposure, $E(\tilde{d})$, and control variables for differences in the assessed loss-sharing ratio, $E(\tilde{q})$. There will be a discussion about the control variables later on this chapter.

Table 3.3.A: Models tested in prior studies

Author(s)	Empirical models tested
Simunic (1980)	$AFEE/ASSETS^{0.5} = b_0 + b_1SUBS + b_2DIVERS + b_3FORGN + b_4RECV + b_5INV + b_6PROFIT + b_7LOSS + b_8OPINION + b_9TIME + b_{10}AUDITOR + u$
Taylor & Baker (1981)	$AFEE = b_0 + b_1TOTALASSETS^{0.5} + b_2SUBS + u$
Francis (1984)	$lnAFEE = b_0 + b_1log_{10}ASSETS + b_2SUBS^{0.5} + b_3CURRASSETS(\%) + b_4QUICKR + b_5EQUITYDEBT + b_6ROI + b_7LOSS + b_8OPINION + b_9MONTH\ YR\text{-}END + b_{10}AUDITOR + u$
Firth (1985)	$AFEE = b_0 + b_1ASSETS^{0.5} + b_2RECV + b_3INV + b_4SUBS + b_5LOSS + b_6PROFITVAR + b_7UNSYSRISK + b_8PROFIT + b_9AUDITOR + b_{10}CCA + u$
Simon, *et al* (1986)	$lnFEE = b_0 + b_1lnASSETS + b_2INVRECV + b_3LOSS + b_4SUBS^{0.5} + b_5OPINION + b_6AUDITOR + u$
Palmrose (1986a)	$lnFEE = b_0 + b_1lnASSETS + b_2lnREPORTS + b_3AUDLOC + b_4FEERED + b_5LISTED + b_6OPINION + b_7INDSPEC + b_8AUDITOR + b_9IND + u$
Chung & Lindsay (1988)	$AFEE/ASSETS^{0.5} = b_0 + b_1SUBS + b_2DIVERS + b_3FORGN + b_4RECV + b_5INV + b_6PROFIT + b_7LOSS + b_8TIME + b_9AUDITOR + u$
Johnson *et al* (1995)	$lnAFEE = b_0 + b_1lnASSET + b_2SUBS^{0.5} + b_3INVREC + b_4FEERED + b_5TENURE + b_6LOSS + b_7OPINION + b_8lnRPTS + b_9LISTED + b_{10}AUDITOR + u$
Ezzamel *et al* (1996)	$lnAFEE = b_0 + b_1lnSALES + b_2ROCE + b_3DELAY + b_4HIRF + b_5SIG + b_6LOC + b_7AUDITOR + b_8UKSUBS + b_9OSSUBS + b_{10}NAS + b_{11}REG + u$

Description of variables:

SUBS	= number of consolidated companies;
DIVERS	= number of two digit SIC codes minus 1;
FORGN	= ratio of foreign assets to total assets;
RECV	= ratio of receivables to total assets at year-end;
INV	= ratio of inventory to total assets at year-end;
PROFIT	= ratio of net profit to total assets;
LOSS	= dummy variable, coded 1 if loss in current or one of prior two years, 0 otherwise;
OPINION	= dummy variable, coded 1 if a qualified audit report received in current year, 0 otherwise;
TIME	= length of auditor-client relationship;
AUDITOR	= dummy variable, coded 1 if Big-Eight (Big-Six), 0 otherwise;
CURRASSETS(%)	= current assets to total assets at yea-end;
QUICKR	= cash and receivables and short-term investments divided by current liabilities;
EQUITYDEBT	= total equity to total debt ratio;
ROI	= return on investment = PROFIT (see above);
MONTH YR-END	= the month the fiscal year ends;
PROFITVAR	= variance of the return on shareholders' equity over a ten year period;
UNSYSRISK	= variance of the return on shareholders' equity less the variance of the market;
CCA	= dummy variable, coded 1 if companies produced Current Cost Accounts, 0 otherwise;
INVREC	= the percentage of total assets held in inventory and receivables;
REPORTS	= number of reports;
AUDLOC	= number of audit locations;
FEERED	= the percentage fee reduction given for audit assistance provided by the client;
LISTED	= dummy variable, coded 1 if the auditee is a public company, 0 otherwise;
INDSPEC	= dummy variable, coded 1 if auditor is an industry specialist, 0 otherwise;
IND	= dummy variable, coded 1 if the client is operating in a particular industry, 0 otherwise;
TENURE	= dummy variable, coded 1 if the same audit firm has been used for 3 years or less, o otherwise (a test for lowballing);
RPTS	= number of additional audit-related reports provided by the audit firm;
ROCE	= return on capital employed;
DELAY	= interval between the end of the accounting period and the signing of the audit report measured in days;
HIRF	= index of diversification based on Herfindahl;
SIG	= the proportion of the company's equity held by directors and "significant shareholders";
LOC	= coded 1 if the audit report has a London address, otherwise 0;
UKSUBS	= number of UK subsidiaries;
OSSUBS	= number of non-UK subsidiaries;
NAS	= non-audit services;
REG	= coded 1 if the company is operating in a regulated industry (electricity, telecommunications, water).

studies, whereby each of these is allocated to a particular category and/or sub-category.

In the following sections, a review of the empirical evidence found in the relevant audit services' pricing research literature is provided.

3.3.1. Prior research about pricing of audit services

Audit pricing research has extended Simunic's (1980) original work both to consider different sizes of firm (for example, Francis & Stokes, 1986; Francis & Simon, 1987), and to different national settings, apart from the US market (Simunic, 1984; Wallace, 1984; Simon, 1985; Palmrose, 1984, 1986a, 1986b; Simon & Francis, 1988; Turpen, 1990; Ettredge & Greenberg, 1990; Gist, 1992; Pearson and Trompeter, 1994). For example, to the Australian market (Francis, 1984; Francis & Stokes, 1986; Craswell *et al*, 1995), to the Canadian market (Chung and Lindsay, 1988), to the New Zealand market (Firth, 1985; Johnson *et al*, 1995), to the Singapore market (Low *et al*, 1990; Simon *et al*, 1992), to the Hong Kong market (Simon *et al*, 1992; Gul, 1999), to the Indian market (Simon *et al*, 1986), to the Bangladesh market (Karim and Moizer, 1996), to the UK audit market (Taylor & Baker, 1981; Taffler & Ramalinggam, 1982; Ramzy, 1988; Chan *et al*, 1993; Pong & Whittington, 1994; Ezzamel *et al*, 1996). One study (Haskins & Williams, 1988) has made a comparison between audit fees determinants across countries (i.e. Australia, New Zealand, Ireland, the United Kingdom and the United States) and across Big-Eight auditing firms. In most of the above studies similar independent variables are used and almost similar findings have been shown[10]. However, the main focus of most of these studies was not to identify an exhaustive list of significant audit fee determinants as such, but rather:

(1) to investigate whether there exists an audit firm size effect on audit fees, i.e. whether there are identifiable differences between fees charged by the Big-Eight (or Big-Six) firms and those charged by non-Big Eight both in the market segments for the audits of small and large auditees, and hence, to draw conclusions with respect to price competition, product differentiation and economies of scale in the market for audit services; and/or

(2) to examine whether there is evidence of underpricing on initial audit engagements; and/or

(3) to understand the effect of the provision of non-audit services by the external auditor on the pricing of external audit services.

3.3.1.1. Big-Eight (or Big-Six) auditor premium

There does not exist consensus as to the impact of different classes of auditor on differential audit fee pricing and as to whether the impact differs between the small and the large auditee market segment. Simunic (1980) found that the US audit market was generally competitive. Seven of the Big-Eight audit firms (Price Waterhouse was the eighth firm) charged lower audit fees than small audit firms overall (consistent with large audit firm economies of scale - scenario 9 in Table 3.2.A); however, there was no difference in audit fees between large and small audit firms after client control costs were taken into account in both the small and large auditees market (consistent with a competitive market structure, and no scale economies or product differentiation to the Big-Eight - scenario 5 in Table 3.2.A). Firth (1985) also reported a non-significant auditor size effect in the New Zealand market for audit services (without partitioning into large and small auditees).

However, other studies which tested for the existence of a Big-Eight premium found significant results. In a study of 136 Australian companies, Francis (1984), who replicated Simunic's (1980) model for price competition in the Australian market, found evidence that the Big-Eight firms charged 16.5% higher audit fees than non-Big Eight firms both in the large and small auditees market, consistent with a competitive audit market structure with product differentiation (scenario 1 in Table 3.2.A). One explanation for the difference between the above two studies is that Simunic's sample contained much larger companies than did that of Francis. Also, Chan *et al* (1993) reported a significant Big-Eight premium of 36.70% charged in both the small and the large company segment of the market for a sample of 280 UK auditees.

In an attempt to reconcile the above different results, Francis & Stokes (1986) re-examined the Australian audit market and controlled for size effects by estimating

[10] The above mentioned studies are discussed in more detail in the subsequent sections of the chapter.

separate audit fee regression models for samples of large and small companies (Francis' (1984) sample was used). Their analysis indicated that the Australian audit market is segmented by company size. In the large company segment of the market, no significant differences in audit fees between large and small audit firms were observed, suggesting that non-Big Eight diseconomies offset any Big-Eight premiums (scenario 5 in Table 3.2.A). This result is consistent with Simunic (1980), but is in contrast with Johnson *et al* (1995). For the small companies segment though, Francis & Stokes reported that Big-Eight firms charged significantly (18.8%) higher audit fees than non-Big Eight (scenario 4 in Table 3.2.A). This result is similar to Brinn *et al* (1994) who found a significant Big-Eight audit premium (28%) for independent unquoted companies in the UK (they compared their results with the relatively small quoted companies).

Subsequent studies of the US audit market by Palmrose (1986a) and Francis and Simon (1987) have also reported that the Big-Eight firms were associated with higher audit fees with respect to smaller companies. In fact, Palmrose replicated Francis & Stokes (1986) result, while Francis and Simon found a significant Big-Eight premium existed with respect to both second tier national firms (29.7%) and local or regional firms (27.1%). Another study indicated higher Big-Eight premiums charged to smaller companies was that one of the British market by Taffler and Ramalinggam (1982), although detailed comparisons with other studies should be made with care, since the auditor size variable in this study was chosen somewhat very crudely and idiosyncratically (since Arthur Andersen was grouped as one of the small audit firms). The above results are supportive for a competitive audit market with product differentiation to the Big-Eight firms and diseconomies of scale to the non-Big Eight in the audits of large companies (scenario 4 in Table 3.2.A). However, a more recent study has failed to provide evidence of Big-Eight firms premium in the medium-size UK auditees (Che-Ahmad & Houghton, 1996).

Taken together, it seems that monopoly pricing does not prevail in the audit markets, since scenarios 2, 3 and 6 in Table 3.2.A, do not appear to have been matched by any researchers' findings. In other words, the empirical evidence indicates that the market for audit services is indeed competitive, in the sense that it reveals that the audit fees charged by the Big-Eight accounting firms in the large auditee market segment have never been significantly and strictly higher, *ceteris paribus*, than the audit fees charged by the Big-Eight accounting firms in the small auditee market segment[11]. However, although there is a competitive audit market structure, there exists no consensus about the existence of product differentiation and scale (dis)economies. Most results (i.e. those supporting scenarios 1 and 4 in Table 3.2.A) point in the direction of product differentiation. Note that this lack of consensus does not necessarily derive from country-specific elements. Inconsistent evidence with regard to differential audit fee pricing by different classes of auditors was found within countries. For example, Simunic (1980) and Palmrose (1986a) both examined US samples and report such contradictory evidence; the same holds for Francis (1984) and Francis & Stokes (1986) with respect to Australian samples. One explanation, however, may be, as mentioned earlier, the average auditee size in the respective samples of small and large clients[12] and/or different periods of data.

The evidence reviewed in the preceding paragraphs enables us to explain some of the magnitude of the Big-Eight firms fee premiums ranged between 4% and 56% for different countries and periods. The existing literature suggests that there is a systematic difference between the fees charged by the Big-Eight (or Six) as opposed to non-Big Eight (or Six) audit firms. Researchers have classified auditors into two distinct groups, that is Big-Six (or Big-Eight depending on when the studies were undertaken) and non-Big Six firms, and tested for the effect of differences in supplier concentration upon the audit prices. As developed in section 3.2 earlier, the test for competition involves a comparison of the prices paid to Big-Six relative to non-Big Six firms in the <u>small</u> auditee segment (which is assumed to be competitive), and the <u>large</u> auditee segment (where the Big-Six auditors are highly dominant and may behave as a cartel).

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[11] With particular reference to Table 3.2.A, if $CRE|8 > CRE|\overline{8}$ holds for the large auditee segment, then $CRE|8 = CRE|\overline{8}$ and $CRE|8 < CRE|\overline{8}$ never hold for the small auditee segment; and if $CRE|8 = CRE|\overline{8}$ holds for the large auditee segment, then $CRE|8 < CRE|\overline{8}$ never holds for the small auditee segment.

[12] The definition of small and large auditees varies across studies. The average client size, measured in terms of total assets, for the small auditee samples was $40million (US) in Palmrose (1986a); $8 million (Australian) in Francis (1984); $1.8million (Australian) in Francis & Stokes (1986).

However, within the two auditor groups, individual firms may not be homogeneous, that is, all firms may not within a group be associated with above (or below) average fee levels. To resolve this, researchers have performed tests of homogeneity to evaluate whether there are differences in average audit fee (or other dependent variable used) across the firms within a group and whether the possible individual firm effects on the dependent variable could be controlled. So for instance, Simunic found in his (1980) study that Price Waterhouse was a high-value outlier in average deflated audit fee among different Big-Eight audit firms, and more recent studies have added dummy variables for each Big-Six firm to see if there are any audit fee premiums or discounts enjoyed by those firms and, in essence, to check whether a better fit of the model used could be obtained. Table 3.3.1.1.A presents summary results of the premiums or discounts identified in various audit fee studies.

The audit fee results show that in the majority of the studies a general audit fee premium for Big-Six auditors as a group exists in the market for audit services. In addition, some other differences have been detected within the Big-Six firm group. For example, Price Waterhouse seemed to charge higher audit fees in the 1980s in the USA, Canada and New Zealand (Firth, 1985; Chung & Lindsay, 1988; Balachandran and Simon, 1993). Deloitte & Touche had fee premiums in South Africa and USA (Balachandran and Simon, 1993; Simon, 1995), Arthur Andersen in Norway (Firth, 1997a), and so on. It is apparent from Table 3.3.1.1.A that there is a lack of published research work into audit fees in Japan, other European Union countries such as France, Germany, Spain, Greece, etc., as well as in the newly developing Eastern European countries such as Poland, Romania, Czech Republic, Hungary, etc.

3.3.1.1.1. A note on the large auditor premium percentage

As developed in the previous sections of this chapter, cross sectional multiple regression models have been used thoroughly in the audit market research literature to relate audit fees to auditee and auditor characteristics (see Table 3.3.A above for a list of the models specified in prior studies). Researchers have gathered data for the dependent variable (mainly audit fee), and for a number of auditor and firm-specific independent variables. Auditor-related variables have been considered as important test variables, and include among others a variable representing either the name of the accountancy firm or the distinct group to which the firm belongs (see Table 3.4.A below for the other auditor-related variables); auditee-related variables have often been merely regarded as control variables for audit effort, and include a client size variable (total assets or sales), client complexity variables (balance sheet ratios, number of subsidiaries, etc.), client risk variables (liquidity ratio, etc.), and other variables (for a full list and description of the audit fee determinants employed in prior empirical studies, see section 3.4 and Table 3.4.A later in this chapter).

Table 3.3.1.1.A: Summary of premiums or discounts as identified in various audit fee studies

Study	Country	Big-Six (or Eight) Fee Premium	Other Premiums (P) or Discounts (D)
Craswell, Francis & Sneddon (1996)	Australia	30%	Industry Specialist (D)
Francis (1984)	Australia	16.50%	None
Francis & Stokes (1986)	Australia	18.80%	None
Craswell & Francis (1999)	Australia		None
Karim & Moizer (1996)	Bangladesh	18%	None
Chung & Lindsay (1988)	Canada	None	Price Waterhouse (P)
Gul *et al* (1997)	Hong Kong	37%	None
Gul (1999)	Hong Kong	29-39%	None
Simon, Teo & Trompeter (1992)	Hong Kong	31%	None
Simon, Teo & Trompeter (1992)	Malaysia	None	None
Firth (1985)	New Zealand	4%	Price Waterhouse (P)
Firth (1997a)	Norway	None	Arthur Andersen (P)
Simon, Teo & Trompeter (1992)	Singapore	26%	None
Simon (1995)	South Africa	None	Deloitte Touche (P) Ernst & Young (P)
Brinn, Peel & Roberts (1994)	UK	28%	London Office (P)
Chan, Ezzamel & Gwilliam (1993)	UK	36.70%	London Office (P)
Ezzamel, Gwilliam & Holland (1996)	UK	23.4-32.7%	None
Ezzamel, Gwilliam & Holland (1998)	UK	23.4-46.2%	None
Davis *et al* (1999)	UK	5-18.9%	None
Che-Ahmad & Houghton (1996)	UK	None	None
Palmrose (1986)	USA	22.80%	None
Simon & Francis (1988)	USA	16.20%	None
Turpen (1990)	USA	55.70%	None
Francis & Simon (1987)	USA	24.6-29.6%	None
Palmrose (1986)	USA	16.60%	None
Gist (1994)	USA	5%	None
Balachandran & Simon (1993)	USA	None	Price Waterhouse (P) Deloitte Haskins & Sells (P) Peat Marwick (D)

For those studies using a regression model which is a Cobb-Douglas production function (that is, a regression linear in the log of the dependent variable), each of the model regression coefficients is the (partial) elasticity of the dependent variable with respect to independent variables. On this basis, the audit fee percentage change (premium or discount) accruing to individual audit firm or the large, dominant auditor group (that is, the Big-Eight or Big-Six audit firms) is calculated employing the following function:

$$C = \ln(1 + d)$$

where:

C = the value of the regression coefficient for the Big-Eight (or Big-Six) firms group or individual audit firm;

d = the percentage difference in audit fees attributable to membership in the Big-Eight (or Big-Six) firms group or individual audit firm.

The unknown parameter in the above function is the d. For small values near zero, $C \approx d$, but if C is larger than, say, 0.15 or 0.20, the antilog of C is usually taken to obtain an estimate of d (Berndt, 1991, p. 164; Lewis, 1986, p.1140; Moizer, 1997).

3.3.1.2. The pricing of initial audit engagements

Another issue discussed in the audit fee research studies is the links between the pricing of audit services and the independence of the external auditor. In particular, attention has been focused on whether there is differential pricing of new (initial) audit engagements and whether the auditor's search for client-specific quasi-rents may lead to compromises of auditor independence. Researchers have been directed towards this type of empirical work after the strong pricing concerns identified by the Commission on Auditors' Responsibilities (AICPA, 1978). The Commission's allegations that the practice of low-balling (that is, setting audit fees below total current costs on initial audit engagements) impairs auditor independence by creating a future economic interest in clients[13] were opposed by DeAngelo (1981a). DeAngelo shows that low-balling is a competitive response to the expectation and ultimate capture of future quasi-rents (i.e. the existence of client-specific learning-by-doing advantages, positive transactions costs of changing auditors, and competition in the market for audit services) to incumbent auditors, and therefore, low-balling does not

[13] Future economic interest arises because the existence of learning-by-doing advantages, and the presence of positive transaction costs of changing auditors which provides an incumbent auditor with a comparative cost advantage over competitors in future periods. This cost advantage enables the incumbent auditor to charge higher

impair auditor independence[14]. A model of auditor-client contractual relationships with low-balling which explains the equilibrium pricing of audit services was formulated and a critical assertion here is that the initial fee reductions (i.e. the practice of low-balling) are sunk costs to incumbents in the future periods and hence they have no subsequent effect on either (i) the magnitude of future rents, or (ii) auditor independence.

Magee & Tseng (1990) have extended DeAngelo's (1981a) model to identify conditions under which a client-specific quasi-rent may lead an auditor to compromise independence. They report that, when contingent fees or bribes are not allowed, when auditees and clients cannot enter into multiperiod contracts that are binding, and when the auditors' structure and abilities are identical, then an auditor's value of incumbency (i.e. DeAngelo's quasi-rents) creates a direct threat to auditor independence under limited circumstances. These are: (i) auditors must disagree among themselves about the proper application of a reporting issue applied by the client; (ii) auditors are not aware of their own positions on the reporting policy at the time of initial engagement; (iii) the auditee cannot observe incumbent auditor's position on the reporting issue when this arises; (iv) the reporting issue must extend beyond a single reporting period and affect the client for a number of periods; (v) the client's benefit from the preferred reporting strategy is unaffected even after an auditor switch. However, even when all the above conditions hold, a positive value of incumbency will not vitiate the independence of the auditor on reporting issues that are considered as very important by either the client or the auditor.

The US empirical evidence with respect to the presence of price cutting on initial audit engagements is quite consistent. Francis and Simon (1987) tested whether low-balling exists on initial audit engagements, and whether audit quality is affected[15]. Price cutting behaviour was observed on initial engagements, although the number of

(than total costs) future fees, thus creating the "future economic interest" in client. This economic interest, in turn, provides the incentive for auditor opportunism, i.e. impairs auditor independence.

[14] See, also, Lee and Gu (1998) for a theoretical explanation on how the low-balling practice does enhance auditor independence as long as the shareholders have some influence over the appointment and dismissal of the auditors. Also, Dye (1991) who predicts no low-balling in settings where audit fees are publicly available.

[15] The large audit firms (the Big Six) are hypothesised to provide higher quality audit services than those provided by smaller audit firms (the non-Big Six) postulating therefore product differentiation in the audit market. See also Dopuch & Simunic (1980 & 1982) and DeAngelo (1981b).

the observations was very small (only 12) and hence, generalisation of the result concerning audit quality and auditor independence should be cautious. In the same line, Simon and Francis (1988) found evidence of substantial audit fee discount in both the initial year (of 24%) and over the next two years (of 15%) during the first half of the 80's. The discount disappears by the fourth year. Turpen (1990) reports consistently lower audit fees on initial audit engagements regardless of the type of the audit firm, and price cutting seems to occur even on new audits of relatively unprofitable companies (although the sample size for this conclusion is quite limited - only 17 initial audits). Ettredge and Greenberg (1990) reported also price cutting on initial audits during the mid-1980's and their variables found significant proxied for the change in the auditors' relative cost advantage or disadvantage in auditing a given client, the change in auditor class, the number of auditors bidding on the initial engagement, and the difference in auditor industry or situational expertise. Walker and Casterella (1998) examined the role of the auditor industry expertise and client profitability in pricing new engagements. Their results suggest that auditor industry expertise leads to reduced audit fees, whereas when the client reports losses in the financial statements in the prior year, the auditor is less willing to offer discounts to new engagements. Craswell and Francis (1999) report existence of initial engagement discounting (i.e. low-balling) only for upgrades from non-Big Eight to Big-Eight audit firms. The UK evidence finds evidence that low-balling particularly pronounces where newly appointed auditors were not from the ranks of the largest audit firms (Pong & Whittington, 1994). All the above studies lend further support to the product differentiation hypothesis advanced by Simunic (1980). Also, the results from these studies are consistent with DeAngelo's (1981a) low-balling model, but inconsistent with Palmrose (1986a) who reported an insignificant result with respect to the price cutting on US initial engagements. Finally, Simunic (1980) and Francis (1984) do not cite evidence of lower audit fees after an audit change for the US and Australian audit markets respectively.

3.3.1.3. The provision of non-audit services by the external auditor

Over the last two decades many studies have focused on the role of non-audit services and the links between fees received from audit and non-audit services. The audit market literature focuses on "spillover" effects in explaining possible interdependencies in audit and non-audit fees charged to clients[16]. However, this approach is one of the two approaches that have been followed by prior studies. The second theoretical approach focuses on the differential benefits from the purchase of non-audit services. Non-audit services in this second approach have been broken down by type, i.e. recurring and non-recurring non-audit services.

The first approach, pioneered by Simunic (1984), theoretically analyses the underlying associations between audit and non-audit services when the production functions for these two services are interactive (interdependent) which results in "beneficial knowledge spillovers" or efficiencies. Simunic's analysis demonstrates that the provision of non-audit services (resulting in knowledge spillovers) involves reducing the fixed or marginal cost of either external audit services or non-audit services or both, and hence, provided that the external audit is relatively a price elastic commodity, the quantity of the audit and therefore total client expenditure on audit (audit fees) will increase, at the expense of the demand for audit substitutes (i.e. control systems or internal auditing) which will decrease.

Most of the pricing studies, followed Simunic, have reported a significant and positive relationship between audit and non-audit fees. For the US market such evidence was, for example, reported by Simon (1985), Palmrose (1986b), Dye (1989), Turpen (1990), Barefield *et al* (1993), Davis *et al* (1993). In Australia, Francis & Pollard (1979), Craswell *et al* (1995), Butterworth & Houghton (1993), Barkess and Simnett (1994). One study in the UK, Ezzamel *et al* (1996), and one study in Norway, Firth (1997a). All but Simon & Francis (1988), Abdel-Khalik (1990), O'Keefe *et al* (1994), Craswell *et al* (1996), Ezzamel *et al* (1998), have shown a significant positive correlation between the pricing of audit and non-audit services.

Moreover, most of the above studies have used aggregate figures for non-audit fees with the exception of Palmrose (1986b), Davis *et al* (1993), O'Keefe *et al* (1994), Ezzamel *et al* (1998) which also examined the specific effects on audit fees of

[16] That is, audit fees may depend upon whether the auditor also supplies non-audit services to a client because the provision of non-audit services influences (spills over into) the cost of providing the audit by transferring the knowledge that occurs when non-audit services are provided by the incumbent auditor. However, see Solomon

different categories of non-audit services, such as tax services, accounting related MAS, non-accounting related MAS.

The second approach, developed by Beck *et al* (1988a; 1988b), brings together the agency theory[17] and the provision of non-audit services. Beck *et al* illustrate that the frequency of other services purchased from the incumbent external auditor reflects the level of incremental economic bonding between auditor and client and, therefore, determines whether the auditor's independence (or appearance of independence) has been impaired. Such bonding, perceived as an impairment to auditor independence (in order for the auditor to ensure continued tenure), reduces the expected monitoring value of an audit (and increases the agency costs) and motivates the client to restrict non-audit purchases[18]. Recurring non-audit services are perceived as an annuity with high economic bonding. On the contrary, the non-recurring non-audit services are "one-off" engagements and thus, the bonding effects of the non-recurring services are minimal. Any impairment to auditor independence and credibility caused by this minimal economic bonding is limited.

Beck *et al* (1988b) find also evidence of a positive association between the provision of recurring non-audit services and the length of the auditor's tenure whereas Barkess & Simnett (1994) find no association between recurring non-audit services consumption and auditor tenure. DeBerg *et al* (1991) report that the level of recurring non-audit services purchased from the incumbent auditor declines following a change of auditors. Also, Parkash & Venable (1993) reach a similar conclusion with Beck *et al*, i.e. that auditees anticipate the potential impairment of their auditor's independence and accordingly control the proportion of joint audit and non-audit services. Furthermore, expanded interpretations of earlier studies' findings support the above implications (Glezen & Millar, 1985; Scheiner & Kiger, 1982; Scheiner, 1984).

(1990) for a number of other possible explanations for any perceived positive association between fees paid for audit and non-audit services.

[17] For a review of the agency literature, see for example Jensen & Meckling (1976), Watts (1977), Watts & Zimmerman (1981; 1983), Fama & Jensen (1983a; 1983b).

[18] Firth (1997b) provides empirical UK evidence that companies with high agency costs purchase smaller amount of non-audit services from their auditor. See also Wines (1994) who uses a probit analysis and provides evidence that auditors are less likely to express a qualified opinion when higher levels of non-audit services fees are derived

Cready (1992) applied a reservation price model where the units of a service (provision of external audit services) either are acquired or are not acquired by the consumer (auditee)[19] to explain for audit and non-audit fee interdependencies. Cready demonstrates that a relation between the auditor's pricing of audit and non-audit services occurs as a reflection of underlying correlations in the bivariate distribution of the reservation prices for audit and non-audit services provided by the auditor across clients. Cready explains that a positive correlation exists between the reservation prices for audit and non-audit services across clients and therefore the following function holds:

$$E(R_A | R_{NA} > C_{NA}) > E(R_A | R_{NA} < C_{NA})$$ [20]

where:

R_A = the reservation price for audit services;
R_{NA} = the reservation price for non-audit services;
C_{NA} = the constant unit cost for an auditor to provide non-audit services;
P_A = the price charged by the auditor for the provision of audit services.

The above inequality means that R_A, and thus P_A, for clients who acquire non-audit services (i.e. clients with $R_{NA} > C_{NA}$) on average exceeds R_A, and thus P_A, for clients who do not acquire non-audit services. Hence, Cready clearly is consistent with Simunic's (1984) findings which suggest that accounting firms charge a premium for the joint production of audit and other services to auditees.

Also, Cready (1991) in an earlier study proposes another related explanation for higher audit fees when non-audit services are purchased. Specifically, he presents evidence consistent with the use of "premium bundling"[21] by the accounting firms in

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and, thus, the independence of auditors may have been jeopardised. For a theoretical analysis of the circumstances under which auditor independence may be affected by offering non-audit services, see also Dye (1989).

[19] In contrast with the traditional supply and demand curve models like that of Simunic (1980) where consumers (auditees) do acquire partial or multiple units of the service.

[20] In order for the inequality to hold, the auditor sets $P_A = R_A$ for each audit client with $R_A > C_A$ and sets $P_{NA} = R_{NA}$ for each audit client with $R_{NA} > C_{AN}$. If the auditor sets $P_A > R_A$, the auditee will not purchase the service from the potential auditor.

[21] In premium bundling, sellers price discriminate by offering products both separately and as bundles, but bundles are sold at a premium (rather than at a discount) relative to the prices charged for the individual components. In order such a strategy to be implemented, sellers must prevent potential bundle purchasers form either directly or indirectly acquiring all of a bundle's components at component prices. This ability to exclude buyers is clearly product or market specific and therefore sellers of services, with their direct knowledge of customer identities and purchases, can readily implement premium bundling strategies. In our case, audit firms know which of their clients are audit-only buyers, which are other services-only buyers, and which are joint audit/other services buyers, and

the market for audit services, wherein the auditor offers the client a choice of audit services provision (A) at price P_A, non-audit services production (NA) at price P_{NA} and a bundle consisting of both audit and non-audit services at price P_B where $P_B > P_A + P_{NA}$. Under such circumstances, the prices allocated to the bundle components (A & NA) when purchased by bundle purchasers should exceed the prices charged for the sale of bundle components to non-bundle purchasers, since the implicit price being charged to bundle purchasers for bundle components exceeds the explicit price charged to single-component purchasers. Thus, auditees that have purchased non-audit services implicitly pay more for audit services than do auditees that have purchased only audit services. Again, this analysis is consistent with Simunic's results.

3.4. Determinants of audit quantity

This subsection reviews the major surveys and analyses of audit fees to identify factors to be included in our analysis. Most of the earliest research used surveys; more recently, statistical analysis of data has largely supplanted surveys. This previous work has collected data for the dependent variable (audit fee), and for a number of auditor and auditee independent variables. Audit effort proxies are the test variables and auditee-related variables are the control variables. The rationale for such an approach is that it reveals to some extent what is priced in the audit market, or put it differently, what determines audit quantity.

In most of these studies a list of independent variables is regressed against the dependent variable, that is the audit fee. The independent variables typically include a

1. client size variable (total assets, sales or other combinations);
2. client complexity (the No of subsidiaries, the ratio of inventory to total assets, etc.);
3. client risk variable (liquidity ratio, gearing ratio, etc.);
4. auditor size dichotomous variable (Big-Six vs. non-Big Six);

plus some other variables as discussed below.

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consequently, they can prohibit single-service clients from acquiring the joint audit/other services without paying the required premium.

3.4.1. Client Size

Client size is considered as a proxy of the amount of audit work performed and hence for the audit fee charged. It accounts (together with client complexity) for the most variance explained by the regression models previously developed. All the major studies (for example Simunic, 1980; Francis, 1984; Francis & Stokes, 1986; Francis and Simon, 1987; Simon and Francis, 1988; Chan *et al*, 1993) have proxied auditee size with turnover or total assets, and all have shown a dominant effect on the level of audit fees.

As a result of potential scale economies in the auditor's production function, for example those derived from using sampling techniques, and the probability of more advanced internal control procedures in larger companies, the relationship between client size and audit fee is unlikely to be linear in specification and, therefore, log or square root[22] transformations of client size measures are typically applied.

3.4.2. Client Complexity

Another measurable factor that is commonly tested and appears to be generally a significant explanatory variable in determining audit fees is client complexity. Increased client complexity may increase the requisite audit effort and hence the level of the audit fees. Client complexity variables control for such difficult audit areas as subsidiary companies, inventory, debtors and accounts receivable. The explanatory variables used in previous studies have either related to the (square root of the) number of subsidiaries (for example, Simunic, 1984; Ettredge & Greenberg, 1990; Turpen, 1990; Chan *et al*, 1993; Brinn, *et al*, 1994; Ezzamel *et al*, 1996; Pong & Whittington, 1994), and (the log of) the number of their geographical locations (for example, Palmrose, 1986; Chan, *et al*, 1993; Ezzamel *et al*, 1996), or to particular balance sheet figures such as the inventory to total assets ratio and accounts receivable to total assets ratio (for example, Simunic, 1980 & 1984; Simon & Francis, 1988; Ettredge & Greenberg, 1990; Johnson *et al*, 1995). All the above studies have reported significant positive coefficients concerning client complexity.

3.4.3. Client Risk

The estimation of client risk offers a number of alternative measures and a quite distinct amount of auditee-related variables were used as proxies for clients' operating risk. Two reasons are cited for measuring the client risk. First, the auditor's assessment of client's "inherent risk" may be affected[23]. The riskier the auditee's operations (i.e. the larger the probability of business failure by the client), the greater the perceived risk of audit failure and, therefore, a possible increased audit effort and direct cost. Second, the auditor's perception of "business risk" associated with a client situation may be influenced[24]. The greater the risk of audit failure, the larger the possibility of legal action for auditor negligence and/or the greater the possible loss of income from future audit services and, thus, the higher the audit fee charged by the auditor (to compensate him/herself for the high business risk)[25]. Unlike the previous two categories (client size and complexity), the empirical evidence on the direction and the power of the relationship between the client-risk variables and audit fee is ambiguous.

A comparison of the empirical findings across studies (see Appendix I) reveals, from the list of client risk-related variables in Table 3.4.A, that only prior audit qualifications and profitability appear to be significant in determining cross sectional variations of audit fees. However, no consensus exists for the gearing and liquidity measures, and the results for the other types of client risk variables are very mixed or weak.

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[22] The majority of studies has log transformed the client size variable whereas Elliot & Korpi (1978) and Taylor & Baker (1981) have used the square root sign over the client size (turnover-total assets respectively) variable in their multiple regression technique.

[23] By "inherent risk", we mean the susceptibility of the client financial statements to material errors before any audit work has started. The inherent risk is part of the audit risk model in which the great majority of audit firms base their audit approach. The auditor assesses which financial statements areas are more likely to have a material misstatement and plans the audit programme accordingly. If the inherent risk (together with the control risk, the second component of the audit risk model) is high, then the amount of audit work and the detailed testing must increase in order for the auditor to avoid failure.

[24] By "business risk", we mean the risk that the auditor will suffer financial loss or injury to their reputation from litigation or adverse publicity in connection with an audit.

3.4.4. Auditor size (Big-Six vs. non-Big Six)

Auditor size and other auditor-related variables, such as auditor experience proxied by auditor's tenure, auditor's industry specialisation or the presence of an initial audit engagement, and provision of non-audit services, and auditor location, have been discussed in the preceding section of this chapter.

3.4.5. Other

There are few more categories of independent variables that have been applied in a limited number of the audit fee studies. These may be classified as external audit substitutes and audit timing (1.D and 1.E in Table 3.4.A below). Both are variables that related to the client. Other variables are the cost of audit and non-audit services provided by other non-principal audit firms (3.A and 3.B in Table 3.4.A below).

First, the client-related variables, and Wallace (1984), Palmrose (1986a; 1986b) and Turpen (1990) have included a client-participation variable (such as internal audit functions, internal control systems, auditor's utilisation of client accounting staff) that reduce the audit scope and fees in their regression models, and all have reported a negative and significant correlation between audit fees and audit substitutes. However, any findings about fee reduction from client inputs should be interpreted with care as typically the data is derived from client estimates of such savings. The other client-related variable is related to the timing of the audit. "Audit-timing" or "busy-audit-season" models the effect on audit fees of the client's accounting year-end and has been investigated by four studies (Francis, 1984; Firth, 1985; Francis & Stokes, 1986; Chan *et al*, 1993) to account for off-peak pricing. None of these studies shown a significant effect. "Audit-delay" variable refers to the lag between the client accounting year-end and the audit report date. Long lags might indicate audit problems requiring additional audit effort, whereas short lags might reflect tight reporting deadlines which may, in turn, lead to inefficient and higher cost auditing. This variable has only been tested in two studies (Firth, 1985 and Chan *et al*, 1993) which report contradictory findings. A final client-related variable is the "number-of-

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[25] See Houston *et al* (1999) on why audit fees include risk premiums when the risks associated with an audit cannot be controlled sufficiently by applying normal audit procedures.

separate/additional/special-audit-reports-required" which affect the number of full-scope audits needed beyond what is required by statute and auditing standards and which leads to higher audit fees. Firth (1985) and Palmrose (1986b) explore the association of this variable with the audit fees and both report significant results.

Table 3.4.A: Overview of the audit quantity (audit fees) determinants employed in previous audit fee empirical studies

1. Client		
A. Size		Total Assets(TA); Turnover; Operating Profit
B. Complexity		No of Subsidiaries; Diversification; Foreign Assets/TA; No of Locations; Receivables/TA; Inventory/TA; Current Assets/TA
C. Risk	Liquidity	Quick Ratio; Current Ratio; Working Capital/TA
	Gearing or leverage	Total Liabilities/TA; Long-term Liabilities/TA
	Profitability	ROI; ROS; ROTA; ROCE
	Variability of return	Systematic/Unsystematic Risk
	Nature of business	Industry Indicator; Regulated/Unregulated; Age
	Financial distress	Audit qualification; Loss; EBIT/TA; D/E; D/TA
	External parties	Ownership; Private/Public Company
D. External Audit Substitutes		Internal Audit Expenses; Reduction in Audit Fee from Internal Audit
E. Audit Timing		Busy Audit Season; Audit Delay; No of Separate Reports
2. Auditor		
A. Size		Big-Eight (or Big-Six) Audit firm/Non Big Eight
B. Experience		Auditor Tenure; Industry Specialisation; New Audit Engagement
C. Non-audit services		MAS; Accounting Services; Non-Accounting Services; Taxation Services
D. Other		Auditor Location
3. Non-Principal Auditor		
A. Fee for (non-principal) audit services		Audit fees paid to non-principals
B. Fee for non-audit services		Consultancy fees paid to non-principals

Secondly there is the issue of joint appointments. The production of non-principal audit services refers to the audit fees attributable to the audit services performed by other (non-principal) audit firm(s) - for example, in the case of an engagement involving more than one auditor where e.g. the non-principal audits distant subsidiaries - as a proportion of the total audit fee charged. Turpen (1990) investigates the effects of concurrent service purchases from the incumbent auditor and other audit firm(s) and shows a positive significant result. The final non-principal auditor-related variable is the non-incumbent non-audit services fee variable and has been included in the regression model of Palmrose (1986b). She shows a positive significant association with the audit fees charged by the incumbent auditor in the large auditee segment of the market. This result is in contrast with Palmrose's prediction sign where she hypothesised that there should be no joint-supply benefits between the audit services of the incumbent auditor and the non-audit services of non-incumbent(s).

3.5. Audit fee studies: a critical examination

The last twenty-five years have witnessed a surge in litigation against the accounting firms. Dopuch & Simunic (1980; 1982) and DeAngelo (1981b) among others assert that larger audit firms supply a higher level of audit quality and lend greater credibility to clients' financial statements than smaller firms. Two theoretical explanations for the positive correlation between auditor size and audit quality have been provided: these relate to auditors' reputation and the depth of auditors' pocket. The "reputation hypothesis" states that large audit firms have more incentive to issue accurate audit reports because they have more extensive investments in brand name reputations and therefore their reputations are more valuable (DeAngelo, 1981b). If the auditor's reputation (or credibility) is called into question, then the credibility of clients' financial statements may be questioned and the auditor could suffer a loss of rent through client losses or lower fees. The "deep pockets/insurance hypothesis" (see, for example, Wallace, 1980 and Dye, 1993) states that large auditors have more incentives to issue accurate audit reports because they have greater wealth in risk from litigation[26]. The auditor appears to have an implicit co-insurer role (together with the client) in the event a bankrupt client is unable to pay losses from litigation, and functionally serves as an indemnifier of losses sustained as a result of alleged financial statement misrepresentations[27]. Large accounting firms are perceived as having the

[26] Note that accountancy firms are partnerships with unlimited liability. Recently however audit firms have gained the ability to adopt limited liability (LLP) in some countries.
[27] Note, that in order for the auditor to be sued, an allegation that the financial statements contain a material error is required. Then, users who suffer investment or credit losses may seek reimbursement or indemnification from

resources to provide additional insurance for potential claimants (Scwartz & Menon, 1985).

It seems that little formal empirical work has been done on the market effects of auditor litigation on auditor quality. In other words, the liability deep pockets/insurance rationale for audit demand has not been investigated. A reason is that auditor professional liability rules have not been employed in prior models of audit demand. Although Simunic's (1980) model of audit demand assumes loss sharing between auditee and auditor based on their joint and several liability for losses to users of material distorted financial statements, the model was clearly not developed to investigate the impact of liability rules on the client financial reporting system (including internal control required and external audit quantity demanded)[28].

A suggestion for future research is to investigate the impact (on audit quality) of a minimum legal norm of due care for auditees and auditors which will then determine each party's actions and corresponding legal responsibility. Krishnan & Krishnan (1995) show that auditor resignations are positively associated with litigation risk. Auditor lawsuits possess information content in the sense that investors react negatively (i.e. the share prices for client companies drop in the market) to those lawsuits that are perceived as material to an accounting firm's ability to pay damages (or provide insurance) or reducing the audit quality provided by the sued auditor (Pacini, 1999). These negative share price reactions provide empirical support for the deep pockets/insurance hypothesis and this result is consistent with Lennox (1999). Future research could clarify the issues raised above.

Furthermore, a major problem with the past audit fee research studies is the fact that the proxies for audit effort (or audit quantity) used as control variables in the multiple

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the accountants. Hence, implicit in an auditor lawsuit is the notion that financial statements reliability (or auditor quality) is below some expected minimum standard.

[28] Recall that the "legal" environment in which auditees and auditors behave is taken into account in Simunic's pricing model. In particular, the legal exposure of the auditee's financial statements is assumed to drive the choice of the level of internal control and external audit work. However, the legal setting in Simunic's model has been severely simplified. First, the impact of *ex ante* regulation by professional auditing standards on audit production is ignored. Simunic's model is basically an audit demand model, and the analysis only generally addresses auditor production issues in relationship with their impact on audit demand and pricing. Second, the model does not take into consideration the process by which losses are to be distributed over both parties (auditee and auditor), as the loss sharing ratio, θ, is assumed to be a random variable.

regression techniques have rarely been subject to experimental interest. As a result, there are no insights about the way the control variables affect audit quantity in the statistical models, as their impact on audit cost and audit production is not known[29]. Consequently, *ad hoc* non-experimental models were built where the dependent variable (audit fee) has often been transformed logarithmically. By doing this, a universal multiplicative interaction among the independent explanatory variables is assumed. Pong & Whittington (1994) explore the theoretical rationale of the empirical models of audit fees and criticise the *ad hoc* nature of prior audit fee regression models. Instead, they have developed an alternative statistical model, which takes the following quadratic (algebraic) form: $y_t = \beta_1 + \beta_2 x_t + \beta_3 x_t^2 + e_t$. Furthermore, they have argued that the previous studies on the determinants of audit fees have implicitly been estimating the *supply* curve of audit services (i.e. the willingness of accounting firms to supply audit services at different audit fee levels), although this has been implicitly assumed but has not been explicitly discussed in these studies. Expanding on this, they assert that demand for audit services is inelastic to audit fee, since the audit is a statutory requirement and, thus, it is mainly dependent upon the amount of work required, as determined by the client size. The above argument is very interesting and in contrast with the *demand* model for auditing developed by Simunic's (1980) pioneered work, and subsequently followed by other researchers, who have chosen the control variables in their pricing models in accordance with the auditee *demand*.

Without regard to what is observed (supply, demand or a meaningless hybrid), the quantity of audit services demanded, q, and the unit price of external audit services, p, have not been able to be tested by the previous audit fee literature. Also, no conclusions can be drawn with respect to what constitutes audit quality, as it is assumed that audit quality (i.e. product differentiation?) is determined by audit firm size (DeAngelo, 1981a; 1981b).

[29] This does not imply that the values of economic variables can indeed be experimentally observed and generated beforehand (in order to be consistent with the economic and statistical models). In accounting, economics and, generally, social sciences, many of the experiments are uncontrolled and in a sense designed and carried out by society. Thus, we are passive observers of the process by which the data we use are obtained.

To summarise, the use of proxies for audit effort in *ad hoc* regression models may lead to inferences about audit pricing that are distorted. Inferences about unit prices in a market are only possible if the product that is priced is fully understood. Future research along the following dimensions may help clarify the issues discussed above. The first dimension of research could examine the impact of re-specifying the regression models employed so far on the findings in prior research. The robustness of the pricing evidence obtained so far could then be established. Some recent studies have already addressed this issue (Pong & Whittington, 1994; Ezzamel *et al*, 1996). Second, more attention could be devoted on future research to test audit pricing using actual data on audit effort (hours) instead of proxies (Rankine & Felix, 1993; Davis *et al*, 1993; O'Keefe *et al*, 1994; Deis and Giroux, 1996). Third, future research could solicit information from accounting firms on audit hours and client characteristics, and study the effects on audit hours of client size, complexity and risk. By studying the determinants of audit effort, the audit production function is investigated. Davis *et al*, (1993) and O'Keefe *et al* (1994) have reported that cross-sectional variation in the quantity of labour inputs can largely be explained by the same auditee category of independent variables found to be significant in prior studies on audit fees. However, more studies including other accounting firms and clients required to establish faith in audit effort proxies.

CHAPTER IV

ACCOUNTANCY FIRM ALUMNI DATA COLLECTION

This study investigates the connections and networks that professional accountancy firms have developed through the dominant positions that their alumni hold in Britain's boardrooms. Network construction is a complex and laborious task, since most of the necessary sources of data are available only in hard copies.

The present survey is based on merging the following sources of data:

1. Price Waterhouse Corporate Register March 1996.
2. 1953-1995 List of Members and Firms of the ICAEW.
3. 1998 Official Directory of the ICAS.
4. 1953-1993 Examination Pass Lists of the ICAEW.
5. 1953-1973 The "Accountant" magazine.
6. 1953-1993 The "Accountants' Magazine".
7. 1974-1979 "Accountancy" magazine.
8. Quantitative data from One-Source, FAME, Datastream.

From these sources it is possible to research the professional background of the CADRE, and the network links between directors and accountancy firms can be reconstructed. Since mergers have played an important role in the evolution of the accountancy profession (Basioudis, 1995), a brief discussion of the effect of mergers in our study is also held. In addition, a historical reference regarding the development of the Big-Six accountancy firms is made, and some statistical information about our sample CADRE is offered. The following sections in this chapter, therefore, describe step-by-step the laborious collection of the data concerning the accountancy firms alumni; give a tabular presentation of the alumni data; discuss how the presence of mergers is tackled in constructing the alumni networks; show the main predecessors of the Big-Six accountancy firms; and, finally, assemble some descriptive statistics regarding the CADRE involved in this study.

4.1. PW database

The Price Waterhouse Corporate Register provided us with the biographies and educational background of nearly 15,000 directors working in all UK stockmarket companies. Those directors who hold a chartered accountancy qualification from the ICAEW or ICAS were extracted from the PW database. This variable is named as "LNAME". As a result, the number of directors in the UK quoted companies who are chartered accountants in 1996 is 2,286, which means that 15.24% (nearly one in six) of the UK directors have received training in a professional accountancy firm. More specifically, 1,508 (10.05%) of the directors are Fellows of the ICAEW (FCAs), 447 (2.98%) are Associates of the ICAEW (ACAs), and 331 (2.21%) are Chartered Accountants of the ICAS (CAs).

Other information extracted from the PW database concerns the gender (abbreviated to "SEX") and the date of birth for the directors-chartered accountants ("BIRTH"), the directorship position they hold ("DIR.POSITION"), their qualifications ("QUAL"), the name of the UK quoted company they work for ("BUSADD1"), and the auditors name ("AUDITORS")(and the town ("AUDTOWN") where available) for each company that has a chartered accountant in its board of directors. Each CADRE is given a unique recognition number for identification reasons appeared in the dataset as "OFF_RECNO" (see Table 4.1.A).

Knowing the names of the directors that hold a chartered accountancy qualification from the ICAEW or ICAS, the next step was to find out when they had been admitted to membership of the two Institutes. For this purpose the 1995 List of Members of the ICAEW and the 1998 Official Directory of the ICAS were consulted. The membership admission date was made available from these directories. It was a labour

Table 4.1.A: Example 1 from the database (the entries in this table are not necessarily real)

OFF_RECNO	SEX	LNAME	QUAL	BIRTH	BUSADD1	DIR.POSITION	AUDITORS	AUDTOWN
000016	M	LANE, Kenneth W W, FCA	FCA	24/03/46	Queensborough Holdings PLC	ExD, FD	Coopers & Lybrand	Liverpool
000799	M	EVANS, Stephen Geoffrey, BSc ACA	BSc ACA	15/09/55	Park Food Group PLC	ExD, CS & MD	KPMG	London
000659	M	HUGHES, Richard John, FCA	FCA	17/10/46	Tay Homes PLC	ExD, FD & CS	Arthur Andersen	Leeds
30873	M	BOURNE, Robert Anthony, FCA	FCA	16/05/50	Ex-Lands (The) PLC	ExD, JChEx	Ernst & Young	Manchester
Source:	*PW*	*Price Waterhouse (PW) Database*	*PW*	*PW*	*PW*	*PW*	*PW*	*PW*

intensive job, mainly due to the unavailability of the membership directories in computer readable format but only in hard copies. This meant that we needed to look for each single director/chartered accountant in both directories and transfer the corresponding membership admission year in a different column beside the name of that director. This variable is named "MEMBADM" (see Table 4.1.B). See also the following subsection 4.2.1.

Table 4.1.B: Example 2 from the database

OFF_RECNO	SEX	LNAME	QUAL	BIRTH	MEMBADMIS
000016	M	LANE, Kenneth W W, FCA	FCA	24/03/46	1972
000799	M	EVANS, Stephen Geoffrey, BSc ACA	BSc ACA	15/09/55	1982
000659	M	HUGHES, Richard John, FCA	FCA	17/10/46	1969
30873	M	BOURNE, Robert Anthony, FCA	FCA	16/05/50	1973
Source:	*PW*	*Price Waterhouse (PW) Database*	*PW*	*PW*	*ICAEW List of Members*

4.2. Building the alumni database/network

Building the database requires consulting the directories of members for the two Institutes of Chartered Accountants of Scotland, and in England and Wales. These directories provide, in addition to a correspondence address for each member, the year of membership admission to the Institutes. The ICAEW examination pass lists and two accountancy magazines are also searched.

4.2.1. Membership Admission

In this subsection, the information collected by the directories of members of the two Institutes of Chartered Accountants of Scotland (ICAS), and in England and Wales (ICAEW) as well as extracts of the directories are presented.

4.2.1.1. The 1998 Official Directory of the ICAS

Searching the directories to point out the director/chartered accountant was not an easy task. The directory of the ICAS, as the two extracts show below, is divided into two parts, whereas the members are listed alphabetically in the first part of the volume and geographically in the second one. Nevertheless, the alphabetical list of members (i.e. the first part of the directory) gives only the name of the members in alphabetical order and their geographical location. In other words, it does not contain information on members' dates of admission to the Institute (see Extract 4.2.1.1.A)

Extract 4.2.1.1.A: The Institute of Chartered Accountants of Scotland
Extract from the 1998 Official Directory (Alphabetical List of Members)

....
Cooke, Jeremy David Philip, MA, ACIS, Stirling
Cooke, John Synnot, Leamington Spa, Warwickshire
Cooke, Mrs Ruth Inbar, MA, London
Coombs, David Campbell, MA, Edinburgh
Cooper, Alan Richard, MA, Inverness
Cooper, Calum Dewar, BA, Edinburgh
Cooper, Miss Elizabeth Jane, BA, Frankfurt, Germany
Cooper, Ms Gillian Tina, BAcc, London
Cooper, John Alexander, Aberdeen
Cooper, Lindsay William Ernest, BCom, Singapore
Cope, Michael, Buena Park, California, U.S.A.
Cope, Mrs Susan Mary Tudor, Bristol
Copeland, Jack Derek, Glasgow
Copestick, Lewis, Oakville, Ontario, Canada
Copland, Colin, Coulsdon, Surrey
Copland, Gregor George lain, BA Vancouver, British Columbia, Canada
Cordiner, John Mark, BSc, Guernsey, Channel Islands
Cordiner, Robert Wilson, Glasgow
Corley, Mrs Susan Hope, BAdmin, Aberdeen
Cormack, Anthony James, Edinburgh
Cormack, lain Matheson, BSc, Glenrothes, Fife
Cormack, John London
Cormack, John Ford, BSc, Wick, Caithness
Cormie, John Alastair Dawson, Edinburgh
Cormie, William Dawson, MA, London
Cornelius, lan, MA, Birmingham
....

The dates relating to dates of admission to the Institute are shown in the second part of the directory whereas the names of the members are listed again, but according to their geographical area. Therefore, knowing the name of the CADRE (who is a member of the ICAS) from our dataset and then the geographical location of those directors from the first part of the ICAS directory, the second part of the directory had to be consulted to give the member's date of admission to the Institute (see Extract 4.2.1.1.B)

Extract 4.2.1.1.B: The Institute of Chartered Accountants of Scotland
Extract from the 1998 Official Directory (Geographical List of Members)

Wands, Peter David, P D Wands, 16 Station Road, FK14 7EJ 1973]

Dornoch, Sutherland

Freir, David Stanley, Wester Lonemore, IV25 3RW [1938]

Mackay, Ian Munro, BCom, Mackay & Co, 8A Castle Street IV25 3SN [1973]

Doune, Perthshire

Daly, Richard Henry, Keralba, 3 Gilbert Grove, FK16 6HX [1960]

Knowles, James Strachan Douglas, FCMA, Maltbarn House, 75 Main Street, FK16 6BW [1960]

Dundee

Allison, Terry Robie Neve, Bsc, Henderson Loggie, Royal Exchange, DD1 lDZ [1989]

Anderson, David Finlay, Wright Health, Group Ltd, Industrial Estate, Kingsway West, DD2 3QD [1973]

Anderson, David George, MA, Dundee College, 30 Constitution Road, DD3 6TB [1976]

Anderson, James Stewan, Craighall, 20 Glamis Road, DD2 1ND [1946]

Dumbarlon

Allen, Arthur Paul, BA, Aggreko Ltd, Overburn Avenue, Broadmeadow, Industrial Estate G82 2RL [1976]

Anderson, Andrew, 1/1 Knoxland Street, Knoxland Court, G82 1HE [1951]

Andrews, Mrs Leslie, BA, Andrews & Co, 129 High Street, 2nd Floor, G82 1LE [1990]

....

4.2.1.2. The 1995 List of Members and Firms of the ICAEW

The task of identifying the year of admission to the membership of the Institutes is different between the two institutes. The ICAEW directory presents the list of its members in a different format than the ICAS directory discussed above. The members of the ICAEW are listed in the ICAEW directory alphabetically. The difference from the ICAS directory is that the ICAEW directory provides directly the date of admission to the Institute in the same section where the names of members are listed alphabetically (see Extract 4.2.1.2.A).

4.2.2. Partner's Name and/or Accountancy Firm

Having completed this task, in other words having obtained the relevant year of admission to membership in the two institutes for each director/chartered accountant (and in effect the year for qualification for most of the directors), the accountancy firm and the town in which the then-trainee chartered accountants have received their professional training were needed next. For this purpose, four different public sources were used and many journeys to two different libraries in the UK (Birmingham & Edinburgh) had to be made.

Extract 4.2.1.2.A: The Institute of Chartered Accountants in England and Wales
Extract from the 1995 List of Members, p. 586

....
LODER, Mr John, FCA *1972*; 60 Augustine Way, Bicknacre, CHELMSFORD, CM3 4ET.
LODGE, Miss Amanda Jane, BSc ACA *1994*; 8 Hurle Road, Clifton, BRISTOL, BS8 2SY.
LODGE, Mr David John, ACA *1986*; 22 Station Road, Barton-under Needwood, BURTON ON TRENT, Staffs, DE13 8DR.
LODGE, Miss Jane Ann, BSc FCA *1979*; Touche Ross & Co., Colmore Gate, 2 Colmore Row, BIRMINGHAM, B3 2BN.
LODGE, Mr Mark Vincent, FCA *1977*; 31 Whitby Court, Parkhurst Road, LONDON, N7 0SU.
LODGE, Mr Philip Charles, FCA *1945*; Harwood, The Green, Goathland, WHITBY, N Yorkshire, YO22 5LX.
LODGE, Mr Trevor Drabes, FCA *1971*; KPMG Peat Marwick, Peat House, 1 Commercial St, Forster Square, BRADFORD, W Yorkshire, BD1 4AS.
LOEB, Mr Jeremy Ian, BSc ACA *1982*; 11 Hoober Road, Ecclesfield, SHEFFIELD, S11 9SF.
LOEBL, Mr John Charles, BA ACA *1987*; 17 Rushton Drive, Bramhall, STOCKPORT, Cheshire, SK7 3LB.
LOMAS, Mr Anthony Victor, BA FCA *1982*; Price Waterhouse, Southwark Towers, 32 London Bridge St, LONDON SE1 9SY
....

Note: the year after the designatory letters (FCA, ACA, BSc, etc) indicates the year of admission to the membership

The ICAEW examination pass lists for the year of qualification were published in the "Accountant" and "Accountancy" magazines whereas the ICAS list of members and membership admission were published by the "Accountants' Magazine".

4.2.2.1. The "Accountants' Magazine" for the ICAS members

The "Accountants' Magazine" has been publishing the list of members for the ICAS until 1990 (see Extract 4.2.2.1.A) and here no "real" problem was created as the magazine provides directly the name of the accountancy firm and the town against the name of each successful candidate (see Table 4.2.2.1.A). However, the University of Warwick library does not hold the "Accountants' Magazine" in its shelves, which meant that we had to find out which library is subscribed to the magazine. The

National Library of Scotland in Edinburgh holds all the issues of the "Accountants' Magazine" since its first issue of January 1897 and, therefore, several journeys to this library were needed.

Extract 4.2.2.1.A: The Institute of Chartered Accountants of Scotland, List of new members in 1958

LIST OF NEW MEMBERS

One hundred and seventy-two applicants were admitted to Membership of the Institute at the Annual General Meeting held in Edinburgh on March 26, I958. Their names are set out in alphabetical order, the names of the firms with whom they served their apprenticeships being shown in brackets.

Abercromby, Eric James (Finnie, Ross, Welch & Co., Glasgow).
Anderson, Wilma (James Meston & Co., Aberdeen).
Armour, Robert Leslie Grant (Kidston, Goff & Harvey, Glasgow).
Baker, Wilfred Oliver (Peat, Marwick, Mitchell & Co., London).
Beaton, John Fyffe (Anderson & Menzies, Kirkcaldy).
Bentley, Mark Traill (Thomson McLintock & Co., London).
Brown, Gillian Gilders (McLay, McAlister & McGibbon, Glasgow).
Cunningham, John Douglas Grieve (R. C. Thomson & Murdoch, Dundee).
Davidson, James Breckenridge (Reid & Mair, Glasgow).
Downie, John (A. & J. Robertson, Edinburgh).
Espitalier-Noel Bertrand (Peat, Marwick, Mitchell & Co., London).
Finlay, Jonh Livingstone (Jolin M. Geoghegan & Co., Edinburgh).
Friend, Bernard John (Peacock & Henry, Glasgow).
Gallacher, James (Nelson, Gilmour, Scott & Co., Glasgow).
....

Source: *The Accountants' Magazine*, August 1958

Table 4.2.2.1.A: Example from the database concerning the ICAS members

OFF_RECNO	SEX	LNAME	BIRTH	MEMBADM	ACCYFIRM	TOWN	MERGEDWITH
004060	M	MACKENZIE, Donald Roderick, CA	17/02/39	1964	McClelland, Moores & Co	Glasgow	see s. 4.2.2.3
004088	M	STEVEN, Ian W, CA		1972	Thomson McLintock & Co	Glasgow	see s. 4.2.2.3
004150	M	WATERS, Donald Henry, OBE CA FRSA	17/12/37	1961	Roderick MacLean & Co, Howden & Molleson	Inverness & Edinburgh	see section 4.2.2.3
004320	M	SMITH, Alastair Moray, CA	19/06/36	1959	Wilson, Stilring & Co	Glasgow	see s. 4.2.2.3
Source:	*PW*	*Price Waterhouse (PW) Database*	*PW*	*List of Members*	*List of Members in the Accountants' Magazine*	*as in ACCYFIRM*	

4.2.2.2. The "Accountant" & "Accountancy" magazines for the ICAEW members

The ICAEW examination pass lists record, against the name of each successful candidate, the accountancy firm and the town. However, we encountered two major difficulties: (1) prior to 1983, the examination lists of successful candidates list, instead of the name of the accountancy firm, the name of the partner to whom the trainee was articled (see Extract 4.2.2.2.A), (2) the publication of the full examination pass lists is discontinued in the "Accountancy" magazine since 1973 and in the "Accountant" magazine since 1979.

Extract 4.2.2.2.A: The Institute of Chartered Accountants in England and Wales
Extract of the Results of Professional Examination II held in December 1980
The names of the **partners** are being shown in brackets

LIST OF SUCCESSFUL CANDIDATES
The following candidates by passing the examination are eligible to apply for membership.

A

Abbot, D. J. L. (M. E. Maskall), London
Adams, R. J. (R. Ham), Manchester
Northampton
Aleyan, S. (D. T. Holm), Colchester
Allan, J C. (N. H. Broxham), Hull
Al
lan, R. A. L. (D. W. Malpas), Bournemouth
Allan, S. R. (E. D. Cox), Birmingham
Allenza, A. (D. T. Guest), Wolverhampton
Allmark, E. G. (Miss) (D. J. Illingworth), Manchester
Applebs, R. C. (J. M. Stanley), Newcastle upon Tyne
Armstrong, J. 1.. (N. F. Marshall), Southampton
Astles, S. D. (R. T. Magson), Birmingham
Atalianis, C. (A. Pinkney), I ondon
Atkinson, A. (R. E. Crav). Newcastle upon Tvne

B

Bagley, D. J. (P. B. Kirby), London
Bailey, A. S. (Miss) (B. H. Hawes), Cambridge
Bailey R. C. (R. N. E. Clark), Leeds
Baker C. M. (J. G. Goodin), London
Bale, A. P. (P. Hale), London
Bali, S. A. (G. C. C. Capon), London
Ball, C. J. (H. R. Brown), London
Banerjee G. (J. Burley), London
Bardwell A. W. (G. Selbv), London

C

Caine, K. M. (Miss) (J. A. Cook), Stockton-on-Tees
Caldwell, D. (J. F. Jee), Nuneaton
Callaghan, S. (D. D. Kidson), Manchester
Carey, A. (G. J. Holbourn), London
Carrick, B. B. (Mrs) (C. G. W. Bathwayt), Bath
Carroli, A. J. (J. S. Craig), Birmingham
Carroll, S. J. (D. Blatcher), Maidstone
Cartwright, S. M. (Miss) (R. G. Noake), Birmingham
....

Matching each director/chartered accountant with the partner or the accountancy firm that trained them was another labour intensive exercise, as it involved, apart from extracting manually the relevant information, visiting and using material from the Central Library of Birmingham. The library of the Warwick University does subscribe to both magazines, but unfortunately it does not hold all the relevant issues and most importantly, most of the lists of the successful candidates to the ICAEW examinations are being missed from the Warwick library[1].

[1] These lists were published as supplements to the magazines not bound together with the rest of the published material/magazine.

The second problem (i.e. discontinue of the publication of the exam pass lists in the "Accountancy" and "Accountant" magazines) was resolved by ordering from the ICAEW's Education and Training Department in Milton Keynes the examination lists from 1980 to 1993. The post-1983 examination lists report the name of the accountancy firm against the name of each successful candidate (see Extract 4.2.2.2.B).

Extract 4.2.2.2.B: The Institute of Chartered Accountants in England and Wales
Extract from the Results of Professional Examination 2 held in December 1993
The names of the **accountancy firms** are being shown in brackets

A

Abbott D.T. (Casson Beckman), London
Abbott M. (Ernst & Young), London
Abdul Rahim A.Z. (Anhur Andersen), Loodon
Abel P.W. (KPMG Peat Marwick), Bristol
Aboobaker R.A.G. (Newby Castleman), Leicester
Abraham D.L. (Stoy Hayward) London
Abram P.J. (Price Waterhouse) Birmingham
Acum G.A. (Touche Ross & Co.), Manchester
Adams C.J. (BDO Binder Hamlyn), London
Adams C.T. (Anhur Andersen), London
Adams D.L. (KPMG Peat Marwick), Birmingham
Adams T.M. (Touche Ross & Co.), Bristol
Adam-Smith M.A. (Grant Thornton), London
Adamson M.R. (Price Waterhouse), Hull
Addy C.J. (Touche Ross & Co.), Leeds
Aggarwal A. (Coopers & Lybrand), Maidstone
Ahmad M.S. (KPMG Peat Marwick), London
Ahmed N. (KPMG Peat Marwick), London
Ahmed U. (Neville Russell), London
Aird A.GS. (Price Waterhouse), London
Aizlewood J.H. (Touche Ross & Co.) London
Akdeniz S.O. (Touche Ross & Co.), Milton Keynes
Alderson K.J. (Coopers & Lybrand), London
Alexander N. (Coopers & Lybrand), London
Alibegov D. (Price Waterhouse), London
Allen F.S. (Clark Whitehill), London
Allen H.C.M. (Coopers & Lybrand), London
Allen J. (Touche Ross & Co.), London
Allen L.D. (KPMG Peat Marwick), Stoke-On-Trent
Allen N.A. (KPMG Peat Marwick), London
Allen S.M. (Rouse & Co), Beaconsfield
Alsop S.J. (Bellman Messik), London
Americanos A. (Frankson S W. & Co), Hayes
Amphlett J.J.R. (Daffern & Co), Coventry

B

Baker M.L. (Coopers & Lybrand), London
Bakhshi R. (Haines Watts), Slough
Balaam M.A. (Touche Ross & Co.), Leeds
Baldock G.M. (Blakemores), London
Ball C.J. (Emst & Young), Birmingham
Ball D.W.D. (Touche Ross & Co.), London
....

The first problem (i.e. exam lists give the name of the partner instead of the name of the accountancy firm) was tackled by consulting the ICAEW Directory of Members for each year since 1953. But, firstly, another time-consuming and laborious task had to be completed. Given the fact that the ICAEW examination pass lists do not record prior to 1983 the name of the accountancy firm against each successful candidate but the name of the partner the trainee was apprenticed, we had to correspond the name of the CADRE with the name of the partner to whom the director was articled. The number of directors/chartered accountants that have qualified with an accountancy firm prior to 1983 was 1,469 names. This meant that having the membership admission year from the 1995 ICAEW List of Members, then we had to look at each single examination pass list (two examinations take place each year) from 1953 to 1983 to trace the 1,469 partners' names and the town. This involved visiting regularly Birmingham's Central Library, looking at the examination lists published in the "Accountant" or "Accountancy" magazines and transferring manually the relevant information (abbreviated as "PARTNAME" & "TOWN" respectively) to the existing database with the names of the directors/chartered accountants (see Table 4.2.2.2.A).

Table 4.2.2.2.A: Example 3 of the Database

OFF_RECNO	SEX	LNAME	QUAL	BIRTH	MEMBADMIS	PARTNAME	TOWN
000016	M	LANE, Kenneth W W, FCA	FCA	24/03/46	1972	Watt I.G.	London
000799	M	EVANS, Stephen Geoffrey, BSc ACA	BSc ACA	15/09/55	1982	Judd D.J.	Swansea
000659	M	HUGHES, Richard John, FCA	FCA	17/10/46	1969	J.G. Hurst, jun.	Liverpool
30873	M	BOURNE, Robert Anthony, FCA	FCA	16/05/50	1973	Sober P.	London
Source:	*PW*	*Price Waterhouse (PW) Database*	*PW*	*PW*	*List of Members*	*ICAEW Exam Pass Lists*	*ICAEW Exam List*

In summary so far, from the original PW dataset which contained detailed information for over 15,000 directors in the UK quoted companies, we have created another smaller database with only the directors who hold the chartered accountancy qualification. It contains the names of 2,286 directors and other relevant information. Then we created another column called "membership admission" and the year they have been admitted to membership was entered there. Later, another two columns were added with the name of the partner and the town to whom the director/chartered accountant today (a trainee chartered accountant then) was articled.

4.2.2.3. Current list of accountancy firms

Using the yearly published ICAEW List of Members for each year since 1953, we were able to trace the partner names back to the name of the accountancy firms. Therefore, another column in the database was created containing the name of the chief accountancy firm that the chartered accountant/director was qualified with (abbreviated as "ACCYFIRM").

Table 4.2.2.3.A: Example 4 of the Database

OFF_RECNO	LNAME	PARTNAME	ACCYFIRM	TODAYACCYF
000016	LANE, Kenneth W W, FCA	Watt I.G.	Thomson McLintock & Co	KPMG
000799	EVANS, Stephen Geoffrey, BSc ACA	Judd D.J.	Deloitte Haskins & Sells	Coopers & Lybrand
000659	HUGHES, Richard John, FCA	J.G. Hurst, jun.	Arthur Young, McClelland, Moores & Co	Ernst & Young
30873	BOURNE, Robert Anthony, FCA	Sober P.	Stoy, Hayward & Co	Stoy Hayward
Source:	*Price Waterhouse Database*	*ICAEW Exam Pass Lists*	*ICAEW List of Members 1953-1983*	*History Books and Family Trees*

Some of the accountancy firms though, that the CADRE have qualified with, have been merged with other firms and consequently these merged firms have disappeared from the list of the current accountancy firms. Most of those firms were small in size and have merged with larger practices. Furthermore, some firms have very complex family trees and, therefore, the full and detailed make-up of these firms was impossible to be unfolded/discovered. As a result, for some of the firms was infeasible to find out where they have gone and the process by which they disappeared. We assumed that some of these firms have remained independent throughout their existence and some have become "defunct" due to mergers. The former firms have classified in this study as Non-Big Six (NB6) while the latter carry the current name that created after the merger(s)[2].

Thus, with the help of the family trees, the origins of the accountancy firms made possible to be traced, and another column needed to be created in the database (abbreviated "TODAYACCYF") which shows the names of today's accountancy firms (see Table 4.2.2.3.A above). This was another labour intensive work, as we had to investigate the development of each single firm that doesn't appear in the list of today's firms and attempt to determine with which today's firm have merged with. If this was infeasible, then that firm was classified as NB6, as we mentioned earlier.

[2] See section 4.3 below for a discussion on the effects of mergers in this study.

4.3. The effect of mergers

Another problem we encountered during the collection of the directors' data was the very big number of accountancy firms that trained the directors/chartered accountants. More specifically, 604 different accounting firms appear in our dataset between 1953-1991[3], and many (if not the majority) of them have now disappeared mainly due to a wave of mergers during the last 40-50 years. These "disappeared" firms have become mainly part of today's "top-twenty" firms - Coopers & Lybrand, Arthur Andersen, KPMG, Ernst & Young, Price Waterhouse, Touche Ross, Grant Thornton, BDO Stoy Hayward, Pannell Kerr Forster, Clark Whitehill, Kidsons Impey, Moore Stephens, Robson Rhodes, Neville Russell, Moores Rowland, Baker Tilly, Smith & Williamson, Haines Watts, Casson Beckman and Saffery Champness[4].

A previous from the preceding problem was to trace the partners names back to the name of the accounting firms. After solving that, going through the ICAEW Lists of Members between 1953 and 1983, and trying to identify the 1,469 partners names, we faced another dilemma. How would we be able to show which firms have disappeared and trace the continuing development of the largest firms of chartered accountants?

The problem became bigger realising that the merger activities were accelerating during the 60s, 70s and 80s, and that mergers have been prevalent throughout the history of the British accounting firms. As a result, many of the previously long-established names in accountancy such as "Barton Mayhew & Co" or "Harmood Banner" have disappeared.

What we needed was a historical database reference containing information about the development of professional firms. The ideal would have been for us to be able to find such a database in a PC readable format. Unfortunately, there was not anywhere available such a database, to our knowledge, but we discovered that many of the accountancy firms have published their histories, although most of these histories are already out-of-date. These books untangle the events in the history of the firms and

[3] See Appendix IV for the full list of accountancy firms that trained today's CADRE.
[4] Listed, in order of fee income, as published in *Accountancy*, July, 1995.

explain their evolution. The most recent book is the history of Price Waterhouse (Jones, 1995) as shown in Table 4.3.A.

Table 4.3.A: Some of the published histories of accountancy firms[5]

Date	Title	Author
1995	True & Fair: A History of the Price Waterhouse	Edgar Jones
1984	The Early History of Coopers & Lybrand	Coopers & Lybrand
1982	Peat, Marwick, Mitchell & Co.	T A Wise
1981	Accountancy & the British Economy: The Evolution of Ernst & Whinney	Edgar Jones
1981	Touche Ross & Co. 1899-1981: The Origins and Growth of the UK Firm	Archibald B. Richards
1974	The Growth of Arthur Andersen & Co.	Leonard Spacek
1958	Deloitte & Co. 1845-1956	Russell Kettle

Another interesting overview of the beginnings and evolution of the British accountancy firms is provided in the "Accountancy" magazine, which published a series of articles titled "What's in a name". Peter Boys (1989, 1990) during this series charted the changes in the names of accountancy firms through a maze of mergers from 1780 to 1990[6]. In that way the family trees of the largest accounting firms in British practice in 1989 were followed to their beginnings.

In addition to the above mentioned sources, the most fruitful historical record was the survey of accounting firms archives financed by the ICAEW and carried out in 1991 and 1992. Wendy Habgood conducted the survey, and she also compiled and edited the guide "Chartered Accountants in England and Wales: A Guide to Historical Records" published in 1994. The larger section of this book comprises lists of historical records, and brief histories of 182 firms of chartered accountants. This figure includes practising firms, "founder" firms[7], and a number of "defunct" firms whose names have become extinct as a result of mergers.

[5] A complete list of bibliographies of accountancy firms' histories can be found in Habgood's guide (1994, pp. 46-55).
[6] For example, Josiah Wade established in 1780 is probably the oldest firm to trace its "continuous existence" and became part of the Deloitte Haskins & Sells in 1969.
[7] Founder firms are defined in the guide as those which can claim continuous partnership descent from a signatory to the Charter or a member of the first Council, or which had been in existence for at least 100 years in 1965 (Howitt, 1966, p. 227). A list of the founder firms is available at the Habgood's guide (1994, pp. 55-59).

By consulting the preceding mentioned lists and history books, we were able to investigate the development of the firms that do not appear among the today's chief accountancy practices and reveal which of the long-established provincial firms with once-familiar names (which have now disappeared) have trained the directors/chartered accountants who run the UK quoted companies today.

4.4. Historical findings from our database

In this section some historical reference will be made regarding the evolution of the Big-Six accountancy firms. It aims to provide some background information about the names and the number of accountancy firms that (1) have trained the today's directors/chartered accountants, and (2) have merged with one of the Big-Six audit firms, that is, alphabetically, Arthur Andersen, Coopers & Lybrand, Ernst & Young, KPMG, Price Waterhouse, and Touche Ross.

As it has been mentioned in the beginning of this chapter, there are 1,955 ICAEW directors/chartered accountants in 1996 in the UK stockmarket companies. 55% of 1,792 CADRE (163 directors were unable to be identified and traced in the directories) has trained with one of the Big-Six firms, or one of their predecessors. More specifically, 105 directors/chartered accountants have trained with firms that make up the Arthur Andersen family tree, 212 with Coopers & Lybrand family tree, 144 with Ernst & Young family tree, 216 with KPMG family tree, 174 with Price Waterhouse family tree and 126 with Touche Ross family tree.

More analytically, each of these firms consists of several once-famous (or not) names of accounting practices and the main names of these disappeared firms are disclosed in the following tables:

ICAEW

Arthur Andersen	**105**
Dangerfield, Brewis & Co	2
James, Edwards, Dangerfield & Co	2
Tansley Witt & Co	4
Barrowcliff C. Percy & Co	4
Smaller	5
Arthur Andersen	88
	105

KPMG	**216**
Armitage & Norton	9
Hays Allam	3
KMG Thomson McLintock	4
Peat Marwick McLintock	9
Peat Marwick Mitchell & Co	18
Thomson McLintock	25
Smaller	18
KPMG	130
	216

Coopers & Lybrand	**212**
Cooper Brothers & Co	35
Deloitte Haskins & Sells	66
Harmood Banner & Co	14
Tribe, Clarke & Co	2
Wallace Cash & Co	2
Winter, Robinson, Sisson & Benson	5
Smaller	21
Coopers & Lybrand	67
	212

Price Waterhouse	**174**
Hodgson Impey (Hull offices only)	2
Howard, Smith, Briggs & Co	2
Mellors, Basden & Co	4
Smaller	8
Price Waterhouse	158
	174

Ernst & Young	**144**
Arthur Young	11
Arthur Young, McClelland, Moores & Co	17
Baker Sutton & Co	3
Barton, Mayhew & Co	11
Brown, Fleming & Murray	3
Ernst & Whinney	24
Josolyne Layton-Bennett & Co	5
Josolyne, Miles & Co	3
Layton-Bennett, Billingham & Co	5
Smith & Garton	3
Turquand, Youngs & Co	10
Whinney Murray & Co	19
Smaller firms	22
Ernst & Young	8
	144

Touche Ross	**126**
Kemp, Chatteris & Co	4
Mann Judd & Co	7
March R.H., Son & Co	2
Spicer & Oppenheim	43
Temple, Gothard & Co	3
Touch (George A.) & Co	2
Smaller	10
Touche Ross	55
	126

4.5. Statistics concerning CADRE

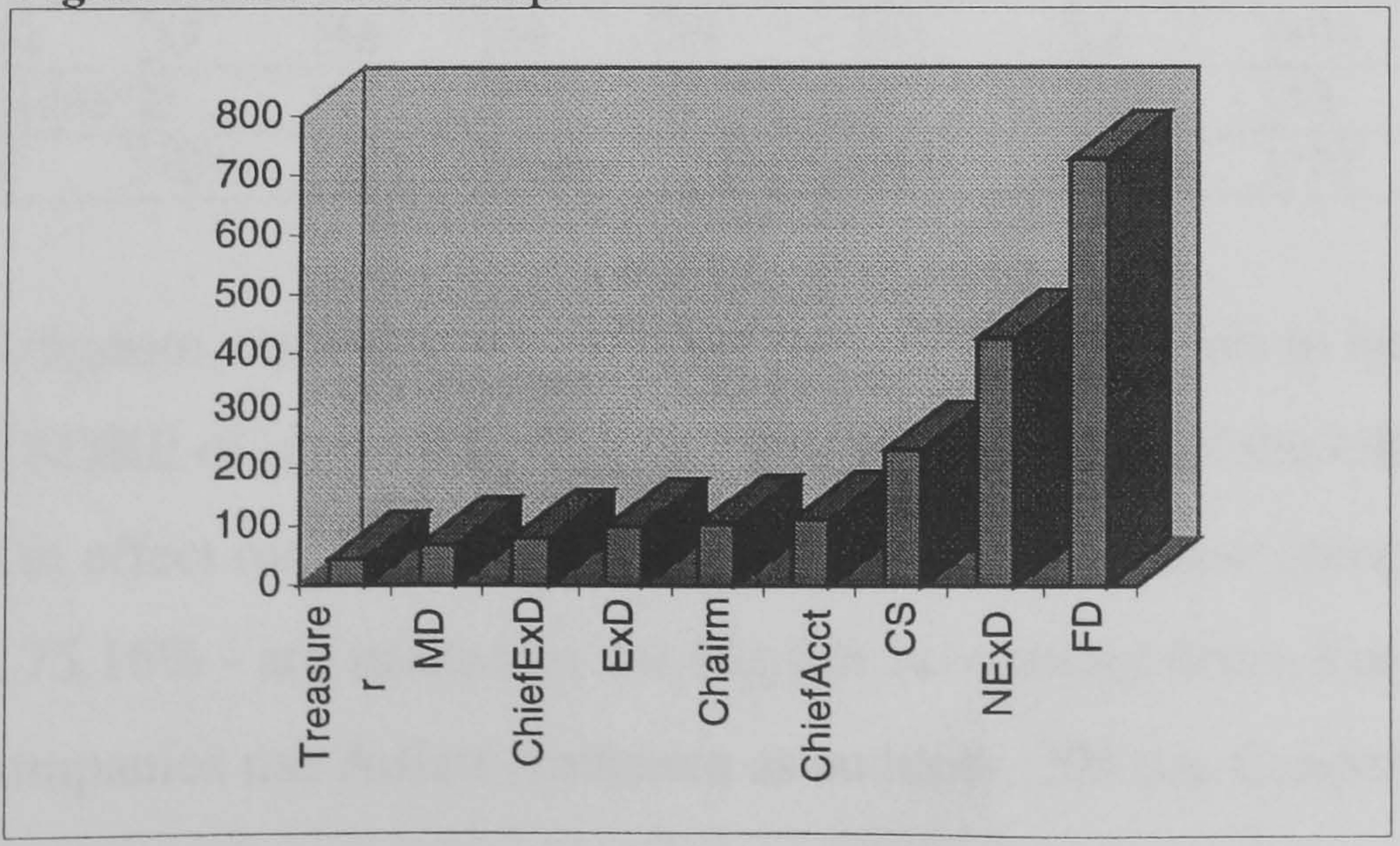
This section presents some descriptive statistics about the chartered accountants-directors (CADRE) on the boards of the UK public companies.

In the introduction of this chapter we referred to the total number of directors who hold a chartered accountancy qualification, that is 2,286 CADRE have received their qualification from the ICAEW or ICAS. However, CADRE who hold an ICAS qualification have not been considered in this study. Subsequent to collecting the data with regard to the accountancy firm and town in which these CADRE have received their professional training, there were extensive missing data problems in respect of financial information for the listed companies that the ICAS CADRE were employed. We decided to continue the current study with those CADRE who hold an ICAEW qualification only, and drop the 331 ICAS CADRE. The total useful sample, therefore, becomes 1,955 chartered accountants-directors. As we will see during the course of the analysis, this number will fluctuate for each different variable discussed. For example, we have managed to trace the current job position of directors for only 1,897 of those 1,955 CADRE. As we can see below, there are in the sample 725 Finance Directors, 105 Chairmen, 83 Chief Executives, and so on.

ExD	ChiefAcct	Chairm	ChiefExD	CS	FD	MD	NExD	Treasurer	*Total*
100	115	105	83	236	725	67	424	42	1897
5.27%	6.06%	5.54%	4.38%	12.44%	38.22%	3.53%	22.35%	2.21%	100.00%

Table 4.5.A: Number and percentage of directorships (ExD = Executive Diroector, ChiefAcct = Chief Accountant, Chairm = Chairman, ChiefExD = Chief Executive, CS = Company Secretary, FD = Finance Director, MD = Managing Director, NExD = non-Executive Director, Treasurer = Treasurer)

Figure 4.5.A: Directorships



From the 1,955 total CADRE, 163 CADRE could not be traced in the exam pass lists or members' directories resulting in only 1,792 CADRE for whom we know the accountancy firm that trained them. For example, 105 CADRE have trained with Arthur Andersen, 212 with Coopers & Lybrand, 216 with KPMG and so on. In this analysis the Big-Six audit firms include their predecessors, we subsequently explore a narrower definition of association.

AA	CL	EY	KPMG	PW	TR	Other	*Total*
105	212	144	216	174	126	815	1792
5.86%	11.83%	8.04%	12.05%	9.71%	7.03%	45.48%	100.00%

Table 4.5.B: Number and percentage of alma mater

When we merge the above two tables, they give the combined Table 4.5.C below where it shows how the positions of directors are distributed by accountancy firm. The total useful number of CADRE becomes 1,749 CADRE. For example, 691 from the 725 Finance Directors were able to be matched with the accountancy firm that trained them. Of these 691, 56 have trained with AA, 77 with CL, 50 with EY and so on. Again in this stage, the Big-Six audit firms include their predecessors.

Table 4.5.C: Directors and alma mater

					Alma Mater				
		AA	CL	EY	KPMG	PW	TR	Other	*Total*
	ExD	6	5	10	16	5	6	42	90
	ChiefAcct	5	13	13	17	9	5	41	103
	Chairm	3	11	6	4	13	3	54	94
Directors	ChiefExD	3	9	7	11	3	10	34	77
	CS	7	30	13	26	12	14	120	222
	FD	56	77	50	94	86	52	276	691
	MD	2	10	5	6	8	5	26	62
	NExD	17	49	34	29	27	22	191	369
	Treasurer	2	4	3	9	4	6	13	41
	Total	101	208	141	212	167	123	797	1749

In the United Kingdom, company law requires the public companies to have an audit. All the 1,955 CADRE of our sample are directors on the boards of the UK listed companies and in effect run corporate Britain. The majority of these companies - 1437 companies, i.e. 75.16% - are audited by the Big-Six accounting firms. For example, 105 CADRE companies use Arthur Andersen as auditors, 295 use Coopers &

AA	TR	EY	PW	CL	KPMG	Other	*Total*
105	295	221	396	217	203	475	1912
5.49%	15.43%	11.56%	20.71%	11.35%	10.62%	24.84%	100.00%

Table 4.5.D: Number and percentage of the CADRE companies audited by audit firms

Lybrand, 203 use KPMG and so on. Data is missing regarding the auditors of 43 companies.

Historically chartered accountants work as apprentices when they were initially hired by the accountancy firms. Table 4.5.E gives the regional areas where the sample CADRE have undergone their lengthy and rigorous accounting training. For example, Britain's boardrooms are dominated by chartered accountants - 981 CADRE, i.e. 57% - who have been trained in the London area. Data of 226 places is missing regarding the town where CADRE trained as auditors.

Table 4.5.E: UK regional areas where CADRE were trained

North	58	3.35%
North West	180	10.41%
North East	163	9.43%
W. Midlands	146	8.44%
E. Midlands	51	2.95%
E. Anglia	26	1.50%
Gr. London	981	56.74%
S. West	68	3.93%
S. Coast	33	1.91%
Wales	23	1.33%
Total	1729	100.00%

Analysing further the data, the following Table 4.5.F gives the areas where the number of directors have taken their apprenticeships. For example, 376 out of 669 finance directors were apprenticed in London. North England has produced 19 finance directors-chartered accountants, West Midlands 71, and so on. We were not able to trace the directorship for 44 of the 1,729 accounting firm alumni.

Table 4.5.F: Directors and accounting firm alumni town

		Directors Job Position									
		ExD	ChfAcct	Chrm	ChfExD	CS	FD	MD	NExD	Treas	*Total*
	North	3	6	5	3	7	19	2	11	2	58
	N. West	15	13	12	9	26	55	8	36	5	179
Alumni	North East	9	8	9	10	20	73	6	22	1	158
Town	W. Midlnds	8	5	6	4	24	71	5	18	3	144
	E. Midlnds	3	1	6	1	6	21	3	8	1	50
	E. Anglia	2	1	0	0	6	10	2	5	0	26
	Gr. London	45	57	48	41	106	376	30	221	25	949
	S. West	2	4	4	3	11	23	0	18	2	67
	S. Coast	1	1	3	3	4	14	2	4	0	32
	Wales	1	2	2	2	3	7	1	3	1	22
	Total	89	98	95	76	213	669	59	346	40	1685

The absence of women from the Britain's boardrooms has well been documented (e.g. PW Corporate Register, September, 1995, p. 7). The preponderance of the male elite with accounting training is prevalent in our sample too. Women remain a minority. Just 52 of the 1,955 directors-chartered accountants - 2.66% - are women.

Finally, while the average age of a director is in the early fifties, there are some very young and very old directors thrown up by our database. The youngest appear to be born later than 1970. They are chief accountant, company secretary and finance director of Lionheart, Alphameric and Epic Multimedia Group PLCs respectively. In fact, of the CADRE in the database who own up to a date of birth, forty-eight are under thirty. Interestingly, nine of these forty-eight are women[8]. But two directors-chartered accountants have seen it all before. At 76 they are the oldest CADRE in the database as a company secretary and a non-executive director at Penna Holdings and Transtec PLCs respectively.

Concluding, this chapter has presented analytically the steps by which the data concerning the accounting firms alumni was collected. Having constructed the alumni network, therefore, the next step is to identify whether there is an association between the auditor of the CADRE's current employer with the CADRE's alma mater. This is the main analysis of the next chapter.

[8] There is an influx of women into accounting training (Business Week, 1997). This gender shift and leavening of female talent in accounting might be a signal of a more equitable distribution between sexes in the future boardrooms.

CHAPTER V

ACCOUNTANCY FIRMS, ALUMNI, AND DIRECTORS ON THE BOARDS OF THE U.K. QUOTED COMPANIES

This chapter sets out and presents the evidence on directors (executive and non-executive) who sit on the boards of the public limited companies in the UK and at the same time hold a chartered accountancy qualification from the ICAEW. The analyses in the following sections shed new light on the market for audit services, and on the role of chartered accountant-directors in understanding this market. The evidence allows us to address the theoretical issues discussed in Chapter II, and to consider more specifically whether there is an association between the auditor of the company and the accountancy firm that the chartered accountant-director trained with, and how the distribution of the alumni differs among the Big-Six accountancy firms. A number of tests will be performed which identify the "alumni effect" and shows how the "alumni effect" varies by accountancy firm. The dataset that has been assembled is as far as the literature concerned unique world-wide and its assembly constitutes an important contribution to public scientific knowledge in its own right.

The following section discusses the problems and solutions dealing with the analysis of the dataset and also, it describes the sections to follow in more detail.

5.1. Introduction

Accountancy firms employ thousand of trainees each year. They are able to do so partially because these firms are characterised by high levels of staff turnover (Iyer *et al*, 1997) as a result of the up-or-out system that these firms employ. Accordingly the number of the alumni of those accountancy firms is comparatively high as one would expect. Recall that the number of alumni (i.e. chartered accountants qualified with an accountancy firm) by the year 1996 who are also directors on the boards of the listed companies in the UK is 1,955. *These chartered accountants-directors carry on the abbreviation CADRE.* Also, *the mnemonic used to characterise the accountancy firm that a CADRE has trained and qualified with is named ALMA MATER.*

The association of CADRE with the auditor and with the accountancy firm that trained with presents quantitative analysis with a number of problems. The solution adopted is to define quite closely the definition chosen, and to duplicate the analysis for alternative definitions to see if the results are robust to alternative definitions. For illustration, a major problem in the association of a CADRE with his/her ALMA MATER is that the training accounting firm may have subsequently merged, as was discussed in Chapter IV. Accordingly our analysis considers association under two definitions: *a broad definition*, which includes the accountancy firm (i.e. alma mater) and all its predecessor firm(s), and second *a narrow definition*, which excludes predecessor firm(s). For the broad definition the predecessor firm(s) are those set out in the tables of section 4.4. in the Chapter IV.

Another major problem in the CADRE association with his/her auditor is the multiple CADREs on the boards of directors. There are cases in the dataset where more than one CADRE are employed as directors in the same company. Accordingly, the association is explored under three definitions: *a broad definition*, which all CADREs are counted (and consequently, some companies appear in the database as many times as the number of CADREs on their boards); *a narrow 1 definition*, which only one CADRE per company is included (the problem of which director(s) is eliminated is discussed later in the chapter); and *a narrow 2 definition*, which only the Finance Director, Chairman and/or Chief Executive are considered.

The remainder of the chapter is divided as follows: the next section presents the broad-broad test in which the number of CADREs who qualified with accountancy firms including their predecessor(s) are counted. The broad-narrow test is performed in section 3 where only those CADRE who have qualified with a founder firm appear in the tables. Section 4 analyses the narrow1-broad test in which only one CADRE per

		ALMA MATER	
		BROAD	**NARROW**
		FOUNDER & DISAPPEARED	**FOUNDER**
AUDITOR	**BROAD**	SECTION 2	SECTION 3
AUDITOR	**NARROW 1**	SECTION 4	SECTION 5
AUDITOR	**NARROW 2**	SECTION 6	SECTION 7

public company is counted (selected initially in CADRE alphabetical order, second by the eldest director and third by the youngest) under the founder and disappeared alma mater category. In section 5 the narrow1-narrow test is presented, taking the narrow definition of alma mater as the founder firm category. The corresponding narrow2-broad test is performed in section 6 in which CADRE are restricted to only the Finance Director, or Chairman or Chief Executive under the founder and disappeared alma mater category. In section 7 the narrow2-narrow test is shown combining the results of these two definitions.

5.2. The Broad-Broad Test

This section presents an analysis of the data as a whole. The decompositions are discussed later in the chapter. The CADRE who have qualified with one of the Big-Six firm or its predecessor(s) are counted and analysed in this section.

5.2.1. Specifying the data involved for the test

The data used for the Broad-Broad test is discussed in this section in which the number of CADRE who qualified as chartered accountants with one of the Big-Six firm or their predecessor(s) are merely counted. Every CADRE is designated a matrix position *(i,j)*, where:

> i = the name of the accountancy firm with whom the CADRE trained (i.e. ALMA MATER)
>
> j = the name of the auditor of the CADRE's company.

The summation/tabulation of these matrix positions for all CADRE is the basis of constructing the contingency table presented below.

Table 5.2.1.A: Total CADRE on the boards (read horizontally only)

		AUDITORS OF PUBLIC COMPANIES									
		AA	CL	EY	KPMG	PW	TR	*Big-6 Subtotal*	Other	No Auditor	*Total*
	AA	**21**	14	16	14	14	12	*91*	12	2	105
ALMA	CL	10	**58**	21	38	18	15	*160*	49	3	212
MATER	EY	7	26	**38**	22	11	15	*119*	23	2	144
	KPMG	10	35	22	**66**	16	19	*168*	47	1	216
	PW	8	26	13	40	**39**	17	*143*	27	4	174
	TR	4	17	11	27	11	**31**	*101*	23	2	126
	Subtotal							*782*			**977**
	Other	41	97	83	162	87	72		258	15	815
	Missing	4	22	17	27	21	22		36	14	163
	Total	105	295	221	396	217	203		475	43	**1955**

The row total gives the number of CADRE who trained with each accountancy firm or its predecessor(s), for example 105 CADRE with AA, 212 with CL, 144 with EY and so on. The columns give the firms that these chartered accountants-directors use as their auditor. So, for Arthur Andersen, twenty-one CADRE use AA, fourteen CL, sixteen EY, fourteen KPMG, fourteen PW, twelve TR and twelve "other" (non-Big Six) accountancy firms. Thus out of 105 former employees of AA, twenty-one favour their alma mater. The same table shows that fifty-eight out of 212 CADRE who qualified with Coopers & Lybrand use them as auditors. Following a similar pattern for the rest of the Big-Six firms, the following Table 5.2.1.B and Graph 5.2.1.A can be constructed.

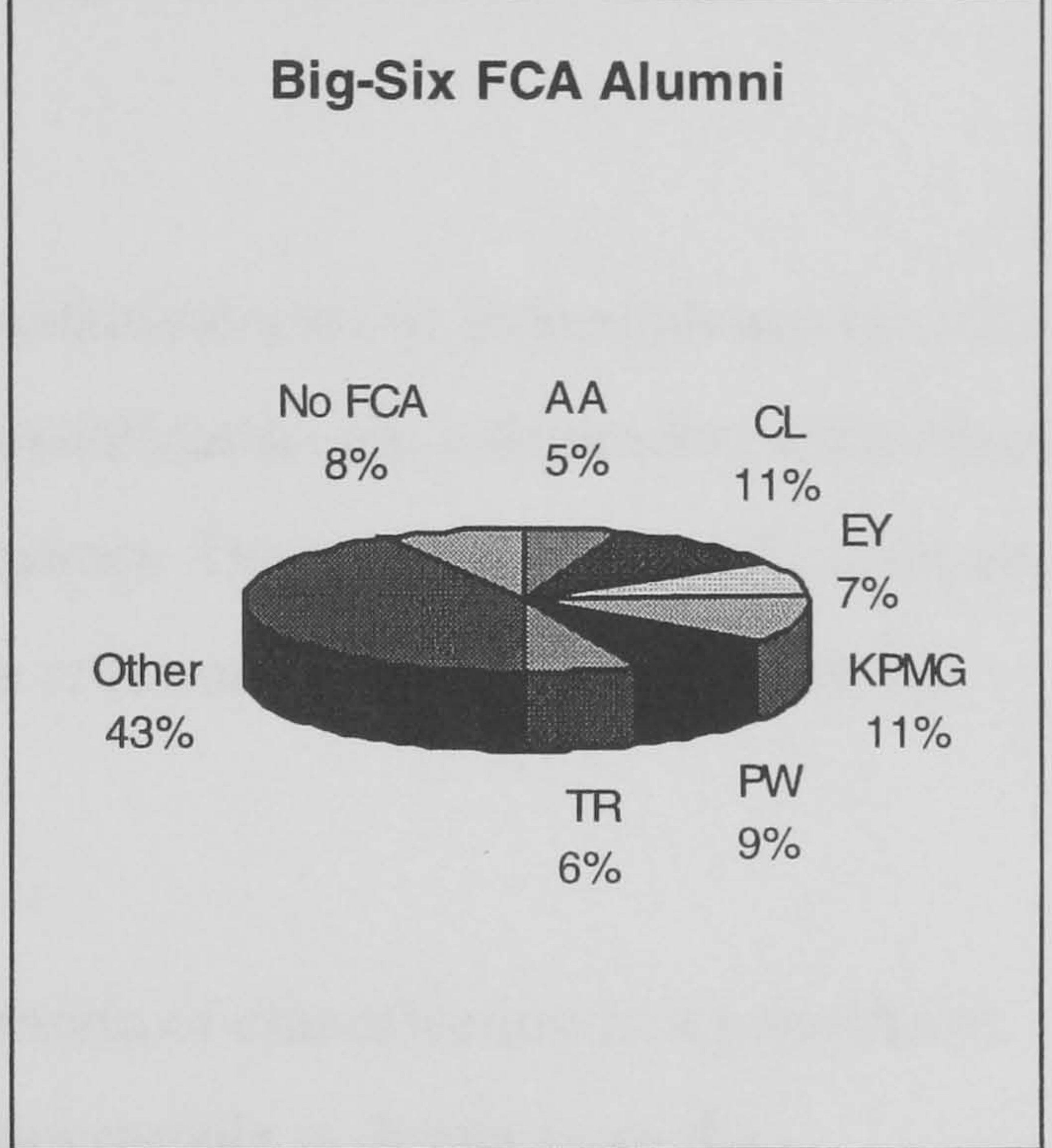
It is important to note here that the columns in Table 5.2.1.A give just the name of the accountancy firms that CADRE use as their auditor. They do not give the total number of auditors or the number of the UK public companies who have on their boards of directors a chartered accountant(s) because some listed companies have more than one CADRE on their boards. In other words, the columns total is not meaningful in Table 5.2.1.A. This problem is discussed in more detail in section 5.4.1.

Table 5.2.1.B: No of CADRE on Boards (%)

	No of CADRE per Accg Firm	Alumni and Audit Client	Alumni (%)
AA	105	21	20.00
CL	212	58	27.36
EY	144	38	26.39
KPMG	216	66	30.56
PW	174	39	22.41
TR	126	31	24.60
	977	253	25.90
Other	815	258	
Missing	163	14	
	1955	525	

Note: "Alumni and audit client" refers to the situation where a CADRE is audited by his ALMA MATER

Figure 5.2.1.A: Alumni on boards



Nevertheless, looking at the rows of the Table 5.2.1.A, we observe that nearly 50% (977 out of 1,955) of the chartered accountants on the boards of directors trained and qualified with one of the Big-Six auditing firms or one of the Big-Six's predecessor. Adding the main diagonal in the table, it shows that 253 of them (25.90%) have as their auditors the firm that they have qualified with (see also Table 5.2.1.B). For the non-Big Six firms 815 out of 1,955 supplied the directors.

Having explained the data that will be involved for the test in this section, we need to develop the tools with which to analyse the data (in the next subsection), before we move into performing the test itself. The following section, therefore, presents a detailed explanation of the chi-square test which will be used in the subsequent analysis.

5.2.2. An explanation of the chi-square test

We use the chi-square distribution as an approximate sampling distribution to compare observed frequencies with those expected under the null hypothesis. We have used this distribution because the testing procedures are simplified when sampling is from populations whose elements can be classified into one or more categories.

5.2.2.1. Tests of independence

We use the chi-square distribution to conduct statistical tests of independence in order to explore the proposition that two criteria of classification are independent each other when applied to a population of subjects (or objects). Two criteria of classification are said to be independent if the distribution of one criterion in no way depends on the distribution of the other.

Typically, we make decisions about whether criteria of classification in a population are related on the basis of sample data. A random sample is drawn from the population of interest and we cross-classify the subjects according to the criteria. The cross-classification is displayed in a table, called a contingency table. In a contingency table, the levels of one criterion provide row headings, and the levels of the other criterion provide the column headings. Having the data organised into a contingency table, the test is whether classification on the row variable is independent of classification on the column variable (this represents the null hypothesis).

Table 5.2.2.1.A shows a contingency table in which a sample of n subjects has been cross-classified according to two criteria. There are r levels of the criterion forming the rows and c levels of the criterion forming the columns. We place the observed number O_{ij} of subjects that may be characterised by one level of each criterion in the cell formed by the intersection of the ith row and jth column. The cell entries are referred to as observed cell frequencies.

Table 5.2.2.1.A: Two-way classification of a sample of subjects

	First Criterion of Classification						
				Level			
	Level	1	2	3	....	c	*Total*
Second Criterion of Classification	1	O_{11}	O_{12}	O_{13}	....	O_{1c}	R_1
	2	O_{21}	O_{22}	O_{23}	....	O_{2c}	R_2
	3	O_{31}	O_{32}	O_{33}	....	O_{3c}	R_3
	.	.	.	.	.	.	.
	.	.	.	.	.	.	.
	.	.	.	.	.	.	.
	r	O_{r1}	O_{r2}	O_{r3}	....	O_{rc}	R_r
	Total	C_1	C_2	C_3	....	C_c	n

The notation used in Table 5.2.2.1.A is as follows:

O_{ij} = number in the random sample observed to belong to ith row and jth column; first subscript, i, denotes row; second, j, column

R_i = total observed number in ith row; found by summing the frequencies in row i

C_j = total observed number in jth column; found by summing the frequencies in column j

n = sample size; the sum of the frequencies for all cells = $\sum_{i=1}^{r} R_i = \sum_{j=1}^{c} C_j$

To test the hypothesis that the criteria of classification in the rows and columns are independent, i.e. calculate the chi-square statistic value, we compute an expected number of sample elements for each cell E_{ij} and employ a χ^2 statistic that approximately follows the chi-square distribution.

To find the expected cell frequencies (E_{ij}) needed to calculate the chi-square statistic value, the principles of probability are used. The expected cell frequencies are derived from the marginal frequencies (the marginal frequencies are the row and columns sums). These expected frequencies can be calculated using the formula:

$$E_{ij} = \frac{R_i C_j}{n}$$

where: E_{ij} = the expected frequency for cell in row i, column j

The sums of the expected frequencies in each row and column must be equal to the marginal frequencies (or put it differently, both ΣR_i and ΣC_j must be equal to n). These restrictions determine the number of degrees of freedom to be $(r - 1)(c - 1)$, where r is the number of rows and c is the number of columns.

To perform the test, we find the contribution of each cell to the χ^2. The contribution of the (i, j)th cell is (observed cell frequency - expected cell frequency)^2 divided by the expected cell frequency. There are a total of rc such contributions, and the calculated χ^2 is their sum, as given in the following equation.

$$\chi^2 = \sum_{i=1}^{r} \sum_{j=1}^{c} \frac{(O_{ij} - E_{ij})^2}{E_{ij}}$$

At some predetermined level of significance, the calculated chi-square is compared with the tabled value (or critical value). Only a one-tailed test is appropriate, with the rejection region in the right tail of the distribution of the test statistic. If the calculated statistic equals or exceeds the tabled value, the finding is significant and the hypothesis of independence is rejected; the row and the column variables are determined to be dependent at the specified level of significance. The exact interpretation will be dependent upon the nature of the row and column criteria. If the calculated statistic is smaller than the tabled value, no significant relationship between row and column variables has been determined to exist, and we cannot reject the null hypothesis.

Further, in the application of this test which follows, I employ 5% or 1% as significance level. This means that under the null hypothesis that there is independence between the criteria, there is 1 in 20 (or 1 in 100) chance that I will erroneously conclude that there is a relationship between the criteria.

5.2.3. Performing the Broad-Broad Test

This section performs the chi-square tests (discussed in the subsection 5.2.2.1 above) for the dataset described in section 5.2.1. We test the Table 5.2.1.A in two stages, first for the Big-Six accountancy firms and next we repeat the same test for the non-Big Six firms. Each test is discussed in the following two subsections 5.2.3.1 and 5.2.3.2.

5.2.3.1. The test for the Big-Six firms

In order to test the hypothesis that the criteria of classification in the rows and columns of Table 5.2.1.A are independent, and determine the critical value of χ^2, we must compute the chi-square statistic value. This subsection explores the proposition that there is an alumni effect among the Big-Six accountancy firms.

To resume the discourse/exposition, therefore, presented with Table 5.2.1.A, the first question one considers is whether the frequencies in Table 5.2.1.A are merely the result of chance. In other words, for the Big-Six firms, is there an association between the ALMA MATER and the auditor of the company? Formally, the chi-square statistic is used to test the null hypothesis H_o

H_o: there is independence between auditor and ALMA MATER,

versus the alternative hypothesis

H_1: non-independence.

Applying the chi-square test for independence to Table 5.2.1.A, we test whether the two criteria of classification are independent. The two criteria of classifying CADRE

Table 5.2.3.1.A: Big-Six firms alumni on the boards (read horizontally only)

		AUDITORS OF PUBLIC COMPANIES						
		AA	CL	EY	KPMG	PW	TR	*Big-6 Subtotal*
	AA	**21**	14	16	14	14	12	*91*
ALMA	CL	10	**58**	21	38	18	15	*160*
MATER	EY	7	26	**38**	22	11	15	*119*
	KPMG	10	35	22	**66**	16	19	*168*
	PW	8	26	13	40	**39**	17	*143*
	TR	4	17	11	27	11	**31**	*101*
	Subtotal	60	176	121	207	109	109	*782*

in the Table 5.2.1.A is by ALMA MATER and by auditor. We concentrate here on the Big-Six effect only, thus the Table 5.2.3.1.A above jettisons several frequencies from the Table 5.2.1.A and focuses only on the Big-Six observations.

The observed and expected frequencies are displayed together in Table 5.2.3.1.B where the expected frequencies appear in italics under the observed frequencies for each accountancy firm. The Table 5.2.3.1.B is a 6 x 6 contingency table so that there are 25 degrees of freedom.

Table 5.2.3.1.B: ALMA MATER * AUDITORS Crosstabulation

			AUDITORS OF PUBLIC COMPANIES						
			AA	CL	EY	KPMG	PW	TR	Total
	AA	Count	21	14	16	14	14	12	91
		Expected Count	*7.0*	*20.5*	*14.1*	*24.1*	*12.7*	*12.7*	*91.0*
	CL	Count	10	58	21	38	18	15	160
		Expected Count	*12.3*	*36.0*	*24.8*	*42.4*	*22.3*	*22.3*	*160.0*
ALMA	EY	Count	7	26	38	22	11	15	119
MATER		Expected Count	*9.1*	*26.8*	*18.4*	*31.5*	*16.6*	*16.6*	*119.0*
	KPMG	Count	10	35	22	66	16	19	168
		Expected Count	*12.9*	*37.8*	*26.0*	*44.5*	*23.4*	*23.4*	*168.0*
	PW	Count	8	26	13	40	39	17	143
		Expected Count	*11.0*	*32.2*	*22.1*	*37.9*	*19.9*	*19.9*	*143.0*
	TR	Count	4	17	11	27	11	31	101
		Expected Count	*7.7*	*22.7*	*15.6*	*26.7*	*14.1*	*14.1*	*101.0*
	Total	Count	60	176	121	207	109	109	782
		Expected Count	*60.0*	*176.0*	*121.0*	*207.0*	*109.0*	*109.0*	*782.0*

The value of the test statistic is 144.470 ($p < 0.001$), compared to the critical value of the χ^2 with 99% confidence level and 25 degrees of freedom which is $\chi^2_{(0.99,25)} = 44.314$. Accordingly we reject H_o. The outcomes are not merely the result of chance. Moreover, examining the difference in the frequencies of the Table 5.2.3.1.B, one cannot fail to notice the strong diagonal in Table 5.2.3.1.C below which indicates that for the Big-Six accountancy firms there is a strong association between

Table 5.2.3.1.C: Differences between observed & expected frequencies

		AUDITORS OF PUBLIC COMPANIES						
		AA	CL	EY	KPMG	PW	TR	
	AA	+	-	+	-	+	-	
ALMA	CL	-	+	-	-	-	-	
MATER	EY	-	-	+	-	-	-	
	KPMG	-	-	-	+	-	-	
	PW	-	-	-	+	+	-	
	TR	-	-	-	+	-	+	

the auditor of the UK public company and the accountancy firm that the CADRE qualified with (i.e. alma mater).

We have identified in Tables 5.2.1.A and 5.2.3.1.C above the main diagonal effect in the cross-classification as the principal pattern in the data. This means that there is a greater propensity for CADRE to have as their auditors the accounting firm that they trained with. The natural question to ask is whether this tendency varies by accountancy firm. For the Big-Six firms, the relevant data is set out in Table 5.2.1.B.

Another hypothesis, therefore, to be examined here, is based on Table 5.2.1.B, and looks only at those CADRE who have their ex-employer (i.e. "old" accountancy firm) as their auditor in connection with the total number of CADRE who have been trained by the Big-Six firms. In particular, the question here is whether the incidence of an "alumni and audit client" situation occurs proportional independently of the total number of the Big-Six CADRE/alumni. The "alumni and audit client" refers to the situation where a CADRE is audited by his/her ALMA MATER. Formally the chi-square statistic with 5 degrees of freedom is used to test the null hypothesis H_o

H_o: the same proportion of CADRE have their alma mater as auditors,

versus the alternative hypothesis H_1

H_1: different proportion of CADRE have their alma mater as auditors.

The observed and expected frequencies are displayed together in Table 5.2.3.1.D below. The expected frequencies show the proportional number of CADRE trained by each firm. The Table 5.2.1.B is a 6 x 2 contingency table so that there are 5 degrees of freedom.

The value of the test statistic proves to be 4.307 ($p = 0.506$), and the pertinent value of the χ^2 for a=0.05 and 5 degrees of freedom is 11.070. Accordingly the statistic is not significant at the 95% confidence level and the null hypothesis is accepted. In other words, the proportion of Big-Six CADRE who have their alma mater as auditors does not differ. The proportion is a constant parameter between audit firms - no individual

Table 5.2.3.1.D: Chi-aquare test based on Table 5.2.1.B

	Observed N	Expected N	Residual
AA	21	27.2	-6.19
CL	58	54.9	3.11
EY	38	37.3	0.71
KPMG	66	55.9	10.06
PW	39	45.1	-6.06
TR	31	32.6	-5.63
Total	253		

firm has alumni who are more (or less) loyal to their alma mater than their competitors.

5.2.3.2. The test for the non-Big Six firms

Having established in the last subsection that there is an association for the Big-Six accounting firms between ALMA MATER and the auditor of the UK public company in which the CADRE is currently working as a director, this subsection explores whether a similar kind of association exists for the non-Big Six firms, in other words, for the non-Big Six firms, is there a significant relationship between the ALMA MATER and the auditor of the company? Formally, the chi-square statistic is used to test the null hypothesis H_o

H_o: there is independence between auditor and ALMA MATER,

versus the alternative hypothesis

H_1: non-independence.

Before we apply the chi-square test, we need first to show the table which includes the non-Big Six accountancy firms. Table 5.2.1.A includes a row and a column named "other". "Other" means the non-Big Six accountancy firms. There are 258 CADRE in Table 5.2.1.A who have qualified with "other" (non-Big Six) firms and at the same time use as their auditors "other" (non-Big Six) accounting firms. Most of those 258 CADRE are displayed below in the Table 5.2.3.2.A.

The abbreviations used in the Table 5.2.3.2.A below represent the following non-Big Six accounting firms:

Non-Bix Six Audit Firms		
Baker Tilly (BT)	Burnett Swayne (BS)	Robson Rhodes (RR)
BDO Stoy Hayward (BDO)	Clark Whitehill (CW)	Smailes Goldie (SG)
Beavis Walker (BW)	Grant Thornton (GT)	Thomas May (TM)
Binder Hamlyn (BH)	Page Robt. A. & Co (PRA)	Other (O)
Blythens (B)	Pannell Kerr Forster (PKF)	

Table 5.2.3.2.A: Non-Big Six firms alumni on the boards (read horizontally only)

	BT	BDO	BW	BH	B	BS	CW	GT	PRA	PKF	RR	SG	TM	O	Total
BT	**1**	0	0	0	0	0	0	0	0	0	0	0	0	1	2
BDO	0	**4**	0	4	0	1	1	2	0	0	1	0	0	7	20
BW	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	1
BH	1	10	0	**9**	0	1	1	2	0	0	1	0	0	2	27
B	0	0	0	0	**1**	0	0	0	0	0	0	0	0	0	1
BS	0	0	0	0	0	**1**	0	0	0	0	0	0	0	1	2
CW	0	0	0	1	0	0	**1**	0	0	0	0	0	0	0	2
GT	1	0	0	2	0	0	0	**7**	0	1	0	0	0	6	17
PRA	0	0	0	0	0	0	0	0	**1**	0	0	0	0	0	1
PKF	1	0	0	2	0	0	0	1	0	**2**	2	0	0	3	11
RR	0	0	0	0	0	0	0	1	0	1	**4**	0	0	3	9
SG	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	1
TM	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	1
Other	3	23	0	23	0	1	4	22	0	10	9	0	0	68	163
Total	7	37	1	41	1	4	7	35	1	14	17	1	1	91	**258**

Looking at the Table 5.2.3.2.A above, we notice that the majority of the observations have zero frequencies, indicating a threat to the validity of the chi-square test. Indeed, when the expected frequencies were calculated, 187 (95.40%) of the 196 cells had expected frequencies less than 5 and, therefore, Table 5.2.3.2.A does not meet the criterion which requires 80 percent of the cells having expected frequencies of 5 or more (Daniel and Terrell, 1995; Foster, 1998). An examination of the dataset does not allow us to combine adjacent rows and/or columns to satisfy the criterion, as such combination would violate the logic of the classification scheme. There is no logic behind collapsing, for example, Baker Tilly and BDO Stoy Hayward and/or other firm(s) into a single category, as after the test we would not be in a position to identify whether there is an association between ALMA MATER and the auditor. Why, for example, a CADRE qualified with Baker Tilly would have a predisposition to benefit BDO Stoy Hayward and/or other accounting firm(s) which we arbitrarily have merged into a single category/firm? In other words, it is not clear what, if anything, the new category represents.

However, we are in a position to replicate Table 5.2.1.B for the non-Big Six audit firms. In other words, as it can be shown in Table 5.2.3.2.A above, there is a main diagonal effect which indicates for the non-Big Six accountancy firms that there is a strong association between CADRE and alma mater. The natural question to ask is

Table 5.2.3.2.B: No of CADRE per non-Big Six audit firms

	No of CADRE per non-Big Six Audit Firms	Alumni and Audit Client	Alumni (%)
Baker Tilly	2	1	50.00
BDO Stoy Hayward	20	4	20.00
Beavis Walker	1	1	100.00
Binder Hamlyn	27	9	33.33
Blythens	1	1	100.00
Burnett Swayne	2	1	50.00
Clark Whitehill	2	1	50.00
Grant Thornton	17	7	41.18
Page Robt. A. & Co	1	1	100.00
Pannell Kerr Forster	11	2	18.19
Robson Rhodes	9	4	44.44
Smailes Goldie	1	1	100.00
Thomas May	1	1	100.00
Neville Russell	2	1	50.00
Latham Crossley & Davis	1	1	100.00
	98	36	36.73
Other	160	60	
Total	258	96	

whether this diagonal effect varies by non-Big Six firm. Formally the chi-square statistic is used to test the null hypothesis H_0

H_0: the proportion of CADRE who have their alma mater as auditors does not differ

versus the alternative hypothesis H_1

H_1: the proportion of CADRE differs.

The observed and expected frequencies are displayed together in Table 5.2.3.2.C. The expected frequencies show the proportional number of CADRE trained by each firm.

The Table 5.2.3.2.B is a 15 x 2 contingency table so that there are 14 degrees of freedom.

Table 5.2.3.2.C: Proportional CADRE per non-Big Six audit firm

	Observed N	Expected N	Residual
Baker Tilly	1	.7	.3
BDO Stoy Hayward	4	7.4	-3.4
Beavis Walker	1	.4	.6
Binder Hamlyn	9	9.9	-.9
Blythens	1	.4	.6
Burnett Swayne	1	.7	.3
Clark Whitehill	1	.7	.3
Grant Thornton	7	6.2	.8
Page Robt. A. & Co	1	.4	.6
Pannell Kerr Forster	2	4.0	-2.0
Robson Rhodes	4	3.3	.7
Smailes Goldie	1	.4	.6
Thomas May	1	.4	.6
Neville Russell	1	.7	.3
Latham Crossley & Davis	1	.4	.6
Total	36		

The value of the test statistic proves to be 9.714 ($p = 0.783$), and the pertinent value of the χ^2 for a=0.05 and 14 degrees of freedom is 23.685. Accordingly the statistic is not significant at the 95% confidence level and the null hypothesis is accepted. In other words, the same proportion of non-Big Six CADRE have their alma mater as auditors. However, this result should be interpreted with care as more than 20% of the cells have expected frequencies with less than five.

5.3. The Broad-Narrow test

The previous section is very encouraging. The findings are that there is an alumni effect, and for the Big-Six firms 25.9% of CADRE have their ALMA MATER as auditors. This percentage does not significantly differ between Big-Six accountancy firms. To see if this results are robust with respect to Broad-Narrow definitions, this section merely counts those CADRE who have qualified with a founder firm.

5.3.1. Specifying the data involved for the test

This subsection presents a description of the data involved for the Broad-Narrow test.

In particular, in the light of the fact that there was (and apparently still is) an active merger activity among accounting practices and, therefore, many CADRE have qualified with a firm which no longer exists as an independent entry, but has been absorbed into a successor firm, I have grouped CADRE into two classes. They have been categorised into those who trained and qualified with a "founder firm", and those who trained with an accountancy firm that has been amalgamated or absorbed into one of the Big-Six audit firm (the disappeared firm)[1]. In this way, a better understanding of the nature of the relationship between auditors and client management can be drawn.

I define what I have termed a *"founder firm" as one which has not been involved in mergers or if it has, its name has not disappeared as a result of the absorption*[2]. For example, most of the Big-Six have amalgamated with other smaller accounting firms, however, their names have not been lost through the years.

The broad-narrow test is discussed in this section in which the number of CADRE who qualified as chartered accountants with one of the Big-Six firm (as a founder firm) are merely counted. For example, EY has the smaller amount of CADRE on the boards, simply because EY has been created only recently (in September 1989 after the merger of Ernst & Whinney with Arthur Young). Every CADRE is designated a matrix position *(i,j)*, where:

i = the name of the accountancy firm with whom the CADRE trained (i.e. ALMA MATER)

j = the name of the auditor of the CADRE's company.

The summation/tabulation of these matrix positions for all CADRE (who satisfy the criterion laid down in the preceding paragraph) is the basis of constructing the contingency Table 5.3.1.A presented below.

[1] However, the presentation and analysis of the data concerning the disappeared firms is not pursued in this study, mainly because more than 40% of the cells has observed and expected frequencies less than five. Nevertheless, appendix II presents the table with the observed frequencies of the disappeared firms.

[2] The above definition differs from the one given by Howitt (1966) who writing the history of ICAEW has defined the term "founder firm" as a firm which can claim continuous partnership descent from a signatory to the Charter

Table 5.3.1.A: CADRE qualified with a founder accountancy firm (read horizontally)

FOUNDER FIRMS		**AUDITORS OF PUBLIC COMPANIES**									
		AA	CL	EY	KPMG	PW	TR	*Big-6 Subtotal*	Other	No Auditor	*TOTAL*
	AA	**20**	9	15	11	11	12	*78*	9	2	89
ALMA	CL	3	**17**	8	14	2	8	*52*	15	0	67
MATER	EY	1	0	**4**	2	0	0	*7*	1	0	8
	KPMG	4	19	13	**39**	5	15	*95*	34	1	130
	PW	8	23	12	39	**36**	15	*133*	22	3	158
	TR	2	9	5	12	3	**13**	*44*	12	1	57
	Subtotal							*409*			**509**
	Other	41	97	83	162	87	72		258	15	815
	Missing	4	22	17	27	21	22		36	14	163
	TOTAL	79	174	140	279	144	135		351	22	**1487**

The row total in the Table 5.3.1.A gives the number of CADRE who trained with a founder accountancy firm, for example 89 CADRE with AA, 67 with CL, 8 with EY and so on. The name of the auditor that these CADRE employ is given by the columns. So, for Arthur Andersen, twenty CADRE use AA, nine CL, fifteen EY, eleven KPMG, eleven PW, twelve TR and nine "other" (non-Big Six) accountancy firms. Thus, out of 89 former employees of AA, twenty favour their alma mater. The same table shows that seventeen out of 67 CADRE who qualified with Coopers & Lybrand use them as auditors. Following a similar pattern for the rest of the Big-Six firms, the following table can be constructed.

Table 5.3.1.B: No of CADRE qualified with a founder firm

	No of CADRE qualified with founder firm	Alumni <u>and</u> Audit Client	Alumni (%)
AA	89	20	22.47
CL	67	17	25.37
EY	8	4	50.00
KPMG	130	39	30.00
PW	158	36	22.78
TR	<u>57</u>	<u>13</u>	22.81
	<u>509</u>	<u>129</u>	25.34

Note: "Alumni <u>and</u> audit client" refers to the situation where a CADRE is audited by his/her ALMA MATER.

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or a member of the first Council, or which had been in existence for at least 100 years in 1965 (p. 227). However, this terminology is not regarded as a recognised title (see also footnote 7 of Chapter IV).

It is important to note here that the columns in Table 5.3.1.A give just the name of the accountancy firms that CADRE use as their auditor. They do not give the actual number of auditors or the number of the UK public companies who have on their boards of directors a chartered accountant(s). In other words, the columns total must be ignored in this table. The problem arises because some listed companies have more than one CADRE in their boards. This problem is discussed in more detail in section 5.4.1.

Another point to notice here is that the listing involving "other" in the alma mater classification in the table 5.3.1.A is by no means comprehensive and complete. In some cases the details in the entries regarding small firms is incomplete due to unavailability of information. Some small firms' histories could not be traced and as a result they appear in the founder Table 5.3.1.A notwithstanding our reservation for the possibility of containing false information. In other words, we don't know whether these small practices do still exist today or have merged and absorbed into other firms. Thus, considering the inappropriateness of the data in the "other" entry of the alma mater classification in the Table 5.3.1.A, I have ignored the figures appear in this row in the subsequent analysis and concentrated only on the impact of qualifying as a chartered accountant with one of the Big-Six firms.

Having explained the data that will be involved for the test in this section, we move now into performing the test itself.

5.3.2. Performing the Broad-Narrow Test

This section performs the chi-square test for the dataset described in the preceding section. In order to test the hypothesis that the criteria of classification in the rows and columns of the Table 5.3.1.A are independent, and determine the critical value of χ^2, we must compute the chi-square statistic value. This subsection explores the proposition that there is an alumni effect among the Big-Six accountancy firms.

Due to inappropriateness of the data in the "other" row entry in the Table 5.3.1.A explained in the last paragraph of the preceding section, we concentrate here only on the Big-Six firms, and therefore, the Table 5.3.1.A is transformed into the following Table 5.3.2.A:

Table 5.3.2.A: Big-Six CADRE qualified with a founder firm (read horizontally only)

FOUNDER FIRMS		**AUDITORS OF PUBLIC COMPANIES**						
		AA	CL	EY	KPMG	PW	TR	*Big-6 Subtotal*
	AA	**20**	9	15	11	11	12	*78*
ALMA	CL	3	**17**	8	14	2	8	*52*
MATER	EY	1	0	**4**	2	0	0	*7*
	KPMG	4	19	13	**39**	5	15	*95*
	PW	8	23	12	39	**36**	15	*133*
	TR	2	9	5	12	3	**13**	*44*
	Subtotal	38	77	57	117	57	63	*409*

We question whether there is a significant association between the ALMA MATER and the auditor of the company, and formally, the chi-square statistic is used to test the null hypothesis H_o

H_o: auditor and ALMA MATER are independent,

versus the alternative hypothesis

H_1: auditor is dependent upon the ALMA MATER.

The observed and expected frequencies are displayed together in Table 5.3.2.B where the expected frequencies appear in italics under the observed frequencies for each accountancy firm. The Table 5.3.2.A is a 6 x 6 contingency table so that there are 25 degrees of freedom.

We notice that 8 cells (22.22%) have expected count less than 5. This poses a possible threat to the validity of the chi-square test since more than 20% of the cells have expected frequencies of less than 5, and as are result the test statistic would not closely approximate a chi-square distribution (Daniel and Terrell, 1995; Roscoe, 1969). In view of this problem, we have decided to delete the cells (row) where the frequencies are low in order to satisfy the rule. We notice that 6 out of 8 cells that have expected frequencies less than 5 are in the row that represents EY. Thus, a new contingency table is constructed in which the alma mater EY row has been discarded from the

Table 5.3.2.B.

Table 5.3.2.B: ALMA MATER * AUDITORS Crosstabulation No 1

			AUDITORS OF PUBLIC COMPANIES						
			AA	CL	EY	KPMG	PW	TR	Total
ALMA MATER	AA	Count	20	9	15	11	11	12	78
		Expected Count	*7.2*	*14.7*	*10.9*	*22.3*	*10.9*	*12.0*	*78.0*
	CL	Count	3	17	8	14	2	8	52
		Expected Count	*4.8*	*9.8*	*7.2*	*14.9*	*7.2*	*8.0*	*52.0*
	EY	Count	1	0	4	2	0	0	7
		Expected Count	*0.7*	*1.3*	*1.0*	*2.0*	*1.0*	*1.1*	*7.0*
	KPMG	Count	4	19	13	39	5	15	95
		Expected Count	*8.8*	*17.9*	*13.2*	*27.2*	*13.2*	*14.6*	*95.0*
	PW	Count	8	23	12	39	36	15	133
		Expected Count	*12.4*	*25.0*	*18.5*	*38.0*	*18.5*	*20.5*	*133.0*
	TR	Count	2	9	5	12	3	13	44
		Expected Count	*4.1*	*8.3*	*6.1*	*12.6*	*6.1*	*6.8*	*44.0*
	Total	Count	38	77	57	117	57	63	409
		Expected Count	*38.0*	*77.0*	*57.0*	*117.0*	*57.0*	*63.0*	*409.0*

The Table 5.3.2.C is a 5 x 6 contingency table and has only 2 cells (6.70%) with expected count less than 5. The test statistic closely approximates a chi-square distribution and its value is 85.063 ($p < 0.001$), compared to the critical value of the χ^2 with 95% confidence level and 20 degrees of freedom which is $\chi^2_{(0.95,20)} = 31.410$.

Table 5.3.2.C: ALMA MATER * AUDITORS Crosstabulation No 2

			AUDITORS OF PUBLIC COMPANIES						
			AA	CL	EY	KPMG	PW	TR	*Total*
ALMA MATER	AA	Count	20	9	15	11	11	12	78
		Expected Count	*7.2*	*14.9*	*10.3*	*22.3*	*11.1*	*12.0*	*78.0*
	CL	Count	4	17	12	16	2	8	52
		Expected Count	*4.8*	*10.0*	*6.9*	*14.9*	*7.4*	*8.1*	*52.0*
	KPMG	Count	4	19	13	39	5	15	95
		Expected Count	*8.7*	*18.2*	*12.5*	*27.2*	*13.5*	*14.9*	*95.0*
	PW	Count	8	23	12	39	36	15	133
		Expected Count	*12.2*	*25.5*	*17.5*	*38.0*	*18.9*	*20.8*	*133.0*
	TR	Count	2	9	5	12	3	13	44
		Expected Count	*4.0*	*8.4*	*5.8*	*12.6*	*6.2*	*6.9*	*44.0*
	Total	Count	37	77	53	115	57	63	402
		Expected Count	*37.0*	*77.0*	*53.0*	*115.0*	*57.0*	*63.0*	*402.0*

Accordingly, we reject H_o. There is a significant relationship between ALMA MATER and auditor. This is a confirmatory result and despite the narrower definition of ALMA MATER, an alumni effect still exists.

Another hypothesis to be examined here, is based on Table 5.3.1.B, and looks only at those CADRE who have their former employer (i.e. former accountancy firm) as their auditor in connection with the total number of CADRE who have been trained by the Big-Six (as founder firm). In particular, the question here is whether we can conclude from the Table 5.3.1.B that the Big-Six firms as auditors are not equally preferred by the CADRE. If there is no preference, one would expect to observe the same number of CADRE proportionally for each accountancy firm. In other words, one would expect the total number of CADRE (who use their alma mater as auditor) to be distributed proportional uniformly among the Big-Six (as founder firms). Pursuing this line of reasoning, we may conduct the chi-square statistic test with 5 degrees of freedom to test the null hypothesis H_o

H_o: the Big-Six firms (as founder firms) are proportional equally preferred,

versus the alternative hypothesis H_1

H_1: the Big-Six firms (as founder firms) are not proportional equally preferred.

The observed and expected frequencies are displayed together in Table 5.3.2.D below. The Table 5.3.1.B is a 6 x 2 contingency table so that there are 5 degrees of freedom.

Table 5.3.2.D: Chi-square test based on Table 5.3.1.B

	Observed N	Expected N	Residual
AA	20	22.6	-2.6
CL	17	16.9	0.1
EY	4	2.1	1.9
KPMG	39	32.9	6.1
PW	36	40.1	-4.1
TR	13	14.4	-1.4
Total	129		

The value of the test statistic proves to be 3.705 ($p = 0.593$), and the tabled value of the χ^2 for a = 0.01 and 5 degrees of freedom is $\chi^2 = 15.086$. Accordingly the statistic is not significant at the 99% confidence level and the null hypothesis is accepted. In other words, there is evidence that the same proportion of CADRE have their alma mater as auditors.

5.4. The Narrow1-Broad Test

This section counts and tests one CADRE only per company. The following subsection discusses the data involved for the Narrow1-Broad test and subsection 5.4.2 performs the chi-square statistic test.

5.4.1. Specifying the data involved for the test

This subsection presents a description of the data involved for the Narrow1-Broad test. One of the major problems in the CADRE association with his/her auditor we faced was the multiple CADREs on the boards of directors. There are public companies in the dataset that employ more than one CADRE on their boards. This posed the problem in section 5.2.1 that although we successfully computed the number of CADRE qualified with the Big-Six firms, we were unable to specify the number of quoted companies that had the Big-Six as auditors. We forced in Table 5.2.1.A to ignore the columns total representing the auditors of the public companies and to take into consideration from those columns only the name of the Big-Six firms that CADRE have as their auditor.

However, an alternative way of looking at the data is by the number of companies. By adopting this procedure, companies appear only once in the dataset and in effect only one CADRE per company. In other words, companies that emerge in the dataset a couple of times because of the multiple CADRE on their boards have been deleted/deselected from the dataset and, as a result, columns and rows totals present real figures. This gives a slightly different perspective because it eliminates the problem of multiple CADREs on boards and allows us to test more realistically any association between ALMA MATER and auditor.

However, by deselecting companies from the database, in essence CADRE are deselected as well. This poses another major problem. Which CADRE should be deselected? Let's take an illustration from the dataset itself and try to explain the problem and its solution adopted. National Express Group Plc, for example, has three directors (two executive and one non-executive) on its board who have qualified as chartered accountants with three different accounting firms (the alma mater). The auditor of the National Express is Ernst & Young and the same accountancy firm has

CADRE'S NAME	PUBLIC COMPANY	DIRECTOR POSITION	ALMA MATER	AUDITOR
A	National Express Group plc	ExD, GrFD	Ernst & Young	Ernst & Young
B	National Express Group plc	ExD, DChEx	Moores Rowland	Ernst & Young
C	National Express Group plc	NExD	Pannell Kerr Forster	Ernst & Young

trained the Group Finance Director of National Express. The procedure of selecting one CADRE per company presents quantitative analysis with the problem of which CADRE should be selected. In our illustration, director A, B, or C?

In pursuing the correct answer to the above problem, the following solution has been adopted. Since one CADRE per company must be included according to the narrow1 definition, four different solutions have been taken up when there are multiple CADRE per company: (1) the CADRE who selected per company is the last one when they are listed in ascending alphabetical order (i.e. CADRE "C" in the example above), (2) the CADRE who selected per company is the last one when they are listed in descending alphabetical order (i.e. CADRE "A" in the example above), (3) the CADRE who selected per company is the eldest one and, finally, (4) the CADRE who selected per company is the youngest one.

The above solutions have selected in view that if the chi-square statistical results that will be performed in the section 5.4.2 below hold for all the four different groupings of CADRE and their auditors, then any differences in the association of ALMA MATER and auditor due to different groupings are eliminated more or less.

The two subsections below describe the data involved in the four different solutions adopted in the prior discussion.

5.4.1.1. CADRE in ascending order

We describe the Narrow1-Broad test in this section whereas according to the narrow1 definition, given in the introduction section of this chapter, only one CADRE per company is counted. This definition, however, caused the problem of which CADRE is eliminated when there are more than one CADRE per company, and four solutions have been suggested in the last section 5.4.1. The first one is discussed in this subsection whereas the CADRE who selected per company is the last one when they are listed in ascending alphabetical order. According to the broad alma mater definition, founder and disappeared alma mater are counted for the test in this section.

Every CADRE is designated a matrix position (i,j), where:

i = the name of the accountancy firm with whom the CADRE trained (i.e. ALMA MATER)

j = the name of the auditor of the CADRE's company.

The summation/tabulation of these matrix positions for all CADRE (who satisfy the criteria laid down in the preceding paragraphs) is the basis of constructing the contingency Table 5.4.1.1.A presented below.

The column total in Table 5.4.1.1.A gives the number of accountancy firms' clients. In other words, the number of the UK public companies that have one at least chartered accountant on their boards and use one of the accountancy firms as auditors appear in the column total. For example, AA has 68 clients that have one at least CADRE, CL has 193, EY has 141, and so on. The rows give the accountancy firms that those CADRE have qualified with. They also give the minimum number of CADRE in the dataset, that is one CADRE per company and since there are 1,277 quoted companies

Table 5.4.1.1.A: Total number of quoted companies classified according to alma mater and auditors*

		AUDITORS OF PUBLIC COMPANIES									
		AA	CL	EY	KPMG	PW	TR	*Subtotal*	Other	No Auditor	*Total*
	AA	**13**	10	12	7	10	6		9	2	69
	CL	6	**36**	14	27	11	10		33	3	140
ALMA	EY	4	14	**23**	17	7	7		19	2	93
MATER	KPMG	5	25	13	**38**	12	18		35	1	147
	PW	6	16	9	27	**29**	14		14	3	118
	TR	3	10	9	16	9	**21**		13	1	82
	Big-6 Subtotal	*37*	*111*	*80*	*132*	*78*	*76*	*514*			
	Other	28	67	50	102	52	38		174	10	521
	Missing	3	15	11	18	13	17		21	9	107
	Total	68	193	141	252	143	131	**928**	318	31	**1277**

*Note: The CADRE chosen to enter in the ALMA MATER classification listed in ascending order with one CADRE on their boards, there are 1,277 CADRE too[3].

From the preceding paragraph, it follows that for Arthur Andersen, there are thirteen clients with AA on board, six with CL, four with EY, five with KPMG, six with PW, three with TR and twenty-eight with "other" (non-Big) Six firms. Hence, out of 68 AA clients, thirteen clients have employed personnel from their auditors. The same table shows that thirty-six CL clients (out of 193) have CL qualified directors. Following a similar pattern for the rest of the Big-Six firms, that is looking at the main diagonal of the Table 5.4.1.1.A, the Table 5.4.1.1.B can be produced and is presented below.

Looking at the columns of the Table 5.4.1.1.A, we note that 73% (928 out of 1.277) of the quoted companies in the UK (with a chartered accountant on their boards) have one of the Big-Six firms as their auditor. Adding up the main diagonal of the Table 5.4.1.1.A, it shows that for 160 of those 928 companies (17.24%), one at least of their directors trained and qualified with the same accountancy firm as their auditor. For the non-Big Six firms, 318 listed companies out of 1,277 use them as auditors.

Table 5.4.1.1.B: Clients with one CADRE on boards (%)

	No of Clients per Accg Firm	Clients with one CADRE on Boards	Alumni (%)	Total Alumni and Audit Client
AA	68	13	19.12	21
CL	193	36	18.65	58
EY	141	23	16.31	38
KPMG	252	38	15.08	66
PW	143	29	20.28	39
TR	131	21	16.03	31
	928	160	17.24	253
Other	318	174		258
Missing	31	9		14
	1277	343		525

Having described and analysed the data involved for the first solution adopted to deal

[3] We know, however, from section 5.2.1 that the actual number of CADRE in the database is 1,955, the difference is due to the multiple CADREs on boards of directors.

with the problem of multiple CADRE on boards, the next subsection presents the data for the next three solutions given to the problem of multiple CADRE.

5.4.1.2. The next three solutions suggested

In this subsection, we merely present the data involved in the other three solutions given to the problem of multiple CADRE on the boards without any further analysis. The reason for this is that the data in the other three solutions do not change much from the data analysed in the last subsection in order for it to require further analysis and discussion. As a result, the following Table 5.4.1.2.A, Table 5.4.1.2.B and Table

Table 5.4.1.2.A: Total number of quoted companies classified according to alma mater and auditors*

		AUDITORS OF PUBLIC COMPANIES									
		AA	CL	EY	KPMG	PW	TR	*Subtotal*	Other	No Auditor	*Total*
	AA	**15**	8	12	8	9	5		7	2	66
	CL	8	**35**	12	22	12	11		35	3	138
ALMA	EY	4	16	**17**	17	8	10		15	2	89
MATER	KPMG	5	28	13	**45**	8	13		31	1	144
	PW	5	17	8	25	**28**	12		13	3	111
	TR	3	11	9	17	7	**19**		17	2	85
	Big-6 Subtotal	*40*	*115*	*71*	*134*	*72*	*70*	*502*			
	Other	26	62	57	100	57	47		178	11	538
	Missing	3	16	12	18	13	15		22	7	106
	Total	69	193	140	252	142	132	**928**	318	31	**1277**

*Note: The CADRE chosen to enter in the ALMA MATER classification listed in descending order

Table 5.4.1.2.B: Total number of quoted companies classified according to alma mater and auditors*

		AUDITORS OF PUBLIC COMPANIES									
		AA	CL	EY	KPMG	PW	TR	*Subtotal*	Other	No Auditor	*Total*
	AA	**13**	9	12	4	10	4		9	2	63
	CL	8	**34**	15	19	11	10		27	3	127
ALMA	EY	4	16	**15**	15	9	8		16	2	85
MATER	KPMG	5	23	12	**36**	9	14		27	1	127
	PW	5	16	7	27	**27**	11		14	2	109
	TR	2	9	9	18	7	**18**		15	1	79
	Big-6 Subtotal	*37*	*107*	*70*	*119*	*73*	*65*	*471*			
	Other	28	70	59	114	57	49		184	12	573
	Missing	3	16	12	19	13	17		26	8	114
	Total	68	193	141	252	143	131	**928**	318	31	**1277**

*Note: The CADRE chosen per company to enter in the ALMA MATER classification are the eldest ones

5.4.1.2.C merely present the data without any further discussion. The reader can compare these tables with the Table 5.4.1.1.A analysed in the preceding section.

Table 5.4.1.2.C: Total number of quoted companies classified according to alma mater and auditors*

		AUDITORS OF PUBLIC COMPANIES									
		AA	CL	EY	KPMG	PW	TR	Subtotal	Other	No Auditor	Total
	AA	**18**	9	13	9	9	8		7	2	75
	CL	6	**38**	12	25	14	12		41	3	151
ALMA	EY	3	15	**27**	19	6	9		16	2	97
MATER	KPMG	6	27	12	**50**	9	16		37	1	158
	PW	6	17	10	25	**30**	13		16	3	120
	TR	3	10	8	14	8	**21**		14	2	80
	Big-6 Subtotal	*42*	*116*	*82*	*142*	*76*	*79*	*537*			
	Other	24	62	48	93	53	38		167	10	495
	No FCA	3	15	10	17	13	15		20	8	101
	Total	69	193	140	252	142	132	**928**	318	31	**1277**

*Note: The CADRE chosen per company to enter in the ALMA MATER classification are the youngest ones

5.4.2. Performing the Narrow1-Broad Test

Section 5.4.1 has described and analysed the data involved for this test. The data are classified according to two criteria of classification, i.e. alma mater and auditor of the public company, in the Table 5.4.1.1.A and Tables 5.4.1.2.A-C, and we would like here to know whether or not these criteria are independent of one another. To test this hypothesis, the chi-square statistic is employed and computed. The next subsection tests whether the hypothesis holds for the Big-Six firms only, and the subsection 5.4.2.2 for the non-Big Six firms.

5.4.2.1. The test for the Big-Six firms

We test in this subsection whether there is a statistical association between the two criteria of classification. We focus only on the Big-Six firms here and the chi-square test of independence will be performed for each different solution given in the subsections 5.4.1.1 and 5.4.1.2. above.

5.4.2.1.1. The test for the CADRE in ascending order

Table 5.4.1.1.A gives the number of public companies in the form of the numbers of

CADRE in cell of a two-way contingency table. We test the hypothesis H_o

H_o: ALMA MATER and auditor (the Big-Six firms) are independent,

versus the alternative hypothesis H_1

H_1: auditor is dependent upon ALMA MATER.

Remember here, that we test the Table 5.4.1.1.A which has been constructed according to narrow1 definition and the CADRE who selected per company was the last one when CADRE were listed in ascending alphabetical order. Also, we focus only on the Big-Six firms in this subsection, hence, the Table 5.4.1.1.A is transformed into the following Table 5.4.2.1.1.A.

To test the above hypothesis, we compute the expected frequencies for each cell E_{ij} and employ the chi-square statistic that approximately follows the chi-square distribution.

Table 5.4.2.1.1.A: Big-Six auditor and CADRE in ascending order

		AUDITORS OF PUBLIC COMPANIES						
		AA	CL	EY	KPMG	PW	TR	*Subtotal*
	AA	**13**	10	12	7	10	6	58
	CL	6	**36**	14	27	11	10	104
ALMA	EY	4	14	**23**	17	7	7	72
MATER	KPMG	5	25	13	**38**	12	18	111
	PW	6	16	9	27	**29**	14	101
	TR	3	10	9	16	9	**21**	68
	Big-6 Subtotal	*37*	*111*	*80*	*132*	*78*	*76*	*514*

The observed and expected frequencies are displayed together in Table 5.4.2.1.1.B below where the expected frequencies appear in italics under the observed frequencies for each alma mater. The Table 5.4.2.1.1.B is a 6 x 6 contingency table so that there are 25 degrees of freedom.

The value of the test statistic is 91.511 ($p < 0.001$), compared to the tabled value of the χ^2 with 99% significance level and 25 degrees of freedom which is

$\chi^2_{(0.99,25)} = 44.314$. Accordingly we reject H_o. There is an association between ALMA MATER and the Big-Six auditors, when CADRE selected in the predetermined way discussed in the previous section.

Table 5.4.2.1.1.B: ALMA MATER * AUDITORS Crosstabulation

			AUDITORS OF PUBLIC COMPANIES						
			AA	CL	EY	KPMG	PW	TR	Total
ALMA MATER	AA	Count	13	10	12	7	10	6	58
		Expected Count	*4.2*	*12.5*	*9.0*	*14.9*	*8.8*	*8.6*	*58.0*
	CL	Count	6	36	14	27	11	10	104
		Expected Count	*7.5*	*22.5*	*16.2*	*26.7*	*15.8*	*15.4*	*104.0*
	EY	Count	4	14	23	17	7	7	72
		Expected Count	*5.2*	*15.5*	*11.2*	*18.5*	*10.9*	*10.6*	*72.0*
	KPMG	Count	5	25	13	38	12	18	111
		Expected Count	*8.0*	*24.0*	*17.3*	*28.5*	*16.8*	*16.4*	*111.0*
	PW	Count	6	16	9	27	29	14	101
		Expected Count	*7.3*	*21.8*	*15.7*	*25.9*	*15.3*	*14.9*	*101.0*
	TR	Count	3	10	9	16	9	21	68
		Expected Count	*4.9*	*14.7*	*10.6*	*17.5*	*10.3*	*10.1*	*68.0*
Total		Count	37	111	80	132	78	76	514
		Expected Count	*37.0*	*111.0*	*80.0*	*132.0*	*78.0*	*76.0*	*514.0*

Moreover, examining the difference in the frequencies of the Table 5.4.2.1.1.B, one cannot fail to notice the strong diagonal in Table 5.4.2.1.1.C which indicates that for

Table 5.4.2.1.1.C: Differences between observed & expected frequencies

		AUDITORS OF PUBLIC COMPANIES						
		AA	CL	EY	KPMG	PW	TR	
	AA	+	-	+	-	+	-	
ALMA	CL	-	+	-	+	-	-	
MATER	EY	-	-	+	-	-	-	
	KPMG	-	+	-	+	-	+	
	PW	-	-	-	+	+	-	
	TR	-	-	-	-	-	+	

the Big-Six accountancy firms there is a strong association between the auditor of the UK public company and the accountancy firm that the CADRE qualified with (i.e. alma mater).

Another hypothesis to be examined here, is based on Table 5.4.1.1.B, and looks only at those CADRE who have their ex-employer (i.e. "old" accountancy firm) as their auditor in connection with the total number of public companies that have one at least CADRE on their boards and have selected one of the Big-Six firms as auditor. We notice in Table 5.4.1.1.B that 17.24% of the UK public companies have at least one Big-Six CADRE on their boards given that these companies employ as auditors one of the Big-Six firms. Does this proportionally differ among Big-Six clients? In particular, the question here is whether the incidence of an "alumni and audit client" situation occurs independently of the total number of the Big-Six clients. The "alumni and audit client" refers to the situation where a CADRE is audited by his/her ALMA MATER. Formally the chi-square statistic is used to test the null hypothesis H_o

> H_o: the Big-Six accounting firms are equally preferred (in proportion) by the public companies irrespective of the "alumni and audit client" situation

versus the alternative hypothesis H_1

> H_1: the Big-Six are not equally preferred (in proportion).

The observed and expected frequencies are displayed together in Table 5.4.2.1.1.D below. The Table 5.4.2.1.1.D is a 6 x 2 contingency table so that there are 5 degrees of freedom.

Table 5.4.2.1.1.D: Chi-square test based on Table 5.4.1.1.B

	Observed N	Expected N	Residual
AA	13	11.7	1.3
CL	36	33.3	2.7
EY	23	24.3	-1.3
KPMG	38	43.4	-5.4
PW	29	24.7	4.3
TR	21	22.6	-1.6
Total	160		

The value of the test statistic proves to be 1.967 ($p = 0.854$), and the pertinent value of the χ^2 for a=0.01 and 5 degrees of freedom is 15.086. Accordingly the statistic is not significant at the 99% confidence level and the null hypothesis is accepted. The Big-Six firms do not differ in proportion of clients that have one at least Big-Six CADRE on their boards, and the tendency for the CADRE to have as their auditors the audit firm that trained with does not vary.

5.4.2.1.2. The test for the alternative solutions

We run the chi-square statistic tests of independence for each of the tables presented in the subsection 5.4.1.2. The tables have been transformed to include only the Big-Six audit firms (not shown) and the results are only offered below.

Second Solution: CADRE in descending order

The value of the test statistic is 94.148 ($p < 0.001$), compared to the tabled value of the χ^2 with 1% significance level and 25 degrees of freedom which is $\chi^2_{(0.99,25)} = 44.314$. Accordingly we reject H_0. There is an association between ALMA MATER and the Big-Six auditors, when CADRE selected in the predetermined way discussed in the previous section.

Third Solution: CADRE selected are the eldest

The value of the test statistic is 84.733 ($p < 0.001$), compared to the tabled value of the χ^2 with 1% significance level and 25 degrees of freedom which is $\chi^2_{(0.99,25)} = 44.314$. Accordingly we reject H_0. There is an association between ALMA MATER and the Big-Six auditors, when CADRE selected in the predetermined way discussed in the previous section.

Fourth Solution: CADRE selected are the youngest

The value of the test statistic is 131.398 ($p < 0.001$), compared to the tabled value of the χ^2 with 1% significance level and 25 degrees of freedom which is $\chi^2_{(0.99,25)} = 44.314$. Accordingly we reject H_0. There is an association between ALMA

Table 5.4.2.1.2.A: Summary results of the Narrow1-Broad test

Solutions\Results	Chi-square test statistic	Null Hypothesis H_0	Alumni Effect
First Solution	91.511	rejected	Yes
Second Solution	94.148	rejected	Yes
Third Solution	84.733	rejected	Yes
Fourth Solution	131.398	rejected	Yes

MATER and the Big-Six auditors, when CADRE selected in the predetermined way discussed in the previous section.

We notice that all the tests yield exactly the same outcome and we can conclude, therefore, that it does not make any difference on how we select the CADRE when there are more than one CADRE per quoted company (see Table 5.4.2.1.2.A). There are no differences in the association of ALMA MATER and auditor due to different CADRE groupings.

5.4.2.2. The test for the non-Big Six firms

The last subsection has established that there is a significant relationship for the Big-Six audit firms between ALMA MATER and auditor of the UK public companies in which the CADRE works as a director. The ALMA MATER criterion of classification was based on the definition that only one CADRE per company is counted.

This subsection explores whether the same hypothesis stands for the non-Big Six firms, in other words, for the non-Big Six firms, is there an association between ALMA MATER and auditor? Before we continue though, lets construct the contingency table for the non-Big Six firms and check whether any cells yield small expected frequencies.

Table 5.4.2.2.A below displays most of the 174 CADRE qualified with a non-Big Six audit firm and have as auditor a non-Big Six firm. The following Table 5.4.2.2.A is an extension of the Table 5.4.1.1.A where a row and a column named "other" are included there. "Other" was taken to mean the non-Big Six accounting firms in Table 5.4.1.1.A. The abbreviations used in the table are the same used in the Table 5.2.3.2.A.

Furthermore, 160 (95.24%) out of the 174 cells in Table 5.4.2.2.A have expected frequencies less than 5 and, therefore, the rule that no more than 20% of the cells must have expected frequencies of less than 5 is not met (Daniel and Terrell, 1995; Foster, 1998; Roscoe, 1969). The test statistic does not closely approximates a chi-square distribution and as a result, we abandon the test, as further analysis may affect the correct decision to be taken.

Table 5.4.2.2.A: Non-Big Six firms ALMA MATER and AUDITOR

	BT	BDO	BW	BH	B	BS	CW	GT	PRA	PKF	RR	SG	TM	O	Total
BDO	0	**2**	0	4	0	1	1	1	0	0	1	0	0	7	17
BW	0	0	**1**	0	0	0	0	0	0	0	0	0	0	0	1
BH	1	8	0	**6**	0	0	1	2	0	0	0	0	0	2	20
B	0	0	0	0	**1**	0	0	0	0	0	0	0	0	0	1
CW	0	0	0	0	0	0	**1**	0	0	0	0	0	0	0	1
GT	0	0	0	2	0	0	0	**4**	0	0	0	0	0	3	9
PRA	0	0	0	0	0	0	0	0	**1**	0	0	0	0	0	1
PKF	0	0	0	2	0	0	0	0	0	**1**	1	0	0	3	7
RR	0	0	0	0	0	0	0	0	0	0	**2**	0	0	2	4
SG	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	1
TM	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	1
O	2	15	0	13	0	1	3	15	0	8	5	0	0	49	111
Total	3	25	1	27	1	2	6	22	1	9	9	1	1	66	174

However, we are in a position to replicate Table 5.4.1.1.B for the non-Big Six audit firms. In other words, as it can be seen in Table 5.4.2.2.A above, there is a main diagonal effect which indicates for the non-Big Six accountancy firms that there is a strong association between CADRE and alma mater (see also Table 5.4.2.2.B). The

Table 5.4.2.2.B: No of CADRE per non-Big Six audit firms

	No of CADRE per non-Big Six Audit Firms	Alumni and Audit Client	Alumni (%)
BDO Stoy Hayward	17	2	11.76
Beavis Walker	1	1	100.00
Binder Hamlyn	20	6	30.00
Blythens	1	1	100.00
Clark Whitehill	1	1	100.00
Grant Thornton	9	4	44.44
Page Robt. A. & Co	1	1	100.00
Pannell Kerr Forster	7	1	14.29
Robson Rhodes	4	2	50.00
Smailes Goldie	1	1	100.00
Thomas May	1	1	100.00
Neville Russell	1	1	100.00
Latham Crossley & Davis	1	1	100.00
	65	23	35.38
Other	109	43	
Total	174	66	

natural question to ask is whether this diagonal effect varies by non-Big Six firm. Formally the chi-square statistic is used to test the null hypothesis H_o

H_o: the proportion of CADRE who have their alma mater as auditors does not differ

versus the alternative hypothesis H_1

H1: the proportion of CADRE differs.

The observed and expected frequencies are displayed together in Table 5.4.2.2.C. The expected frequencies show the proportional number of CADRE trained by each firm. The Table 5.4.2.2.B is a 13 x 2 contingency table so that there are 12 degrees of freedom.

The value of the test statistic proves to be 12.755 (p = 0.387), and the pertinent value of the χ^2 for a=0.05 and 12 degrees of freedom is 21.026. Accordingly the statistic is not significant at the 95% confidence level and the null hypothesis is accepted. In other words, the same proportion of non-Big Six CADRE have their alma mater as auditors. This result should be interpreted with caution, however, as more than 20% of the cells have expected frequencies with less than five.

Table 5.4.2.2.C: Proportional CADRE per non-Big Six audit firm

	Observed N	Expected N	Residual
BDO Stoy Hayward	2	6.0	-4.0
Beavis Walker	1	.4	.6
Binder Hamlyn	6	7.0	-1.0
Blythens	1	.4	.6
Clark Whitehill	1	.4	.6
Grant Thornton	4	3.1	.9
Page Robt. A. & Co	1	.3	.7
Pannell Kerr Forster	1	2.4	-1.4
Robson Rhodes	2	1.4	.6
Smailes Goldie	1	.4	.6
Thomas May	1	.4	.6
Neville Russell	1	.4	.6
Latham Crossley & Davis	1	.3	.7
Total	23		

5.5. The Narrow1-Narrow Test

In this section the narrow1-narrow test is presented and analysed. Only one CADRE is selected per quoted company. Those CADRE selected have qualified with a founder accountancy firm.

5.5.1. Specifying the data involved for the test

This subsection presents a description of the data involved for the Narrow1-Narrow test. In particular, only one CADRE per listed company and only those CADRE who qualified with a founder audit firm are counted for this test.

In section 5.4.1 we faced with the problem of which CADRE are selected when there are more than one of them per company. Four different solutions were offered when that problem propounded in section 5.4.1. Nevertheless we concluded, after the tests were run, in section 5.4.2.1.2 that all the solutions suggested for the problem give similar results and, therefore, we will present the data in this section according to the first solution given in that section.

The first solution adopted in section 5.4.1 indicates that the CADRE who selected per company is the last one when they are listed in ascending alphabetical order. Also, according to the narrow alma mater definition, only founder alma mater are counted for this test. Every CADRE is designated a matrix position (i,j), where:

i = the name of the accountancy firm with whom the CADRE trained (i.e. ALMA MATER)

j = the name of the auditor of the CADRE's company.

The summation/tabulation of these matrix positions for all CADRE (who satisfy the criteria laid down in the preceding paragraphs) is the basis of constructing the contingency Table 5.5.1.A presented below.

The row total in the Table 5.5.1.A gives the <u>minimum</u> number of CADRE who trained with a founder accountancy firm, since only one CADRE per company is selected, for example, 61 CADRE with AA, 45 with CL, 6 with EY and so on[4]. The name of the auditor that these CADRE employ is given by the columns. So, for Arthur Andersen, twelve CADRE use AA, seven CL, twelve EY, seven KPMG, eight PW, six TR and seven "other" (non-Big Six) accountancy firms. Thus, out of 61 former employees of

Table 5.5.1.A: Narrow1-Narrow criteria of classification

		AUDITORS OF PUBLIC COMPANIES									
		AA	CL	EY	KPMG	PW	TR	*Subtotal*	Other	No Auditor	*Total*
	AA	**12**	7	12	7	8	6	*52*	7	2	61
	CL	2	**12**	5	10	1	5	*35*	10	0	45
ALMA	EY	0	0	**3**	2	0	0	*5*	1	0	6
MATER	KPMG	1	13	11	**23**	4	15	*67*	25	1	93
	PW	6	14	9	26	**27**	13	*95*	11	2	108
	TR	2	5	4	7	3	**11**	*32*	8	1	41
	Big-6 Subtotal	*23*	*51*	*44*	*75*	*43*	*50*	*286*	62	6	354

Note: The rows "other" and "missing" have been deleted from this table, due to inappropriateness of the data in those entries discussed in more detail in section 3.1.

AA, twelve favour their alma mater. The same table shows that twelve out of 45 CADRE who qualified with Coopers & Lybrand use them as auditors. Following a similar pattern for the rest of the Big-Six firms, the following Table 5.5.1.B can be constructed.

The column total in Table 5.5.1.A gives, also, the number of accountancy firms' clients. In other words, the number of the UK public companies that have one at least chartered accountant on their boards and use one of the accountancy firms as auditors appear in the column total. For example, AA has 23 clients that have one at least CADRE, CL has 51, EY has 44, and so on. From this, it follows that for Arthur Andersen, there are twelve of its clients with an AA CADRE on board, two with CL, zero with EY, one with KPMG, six with PW, and two with TR. Hence, out of 23 AA clients, twelve clients have employed personnel from their auditors. The same table shows that twelve CL clients (out of 51) have CL qualified directors. Following a similar pattern for the rest of the Big-Six firms, that is, looking at the main diagonal of the Table 5.5.1.A, the following Table 5.5.1.C can be produced.

[4] These figures are comparable to figures shown in Table 5.3.1.A where <u>all</u> the CADRE (and not only one per company) who qualified with a founder firm were counted there.

Looking at the Table 5.5.1.A, the main diagonal shows that 88 of CADRE (24.86%) have as their auditors the firm that they trained with (see Table 5.5.1.B). Moreover, the same diagonal indicates that for 88 of those 286 listed companies (30.77%), one at least of their directors trained and qualified with the same accountancy firm as their auditor (see Table 5.5.1.C).

Table 5.5.1.B: No of CADRE qualified with a founder firm on boards of directors

	Minimum No of CADRE qualified with founder firm	Alumni and client	(%)
AA	61	12	19.67
CL	45	12	26.66
EY	6	3	50.00
KPMG	93	23	24.73
PW	108	27	25.00
TR	41	11	26.83
Big-6 Subtotal	354	88	24.86

Note: "Alumni and audit client" refers to the situation where a CADRE is audited by his/her ALMA MATER.

Table 5.5.1.C: Clients with one CADRE on boards

	No of Clients per Accg Firm	Clients with one CADRE on boards	Alumni (%)
AA	23	12	52.17
CL	51	12	23.53
EY	44	3	6.82
KPMG	75	23	30.67
PW	43	27	62.79
TR	50	11	22.00
Big-6 Subtotal	286	88	30.77

Having explained the data that is provided for the test statistic, the following subsection computes the chi-square statistic to find out whether an alumni effect prevails under the narrow1-narrow definitions.

5.5.2. Performing the Narrow1-Narrow Test

This subsection performs the chi-square test for the data described in the preceding subsection. We test whether there is an alumni effect among only the Big-Six audit firms under the narrow1-narrow definitions[5]. In order to do this, we must employ and compute the chi-square test of independence.

The chi-square statistic is used to test the null hypothesis

H_o: there is a non-association between ALMA MATER and the auditor,

versus the alternative hypothesis

H_1: an association exists.

The observed and expected frequencies are displayed together in Table 5.5.2.A where the expected frequencies appear in italics under the observed frequencies for each Big-Six firm. The Table 5.5.1.A is a 6 x 6 contingency table so that there are 25 degrees of freedom. The "other" column category in the Table 5.5.1.A is discarded as we are interested in the association between alma mater and Big-Six auditor.

Again here, as in section 5.3.2, we encountered the same problem with the expected frequencies when the test statistic was calculated, that is 30.6% (11 cells) had expected frequencies of less than 5. This violates the rule which requires no more than 20% of the cells have expected frequencies of less than 5. Again here, all EY row entries contained expected frequencies of less than 5 and, therefore, they are deleted (as in section 5.3.2.). As a result, the following Table 5.5.2.A presents the amended information (the EY alma mater is discarded).

The Table 5.5.2.A is a 5 x 6 contingency table and has 5 cells (16.7%) with expected frequencies less than 5. The test statistic, therefore, closely approximates a chi-square distribution and its value proves to be 61.626 ($p < 0.001$). The comparative critical value of the χ^2 with 99% confidence level and 20 degrees of freedom is $\chi^2_{(0.99,20)} = 37.566$. Accordingly, we cannot accept the null hypothesis. There is a significant alumni effect among the Big-Six audit firms.

[5] Some of the histories of the non-Big Six firms could not be traced and, therefore, due to incompleteness of the data, it is not clear that we can employ the chi-square test for the non-Big Six firms (see section 5.3.1 for further details).

Table 5.5.2.A: ALMA MATER * AUDITORS Crosstabulation (Narrow1-Narrow)

			AUDITORS OF PUBLIC COMPANIES						
			AA	CL	EY	KPMG	PW	TR	*Total*
	AA	Count	12	7	12	7	8	6	52
		Expected Count	*4.3*	*9.4*	*7.6*	*13.5*	*8.0*	*9.3*	*52.0*
	CL	Count	2	12	5	10	1	5	35
		Expected Count	*2.9*	*6.4*	*5.1*	*9.1*	*5.4*	*6.2*	*35.0*
ALMA	KPMG	Count	1	13	11	23	4	15	67
MATER		Expected Count	*5.5*	*12.2*	*9.8*	*17.4*	*10.3*	*11.9*	*67.0*
	PW	Count	6	14	9	26	27	13	95
		Expected Count	*7.8*	*17.2*	*13.9*	*24.7*	*14.5*	*16.9*	*95.0*
	TR	Count	2	5	4	7	3	11	32
		Expected Count	*2.6*	*5.8*	*4.7*	*8.3*	*4.9*	*5.7*	*32.0*
	Total	Count	23	51	41	73	43	50	281
		Expected Count	*23.0*	*51.0*	*41.0*	*73.0*	*43.0*	*50.0*	*281.0*

Further, analysing the difference in the frequencies of the Table 5.5.2.A, one cannot fail to observe that a strong main diagonal do prevail (see Table 5.5.2.B). This indicates that for the Big-Six accountancy firms there is a strong association between the auditor of the UK public company and the accountancy firm that the CADRE qualified with (i.e. alma mater).

Table 5.5.2.B: Differences between observed & expected frequencies*

		AUDITORS OF PUBLIC COMPANIES						
		AA	CL	KPMG	PW	TR		
	AA	+	-	-	+/-	-		
ALMA	CL	-	+	+	-	-		
MATER	KPMG	-	+	+	-	+		
	PW	-	-	+	+	-		
	TR	-	-	-	-	+		

*The column of EY entries has been eliminated in order for the main effect to be clearly shown

In Table 5.5.1.A the main diagonal effect in the cross-classification has been identified as the principal pattern in the data. This means (1) that there is a greater propensity for CADRE to have as their auditor the accounting firm they qualified with (see Table 5.5.1.B), and (2) that there is a greater propensity for Big-Six clients to have employed CADRE from their incumbent auditor (see Table 5.5.1.C). Does the above tendencies vary proportionally by audit firm?

In answering the above question, the chi-square statistic is employed to test the following null hypothesis (1)

H_{o1}: the same proportion of CADRE have their alma mater a auditor

versus the alternative hypothesis

H_{11}: disproportion,

and the null hypothesis (2)

H_{o2}: the distribution of Big-Six firms (as auditors) does not differ in proportion of Big-Six clients that have CADRE on their boards

versus the alternative hypothesis

H_{12}: the distribution differs in proportion.

The first hypothesis is based on Table 5.5.1.B, and the second hypothesis on Table 5.5.1.C. The observed and expected frequencies for each hypothesis are displayed together in Tables 5.5.2.C and 5.5.2.D respectively. The number of degrees of freedom is 5 for both hypotheses.

Table 5.5.2.C: Chi-square based on Table 5.5.1.B

	Observed N	Expected N
AA	12	15.2
CL	12	11.2
EY	3	1.5
KPMG	23	23.1
PW	27	26.8
TR	11	10.2
Total	88	

Computed value: 2.295 (p = 0.807)

Table 5.5.2.D: Chi-square based on Table 5.5.1.C

	Observed N	Expected N
AA	12	7.1
CL	12	15.7
EY	3	13.6
KPMG	23	23.0
PW	27	13.2
TR	11	15.4
Total	88	

Computed value: 28.200 (p < 0.001)

The value of the test statistic for the Table 5.5.2.C is 2.295 (p = 0.807), and for the Table 5.5.2.D is 28.200 (p < 0.001). The critical value of the chi-square for a = 0.05 is 11.070. Accordingly, the test statistic is not significant and the null hypothesis is accepted. In other words, the same proportion of CADRE have their alma mater a auditor. On the other test based on Table 5.5.2.D, the null hypothesis is rejected. The distribution of Big-Six firms does differ in proportion of clients that have one at least Big-Six CADRE on their boards.

5.6. The Narrow2-Broad Test

Previous sections have selected CADRE in a pre-described way. However, the problem with these previous definitions was that we do not know who among the CADRE in a board of directors influences most the decision about appointment of auditors and audit fees to be paid. This section, therefore, takes the narrow2 definition for the auditor where only those directors who have been identified in the literature as the most influential directors regarding the decision about the auditor choice are considered, and the broad definition of alma mater as the founder and disappeared firm. In essence, the Narrow2-Broad test is analysed and computed. It involves describing the data that will be used for the test (in section 5.6.1) and performing the chi-square test (in section 5.6.2).

5.6.1. Specifying the data involved for the test

The data used for the Narrow2-Broad test is discussed in this section. The Finance Director, Chairman and/or Chief Executive who qualified as chartered accountants with one of the Big-Six audit firms or their predecessor(s) are merely counted. As we have explained in section 5.1, due to the number of problems in analysing the alumni effect between alma mater and auditor, we have closely monitored the definitions chosen and duplicated the analyses for alternative definitions. Therefore, the analysis in this section duplicates the analyses carried out in the previous sections under different definitions for auditor categories though.

The Finance Director, Chairman and/or Chief Executive (FD, Ch, ChiefExec) have been selected under the narrow2 definition. This is in accordance with prior literature which indicates that these directors are basically responsible for the appointment of auditors (Hussey and Jack, 1994; Beattie and Fearnley, 1998).

Every CADRE is designated a matrix position (*i,j*), where:

i = the name of the accountancy firm with whom the CADRE trained (i.e. ALMA MATER)

j = the name of the auditor of the CADRE's company.

The summation/tabulation of these matrix positions for all CADRE (who satisfy the criteria laid down in the preceding paragraphs) is the basis of constructing the contingency Table 5.6.1.A presented below.

The row total gives the number of CADRE (that is, FD, Ch and ChiefExec) who qualified with each audit firm and its predecessor(s). For example, 62 CADRE with AA, 95 with CL, 63 with EY, 109 with KPMG and so on. The columns give just the name of the accountancy firms that these CADRE use as their auditor. So, for AA, fourteen CADRE use AA, eight CL, nine EY, eight KPMG, eleven PW, seven TR and five "other" (non-Big Six) firms. Hence, out of 62 former employees of AA, fourteen favour their alma mater (22.58%). The same table shows that twenty-two out of 95 CADRE who trained with CL use them as auditors (23.15%). Following a similar pattern for the rest of the Big-Six firms, the following Table 5.6.1.B can be produced.

Table 5.6.1.A: CADRE classified according to alma mater and auditors*

		AUDITORS OF PUBLIC COMPANIES								
		AA	CL	EY	KPMG	PW	TR	*Subtotal*	Other	Total
	AA	**14**	8	9	8	11	7	*57*	5	62
	CL	6	**22**	7	18	8	10	*71*	24	95
ALMA	EY	3	12	**16**	9	3	7	*50*	13	63
MATER	KPMG	1	24	6	**36**	7	7	*81*	28	109
	PW	6	15	8	21	**26**	11	*87*	14	101
	TR	4	11	4	14	4	**19**	*56*	8	64
	Subtotal							*402*		**494**
	Other	21	42	36	75	38	29		116	357
	Total	55	134	86	181	97	90		208	**851**

*CADRE chosen are the Finance Director, Chairman and Chief Executive only

Again, the same caution applies here as in sections 5.2 and 5.4 about the information provided in the columns of Table 5.6.1.A. The columns give just the name of the audit firm that CADRE use as their auditor. They do not give the total number of auditors or the number of the UK public companies who have on their boards of directors a chartered accountant(s) because some listed companies have more than one CADRE (that is, FD and Chairman and Chief Executive) on their boards. In other words, the columns total is not meaningful in Table 5.6.1.A. This problem has been discussed in more detail in section 5.4.1.

Besides the above caveat, we can still extract some very useful information from the

Table 5.6.1.A. We notice, for example, that 494 out of 851 (58%) Finance Directors, Chairman and Chief Executives have trained and qualified with one of the Big-Six accountancy firms or their predecessors. Summing the main diagonal in the Table 5.6.1.A, it shows that 133 of them (26.92%) have as their auditors the accounting firm that they have qualified with as chartered accountants (see also Table 5.6.1.B).

Table 5.6.1.B: No of CADRE on boards of directors*

	No of CADRE per Accg Firm	Alumni and client	(%)
AA	62	14	22.58
CL	95	22	23.16
EY	63	16	25.39
KPMG	109	36	33.02
PW	101	26	25.74
TR	64	19	29.68
Big-6 Subtotal	494	133	26.92
Other	357	116	
	851	249	

Note: "Alumni and audit client" refers to the situation where a CADRE is audited by his/her ALMA MATER.
*CADRE chosen are the Finance Director, Chairman and Chief Executive only

Having explained and analysed the data that is provided for the test statistic, the following subsection performs the chi-square statistic to find out whether an alumni effect prevails under the narrow2-broad definitions.

5.6.2. Performing the Narrow2-Broad Test

This subsection performs the chi-square test for the data described in the preceding subsection. We test whether there is an alumni effect among the accountancy firms under the narrow2-broad definitions. In order to do this, we must employ and compute the chi-square test of independence. The next subsection applies the test only for the Big-Six audit firms and subsection 5.6.2.2 for the non-Big Six firms.

5.6.2.1. The test for the Big-Six firms

In order to test the hypothesis that there is relationship between auditor and alma mater in Table 5.6.1.A, we must compute the chi-square statistic value. This subsection explores the proposition that there is an alumni effect among only the Big-Six firms.

The chi-square statistic is used to test the null hypothesis

H_0: there is a non-association between alma mater and auditor

versus the alternative hypothesis

H_1: an association exists.

We concentrate in this subsection on Big-Six firms effect only, thus Table 5.6.2.1.A below jettisons several cells from the Table 5.6.1.A.

Table 5.6.2.1.A: Big-Six CADRE classified according to alma mater and auditors*

		AUDITORS OF PUBLIC COMPANIES							
		AA	CL	EY	KPMG	PW	TR	*Subtotal*	
	AA	**14**	8	9	8	11	7	*57*	
	CL	6	**22**	7	18	8	10	*71*	
ALMA	EY	3	12	**16**	9	3	7	*50*	
MATER	KPMG	1	24	6	**36**	7	7	*81*	
	PW	6	15	8	21	**26**	11	*87*	
	TR	4	11	4	14	4	**19**	*56*	
	Subtotal	34	92	50	106	59	61	*402*	

*CADRE chosen are the Finance Director, Chairman and Chief Executive only

The observed and expected frequencies are displayed together in Table 5.6.2.1.B where the expected frequencies appear in italics under the observed frequencies for each Big-Six firm. The Table 5.6.2.1.A is a 6 x 6 contingency table so that there are 25 degrees of freedom.

Table 5.6.2.1.B: ALMA MATER * AUDITORS Crosstabulation (Narrow2-Broad test)

			AUDITORS OF PUBLIC COMPANIES						
			AA	CL	EY	KPMG	PW	TR	*Total*
	AA	Count	14	8	9	8	11	7	57
		Expected Count	*4.8*	*13.0*	*7.1*	*15.0*	*8.4*	*8.6*	*57.0*
	CL	Count	6	22	7	18	8	10	71
		Expected Count	*6.0*	*16.2*	*8.8*	*18.7*	*10.4*	*10.8*	*71.0*
	EY	Count	3	12	16	9	3	7	50
		Expected Count	*4.2*	*11.4*	*6.2*	*13.2*	*7.3*	*7.6*	*50.0*
ALMA	KPMG	Count	1	24	6	36	7	7	81
MATER		Expected Count	*6.9*	*18.5*	*10.1*	*21.4*	*11.9*	*12.3*	*81.0*
	PW	Count	6	15	8	21	26	11	87
		Expected Count	*7.4*	*19.9*	*10.8*	*22.9*	*12.8*	*13.2*	*87.0*
	TR	Count	4	11	4	14	4	19	56
		Expected Count	*4.7*	*12.8*	*7.0*	*14.8*	*8.2*	*8.5*	*56.0*
	Total	Count	34	92	50	106	59	61	402
		Expected Count	*34.0*	*92.0*	*50.0*	*106.0*	*59.0*	*61.0*	*402.0*

The value of the test statistic proves to be 102.980 ($p < 0.001$). The comparative critical value of the χ^2 with 99% confidence level and 25 degrees of freedom is $\chi^2_{(0.99,20)} = 44.314$. Accordingly, we cannot accept the null hypothesis. There is a significant alumni effect among the Big-Six audit firms.

Further, analysing the difference in the frequencies of the Table 5.6.2.1.B, one cannot fail to observe that a strong main diagonal prevails (see Table 5.6.2.1.C). This

Table 5.6.2.1.C: Differences between observed & expected frequencies

		AUDITORS OF PUBLIC COMPANIES						
		AA	CL	EY	KPMG	PW	TR	
	AA	+	-	-	-	+	-	
ALMA	CL	+/-	+	-	-	-	-	
MATER	EY	-	+	+	-	-	-	
	KPMG	-	+	-	+	-	-	
	PW	-	-	-	-	+	-	
	TR	-	-	-	-	-	+	

indicates that for the Big-Six accountancy firms there is a strong association between the auditor of the UK public company and the Big-Six audit firm that the CADRE qualified with (i.e. alma mater).

We have identified in Table 5.6.1.A the main diagonal effect in the cross-classification as the principal pattern in the data. This means that there is a greater propensity for CADRE (that is, FD, Ch and ChiefExec) to have as their auditors the audit firm that they qualified with. The natural question to ask is whether this tendency varies by accountancy firm. For the Big-Six firms, the relevant data is set out in Table 5.6.1.B.

Another hypothesis, therefore, to be examined here, is based on Table 5.6.1.B, and looks only at those CADRE (FD, Ch and ChiefExec) who have their ex-employer (i.e. alma mater) as their auditor in connection with the total number of CADRE (FD, Ch and ChiefExec) who have been trained by the Big-Six firms. In particular, the question here is whether the incidence of an "alumni and audit client" situation occurs independently of the total number of the Big-Six CADRE/alumni. The "alumni and audit client" refers to the situation where a CADRE is audited by his/her ALMA MATER. Formally, the chi-square statistic is used to test the null hypothesis H_o

H_o: the same proportion of CADRE (that is, FD, Ch and ChiefExec) have their alma mater as auditors,

versus the alternative hypothesis H_1

H_1: different proportion of CADRE have their alma mater as auditors.

The observed and expected frequencies are displayed together in Table 5.6.2.1.D below. The expected frequencies show the proportional number of CADRE trained by each firm. The Table 5.6.2.1.D is a 6 x 2 contingency table so that there are 5 degrees of freedom.

Table 5.6.2.1.D: Chi-square based on Table 5.6.1.B

	Observed N	Expected N	Residual
AA	14	16.7	-2.7
CL	22	25.6	-3.6
EY	16	17.0	-1.0
KPMG	36	29.3	6.7
PW	26	27.2	-1.2
TR	19	17.2	1.8
Total	133		

The value of the test statistic proves to be 2.775 ($p = 0.735$), and the pertinent value of the chi-square for a=0.05 is 11.070. Accordingly the null hypothesis is accepted. In other words, the same proportion of CADRE (that is, FD, Ch and ChiefExec) have their alma mater as auditors and the number of CADRE is in proportion to the numbers trained by each audit firm.

5.6.2.2. The test for the non-Big Six firms

Having our thesis been proved in the last subsection that there is indeed an alumni effect among the Big-Six audit firms even when the CADRE selected are only the Finance Director, Chairman and Chief Executive, this subsection explores whether a similar kind of association exists for the non-Big Six firms. In other words, for the non-Big Six firms, is there a significant relationship between the ALMA MATER and the auditor of the company? The CADRE chosen are only Finance Director, Chairman and Chief Executive for this test as well.

Formally, the chi-square statistic is used to test the null hypothesis H_o

> H_o: there is independence between auditor (a non-Big Six firm) and ALMA MATER,

versus the alternative hypothesis

> H_1: non-independence.

Before we apply the chi-square test, we need first to show the table which includes the non-Big Six accountancy firms. Table 5.6.1.A includes a row and a column named "other". "Other" means the non-Big Six audit firms. There are 116 CADRE in Table 5.6.1.A who have qualified with "other" (non-Big Six) firms and at the same time use as their auditors "other" (non-Big Six) accounting firms. Most of those 116 CADRE are displayed below in the Table 5.6.2.2.A.

Table 5.6.2.2.A: Non-Big Six firms alumni on the boards (the narrow2-broad test)

	BT	BDO	BH	BS	CW	GT	PRA	PKF	RR	SG	TM	NR	LCD	O	Total
BT	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
BDO	0	**2**	1	1	1	1	0	0	1	0	0	0	0	4	11
BH	0	3	**5**	0	1	1	0	0	1	0	0	0	0	1	12
BS	0	0	0	**1**	0	0	0	0	0	0	0	0	0	0	1
GT	0	0	0	0	0	**2**	0	0	0	0	0	0	0	5	7
PRA	0	0	0	0	0	0	**1**	0	0	0	0	0	0	0	1
PKF	1	0	1	0	0	1	0	**1**	1	0	0	0	0	1	6
RR	0	0	0	0	0	0	0	0	**2**	0	0	0	0	1	3
SG	0	0	0	0	0	0	0	0	0	**1**	0	0	0	0	1
TM	0	0	0	0	0	0	0	0	0	0	**1**	0	0	0	1
NR	0	0	0	0	0	0	0	0	0	0	0	**1**	0	0	1
LCD	0	0	0	0	0	0	0	0	0	0	0	0	**1**	0	1
Other	1	14	5	0	1	11	0	4	1	0	0	2	0	31	70
Total	2	19	12	2	3	16	1	5	6	1	1	3	1	44	**116**

The abbreviations used in the table above are the same used in the Table 5.2.3.2.A. Further, 178 out of 182 cells (97.8%) in the above table have expected frequencies less than 5 and, as a result, the rule that 80% of the cells must have expected frequencies of more than 5 is violated (Roscoe, 1969). No adjacent rows and/or columns can be combined (as any such combination would have been meaningless) and, therefore, the test statistic does not closely approximates a chi-square distribution. The test is abandoned as further analysis may affect the correct decision to be taken.

However, we are in a position to replicate Table 5.6.1.B for the non-Big Six audit firms. In other words, as it can be seen in Table 5.6.2.2.A above, there is a main diagonal effect which indicates for the non-Big Six accountancy firms that there is a strong association between CADRE and alma mater. The natural question to ask is

Table 5.6.2.2.B: No of CADRE per non-Big Six audit firms*

	No of CADRE per non-Big Six Audit Firms	Alumni and Audit Client	Alumni (%)
Baker Tilly	1	0	0.00
BDO Stoy Hayward	11	2	18.18
Binder Hamlyn	12	5	41.66
Burnett Swayne	1	1	100.00
Grant Thornton	7	2	28.58
Page Robt. A. & Co	1	1	100.00
Pannell Kerr Forster	6	1	16.66
Robson Rhodes	3	2	66.66
Smailes Goldie	1	1	100.00
Thomas May	1	1	100.00
Neville Russell	1	1	100.00
Latham Crossley & Davis	1	1	100.00
	46	**18**	42.24
Other	70	31	
Total	116	49	

*CADRE chosen are the Finance Director, Chairman and Chief Executive only

whether this diagonal effect varies by non-Big Six firm. Formally the chi-square statistic is used to test the null hypothesis H_o

H_o: the proportion of CADRE (that is, FD, Ch and ChiefExec) who have their alma mater as auditors does not differ

versus the alternative hypothesis H_1

H1: the proportion of CADRE differs.

The observed and expected frequencies are displayed together in Table 5.6.2.2.C. The expected frequencies show the proportional number of CADRE trained by each firm. The Table 5.6.2.2.B is a 12 x 2 contingency table so that there are 11 degrees of freedom.

Table 5.6.2.2.C: Proportional CADRE per non-Big Six audit firm

	Observed N	Expected N	Residual
BDO Stoy Hayward	2	4.4	-2.4
Binder Hamlyn	5	4.8	.2
Burnett Swayne	1	.4	.6
Grant Thornton	2	2.8	-.8
Page Robt. A. & Co	1	.4	.6
Pannell Kerr Forster	1	2.4	-1.4
Robson Rhodes	2	1.2	.8
Smailes Goldie	1	.4	.6
Thomas May	1	.4	.6
Neville Russell	1	.4	.6
Latham Crossley & Davis	1	.4	.6
Total	18		

The value of the test statistic proves to be 8.296 ($p = 0.600$), and the pertinent value of the χ^2 for a=0.05 and 11 degrees of freedom is 19.675. Accordingly the statistic is not significant at the 95% confidence level and the null hypothesis is accepted. In other words, the same proportion of non-Big Six CADRE have their alma mater as auditors. This result should be interpreted with care, however, as more than 20% of the cells have expected frequencies with less than five.

5.7. The Narrow2-Narrow Test

This section counts those CADRE who are Finance Director, Chairman and Chief Executive and also, have qualified only with a founder firm. The following subsection describes the data involved for the Narrow2-Narrow test and subsection 5.7.2 performs the chi-square test.

5.7.1. Specifying the data involved for the test

The data used for the Narrow2-Narrow test is analysed in this subsection. In particular, only CADRE who are Finance Directors, Chairman and Chief Executive and also, have qualified with a founder firm are merely counted[6].

Every CADRE is designated a matrix position (*i,j*), where:

i = the name of the accountancy firm with whom the CADRE trained (i.e. ALMA MATER)

j = the name of the auditor of the CADRE's company.

The summation/tabulation of these matrix positions for all CADRE (who satisfy the criteria laid down in the preceding paragraphs) is the basis of constructing the contingency Table 5.7.1.A presented below.

The row total gives the number of CADRE (that is, FD, Ch and ChiefExec) who qualified with a founder audit firm, for example, 58 CADRE with AA, 37 with CL, 1

Table 5.7.1.A: CADRE classified according to alma mater and auditors*

		AUDITORS OF PUBLIC COMPANIES								
		AA	CL	EY	KPMG	PW	TR	*Subtotal*	Other	Total
	AA	**14**	6	9	7	10	7	*53*	5	58
	CL	1	**8**	3	8	2	5	*27*	10	37
ALMA	EY	0	0	**1**	0	0	0	*1*	0	1
MATER	KPMG	1	15	3	**20**	1	7	*47*	19	66
	PW	6	13	8	20	**23**	10	*80*	12	92
	TR	2	6	2	7	1	**9**	*27*	1	28
	Subtotal	24	45	26	62	37	38	*235*		**282**

Note: The row "other" has been deleted from this table, due to incompleteness of the data in those row entries discussed in more detail in section 5.3.1.

*CADRE chosen are the Finance Director, Chairman and Chief Executive only

with EY, 66 with KPMG and so on. The columns give the name of the auditor that these CADRE companies use. So, for AA, fourteen CADRE use AA as their auditor, six CL, nine EY, seven KPMG, ten PW, seven TR and five "other" (non-Big Six) accounting firms. Thus, out of 58 alumni of AA, fourteen favour their alma mater (24.14%). The diagonal in the Table 5.7.1.A shows that eight out of 37 CADRE who trained with CL have CL as their auditors. Following a similar pattern for the rest of the Big-Six firms, the Table 5.7.1.B can be created below.

[6] For a definition of the founder firm, see section 5.3.1.

It is mentioned in the preceding paragraph that the columns give just the name of the audit firm that CADRE use as their auditor. The columns do not give the number of auditors or the number of the UK public companies who have on their boards of directors a chartered accountant(s) because some listed companies have more than one CADRE (that is, FD and Chairman and Chief Executive) on their boards. In other words, the columns total is not meaningful in Table 5.7.1.A. This problem has been discussed in more detail in section 5.4.1.

However, we can still extract some very useful information from Table 5.7.1.A. We notice, for example, that 235 out of 282 (83.33%) Finance Directors, Chairmen and Chief Executives who have trained and qualified with one of the Big-Six accountancy firms (as founder firms) use as their auditors one of the Big-Six firms. Moreover, adding up the main diagonal in the Table 5.7.1.A, it shows that 75 of them (26.59%) have as their auditors the accounting firm that they have qualified with as chartered accountants (see Table 5.7.1.B).

Table 5.7.1.B: No of CADRE on boards of directors*

	No of CADRE per Accg Firm	Alumni and client	(%)
AA	58	14	24.14
CL	37	8	21.62
EY	1	1	100.00
KPMG	66	20	30.30
PW	92	23	25.00
TR	28	9	32.14
Big-6 Subtotal	**282**	**75**	26.59
Other	357	116	
	639	**191**	

Note: "Alumni and audit client" refers to the situation where a CADRE is audited by his/her ALMA MATER.
*CADRE chosen are the Finance Director, Chairman and Chief Executive only

Having explained and analysed the data that is provided for the test statistic, the following subsection performs the chi-square statistic to find out whether an alumni effect prevails under the narrow2-narrow definitions.

5.7.2. Performing the Narrow2-Narrow Test

This subsection performs the chi-square test for the data described in the preceding subsection. We test whether there is an alumni effect among the Big-Six audit firms under the narrow2-narrow definitions. In order to do this, we must employ and compute the chi-square test of independence.

We investigate whether there is an association between the ALMA MATER and the auditor of the company that the CADRE is currently employed, and formally, the chi-square statistic is used to test the null hypothesis

H_0: ALMA MATER and auditor are independent,

versus the alternative hypothesis

H_1: non-independence.

The observed and expected frequencies are displayed together in Table 5.7.2.A where the expected frequencies appear in italics under the observed frequencies for each Big-Six firm. The Table 5.7.1.A is a 6 x 6 contingency table so that there are 25 degrees of freedom. The "other" column category in the Table 5.7.1.A is discarded as we are interested in the association between alma mater and Big-Six auditor.

When the expected frequencies were computed, 41.7% (15 cells) were proved to have expected frequencies of less than 5 (similar kind of problem with sections 5.3.2 and 5.5.2). The rule that no more than 20% of the cells must have expected frequencies of less than 5 was not met (Daniel and Terrell, 1995). All EY row entries contained expected frequencies of less than 5 and, therefore, EY row and column were eliminated. However, even when the EY row and column were deleted, there was still a merely 24% (6 cells in the 5 x 5 contingency table) that had expected frequencies of less than 5. As a result, it was decided to jettison TR row and column from the contingency table. The test now will give us valid results. The following Table 5.7.2.A presents the amended information (the EY and TR alma mater and auditor are discarded).

Table 5.7.2.A: ALMA MATER * AUDITORS Crosstabulation (narrow2-narrow test)

			AUDITORS OF PUBLIC COMPANIES				
			AA	CL	KPMG	PW	*Total*
ALMA MATER	AA	Count	14	6	7	10	37
		Expected Count	*5.3*	*10.0*	*13.1*	*8.6*	*37.0*
	CL	Count	1	8	8	2	19
		Expected Count	*2.7*	*5.1*	*6.7*	*4.4*	*19.0*
	KPMG	Count	1	15	20	1	37
		Expected Count	*5.3*	*10.0*	*13.1*	*8.6*	*37.0*
	PW	Count	6	13	20	23	62
		Expected Count	*8.8*	*16.8*	*22.0*	*14.4*	*62.0*
	Total	Count	22	42	55	36	155
		Expected Count	*22.0*	*42.0*	*55.0*	*36.0*	*155.0*

The Table 5.7.2.A is a 4 x 4 contingency table and has 2 cells (12.5%) with expected frequencies less than 5. The test statistic, therefore, closely approximates a chi-square distribution and its value proves to be 46.767 ($p < 0.001$). The comparative critical value of the chi-square with 99% confidence level and 9 degrees of freedom is $\chi^2_{(0.99,9)} = 21.666$. Accordingly, the null hypothesis is rejected. Auditor and alma mater are dependent each other and accordingly there is a significant alumni effect among the Big-Six audit firms.

Another hypothesis to be examined here is based on the main diagonal of the contingency Table 5.7.1.A. This diagonal has been identified as the principal pattern in the data. The extract from Table 5.7.1.A is presented in Table 5.7.1.B. The question is whether the same proportion of CADRE have their alma mater as their auditor.

In investigating the above issue, the chi-square statistic is employed to test the following null hypothesis

H_0: the proportion of CADRE who have their alma mater as auditors does not differ

H_1: the proportion differs.

The observed and expected frequencies are displayed together in Tables 5.7.2.B below. The number of degrees of freedom is 5.

Table 5.7.2.B: Chi-square test based on 5.7.1.B

	Observed N	Expected N	Residual
AA	14	15.4	-1.4
CL	8	9.9	-1.9
EY	1	.3	.7
KPMG	20	17.6	2.4
PW	23	24.4	-1.4
TR	9	7.4	1.6
Total	75		

The value of the test statistic is 2.879 (p = 0.719). The critical value of the chi-square for a = 0.01 and 5 degrees of freedom is $\chi^2_{(0.95,5)} = 11.070$. Accordingly the null hypothesis cannot be rejected. There is evidence that the same proportion of CADRE have their alma mater as their auditors.

5.8. Summary and conclusions

The objective of this chapter was to investigate whether there is an alumni effect in the UK audit market. The alumni effect has been defined as the association between the accountancy firm that the director of the UK public company has qualified with (as chartered accountant) and the auditor of the company that the director is currently employed. Because of the problems in the quantitative analysis of the alumni effect, several definitions were suggested and accordingly analyses were performed in order to see if the results are robust.

Further, accountancy firms operate commercial services in the professional appointments-executive search and recruitment market. Chapter II explains that due to adoption of the up-or-out system, large accountancy firms outplace in prestigious jobs most of their employees who cannot make it for partnership. In this way, the audit firms have developed connections and networks through the dominant positions that their former employees hold in the UK boardrooms. Chapter II conjectures that an alumni effect does prevail in the UK audit market and that the alumni of the audit firms do act to advance the interests of the firm which trained them with regard to the provision of audit and non-audit services.

Table 5.8.A: Results of the chapter

		Big-Six audit firms		*Non-Big Six audit firms*	
Sections	**Test**	**Alumni Effect**	**Alumni and Audit Client**	**Alumni Effect**	**Alumni and Audit Client**
2	**Broad-Broad**	YES	YES	abandoned	YES
3	**Broad-Narrow**	YES	YES	---	---
4	**Narrow1-Broad**	YES	YES	abandoned	YES
5	**Narrow1-Narrow**	YES	YES	---	---
6	**Narrow2-Broad**	YES	YES	abandoned	YES
7	**Narrow2-Narrrow**	YES	YES	---	---

Table 5.8.B: Summary results of the percentage of CADRE audited by their alma mater

Table	**Test**	**The % of CADRE who also have their previous accounting firm as auditors for various definitions of association**
5.2.1.B.	Broad-Broad	25.90%
5.3.1.B.	Broad-Narrow	25.34%
5.4.1.1.B.	Narrow1-Broad	17.24%
5.5.1.B.	Narrow1-Narrow	24.86%
5.6.1.B.	Narrow2-Broad	26.92%
5.7.1.B.	Narrow2-Narrrow	26.59%

The results of this chapter suggest that there is a significant relationship between CADRE's alma mater and the auditor that is used by the CADRE's company. Another finding of this chapter is that the alumni effect does not vary by large audit firm. These results hold for all definitions and tests performed (see tables above). The alumni effect, therefore, appears to be a potential and important variable in the considerable research effort that the academic community has devoted to the determinants of audit fee. This study also investigates whether the alumni effect has any effect on the audit pricing. The impact on audit fee, therefore, of the existence of chartered accountants on the UK boards of directors is modelled in Chapter IX.

CHAPTER VI

AUDIT FEES:
FORMULATION OF HYPOTHESES
AND SELECTION OF VARIABLES

6.1. Hypotheses

There is some evidence in the prior literature on audit fees that the market is segmented between large and small audit clients. For small companies the barriers to entry are not great and the differing competitive conditions lead to differing pricing equations (for example, Simunic, 1980; Palmrose, 1986a; Francis and Simon, 1987). The precise definition of large and small companies does vary somewhat among studies, but for the purposes of this study Table 3.4.A of Chapter III summarises the hypothesised audit fee determinants, and Appendix I presents the direction of the relationships found significant in previous studies. Appendix I summarises the results of 25 leading empirical studies into audit fees, and some 47 variables that have been employed in one or other of these studies. The hypotheses stated below test the "alumni effect" conjectured by this study. The tests also provide additional evidence on price differences (due to economies of scale and/or product differentiation) in the UK audit market varied by auditee size.

Hypotheses numbered 1 through 6 (which are stated in the null form) are concerned with product differentiation and economies of scale. Hypotheses numbered 7 through 11 relate to the main objective of this study, and are developed from the theoretical analysis of the chapter II. This research is different from past studies in the focus that directs onto the alumni variable. This is not simply just another new variable to the audit fee studies to add to the variables already used, but a new sociometric to measure the effect of personal and professional networks in the market for accountancy services. It is important to see if the effects of alumni are reflected in audit prices. In Chapter II, the theory of human capital was adapted to explicate the role that alumni play in the large audit firm. Apart from sociological and organisational consequences for understanding UK business, the economic consequences are unknown. This research uses three levels of the audit firm size variable and two levels of the client size (large and small) in order to gauge the magnitude of the effects of product differences and economies of scale on audit fees.

Hypotheses numbered 1 through 6 are a replication of prior studies. They are needed as a control for the association between alumni and audit firm. Thus, if there is a price differential in the sample due to Big-Six/non-Big Six firms, which was omitted in the test, and alumni are differently associated with Big-Six/non-Big Six audit firms, then what would appear as an alumni effect in the pricing equations would merely be due to alumni proxying for audit firm size. To identify any economic implications of alumni associations the problem of missing variables is acute. The strategy adopted is to control for all known alternative variables used in prior studies.

Hypotheses 1 through 6 that are related to product differentiation and/or economies of scale as below

> *H1: for the large companies sub-sample, there will be no differential pricing of audit services between Big Six and non-Big Six accountancy firms.*

Hypothesis 1 assumes that lower prices due to economies of scale offset any Big Six premiums from product differentiation and/or that non-Big Six diseconomies balance any Big Six higher fee charges. A rejection of this hypothesis, on the other hand, may imply that either product differentiation (in the case that Big Six charge higher prices) or economies of scale (in the case that Big Six charge lower prices) accruing to the Big Six in servicing companies in the large auditee market do prevail.

H2: for the small companies sub-sample, the Big Six charge lower audit fee than (or equal to) the non-Big Six firms.

H3: for the small companies sub-sample, the Big Six charge lower audit fee than (or equal to) the second-tier accountancy firms.

H4: for the small companies sub-sample, the Big Six charge lower audit fee than (or equal to) the local/regional accountancy firms.

H5: for the small companies sub-sample, the second-tier firms charge lower audit fee than (or equal to) the local/regional accountancy firms.

Hypotheses 2 through 5 deal with competition in the small companies audit market. The prior literature suggests that hypotheses 2 through 5 will not be accepted, consistent with price competition with differentiated product to the Big Six (or second-tier accounting firms) in the small companies segment. It should be noted here that if the coefficients of the audit firm variables (Big Six=1 & non-Big Six=0; second-tier=1 & other=0) are positive and significant across both segments (i.e., the large and small clients), then we may conclude that product differentiation prevails. On the other hand, if the auditor coefficients are only significantly positive for the small auditees market segment, then this may be interpreted as economies of scale dominating the large companies market with the effect of the differentiated product becoming more apparent as the analysis crosses a threshold to the smaller clients segment.

H6: the pricing of audit services is related to the pricing of non-audit services

According to the prior literature[1], there is a significant and positive relationship between fees paid to the incumbent auditor for audit services and for non-audit services, and hence, it is expected that hypothesis 6 will be accepted. If, however, the above hypothesis will be rejected, then the result may indicate that the client management has responded to the potential impairment of the auditor's independence (due to an increase on the level of incremental economic bonding between auditor and client) by reducing the purchases of recurring non-audit services.

Hypotheses 7 through 11 that are related to "alumni effect" as below

H7: for the large and small companies sub-sample, it makes no difference on audit fees when any director is an ex-employee of the auditor

Hypothesis 7 assumes that the audit firms do not benefit or suffer from outplacing their alumni in industry and commerce, and more specifically, that the pricing of audit services is not related to the existence of an audit firm alumni on the board of directors. In other words, do alumni affect audit fees? Rejection of this hypothesis, on the other hand, may imply that the "alumni effect" has pricing consequences.

H8: for the large and small companies sub-sample, on average it makes no difference on audit fees when a ***non-executive director*** *is an ex-employee of the auditor*

Non-executive directors normally comprise the audit committees in companies. According to the Cadbury Report (1992), the audit committee makes only recommendations to the board on the appointment of auditors and the audit fee. Whether a non-executive director is alumni of the auditor should be irrelevant to the pricing of audit services and hence, the above hypothesis is expected to be accepted. A rejection of this hypothesis, on the other hand, may imply that the audit committees in the UK play a more important role in the everyday management of the companies[2], and further, that all directors (executive and non-executive) have the same influential power to the appointment of auditors.

H9: for the large and small companies sub-sample, there is no audit fee difference when the ***chairman, chief executive or finance director*** *are an alumni of the auditor*

According to prior literature, the chairman, chief executive or finance director are principally responsible for the appointment of auditors (Hussey and Jack, 1994;

[1] See Chapter III.

[2] See for example Rosenstein and Wyatt (1990) who provide evidence of positive stock returns around announcements of non-executive director appointments. This may confirm the notion that non-executive directors serve a unique and valuable function on the board.

Beattie and Fearnley, 1998). Whether this relationship is translated into higher or lower audit fees is a matter of question.

H10: for the large and small companies sub-sample, the audit fee charged will not be lower or higher as the CADRE becomes older

It is expected that hypothesis 10 will be accepted as the older the CADRE become the greater the chances that they will move to higher positions in company hierarchies such as managing directorships or members of the non-executive boards (Price Waterhouse Corporate Register, March 1999). These positions are assumed not to influence directly the audit fees. On the other hand, if the coefficient of the age of the CADRE is significant, then this may imply that the years since the CADRE were qualified as chartered accountants do not deteriorate the "alumni effect".

H11: there is no different relationship between audit and non-audit fee because of existence of auditor alumni

Hypothesis 11 implies that the existence of an auditor alumni on the board of directors of the company does not alter the pricing of audit services in connection with the provision of non-audit services. Rejection of this hypothesis, on the other hand, may indicate that the CADRE companies obtain non-audit services from their ALMA MATER in a discounted price.

6.2. Selection of variables and operational proxies

A body of literature exists on factors affecting the level of external audit fees (see Chapter III). The current study incorporates some independent variables found to be significantly associated with audit prices/fees in previous studies. These variables measure client and audit firm characteristics. Publicly available data was collected on the significant variables described in Chapter III. The variables and operational proxies collected are listed in the Table 6.2 at the end of this chapter.

The independent variables are classified into two major categories: (1) control variables, and (2) test or focus variables. The control variables must be included in the multivariate model to control for cross-sectional differences among client characteristics. Not controlling for these variables will result in model mis-specification and/or misleading results due to confounding effects of omitted variables. The focus variables are used to test the specific hypotheses of this study after controlling for cross-sectional differences among auditees.

A brief description of the dependent and independent variables using the mnemonic symbols appears in Table 6.2 at the end of this chapter. The first eight variables below are the focus or test variables of this study. It is their relationship with audit prices which is tested in this research project. The remaining twenty variables are control variables, as suggested by prior research.

Dependent Variable

AFEE is the British sterling amounts paid to auditors for providing audit services. The audit fees (as well as all the independent variables that follow) are collected from the ONE-SOURCE cd-rom database and have been confirmed by double-checking the web-based FAME database. This continuous variable is transformed to the natural log to ensure a better fit to the regression line (see also the data transformations section in chapter VIII for more discussion).

A regression linear in the log of the dependent variable is multiplicative in the independent factors, as follows:

$$\ln y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_k x_k + u,$$

$$e^{\ln y} = e^{\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_k x_k + u},$$

$$y = e^{\beta_0} e^{\beta_1 x_1} e^{\beta_2 x_2} \ldots e^{\beta_k x_k} e^{u}$$

where

y = dependent variable (audit fees);

$x_1, \ldots, x_k$ = k independent variables;

u = stochastic disturbance term;

e = base of natural logarithm.

As discussed below (as well as in the Chapter VIII) for statistical reasons the independent variables were also transformed, so that the final form of the model fitted is a Cobb-Douglas production function which in its stochastic form is expressed as

$$y = \beta_0 x_1^{\beta_1} x_2^{\beta_2} \ldots x_k^{\beta_k} e^u$$

Each of the regression coefficients β_1 through β_k is then the (partial) elasticity of audit fees y with respect to independent variables x_1 through x_k.

In interpreting the magnitudes of the coefficients, this transformation needs to be recalled.

Independent Variables

Test or Focus Variables

The direction as well as significance level of the auditor firm size variable is examined across auditee size categories to make inferences about observed price premiums being sensitive to mean auditee size categories examined. In more detail, BIG6 is a dummy variable taking a value of one if the auditor is a particular accountancy firm among the Big-Six, and zero otherwise. This dummy variable has primarily been used throughout the literature and is intended to control for any identifiable differences in the auditor fee functions across the two groups of accountancy firms. Prior literature has assumed that the Big-Six firms have the same level of audit quality and be performed relative to the same set of audit standards, a "world-wide audit guide", while non-Big Six firms deliver different level of audit quality or use different procedures than the Big-Six and, therefore, the fees charged by each group of firms may differ too[3]. However, the results are not consistent in the prior studies so far, and therefore, we do not hypothesise a direction for the relationship between AFEE and BIG6.

NAFEE is the British sterling amounts paid to auditors for providing non-audit services. The non-audit fees are also collected from the ONE-SOURCE cd-rom database and have been confirmed by double-checking the web-based FAME database. This continuous variable is transformed to the natural log to ensure a better

[3] See Chapter VIII where a one-way analysis of variance is used to test whether the Big-Six individual audit firms are homogeneous with-in the group.

fit to the regression line (see chapter VIII for a discussion). According to prior studies, the hypothesised relationship between AFEE and NAFEE is positive.

ALUMNI[4] is a dummy variable taking a value of one if the auditor of the public company is the same firm with the one that the CADRE has qualified with, and zero otherwise. This dummy variable measures the "alumni effect" related to the costs of delivering an audit. Does an alumni director lead to lower audit fees or does an alumni offset the need for discounting? There is no prediction of the sign of the coefficient. The relationship is indeterminate *ex ante*.

ALMNEXD is dummy variable taking a value of one if the CADRE is a non-executive director and zero if the CADRE is an executive director. In principal, the shareholders are responsible for the appointment or dismissal of auditors, however, in practice the board of directors effectively appoint or dismiss the external auditor (McInnes, 1993). The presence now of an executive director who is also an alumni of the incumbent auditor makes the relationship between AFEE and ALMNEXD indeterminate *ex ante*.

ALMNFD is dummy variable taking a value of one if the CADRE is finance director, chairman and/or chief executive and zero otherwise. It is known (see Hussey and Jack, 1994; Beattie and Fearnley, 1998) that these directors are mainly associated with the auditor appointment, nevertheless, when these directors happen to be simultaneously chartered accountants and especially qualified with the auditor's firm, then the relationship between AFEE and ALMNFD is indeterminate *ex ante*.

2NDTIER represents the second-tier accountancy firms. It is another dummy variable taking a value of one if the auditor is a second-tier firm (listed in Table 7.1 in the Chapter VII), and zero if the auditor has a local or regional practices. The non-Big Six firms category is partitioned further, therefore, after Francis and Simon (1987) which was the first study to partition the effect of second-tier audit firms. They did not find a

[4] As discussed in Chapter V there are a variety of definitions for ALUMNI/CADRE. For hypotheses 1 through 6, we apply the first definition where the CADRE/ALUMNI selected per company is the last one when they are listed in ascending alphabetical order (for more details see section 5.4.1. in Chapter V). For hypotheses 7 through 11,

significant second-tier firms price premium over local/regional firms. The current study is the first to replicate this in a UK context, again the relationship between AFEE and 2NDTIER is indeterminate *ex ante*.

AGECADRE represents the actual age of the CADRE. This variable captures any deterioration of the "alumni effect" over the years as the alumni of the audit firms become older. The relationship between AFEE and AGECADRE is indeterminate *ex ante*.

Control Variables

Auditee Size & Complexity:

SALES used to control for the size of auditee operations, whereas SUBS, SIC, DEBTR, INV control for the complexity of client operations. These variables are hypothesised to be relevant for controlling cross-sectional differences in degree of audit difficulty.

More specifically, SALES is a continuous variable measuring the net turnover (in UK £000's) of the auditor client. Sales have been used in this study as a size measure instead of total assets because assets are not measured consistently across similar otherwise companies. The main reason for this is the choice of accounting policy (e.g. treatment of goodwill, fixed assets revaluation, etc). Another problem of using total assets as a size measure is the possibility of multicollinearity that may arise with other complexity variables of the type which incorporate total assets directly in their calculation. Additionally, higher asset value may indicate a larger auditee or an auditee whose assets have been re-valued, but whose "size" remained unchanged. Note that the relation between auditee size and audit prices is expected to be non-linear; however, more discussion on this relationship will be held in the chapter dealing with the model specification (see Chapter VIII). The hypothesised relationship between AFEE and SALES is positive.

however, all CADRE/ALUMNI are considered as the vector explaining the dependent variable changes with the introduction of the ALUMNI variable.

SUBS is the number of consolidated subsidiaries reported by the client firm. It is a measure of the complexity and decentralisation-diversity of the client. As a company grows in diversity and complexity, more labour, knowledge and effort are needed to complete an audit of a particular quality, which in turn are likely to lead to higher audit fees charged. Complexity and diversity may also increase litigation costs as the inherent and business risks of the company increase. As with size, a non-linear relationship between audit prices and the count of subsidiaries is hypothesised, but again this matter will be investigated in the Chapter VIII. The hypothesised relationship between AFEE and SUBS is positive.

SIC is the number of different industrial sectors in which the auditee operates. This variable is based on Simunic's (1980) work and measures complexity and industry diversification. The greater the degree of industry diversification, the larger the degree of audit difficulty because of the resulting auditor's inability to treat accounting sub-populations as homogeneous and examine them as an aggregate since the underlying transactions are fundamentally different in their nature. The hypothesised relationship between AFEE and SIC is positive.

DEBTR is a balance sheet composition ratio and is proxied by the proportion of the company's total assets that are represented by debtors. It is a measure of the complexity of the auditee since certain procedures such as establishing the existence of debtors and estimating the realisable value of the debt may be complex and difficult to be audited. The hypothesised relationship between AFEE and DEBTR is positive.

INV is another balance sheet ratio that measures client complexity. It is calculated by dividing the total year-end stocks with the total year-end assets. The greater the relative sterling total of the auditee's stocks, the larger the auditee's complexity and consequently the larger the costs of auditing this certain type of current assets. The hypothesised relationship between AFEE and INV is positive.

If any of the above variables which measure client complexity are collinear, the "best fit" variable, or the variable with the most explanatory power, will be employed for the model.

Auditee Risk (Profitability & Financial Distress):

The variables ROI, LOSS, EARN, AUDQN, DE, DTA, ROCE and ROTA are intended to determine the loss sharing ratio between the auditor and the client since each can be held jointly and severely liable for defects in financial annual reports. These variables are constructs of factors that measure the amount of auditee financial distress (auditee risk). In more detail, ROI is the return on investment given as net income or net loss over total assets at year-end. It is hypothesised that the auditor's expected share of losses is simply a decreasing function of the auditee's accounting rate of return. Therefore, *ceteris paribus* in a cross-section, the auditor's total revenue (fees) from an engagement would vary inversely with the rate of return. The lower the return on investment then, the higher the audit fee. Alternatively, the relationship may not be continuous. A plausible point of significant discontinuity may be when the rate of return becomes negative, that is, the auditee incurs a loss (LOSS). The incidence of a loss in the current fiscal period (which in turn signals evidence of auditee financial distress and riskier operations) increases the risk of audit failure and also increases the posterior probability that the auditor will incur future losses because the auditee is bankrupt[5]. Consequently, the price charged by the audit firm is likely to reflect that and be higher. The hypothesised relationship between AFEE and ROI is negative, and between AFEE and LOSS is positive.

EARN is a variable that predicts the failure of an enterprise (Altman, 1968). It is proxied by the proportion of the company's total assets that are represented by earnings before interest and taxes. Again here, the lower the rate of return the higher the audit fee. EARN is hypothesised to have a negative relationship with AFEE.

DE is the total long-term debt to equity ratio and has been used as a measure of financial distress too. It is intended to address the company's long-run ability to meet its obligations. The higher the amount of long-term debt in the capital structure, the higher the audit fee. The hypothesised relationship between AFEE and DE is positive. Similarly, DTA is the long-term debt to total assets and measures the risk an auditor's client faces not to be able to pay its bills over the long run. A high DTA represents a deterioration in auditee's financial strength and in the ability of the auditee to settle existing debt and/or incur additional debt. Again the hypothesised relationship between AFEE and DTA is positive.

Another plausible measure of auditee risk which has primarily been used throughout the literature is the AUDQN. It provides the type of audit opinion rendered by the auditor on the financial statements for the current fiscal year ("clean" unqualified vs. qualified audit report). The auditor's issuance of a qualified opinion signals significant uncertainties associated with an auditee's operation, and accordingly, the auditee will pay a higher audit price. As an overall result, the hypothesised relationship between AFEE and AUDQN is positive.

Finally, another two rate of returns have been utilised in this study, ROCE and ROTA. These variables are chosen because rate of return measures have been found useful in bankruptcy studies (Beaver, 1966; Altman, 1968) for discriminating between "failed" and "non-failed" companies. As with ROI, ROCE and ROTA are hypothesised to have a negative relationship with AFEE.

Auditee Risk (Gearing):
TLBTA (total liabilities to total assets) and LTLBTA (long-term liabilities to total assets) measure the level of gearing of the client company. They are balance sheet measures of financial risk, and the higher levels of gearing, the higher the audit fees charged due to the greater riskiness of such companies. They are hypothesised to have a positive relationship with AFEE.

Auditee Risk (Liquidity):
CR (current ratio) and QR (quick ratio) have employed in this study as proxies for the level of the auditee liquidity. These liquidity ratios are a measure of the company's ability to meet its short-term financial obligations out of its current assets. Acceptable level of these measures will determine the level of audit fees charged by the auditor.

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[5] A potential problem with this variable is that an isolated net loss may indicate a temporary condition which does not significantly affect audit risk. A better measure might be consecutive losses over several fiscal years,

An apparently low ratio may indicate an unhealthy company and, hence, the risk of audit failure is greater. The hypothesised relationships between AFEE and CR, and AFEE and QR are negative.

Auditee Risk (Nature of Business):
The dummy variable AGECOMP measuring the risk of client failure is expected to affect audit fees because of the potential lack of developed internal control systems in companies incorporated in the last ten years and the higher probability of failure of such companies. The variable takes a value of one if the company is a young company (less than 10 years) and zero otherwise. The hypothesised relationship between AFEE and AGECOMP is positive.

If any of the above control variables which measure auditee risk are collinear, the "best fit" variable, or the variable with the most explanatory power, will be employed for the model.

Auditee - Audit Timing:
BUSY is a dummy variable taking a value of one if the client's accounting year-end is in the periods November/December or March/April and zero otherwise. The clustering of these year-ends produces a busy period effect to the audit firm and, thus, it may affect the audit prices. The hypothesised relationship between AFEE and BUSY is positive.

Auditee - Geographical Location:
GEOLOC is a dummy variable taking a value of one if the geographical location of the auditee is in the pre-described region and zero otherwise. This variable, first used by Brinn *et al* (1994), is included in the model to test for the impact of different regions on differential audit fee pricing. There are eleven GEOLOC dummy variables (twelve regional classifications) [6]. See Table 6.2.A for descriptions of the geographical locations. The companies' registered offices have been selected to construct the

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something that our dataset lacks.

dummy variables as these are the places where the CADRE work and take decisions about the company's financial future. The relationship between AFEE and GEOLOC1-11 are indeterminate *ex ante*, although a London premium is suspected to exist (see Table 6.1 at the end of this chapter where the ratio of audit fees to sales by region is displayed).

Table 6.2.A: Qualitative variable-Geographical Location with 12 number of categories

Regional Areas	Mnemonic Name	Definition	Predicted Sign
Scotland	GEOLOC 1	Geographical location, coded 1 if auditee's registered address is in Scotland, otherwise 0	?
North England	GEOLOC 2	Geographical location, coded 1, if auditee's registered address is in North, otherwise 0	?
North West	GEOLOC 3	Geographical location, coded 1, if auditee's registered address is in North West, otherwise 0	?
North East	GEOLOC 4	Geographical location, coded 1, if auditee's registered address is in West Midlands, otherwise 0	?
West Midlands	GEOLOC 5	Geographical location, coded 1, if auditee's registered address is in West Midlands, otherwise 0	?
East Midlands	GEOLOC 6	Geographical location, coded 1, if auditee's registered address is in East Midlands, otherwise 0	?
East Anglia	GEOLOC 7	Geographical location, coded 1, if auditee's registered address is in East Anglia, otherwise 0	?
Greater London-South East	GEOLOC 8	Geographical location, coded 1, if auditee's registered address is in London, otherwise 0	+
South West	GEOLOC 9	Geographical location, coded 1, if auditee's registered address is in South West, otherwise 0	?
South Coast	GEOLOC 10	Geographical location, coded 1 if auditee's registered address is in South Coast, otherwise 0	?
Northern Ireland	GEOLOC 11	Geographical location, coded 1 if auditee's registered address in Northern Ireland, otherwise 0	?
Wales	GEOLOC 12	Geographical location, coded 1 if auditee's registered address is in Wales, otherwise 0	?

[6] Note that when a qualitative variable has K categories we define K-1 dummy variables in order to code all the categories properly (Koutsoyiannis, 1977, p.284; Daniel & Terrell, 1995, p.569).

6.3. Additional variables

Some independent variables used in prior research will not be examined in this study. These are:

(i) Existence of foreign operations

This variable was used by Simunic (1980) and Francis and Simon (1987) among others who all found the variable to be significant. A foreign operations measure is not available for the UK companies because the UK financial statements generally do not separate UK operations from the other European operations.

(ii) Number of reports issued by the auditor

Palmrose (1986) employed this measure and found it to be statistically significant. The number of audit reports will generally be one unless a subsidiary has a separate report or a separate report is issued on internal control or for management advice. If a separate report is issued the charges should not be included with the audit fee. Thus, this variable is not examined in the present study.

(iii) Number of client locations, client participation, ownership of company

Measures of the number of client locations requiring on site visits by the auditors, and amount of client participation in the audit were used by Palmrose (1986), but information on those variables are not publicly available and, therefore, will not be used in this study. Regarding the variable, ownership of company (public or non-public), this study focuses only on the "alumni effect" on the publicly owned companies.

Table 6.1

Ratio of audit fees to sales (%) by region

REGIONS	AFEESALE	REGIONS	AFEESALE
Scotland	0.13	North	0.09
North West	1.09	North East	0.23
West Midlands	0.26	East Midlands	0.12
East Anglia	0.20	South West	0.74
Greater London/ South East	3.75	South Coast	0.39
Northern Ireland	0.01	Wales	0.04

Table 6.2

Independent Variables and Operational Proxies
(included in the audit fee determinants model)

	CONTROL VARIABLES		
Mnemonic Name	Definition	Auditee Vector	Predicted Sign
SALES	Total turnover of auditees	Auditee size	+
SUBS	Number of consolidated subsidiaries	Auditee complexity	+
SIC	Number of SIC codes minus 1, measures industry diversification	Auditee complexity	+
GEOLOC 1-11	Geographical location, coded 1 if auditee's registered address in pre-described region, otherwise 0 (see Table 6.2.A)		+ (for London) ? (for rest)
DEBTR	Total year-end debtors to total assets	Auditee complexity	+
INV	Total year-end inventories to total assets	Auditee complexity	+
LOSS	Coded 1 if auditee incurred a net loss in the current year, otherwise 0	Auditee fin. distress(risk)	+
EARN	Earnings before interest & tax to total assets	Auditee fin. distress(risk)	-
AUDQN	Audit qualification, coded 1 if auditee received a "qualified report", otherwise 0	Auditee fin. distress(risk)	+
DE	Debt to equity ratio	Auditee fin. distress(risk)	+
DTA	Total long-term debt to total assets	Auditee fin. distress(risk)	+
QR	Quick ratio	Auditee liquidity(risk)	-
CR	Current ratio	Auditee liquidity(risk)	-
TLBTA	Ratio of total liabilities to total assets	Auditee gearing(risk)	+
LTLBTA	Ratio of long-term liabilities to total assets	Auditee	+

		gearing(risk)	
AGECOMP	Coded 1 if auditee incorporated less than 10 years, otherwise 0	Auditee risk	+
BUSY	Coded 1 if auditee's accounting year-end is Nov/Dec or Mar/April, otherwise 0	Audit timing	-
ROCE	Return on capital employed (%)	Auditee profitability	-
ROTA	Return on total assets (%)	Auditee profitability	-
ROI	Return on investment		-

Table 6.2: continued

	TEST OR FOCUS VARIABLES	
Name	Definition	Predicted Sign
BIG6	Coded 1 if the auditor is a "Big Six" firm, otherwise 0	?
NAFEE	Fees paid for non-audit services	+
ALUMNI	Coded 1 if there is an alumni of the auditor on the board of directors, otherwise 0	?
ALMNEXD	Coded 1 if the CADRE is executive director, otherwise 0	?
ALMNFD	Coded 1 if the CADRE is finance director, chairman or chief executive, otherwise 0	?
AGECADRE	Age of the CADRE	?
2NDTIER	Coded 1 if the non-Big Six auditor is a "second-tier" accountancy firm, otherwise 0	?
ALMNNAFEE	Fees paid for non-audit services and auditor alumni on the board of directors (if no auditor alumni on the board of directors, then 0)	?

CHAPTER VII

SAMPLE AND DESCRIPTIVE STATISTICS

7.1. The sample

As we have discussed in Chapter IV, the basis for this study is the list of CADRE, the UK public companies in which those CADRE are employed as directors and their auditors comprising the May 1996 edition of the Corporate Register compiled by Price Waterhouse. This list includes 15,000 directors and 2,000 publicly held companies. Also, the list provides specific information about the companies and the directors such as the industrial sector the companies operate, the names of the executive and non-executive directors, the names of the auditors, the type of sex and the date of birth for directors and their qualifications among others.

The database obtained by the Price Waterhouse contains 15,000 directors, as we mentioned in the preceding paragraph, 2,286 of whom have qualified as chartered accountants with one of the accountancy firms. We concentrate in this study only on those CADRE who hold the ICAEW qualification and, therefore, 1,955 were included in the project. However, of those 1,955 CADRE, 163 are missing as the necessary information about alma mater could not be obtained from any other sources. The information collected and the procedures followed were described in the Chapter IV.

We need also to mention here, that the financial information collected and used in the current study is for 1,172 UK quoted companies (1,277 originally, 105 of which are missing) and for the fiscal year 1995-1996. The number of listed companies is different from the number of CADRE (1,277 companies vs. 1,955 directors), simply because there are publicly held companies that have more than one CADRE on their boards. The implications of this and the discussion were offered in the Chapter V.

We merely state here that the descriptive statistics presented in this chapter use the 1,172 companies. This sample size is also applied for testing the hypotheses 1 through 6, as these hypotheses form a replication of previous studies. However, the full sample (i.e. 1,955 companies) is used for testing the hypotheses 7 through 11. This is done because the total number of CADRE (i.e. 1,955 CADRE) is entered in the regression models.

Table 7.1.A: Characteristics of the sample data

	Auditee Size Classes		
Auditor	*Sales below £251MM*	*Sales exceed £251MM*	*All Auditees*
Big-Six firm	650	218	868
Non-Bix Six firm	286	18	304
All auditors	936	236	1172

Auditee companies have been divided into four classes as described in Table 7.1.A. There are two classes for auditee size as measured by sales and two classes identifying the auditor as a "Big-Six" or a "non-Big Six" audit firm. The boundaries for the two auditee size classes represent approximately those points where the Herfindahl (H) index for the Big-Six firms increases sharply (see below the note in subsection 7.1.1 for further discussion). The class boundaries are not contiguous so as to enhance any inter-class differences.

Of the 1,172 quoted companies, 868 have a Big-Six auditor and 304 have a non-Big Six auditor. Table 7.1.B presents a detailed classification by auditee size and by class of auditor in the auditee size group. Table 7.1.C presents the number and proportion of audits performed by individual Big-Six auditors and Table 7.1.D presents the number and proportion of audits performed by individual non-Big Six auditors (restricted to second-tier firms). Table 7.1.E lists the sample companies by class of auditor and by principal industry (SIC Code). Finally, to obtain an indication of the Big-Six audit firm's dominance in the UK, Table 7.1 at the end of this chapter lists the twenty accountancy firms with the largest UK income in 1995.

Table 7.1.B: Detail classification of the sample data

Auditee Size	*Big-Six Auditor*	*Other Auditor*	*Total*
sales < £15MM	164	143	307
16MM to 50 MM	209	69	278
51MM to 100MM	137	44	181
101MM to 250MM	140	30	170
251MM to 1,900MM	155	18	173
sales > £2,000MM	63	0	63
Total	868	304	1172

Table 7.1.C: Number of audits performed by the Big-Six audit firms

	Auditee Size Classes					
	Sales < £250MM		**Sales > £251MM**		**All Auditees**	
Auditor: Big-Six	Number	%	Number	%	Total No	% of B6 Total
AA	53	8.15	13	5.96	63	7.25
CL	134	20.61	46	21.10	180	20.73
EY	92	14.15	33	15.13	125	14.40
KPMG	182	28.00	56	25.68	238	27.41
PW	94	14.46	44	20.18	138	15.89
TR	95	14.61	26	11.92	121	13.94
Total	650	100.00	218	100.00	868	100.00

Table 7.1.D: Number of audits performed by the non-Big Six firms (only the 2nd-tier firms)[1]

	Auditee Size Classes					
	Sales < £251MM		**Sales > £251MM**		**All Auditees**	
Auditor: Non-Big Six	Number	%	Number	%	Total No	% of NB6 Total
Grant Thornton	33	11.54	4	22.22	37	12.17
BDO Stoy Hayward	46	16.08	3	16.67	49	16.12
Pannell Kerr Forster	17	5.94	3	16.67	20	6.58
Clark Whitehill	12	4.19	1	5.56	13	4.27
Kidsons Impey	6	2.09	0	0.00	6	1.97
Moore Stephens	4	1.39	0	0.00	4	1.32
Robson Rhodes	16	5.60	0	0.00	16	5.26
Neville Russell	7	2.45	0	0.00	7	2.30
Moores Rowland	8	2.79	0	0.00	8	2.63
Baker Tilly	5	1.75	1	5.56	6	1.97
Haines Watts	2	0.69	0	0.00	2	0.66
Casson Beckman	6	2.09	0	0.00	6	1.97
Saffery Champness	3	1.05	0	0.00	3	0.99
Other	121	42.31	6	33.34	127	41.78
Total	286	100.00	18	100.00	304	100.00

7.1.1. A note on the boundaries for the auditee size classes

As discussed in the audit fee literature review chapter (see Chapter III), the size cut-off determining "small" auditee has varied. For example, Simunic (1980) and Francis and Simon (1987) defined small auditees as companies with *sales* less than USA$125 million. Palmrose (1986a) defined small clients as companies with *total assets* less than USA$150 million. These bounds are somewhat arbitrary and based on the assumption that the small auditee segment of the market is competitive while the large auditee segment is not competitive due to the high concentration of the Big-Six firms auditing large clients. Simunic (1980) observed that the marginal Big-Eight[2] market share for clients with sales greater than USA$125 million approaches 90 percent. The sample partition represents a built-in design feature for making inferences about observed differences in the pricing of the audit services when examined across both

[1] The non-Big Six accounting firms that appear in Table 7.1.D are based on the information provided in Table 7.1 at end of this chapter.

[2] Big-Eight then, Big-Six when the research was carried out, Big-Five now after the merger of Price Waterhouse and Coopers & Lybrand.

client segments. The small auditee market segment of the present study is defined as auditees with sales less than UK£251 million.

Table 7.1.E: Industry classification by class of auditor[3]

Index of Industry Classification		Big-Six Auditor	Other Auditor	Total
10	**Mineral Extraction**			
12	Extractive Industries	10	1	11
15	Oil, Intergrated	1	0	1
16	Oil Exploration & Production	6	1	7
20	**General Manufacturers**			
21	Construction	49	14	63
22	Building Materials, Engineering	38	8	46
23	Chemicals	21	2	23
24	Diversified Industrials	5	1	6
25	Electronic & Electrical Equipment	41	16	57
26	Engineering	86	20	106
27	Engineering, Vehicles	11	5	16
28	Paper, Packaging & Printing	33	5	38
30	**Consumer Goods**			
31	Breweries, Pubs & Restaurants	15	16	31
32	Alcoholic Beverages	4	0	4
33	Food Producers	28	8	36
34	Household Goods & Text	65	21	86
36	Health Care	25	8	33
37	Pharmaceuticals	8	2	10
40	**Services**			
41	Distributors	54	18	72
42	Leisure & Hotels	33	9	42
43	Media	50	19	69
44	Retailers, Food	12	5	17
45	Retailers, General	34	17	51
48	Support Services	81	38	119
49	Transport	18	5	23
60	**Utilities**			
62	Electricity	3	1	4
66	Telecommunications	7	2	9
68	Water	8	5	13
70	**Financials**			
71	Banks, Retail	5	0	5
72	Banks, Merchant	2	0	2
73	Life Assurance	18	3	21
74	Insurance	4	1	5
77	Other Financial	29	9	38
79	Property	63	34	97
80	Investment Trust	45	14	59
	Total	912	308	1220

[3] For 44 auditees audited by a Big-Six firm and 4 companies audited by a non-Big Six firms, data is not missing regarding the industry sector into which they operate.

Let us pause here for a minute and attempt to justify our choice of the bound. We have followed Simunic's (1980) argument who calculated the concentration ratio of the Big-Eight firms by auditee size class and then noticed that the market dominance of the Big-Eight audit firms varies significantly with the size of the clients. The concentration ratio he used was simply the number of clients in each size class who were audited by one of the Big-Eight firms divided by the total number of companies in that class. Simunic viewed the low market penetration of the non-Big Eight firms when the size of companies exceeds about USA$100 million in sales as lack of competition and, therefore, higher prices for audit services in this large auditee market segment[4]. He then proposed to investigate, having assumed that the sub-market for audits of smaller clients is competitive, the effect of the difference in concentration by testing for differences in average prices charged by the Big-Eight audit firms, after the effects of other price determinants were controlled[5].

The Big-Six concentration ratios of auditee size class constructed using the data collected for the purposes of this study are as follows:

Table 7.1.1.A: UK Big-Six auditor concentration ratios

Auditee Size as measured by Sales	Big-Six Concentration Ratio based on Herfindahl Index (HI)	Big-Six Concentration Ratio using Simunic's calculation (CR_6_S)	Big-Six Concentration Ratio (CR_6)
sales < £15MM	0.40	0.53	0.63
16MM to 50MM	0.61	0.74	0.78
51MM to 100MM	0.61	0.75	0.77
101MM to 250MM	0.69	0.82	0.83
251MM to 1,900MM	0.82	0.89	0.90
sales > £2,000MM	0.97	0.93	0.98

The concentration ratio (CR_6) measures the proportion of the total market accounted for by the Big-Six audit firms, the Herfindahl Index (HI) squares market shares, and

[4] However, as Simunic (1980) noted in his paper (p. 176), there is no theoretical basis to determine a minimum required market share, and thus, the bounds are somewhat arbitrary.
[5] For a further discussion of Simunic's work, see literature review Chapter III.

finally, the concentration ratio (CR_6_S) which is based on Simunic's (1980) calculation. Following Moizer and Turley (1987 and 1989) recommendation, we also used audit fee information as the most suitable base on which supplier concentration is measured in calculating HI and CR_6, whereas CR_6_S were computed using the number of auditees (as in Simunic).

We notice from the Table 7.1.1.A above, that all ratios provide similar results and that there are three substantially distinguished boundaries that can be drawn for three auditee size classes which are identical for all three different ratios. The three boundaries are below £15 million, between £16 and £250 million, and over £251 million. However, the information presented in Table 7.1.A and thereafter is based on two only subgroups, those of small (sales < £250MM) and large (sales > £250MM) auditees. The reasons are to simplify exposition, be consistent with the previous literature, and most importantly, be in agreement with the assumption that a small market share implies numerous sellers of equal size and, therefore, a competitive audit market.

7.2. Descriptive statistics

This section presents the descriptive information when observations are classified by auditee size (subsection 7.2.1) and by auditor group (subsection 7.2.2).

7.2.1. Descriptive statistics by auditee size

Table 7.2.1.A provides descriptive statistics by auditee size for the variables used in this study. There are 936 observations on auditees with sales less than £251 million and 236 observations on auditees with sales greater than or equal to £251 million. The mean and standard deviation are provided for all continuous variables along with the minimum and maximum values. For the categorical (dummy) variables, the table shows the percentage of observations when a variable takes on a value of one (1). The mean audit fee and mean sales size for the small auditee size are £73,000 and £53,897,000 respectively. The mean number of consolidated subsidiaries (Subs) is

7.3; the mean number of different industrial sectors (Sic) is 1.89. The mean, standard deviation and range are also provided for the rest of the variables used in this study. The mean fee paid for non-audit services for the small auditee market segment is £74,000.

The mean audit fee and mean sales size for the large auditee size are £936,000 and £2,064,607,000 respectively. The mean number of consolidated subsidiaries (Subs) is 24.79; the mean number of different industrial sectors (Sic) is 2.74. The mean fee paid for non-audit services for the small auditee market segment is £716,000.

In the large auditee sub-sample, 92 percent of the observations have one of the Big-Six firms as auditors compared to 69 percent in the small auditee sub-sample. Also, in the large auditee segment, 98 percent of the observations have received a "clean" unqualified opinion, 81 percent are with November/December or March/April fiscal year-end, and 19 percent have incurred loss in the current accounting year. This compares to 97 percent with a "clean" unqualified opinion, 68 percent with November/December or March/April year-end, and 22 percent with negative Profit and Loss Account figure in the small auditee segment.

Table 7.2.1.A also presents a frequency distribution on the cross-classification of auditor size by a specific industry and geographical location for the total sample. Most of the observations are in the "Engineering" and "Support Services" industries, as well as the area of greater London has most of the observations.

As Table 7.2.1.A indicates, there is a sufficient number of observations as well as variability among them to test the hypotheses of this study. For the total sample, 75% of the companies have Big-Six auditors, 97% with "clean" unqualified opinion, 67% with November/December or March/April year-end, and 20% have shown a loss. Also, for the 1,172 UK quoted companies, 1 in 6 companies has a director that qualified as chartered accountant with the present auditor, 79% of the directors are executive directors, and 43% (of these 79%) are Finance Directors.

Table 7.2.1.A: Descriptive statistics by auditee size

Descriptive Statistics		*1172 Total Observations (£'000)*	*936 Observations on Auditees with Sales less than £251MM (£'000)*	*236 Observations on Auditees with Sales greater than £251MM (£'000)*
AFEE	Minimum	0	0	44
	Maximum	8,000	780	8,000
	Mean	246	73	936
	Std. Deviation	645	81	1,205
BIG6	Percentage	74.66%	69.49%	92.37%
NAFEE	Minimum	1	1	4
	Maximum	11,500	2,173	11,500
	Mean	211	74	716
	Std. Deviation	667	137	1,304
ALUMNI	Percentage	14.92%	14.12%	17.65%
EXD	Percentage	78.64%	77.67%	86.38%
FD	Percentage	42.53%	44.72%	39.41%
2NDTIER	Percentage	14.69%	17.48%	5.08%
SEXCADRE	Percentage	97.10%	96.88%	97.50%
AGECADRE	Minimum	0	0	0
	Maximum	76	76	71
	Mean	46.62	46.01	49.06
	Std. Deviation	12.57	12.83	9.73
SALES	Minimum	0	0	251,285
	Maximum	36,106,000	250,030	36,106,000
	Mean	456,019	53,897	2,064,507
	Std. Deviation	1,765,431	59,076	3,517,715
SUBS	Minimum	0	0	0
	Maximum	144	45	144
	Mean	11.1	7.3	24.79
	Std. Deviation	14.59	6.95	23.68
SIC	Minimum	1	1	1
	Maximum	6	6	6
	Mean	2.05	1.89	2.74
	Std. Deviation	1.26	1.13	1.51
DEBTR	Minimum	0	0	0
	Maximum	0.98	0.98	0.97
	Mean	0.22	0.22	0.21
	Std. Deviation	0.19	0.19	0.17
INV	Minimum	0	0	0
	Maximum	0.99	0.99	0.88
	Mean	0.16	0.16	0.17
	Std. Deviation	0.18	0.18	0.17
ROI	Minimum	-58.03	-58.03	-12.17
	Maximum	16.38	3.8	16.38
	Mean	-0.04	-0.07	0.08
	Std. Deviation	1.81	1.9	1.42
LOSS	Mean	20.39%	22.00%	19.17%
EARN	Minimum	-39.86	-39.86	-8.47
	Maximum	49.49	7.25	49.49
	Mean	0.1	0.01	0.42
	Std. Deviation	2	1.35	3.54
DE	Minimum	-33.79	-33.79	-6.1
	Maximum	38.65	38.65	35.39

	Mean	0.42	0.36	0.67
	Std. Deviation	2.49	2.38	2.92
DTA	Minimum	0	0	0
	Maximum	4.31	4.31	2.09
	Mean	0.12	0.12	0.15
	Std. Deviation	0.21	0.22	0.18
AUDQN	Percentage	97.31%	97.24%	98.33%
ROCE	Minimum	-1886.49	-1886.49	-370.48
	Maximum	465.11	465.11	272.79
	Mean	8.44	6.74	15.49
	Std. Deviation	90.64	99.78	39.55
ROTA	Minimum	-376.84	-376.84	-87.02
	Maximum	379.88	379.88	62.26
	Mean	4.25	3.33	8.14
	Std. Deviation	27.94	30.58	12.31
TLBTA	Minimum	0.01	0.01	0.2
	Maximum	5.6	5.6	2.69
	Mean	0.57	0.55	0.65
	Std. Deviation	0.35	0.37	0.25
LTLBTA	Minimum	0	0	0
	Maximum	4.31	4.31	2.16
	Mean	0.17	0.15	0.23
	Std. Deviation	0.23	0.23	0.22
CR	Minimum	0	0.02	0.19
	Maximum	95.44	95.44	4.33
	Mean	1.97	2.11	1.37
	Std. Deviation	4.52	5.04	0.65
QR	Minimum	0	0.02	0.08
	Maximum	95.44	95.44	3.91
	Mean	1.51	1.66	0.93
	Std. Deviation	4.52	5.05	0.49
AGECOMP	Percentage	29.33%	31.88%	15.42%
MINEXTRC	Percentage	1.53%	1.05%	2.50%
CONSTRCT	Percentage	5.22%	4.73%	6.67%
BUILDMAT	Percentage	3.69%	2.73%	8.33%
CHEMICAL	Percentage	2.41%	2.10%	3.33%
ELECTRON	Percentage	4.74%	5.68%	2.08%
ENGINEER	Percentage	9.80%	9.04%	13.75%
PAPRPACK	Percentage	3.05%	3.26%	2.50%
BREWRPUB	Percentage	2.81%	2.73%	3.33%
FOODPROD	Percentage	2.89%	2.10%	5.83%
HOUSHLDG	Percentage	7.07%	8.52%	1.67%
HEALTHPH	Percentage	3.53%	3.58%	2.92%
DISTRBTR	Percentage	5.86%	5.68%	6.25%
LEISHOTE	Percentage	3.45%	3.15%	4.17%
MEDIA	Percentage	5.62%	5.89%	3.75%
RETAILER	Percentage	5.54%	5.05%	8.33%
SUPSERVI	Percentage	9.88%	11.46%	5.00%
TRANSPRT	Percentage	1.93%	1.37%	4.17%
UTILTIES	Percentage	2.09%	1.79%	3.75%
BANKS	Percentage	2.81%	2.00%	6.67%
OTHERFIN	Percentage	3.37%	3.47%	3.33%
PROPERTY	Percentage	7.87%	9.67%	1.25%
BUSY	Percentage	67.19%	68.23%	80.83%
SCOTLAND	Percentage	1.72%	1.77%	1.67%
NENGLD	Percentage	2.79%	3.02%	2.08%

NWEST	Percentage	7.30%	7.51%	6.25%
NEAST	Percentage	7.95%	7.51%	9.58%
WMIDLNDS	Percentage	7.79%	7.82%	8.33%
EMIDLNDS	Percentage	4.75%	5.53%	2.08%
EANGLIA	Percentage	4.10%	4.80%	1.25%
GRTLONDN	Percentage	51.56%	48.80%	60.83%
SWEST	Percentage	5.49%	6.15%	3.33%
SCOAST	Percentage	5.41%	5.94%	3.75%
NIRELAND	Percentage	0.25%	0.31%	0.00%

The above figures are in UK sterling (pounds). The data is in thousands.

7.2.2. Descriptive statistics by auditor group

Table 7.2.2.A presents the descriptive information by auditor group (Big-Six versus non-Big Six audit firms) for the variables used in this study. The mean audit fee charged by the Big-Six auditors is £308,000 with the maximum fee paid of £8 million. The mean sales audited by Big-Six firms is £585,560,000 and the mean number of consolidated subsidiaries is 12.60. The mean non-audit fee paid by the Big-Six clients is £262 thousand with a range of £1 thousand to £11,500 thousand.

In comparison, the mean audit fee charged by non-Big Six audit firms is £72,000 with a range of £1 thousand to £1,400 thousand. The mean sales audited is £76,336,000 with the biggest company having sales of £1,598,500 and the mean number of consolidated subsidiaries is 6.96. The mean non-audit fee paid by the non-Big Six clients is £54 thousand with a range of £1 thousand to £1,300 thousand.

The 868 observations with Big-Six auditors consist of 68.42% with November/December or March/April fiscal year-end, 97.24% with "clean" qualifications, and 20.34% with current losses. The 304 observations with non-Big Six auditors, in comparison, consist of 64.56% with November/December or March/April year-end, 97.67% with "clean" unqualified report, and 20.89% with loss in the Profit and Loss Account.

Finally, the mean asset size is provided in the table as a mean of comparison with Simunic's (1980) study. The mean asset size for the Big-Six clients of £1,449,472,000 (converted to USA dollars using the average exchange rate for 1998 it becomes $2,415,787,000) and £114,447,000 (US$190,745,000) for the non-Big Six clients are reasonably comparable with Simunic's US Big-Eight sample average of $695,600,000 and non-Big Eight sample average of $178,900,000, taking into consideration inflation and the nineteen years time lag between the two studies[6].

Table 7.2.2.A: Descriptive statistics by auditor

Descriptive Statistics		1172 Total Observations (£'000)	868 Observations on Auditees using a Big-Six auditor (£'000)	304 Observations on Auditees using a non-Big Six auditor (£'000)
AFEE	Minimum	0	0	1
	Maximum	8,000	8,000	1,400
	Mean	246	308	72
	Std. Deviation	645	735	144
NAFEE	Minimum	1	1	1
	Maximum	11,500	11,500	1,300
	Mean	211	262	54
	Std. Deviation	667	758	118
ALUMNI	Percentage	14.92%	17.74%	7.30%
EXD	Percentage	78.64%	79.08%	77.71%
FD	Percentage	42.53%	42.81%	42.36%
2NDTIER	Percentage	14.69%	0.00%	58.10%
SEXCADRE	Percentage	97.10%	97.31%	96.20%
AGECADRE	Minimum	0	0	0
	Maximum	76	76	76
	Mean	46.62	46.38	47.18
	Std. Deviation	12.57	12.60	11.63
SALES	Minimum	0	0	0
	Maximum	36,106,000	36,106,000	1,598,500
	Mean	456,019	585,560	76,336
	Std. Deviation	1,765,431	2,034,741	192,453
SUBS	Minimum	0	0	0
	Maximum	144	144	55
	Mean	11.10	12.60	6.96
	Std. Deviation	14.59	16.10	7.46
SIC	Minimum	1	1	1
	Maximum	6	6	6
	Mean	2.05	2.12	1.91
	Std. Deviation	1.26	1.28	1.18
DEBTR	Minimum	0	0	0
	Maximum	0.98	0.97	0.98
	Mean	0.22	0.21	0.22
	Std. Deviation	0.19	0.18	0.19
INV	Minimum	0	0	0
	Maximum	0.99	0.92	0.99
	Mean	0.16	0.16	0.16
	Std. Deviation	0.18	0.17	0.19
ROI	Minimum	-58.03	-58.03	-3.77

[6] If there will be any conflicting results, however, in Simunic's (1980) work where no price premium was observed and our study, an explanation that can be offered is the auditee size differences, as pointed out by Francis and Stokes (1986).

	Maximum	16.38	16.38	3.80
	Mean	-0.04	-0.05	-0.02
	Std. Deviation	1.81	2.10	0.41
LOSS	Percentage	20.39%	20.34%	20.89%
EARN	Minimum	-39.86	-39.86	-3.77
	Maximum	49.49	49.49	2.40
	Mean	0.10	0.12	0.04
	Std. Deviation	2.00	2.32	0.40
DE	Minimum	-33.79	-33.79	-20.67
	Maximum	38.65	38.65	24.43
	Mean	0.42	0.41	0.41
	Std. Deviation	2.49	2.38	2.51
DTA	Minimum	0	0	0
	Maximum	4.31	2.13	4.31
	Mean	0.12	0.13	0.12
	Std. Deviation	0.21	0.17	0.30
AUDQN	Percentage	97.31%	97.24%	97.67%
ROCE	Minimum	-1,886.49	-550.89	-1,886.49
	Maximum	465.11	465.11	272.79
	Mean	8.44	13.34	-8.04
	Std. Deviation	90.64	51.70	155.23
ROTA	Minimum	-376.84	-262.51	-376.84
	Maximum	379.88	62.26	379.88
	Mean	4.25	4.96	2.32
	Std. Deviation	27.94	21.66	41.47
TLBTA	Minimum	0.01	0.01	0.01
	Maximum	5.60	3.56	5.60
	Mean	0.57	0.57	0.57
	Std. Deviation	0.35	0.30	0.47
LTLBTA	Minimum	0	0	0
	Maximum	4.31	2.16	4.31
	Mean	0.17	0.17	0.15
	Std. Deviation	0.23	0.20	0.31
CR	Minimum	0	0	0.04
	Maximum	95.44	94.00	95.44
	Mean	1.97	1.87	2.24
	Std. Deviation	4.52	3.95	5.93
QR	Minimum	0	0	0.03
	Maximum	95.44	94.00	95.44
	Mean	1.51	1.41	1.78
	Std. Deviation	4.52	3.94	5.95
AGECOMP	Percentage	29.33%	29.27%	29.22%
MINEXTRC	Percentage	1.53%	1.85%	0.65%
CONSTRCT	Percentage	5.22%	5.34%	4.53%
BUILDMAT	Percentage	3.69%	4.14%	2.59%
CHEMICAL	Percentage	2.41%	2.84%	0.97%
ELECTRON	Percentage	4.74%	4.47%	5.18%
ENGINEER	Percentage	9.80%	10.58%	8.09%
PAPRPACK	Percentage	3.05%	3.60%	1.62%
BREWRPUB	Percentage	2.81%	2.07%	5.18%
FOODPROD	Percentage	2.89%	3.05%	2.59%
HOUSHLDG	Percentage	7.07%	7.09%	6.80%
HEALTHPH	Percentage	3.53%	3.60%	3.56%
DISTRBTR	Percentage	5.86%	6.00%	5.83%
LEISHOTE	Percentage	3.45%	3.60%	2.91%
MEDIA	Percentage	5.62%	5.56%	6.15%

RETAILER	Percentage	5.54%	5.02%	7.12%
SUPSERVI	Percentage	9.88%	9.05%	12.30%
TRANSPRT	Percentage	1.93%	1.96%	1.62%
UTILTIES	Percentage	2.09%	1.96%	2.59%
BANKS	Percentage	2.81%	3.16%	1.29%
OTHERFIN	Percentage	3.37%	3.16%	2.91%
PROPERTY	Percentage	7.87%	6.98%	11.00%
BUSY	Percentage	67.19%	68.42%	64.56%
SCOTLAND	Percentage	1.72%	2.02%	0.97%
NENGLD	Percentage	2.79%	3.48%	0.65%
NWEST	Percentage	7.30%	6.62%	9.09%
NEAST	Percentage	7.95%	9.20%	4.55%
WMIDLNDS	Percentage	7.79%	8.53%	5.52%
EMIDLNDS	Percentage	4.75%	4.49%	5.84%
EANGLIA	Percentage	4.10%	3.82%	5.19%
GRTLONDN	Percentage	51.56%	49.72%	56.49%
SWEST	Percentage	5.49%	6.29%	2.92%
SCOAST	Percentage	5.41%	4.38%	8.44%
NIRELAND	Percentage	0.25%	0.22%	0.32%
TASSETS	Minimum	155	155	192
	Maximum	170,000,000	170,000,000	6,205,141
	Mean	1,201,795	1,449,472	114,447
	Std. Deviation	9,283,334	9.836,473	597,986

The above figures are in UK sterling (pounds). The data is in thousands.

The descriptive statistics provided in Tables 7.2.1.A and 7.2.2.A show that the Big-Six audit firms tend to audit larger and more complex companies than the non-Big Six firms, and this is reflected in the audit fee. Although audit services may not increase linearly with client size, in other words the quantity of audit services purchased by the auditees is hypothesised to increase at a decreasing rate with the size and complexity of the auditees, clearly bigger clients will purchase more services than smaller clients. Because of this association between fees paid for audit services and the auditee size, the dependent and certain independent variables in the linear model adopted are transformed to avoid problems of heteroscedasticity or non-constant (unequal) variance. The next chapter deals with the model specification and variables' transformations.

Table 7.1

Income of Accounting Firms in the UK*

	Accounting Firm	Fees £m	Partners	Professional Staff	UK Offices
1	Coopers & Lybrand (now PwC)**	575.0	607	6268	36
2	Arthur Andersen	539.5	389	4873	13
3	KPMG	528.4	573	5998	38
4	Ernst & Young	401.2	386	4389	27
5	Price Waterhouse (now PwC)**	383.2	399	3836	26
6	Touche Ross	336.8	345	4303	22
7	Grant Thornton	114.0	213	1516	46
8	BDO Stoy Hayward	96.0	229	1391	34
9	Pannell Kerr Forster	80.1	169	1272	35
10	Clark Whitehill	57.5	231	1136	68
11	Kidsons Impey	54.1	142	804	33
12	Moore Stephens	40.6	136	688	47
13	Robson Rhodes	40.6	70	445	9
14	Neville Russell	33.6	87	493	18
15	Moores Rowland	31.4	94	386	18
16	Baker Tilly	29.1	67	345	13
17	Smith & Williamson	27.7	61	275	3
18	Haines Watts	21.7	51	293	22
19	Casson Beckman	21.2	51	247	12
20	Saffery Champness	16.2	42	205	10

* Accountancy, July 1995.
** PricewaterhouseCoopers

CHAPTER VIII

MODEL SPECIFICATION DIAGNOSTIC PROCEDURES AND "BASIC" AUDIT FEE MODEL

Table 6.2 at the end of chapter VI summarises the hypothesised audit fee determinants and the direction of expected relationships. The test of determinants of audit fee is made by fitting a multiple linear regression model (OLS model), similar to those that have been used in prior research[1], to estimate the coefficients of the following function:

$$AFEE = b_1 + b_2BIG6 + b_3NAFEE + b_4ALUMNI + b_5ALMNEXD + b_6ALMNFD + b_7AGECADRE + b_8SALES + b_9SUBS + b_{10}SIC + b_{11}DEBTR + b_{12}INV + b_{13}ROI + b_{14}LOSS + b_{15}EARN + b_{16}DE + b_{17}DTA + b_{18}AUDQN + b_{19}ROCE + b_{20}ROTA + b_{21}TLBTA + b_{22}LTLBTA + b_{23}CR + b_{24}QR + b_{25}AGECOMP + b_{26}BUSY + b_{27}SCOTLAND + b_{28}NENGLD + b_{29}NWEST + b_{30}NEAST + b_{31}WMIDLNDS + b_{32}EMIDLNDS + b_{33}EANGLIA + b_{34}GRTLONDN + b_{35}SWEST + b_{36}SCOAST + b_{37}NIRELAND + Error$$

[1] See Table 3.3.A in Chapter III for the models used in prior research.

The dependent variable AFEE is to be predicted by independent variables representing perceptions of previous researchers and also our belief that each could have a significant effect on the AFEE.

However, the above model violates some of the assumptions in the multiple regression analysis and some transformations must take place before we move on estimating the regression model and assessing the overall model fit.

8.1. Assessing the assumptions of multiple regression

The classical normal linear regression model is based on several assumptions about the relationships between the dependent and independent variables[2]. The most fundamental assumption in multivariate analysis is normality, referring to the shape of the data distribution for the variables and their correspondence to the normal distribution (Hair *et al*, 1998). In multivariate analysis, the individual variables are normal in a univariate sense but their combinations should also be normal.

In reviewing, therefore, the univariate statistics for the dependent and independent variables used in this study, it appears that the distributions of AFEE, NAFEE and the distributions of the continuous variables which control for auditee size, profitability and liquidity are highly skewed to the right (except ROI, ROCE and ROTA which are skewed to the left). Normal distributions of the underlying variables are assumed by parametric test statistics (i.e. F, t, χ^2); therefore, this violation puts into question the distributions of the test statistics used to evaluate the results of the empirical analysis.

Table 8.1.A shows only those individual variables that exhibit a departure from normality. Table 8.1.A also suggests the appropriate remedy. In addition, a visual examination of the normal probability plots of the residuals allows us to check the normality of the error term distribution (see Figure 8.1.A below). As shown in the Figure 8.1.A, the values do not fall along the straight diagonal line (created by the

[2] For a detailed discussion, see Gujarati (1995); Koutsoyiannis (1977); Hair *et al* (1998).

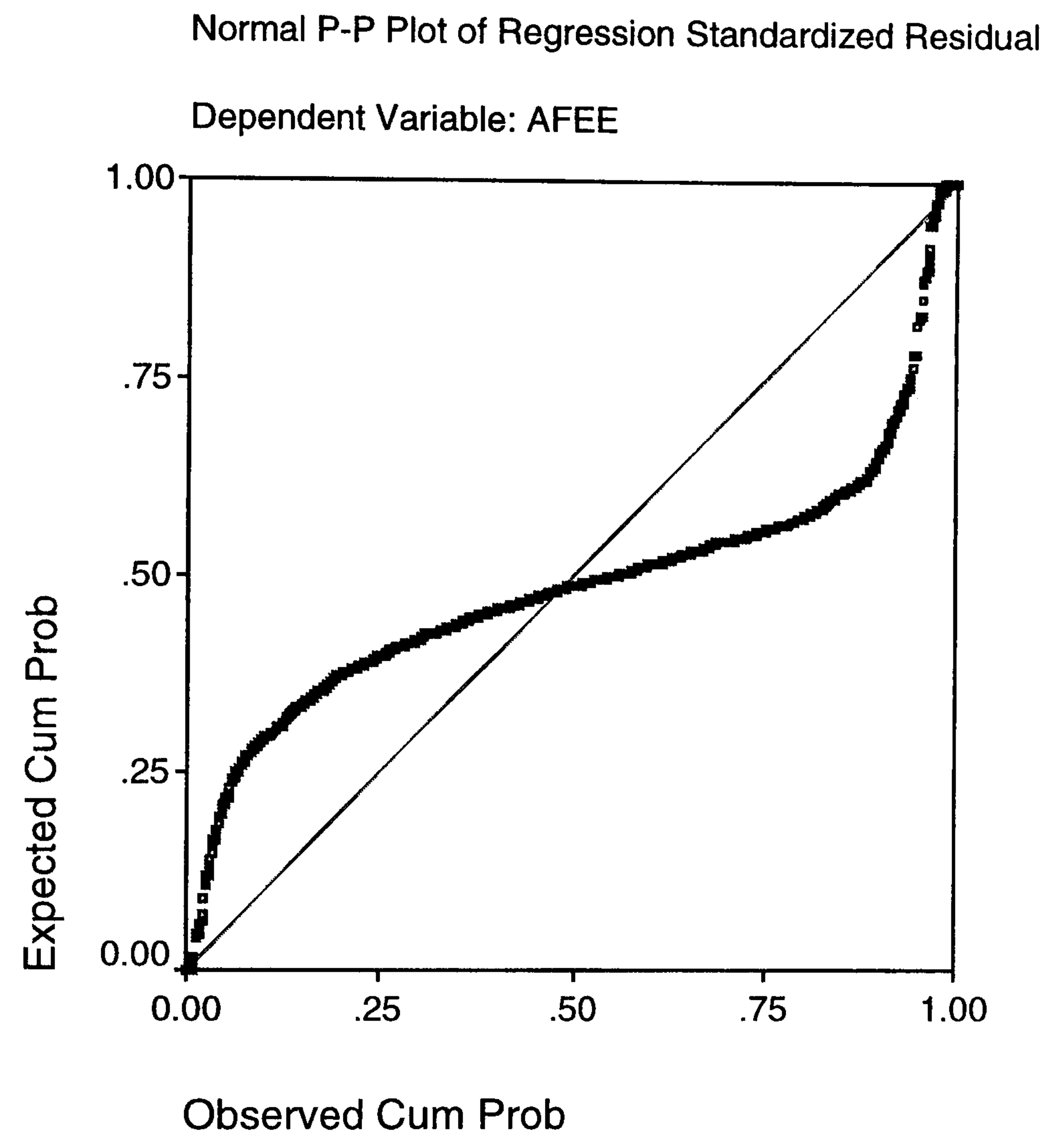
normal distribution); thus, the residuals are considered not to represent a normal distribution as it is assumed under the multiple regression analysis.

Table 8.1.A: Distributional characteristics, testing for normality, and possible remedies

	Shape Descriptors				*Tests of Normality*			
	Skewness		*Kurtosis*		*Kolmogorov-Smirnov*[a]		*Description of the Distribution*	*Possible Remedies*
Variable	*Statistic*	*Std. Error*	*Statistic*	*Std. Error*	*Statistic*	*Sig.*		*Transformation*
AFEE	6.2411	0.0571	51.3470	0.1141	0.3411	0.0000	Positive skewness	Natural log
CR	15.4301	0.0568	262.5821	0.1136	0.3813	0.0000	Positive skewness	Natural log
DE	3.2871	0.0569	110.6331	0.1137	0.2281	0.0000	Positive skewness	Natural log
DEBTR	1.0797	0.0568	1.3850	0.1136	0.4158	0.0000	Positive skewness	Natural log
DTA	7.9573	0.0569	131.8941	0.1137	0.1060	0.0000	Positive skewness	Natural log
EARN	12.2559	0.0571	484.4092	0.1141	0.1913	0.0000	Positive skewness	Natural log
INV	1.5491	0.0568	3.1073	0.1136	0.3365	0.0000	Positive skewness	Natural log
NAFEE	8.7920	0.0608	112.1694	0.1215	0.1592	0.0000	Positive skewness	Natural log
QR	15.6233	0.0568	266.8034	0.1136	0.3613	0.0000	Positive skewness	Natural log
ROCE	-12.3690	0.0572	210.3209	0.1144	0.2578	0.0000	Negative skewness	Natural log
ROI	-26.0870	0.0569	980.5470	0.1137	0.3152	0.0000	Negative skewness	Natural log
ROTA	-4.9896	0.0568	104.5927	0.1136	0.3811	0.0000	Negative skewness	Natural log
SALES	9.1555	0.0569	139.1932	0.1137	0.2488	0.0000	Positive skewness	Natural log
SUBS	3.5386	0.0591	19.4083	0.1181	0.2012	0.0000	Positive skewness	Square root
					[a]Lilliefors Significance Correction			

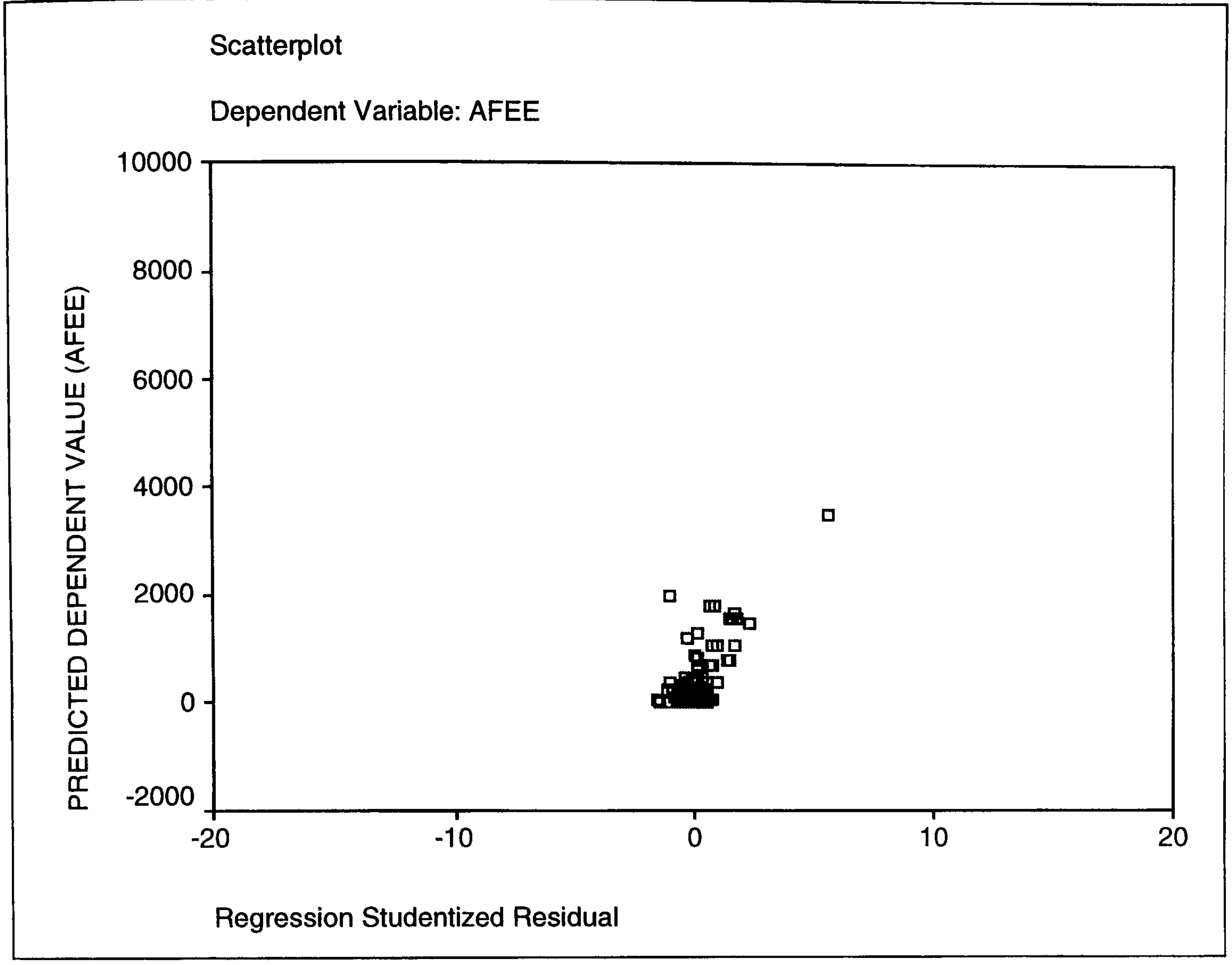
Additionally, these highly skewed variables presented in Table 8.1.A may result in heteroscedasticity (Hair *et al*, 1998). Heteroscedasticity is the condition of unequal (non-constant) variances of the error terms. Equal (constant) variances of the error terms is another assumption underlying ordinary least squares (OLS) regression. Heteroscedasticity affects the significance of the individual coefficients estimates because it affects the standard errors. Estimation using OLS regression with heteroscedasticity will result in biased standard errors and, thus, biased *t* statistics. Since we wish to examine the *t* statistics on the focus (or test) variables, it is important that the effects of heteroscedasticity are controlled.

Figure 8.1.A: Normal probability plot, standardised residuals for the untransformed model



Diagnosis of heteroscedasticity is made with the analysis of residual plots or simple statistical tests. Examining the residuals (studentised) in Figure 8.1.B we notice that a pattern is emerging of increasing residuals. This finding indicates heteroscedasticity in the set of independent variables described above. Also, Spearman's rank correlation test (not shown) has also been calculated for each of the non-normal variables identified in the preceding paragraphs and the hypothesis of heteroscedasticity is not rejected.

Figure 8.1.B: Analysis of studentised residuals (for the untransformed model)



A final comment on the violation of the multiple regression assumptions is about the linearity of the relationship between dependent and independent variables. Inspection of the partial regression plots (and the studentised residual plots above) indicate some linearity problems between the dependent and independent variables. For example, some variables, such as SALES, NAFEE, SUBS, ROTA, ROCE, show a non-linear relationship (see Figure 8.2.A below).

Having examined the data and the variables involved in the regression model described earlier, we conclude that the statistical assumptions underlying the regression analysis have been violated and, therefore, data transformations are necessary to correct those violations. This task is addressed further in the subsection below. Furthermore, these violations occur simultaneously and remedies for one of the violation often corrects problems in other areas as well.

8.2. Data transformations

Having tested for and found evidence of non-normality and heteroscedasticity, this subsection revises the estimation techniques to account for those violations.

Heteroscedasticity can be remedied only by transformation of the dependent variable (Hair *et al*, 1998). Transformations of the dependent variable will change the shape and spread of its distribution. In turn, they may correct the distribution of the error terms. Simultaneous transformations of one or more independent variables may also be needed to obtain or maintain a normal linear regression relation.

In prior research, two different empirical model specifications have been used. Table 3.3.A in Chapter III shows these models. (1) One is a natural log transformation of AFEE and the auditee size measure(s), and also the square root transformation on the count of subsidiaries. (2) The second is a scaling transformation achieved by dividing AFEE by the square root of the auditee size measure[3]. The reason for the transformations in these prior studies is the non-normal distributions of AFEE and the size measure. Both of these transformations seek to correct any violations of the regression model assumptions.

However, both of these transformations discussed in the preceding paragraph are *ad hoc*. There is no theoretical basis for the resulting regression relationships, rather we are speculating about the nature of those relationships. Transforming variables by taking their natural logarithm, the resulting equation assumes a proportional relationship between the dependent and the independent variables (i.e. the coefficient of each of the independent variables measures the percentage change of the dependent variable AFEE for a percentage change of each of the independent variables). Scaling AFEE by the auditee size measure, the resulting equation assumes a relationship between the size measure and the other independent variables which may or may not exist.

[3] The square root of the auditee size measure was used because when the natural log of AFEE is regressed on the natural log of ASSETS or SALES, the estimated regression coefficient for the lnASSET (or lnSALES) variable is approximately 0.5 (for our data, 0.525 for lnASSETS or 0.590 for lnSALES).

Nevertheless, to be consistent with prior research, a transformation technique will be also implemented in the subsequent analysis. In other words, as Table 8.1.A also suggested, the natural log transformation of AFEE and the auditee size, profitability and liquidity measures will be used. The natural log transformation cannot be used on SUBS, because this variable has a value of zero for some observations. The natural log of zero is undefined. As a result, the square root of SUBS is used which effectively removes the non-linearity.

In addition, normal probability plots of the auditee measures with the audit fee for a square root and natural log transformation were examined in order to determine the appropriate transformation to control for heteroscedasticity. The best linear fit as determined by eye was the natural log transformation of both the audit fee and auditee size, profitability and liquidity variables (except the SUBS variable).

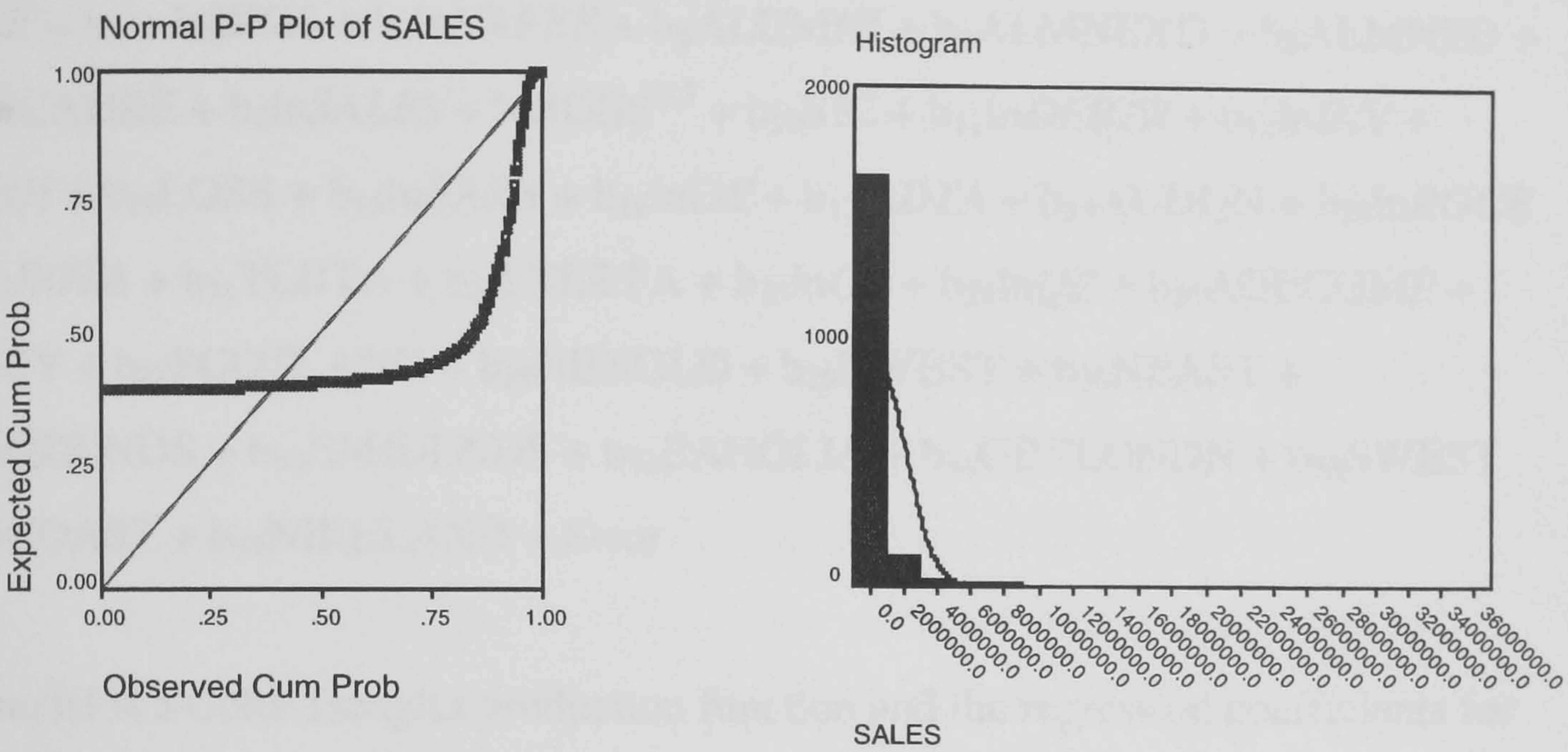
Table 8.2.A: Distribution characteristics after transformation

	Shape Descriptors				*Tests of Normality*	
	Skewness		*Kurtosis*		*Kolmogorov-Smirnov*[a]	
Variable	*Statistic*	*Std. Error*	*Statistic*	*Std. Error*	*Statistic*	*Sig.*
lnAFEE	0.3528	0.0571	0.3663	0.1141	0.0625	0.0000
lnCR	0.3856	0.0569	7.2033	0.1137	0.0937	0.0000
lnDE	-0.7711	0.0632	1.0469	0.1262	0.1202	0.0000
lnDEBTR	-1.5059	0.0582	2.3497	0.1162	0.1826	0.0000
lnDTA	-1.1508	0.0621	1.2285	0.1241	0.1351	0.0000
lnEARN	-1.2992	0.0622	8.2319	0.1242	0.1309	0.0000
lnINV	-1.2880	0.0622	1.4389	0.1242	0.1739	0.0000
lnNAFEE	0.1248	0.0608	0.0426	0.1215	0.0388	0.0000
lnQR	0.5160	0.0569	5.8846	0.1137	0.1157	0.0000
lnROCE	-0.6487	0.0620	1.4616	0.1239	0.0701	0.0000
lnROI	-1.2663	0.0640	5.0051	0.1279	0.1142	0.0000
lnROTA	-1.1970	0.0618	2.6136	0.1235	0.0979	0.0000
lnSALES	-0.3268	0.0571	1.1999	0.1141	0.0549	0.0000
SQRTSUBS	1.2076	0.0591	2.5312	0.1181	0.1100	0.0000

[a] Lilliefors Significance Correction

The above variables have been transformed by taking the natural log or square root were necessary. In each case, the transformed variables demonstrate normality. Figure

Original variable (SALES)



Transformed Variable (lnSALES)

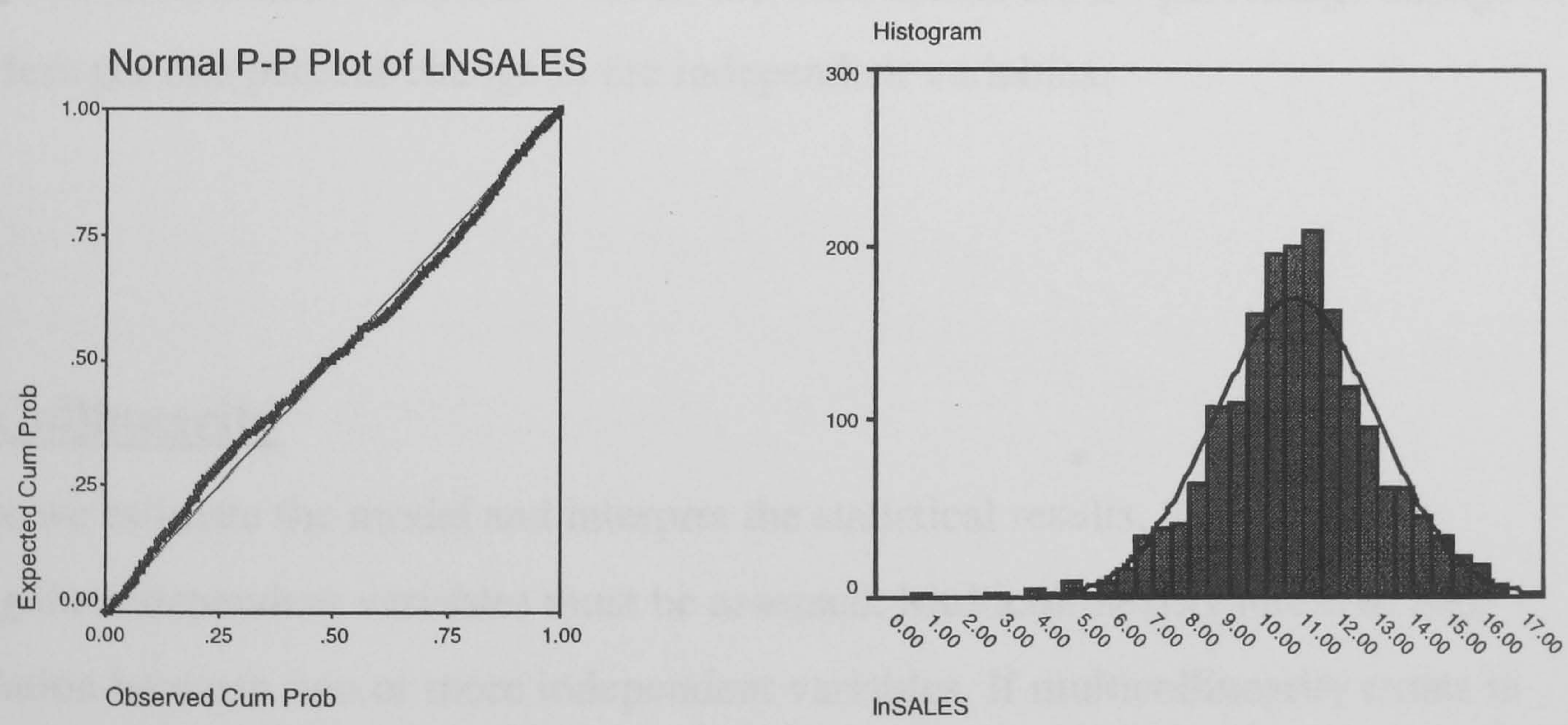


Figure 8.2.A: Transformation of variable SALES to achieve normalilty

8.2.A demonstrates the effect of the transformation on SALES in achieving normality. The transformed variable SALES appears markedly more normal in both graphical portrayals, and the statistical descriptors are also improved (see Table 8.2.A). Some of the transformed variables in Table 8.2.A still show a slight negative skewness, however the departures from normality are not so extreme as in the original variables. In any case, all the techniques are quite sensitive in large samples (exceeding 1,000 observations).

Using these transformations in the multiple regression model initially discussed, we obtain:

$$\begin{aligned}
&\ln \mathit{AFEE} = b_1 + b_2\mathrm{BIG6} + b_3\ln \mathit{NAFEE} + b_4\mathrm{ALUMNI} + b_5\mathrm{ALMNEXD} + b_6\mathrm{ALMNFD} + \\
&b_7\mathrm{AGECADRE} + b_8\ln \mathit{SALES} + b_9\mathrm{SUBS}^{0.5} + b_{10}\mathrm{SIC} + b_{11}\ln \mathit{DEBTR} + b_{12}\ln \mathit{INV} + \\
&b_{13}\ln \mathit{ROI} + b_{14}\mathrm{LOSS} + b_{15}\ln \mathit{EARN} + b_{16}\ln \mathit{DE} + b_{17}\ln \mathit{DTA} + b_{18}\mathrm{AUDQN} + b_{19}\ln \mathit{ROCE} \\
&+ b_{20}\ln \mathit{ROTA} + b_{21}\mathrm{TLBTA} + b_{22}\mathrm{LTLBTA} + b_{23}\ln \mathit{CR} + b_{24}\ln \mathit{QR} + b_{25}\mathrm{AGECOMP} + \\
&b_{26}\mathrm{BUSY} + b_{27}\mathrm{SCOTLAND} + b_{28}\mathrm{NENGLD} + b_{29}\mathrm{NWEST} + b_{30}\mathrm{NEAST} + \\
&b_{31}\mathrm{WMIDLNDS} + b_{32}\mathrm{EMIDLNDS} + b_{33}\mathrm{EANGLIA} + b_{34}\mathrm{GRTLONDN} + b_{35}\mathrm{SWEST} \\
&+ b_{36}\mathrm{SCOAST} + b_{37}\mathrm{NIRELAND} + \mathrm{Error}
\end{aligned}$$

This model is a Cobb-Douglas production function and the regression coefficients for the auditee size, profitability and liquidity variables are elasticities of audit fees on the individual independent variables. That is, the coefficients are the percentage change in audit fees per one percent change in the independent variables.

8.3. Collinearity

Before we estimate the model and interpret the statistical results, the correlation among the independent variables must be assessed. Multicollinearity refers to high correlation between two or more independent variables. If multicollinearity exists in the regression model then the coefficients of the independent variables may be unstable and, thus, not generalisable. In other words, we may not be able to distinguish their separate influences on the dependent variable. In particular, the standard errors of the individual coefficients may be quite large, which means that these coefficients cannot be estimated with great precision or accuracy, and therefore, their individual *t* statistics will be fairly small. This does not mean that the overall regression will not be of value. We simply may not be able to estimate the individual effects of the independent variables (Gujarati, 1995).

We suspect correlation among some of the independent variables, especially among those independent variables which control for the same vector of variables. As a result, we examine the collinearity diagnostics and the correlation matrix to identify multicollinearity in the above regression model.

Pearson's correlation matrix and Spearman's[4] correlation matrix for the non-categorical variables presented in Tables 8.3.A and 8.3.B respectively provide confirming support for the results of the tolerance and variance inflation factors (VIF) analyses as well as support for the results of the condition indices and decomposition matrix of the regression coefficient variance (not shown). All the above collinearity diagnostics show an indication of multicollinearity between ROCE and ROTA variables, between LTLBTA and TLBTA variables, and between DE and DTA variables[5]. As a result, collinear TLBTA, DTA and ROTA variables are omitted from subsequent analysis. Specification error or bias in the model by deleting these independent variables is not created as there are other variable(s) in the same vector to account for the specific auditee measure.

In addition the correlation matrices presented in Tables 8.3.A and 8.3.B below reveal that the dependent variable AFEE shows a high correlation with most of the independent variables in the model as expected.

[4] The Spearman Rank correlation is a non-parametric measure which does not assume normality among the variables.

[5] Tolerance values found to be very close to zero, VIF are very high and definitely in excess of 10, condition indices more than 30 with variance proportions above 90 percent.

Table 8.3.A: Pearson Correlation matrix for total sample

Variable	*LNAFEE*	*LNNAFEE*	*LNSALES*	*LNCR*	*LNDE*	*LNDEBTR*	*LNDTA*	*LNEARN*	*LNINV*	*LNQR*	*LNROCE*	*LNROI*	*LNROTA*	*SQRTSUBS*	*LTLBTA*	*SIC*	*TLBTA*
LNAFEE	1	0.788	0.888	-0.120	0.120	0.175	0.039	0.157	0.031	-0.110	0.102	0.131	0.049	0.666	0.167	0.425	0.176
LNNAFEE		1	0.722	-0.099	0.135	0.048	0.061	0.070	-0.059	-0.066	-0.007	0.054	-0.048	0.510	0.208	0.277	0.197
LNSALES			1	-0.127	0.099	0.160	0.035	0.219	0.077	-0.165	0.145	0.190	0.094	0.603	0.120	0.370	0.142
LNCR				1	-0.179	0.060	-0.123	-0.028	0.393	0.777	-0.108	0.018	-0.002	-0.112	-0.188	-0.023	-0.405
LNDE					1	-0.168	0.916	-0.167	-0.110	-0.155	-0.293	-0.204	-0.258	0.142	0.678	0.047	0.447
LNDEBTR						1	-0.278	0.108	0.304	0.181	0.469	0.205	0.243	0.093	-0.288	0.143	0.261
LNDTA							1	-0.088	-0.125	-0.148	-0.322	-0.125	-0.160	0.086	0.550	0.018	0.157
LNEARN								1	0.039	-0.044	0.488	0.841	0.609	0.006	-0.109	0.045	0.001
LNINV									1	-0.117	0.088	0.051	0.056	0.000	-0.180	0.134	-0.010
LNQR										1	-0.020	0.012	0.037	-0.110	-0.154	-0.053	-0.318
LNROCE											1	0.555	0.867	0.012	-0.384	0.030	0.255
LNROI												1	0.684	0.016	-0.174	0.063	0.031
LNROTA													1	-0.033	-0.224	0.043	-0.003
SQRTSUBS														1	0.152	0.390	0.168
LTLBTA															1	0.030	0.555
SIC																1	0.039
TLBTA																	1

Table 8.3.B: Spearman correlation matrix for total sample

Variable	*LNAFEE*	*LNNAFEE*	*LNSALES*	*LNCR*	*LNDE*	*LNDEBTR*	*LNDTA*	*LNEARN*	*LNINV*	*LNQR*	*LNROCE*	*LNROI*	*LNROTA*	*SQRTSUBS*	*LTLBTA*	*SIC*	*TLBTA*
LNAFEE	1	0.760	0.879	-0.068	0.125	0.118	0.040	0.107	-0.001	-0.047	0.115	0.067	0.075	0.649	0.311	0.410	0.259
LNNAFEE		1	0.703	-0.077	0.163	0.014	0.085	0.027	-0.065	-0.030	0.006	0.008	-0.010	0.475	0.275	0.257	0.233
LNSALES			1	-0.078	0.112	0.074	0.041	0.147	0.057	-0.115	0.124	0.098	0.098	0.578	0.272	0.367	0.235
LNCR				1	-0.202	0.033	-0.115	0.035	0.464	0.675	-0.053	0.056	0.081	-0.105	-0.189	0.004	-0.399
LNDE					1	-0.225	0.902	-0.227	-0.169	-0.176	-0.367	-0.254	-0.332	0.125	0.874	0.025	0.477
LNDEBTR						1	-0.386	0.177	0.191	0.251	0.473	0.193	0.233	0.075	-0.291	0.071	0.404
LNDTA							1	-0.182	-0.198	-0.161	-0.421	-0.208	-0.287	0.061	0.894	-0.014	0.178
LNEARN								1	-0.011	0.072	0.727	0.846	0.832	0.018	-0.165	0.031	-0.036
LNINV									1	-0.154	0.035	-0.051	-0.022	0.005	-0.213	0.082	0.040
LNQR										1	0.112	0.121	0.171	-0.109	-0.204	-0.055	-0.254
LNROCE											1	0.685	0.884	0.051	-0.345	0.006	0.200
LNROI												1	0.787	-0.002	-0.193	0.019	-0.059
LNROTA													1	0.014	-0.234	0.039	-0.080
SQRTSUBS														1	0.235	0.374	0.231
LTLBTA															1	0.125	0.369
SIC																1	0.100
TLBTA																	1

With the regression analysis specified in terms of dependent and independent variables, the sample deemed adequate for the objectives of the study and the assumptions assessed for the individual variables. The estimation of the "basic" regression model and assessment of overall model fit now proceeds.

The results of the "basic" regression model for the total sample are presented in the following subsection, as well as other advanced diagnostic procedures such as residuals analysis and identification of influential observations. The regression results concerning the specific hypotheses of this study are discussed in the next chapter.

8.4. Estimating the "basic" regression model for the total sample

This section replicates the regression model used in prior research. Independent variables found to be significant in previous studies will be entered in the audit fee model. This represents the "basic" regression model. On this basic model, the "new" independent variables will be added in the next chapter where the hypotheses of this study will be tested.

After the regression model has been estimated, the overall relationship of the dependent variable with the independent variables will be assessed. Finally, the observations will be examined to determine whether any observation should be deemed influential. Each of these issues are discussed in the following paragraphs.

The basic regression audit fee model[6] presented below will be estimated in this section:

$$\ln AFEE = b_1 + b_2\mathrm{AGECOMP} + b_3\mathrm{AUDQN} + b_4\mathrm{BIG6} + b_5\mathrm{BUSY} + b_6\mathrm{GRTLONDN} + b_7\ln CR + b_8\ln DE + b_9\ln DEBTR + b_{10}\ln EARN + b_{11}\ln INV + b_{12}\ln NAFEE + b_{13}\ln QR + b_{14}\ln ROCE + b_{15}\ln ROI + b_{16}\ln SALES + b_{17}\mathrm{LTLBTA} + b_{18}\mathrm{NENGLND} + b_{19}\mathrm{SIC} + b_{20}\mathrm{SUBS}^{0.5} + \mathrm{Error}$$

[6] The independent variable LOSS has been deleted from the analysis due to the SPSS error message warning that the LOSS variable appears to be a constant of the AFEE.

The results of the basic regression model for the total sample appear as shown in Table 8.4.A below.

$$\ln AFEE = b_1 + b_2\text{AGECOMP} + b_3\text{AUDQN} + b_4\text{BIG6} + b_5\text{BUSY} + b_6\text{GRTLONDN} + b_7\ln CR + b_8\ln DE + b_9\ln DEBTR + b_{10}\ln EARN + b_{11}\ln INV + b_{12}\ln NAFEE + b_{13}\ln QR + b_{14}\ln ROCE + b_{15}\ln ROI + b_{16}\ln SALES + b_{17}\text{LTLBTA} + b_{18}\text{NENGLND} + b_{19}\text{SIC} + b_{20}\text{SUBS}^{0.5} + \text{Error}$$

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
0.924	0.854	0.850	0.4758	268.075	0.000

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-2.022	0.210		-9.619	0.000		
AGECOMP	-0.001	0.041	0.000	-0.017	0.987	0.871	1.148
AUDQN	0.168	0.173	0.013	0.973	0.331	0.957	1.045
BIG6	0.088	0.041	0.030	2.126	0.034	0.859	1.164
BUSY	0.075	0.037	0.027	2.037	0.042	0.946	1.057
GRTLONDN	0.228	0.034	0.092	6.709	0.000	0.892	1.121
LNCR	-0.046	0.061	-0.019	-0.748	0.455	0.265	3.769
LNDE	-0.066	0.015	-0.094	-4.410	0.000	0.368	2.714
LNDEBTR	0.041	0.021	0.041	1.936	0.053	0.375	2.669
LNEARN	0.052	0.032	0.037	1.602	0.110	0.311	3.216
LNINV	0.041	0.020	0.048	2.038	0.042	0.305	3.279
LNNAFEE	0.212	0.017	0.242	12.312	0.000	0.434	2.303
LNQR	0.212	0.052	0.102	4.062	0.000	0.263	3.797
LNROCE	0.063	0.029	0.044	2.164	0.031	0.408	2.449
LNROI	-0.059	0.026	-0.057	-2.264	0.024	0.266	3.764
LNSALES	0.422	0.015	0.572	27.372	0.000	0.383	2.610
LTLBTA	1.438	0.212	0.170	6.794	0.000	0.268	3.732
NENGLD	-0.249	0.090	-0.038	-2.762	0.006	0.902	1.109
SIC	0.072	0.013	0.078	5.321	0.000	0.770	1.298
SQRTSUBS	0.074	0.012	0.101	6.080	0.000	0.605	1.653

Dependent Variable: LNAFEE

Table 8.4.A: Results of the "basic" multiple regression model

The basic regression model procedure for the total sample provides support for the descriptive validity of the variables explaining variation in the level of external audit fees. The model explains 85.4% of the variability in external audit fees (R Square equals 0.854) and, hence, the prediction single line fits the data remarkably well[7].

[7] Prior studies have reported similar figures for R^2.

16 (out of 20) of the individual coefficients are highly significant (p value < 0.10) and in the hypothesised direction with very low standard error of the estimate[8]. The F statistic is statistically significant ($p < 0.001$), indicating that there is a linear relationship between the independent and dependent variables and that the regression model allows us to explain the dependent variable at greater than chance level.

All variables controlling for size and complexity of auditee operations (i.e., lnDEBTR, lnINV, lnSALES, SIC and $SUBS^{0.5}$) are positive and highly significant (p value < 0.050) and in the hypothesised direction (i.e., a positive effect in audit fees).

Three of the six variables controlling for different constructs of the profitability and financial distress of the auditee (i.e., lnROCE, lnROI, lnDE) are highly significant ($p < 0.031$), but lnROCE and lnDE are not in the hypothesised direction. ROCE is positive indicating higher audit fees for higher returns, and DE is negative indicating lower audit fees for higher long-term debt to equity percentage. Both these directions in the sign cannot be explained given the fact that the auditor can be held jointly and severally liable for defective or misleading financial statements. If the client is insolvent, than all losses incurred by a third party as a result of relying on the defective financial statements may be sought from the auditor. Both ROCE and DE measure the degree of auditee's financial distress and, therefore, we would expect to see a different direction. The classification variable controlling for type of audit opinion (AUDQN) is not significant ($p = 0.331$) but in the hypothesised direction[9]. The variable EARN is positive (i.e. not in the hypothesised direction) and significant at only 11% level ($p = 0.110$).

The variable measuring the effect of the gearing level (LTLBTA) on external audit fees is highly significant ($p < 0.001$) and in the hypothesised direction (positive) for the total sample.

[8] The standard error of the estimate (SEE) reflects the average prediction error for the regression model. Our basic regression model SEE is near to zero, which means that there is nearly no prediction error and the model performs strikingly well.
[9] There are only 44 observations on auditors' clients with a qualified report in the sample.

One of the two variables controlling for the level of auditee's liquidity (QR) is highly significant ($p < 0.001$) but not in the hypothesised direction for the full sample. The coefficient of the quick ratio was expected to be negative indicating lower audit fees for higher ratio. An explanation that can be offered for this difference in the sign of the QR direction, is that a low quick ratio may not necessarily be a bad sign for a company with a large reserve of untapped borrowing power. Hence, a low QR may not mean that higher audit fees are not unavoidable. The CR variable is negative as expected but not significant ($p = 0.455$).

The variable AGECOMP is included in the model to control for the auditee risk of failing. Since a 10-year old or younger company has greater chances to fail (Brinn *et al*, 1994), it is hypothesised that those companies incorporated for less than 10 years will experience higher audit fees than companies whose business life appears to be more than 10 years. The coefficient is in the hypothesised direction (negative) but not statistically significant ($p = 0.987$). Companies, therefore, incorporated for more than 10 years have less chances to fail and this is reflected in the audit fees.

The variable BUSY is included in the basic regression model to control for peak audit pricing. Since 31st December or 31st March are the predominant fiscal year-ends[10], it is hypothesised that audits of clients with non-December/non-March year-ends will have lower audit costs than audits of clients whose year-ends coincide with the busy season for audit firms. The coefficient is significant and in the hypothesised direction (positive), as expected, indicating that December/March year-end companies pay higher audit fees than companies with year-ends that do not coincide with the audit firms high workload.

Two of the eleven variables measuring the effect of auditee's geographical location on external audit fees found to be statistically significant ($p < 0.006$). Companies in London area are paying a higher premium (as expected) whereas companies situated in North England are charged lower audit fees probably awarded for being in an area

[10] The UK tax year-ends are on 31st March making this a common closing date for UK companies. In our dataset, 22.8% of our sample companies have 31st March fiscal year-ends, and 37.6% have 31st December year-ends.

outside London. Further, the other geographical location categorical variables included in the model were not significant.

Having selected the independent and dependent variables, assessed the individual variables for meeting the assumptions of regression, and applied the appropriate remedies where necessary, and also estimating the basic regression model, we turn now into evaluating the basic regression model for the assumptions of the regression analysis.

8.4.1. Evaluating the model for the assumptions of the regression analysis

In this section we discuss testing for the assumptions about the relationships between the dependent and independent variables that affect the statistical procedure used for multiple regression. In particular, two basic issues are addressed: (1) meeting the assumptions underlying regression, and (2) identifying the influential data points.

8.4.1.1. Testing the assumptions of multivariate analysis

The assumptions to examine are linearity, homoscedasticity, and normality. The principal measure used in evaluating the regression model is the residual - the difference between the actual dependent variable value and its predicted value.

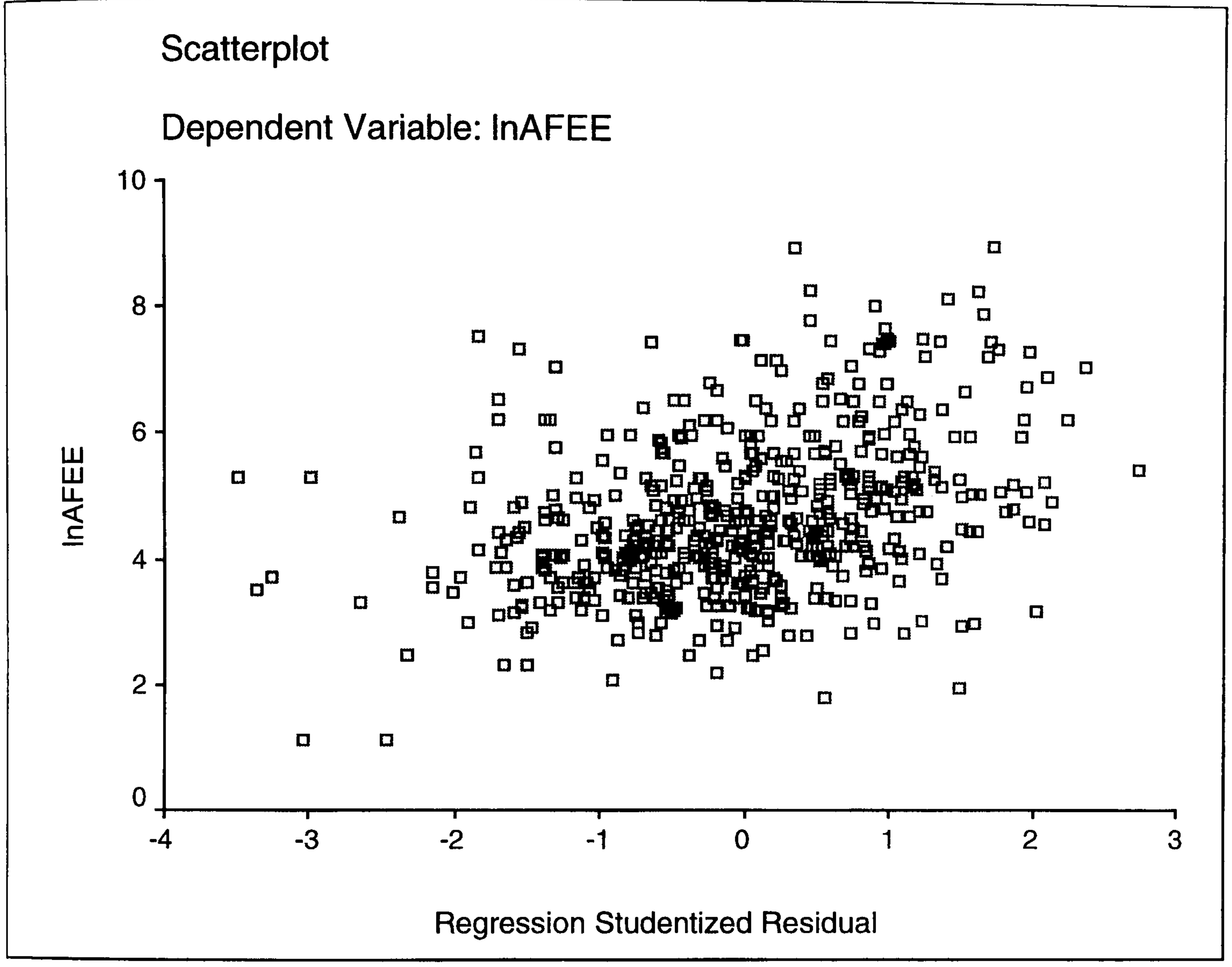
Homoscedasticity

This assumption deals with the constancy of the residuals across values of the independent variables. Our analysis is through examination of the residuals (Figure 8.4.1.1.A); plotting the residuals (studentised) against the predicted dependent values shows no pattern of increasing or decreasing residuals. This finding indicates homoscedasticity in the regression model.

Linearity

This assumption will be assessed again through an analysis of residuals and partial regression plots. Figure 8.4.1.1.A does not exhibit any non-linear pattern to the residuals, thus ensuring that the overall regression model is linear. Using the partial regression plots (see Appendix III), we see that the relationships for most of the independent variables are quite well defined, thus they have strong and significant

Figure 8.4.1.1.A: Analysis of studentised residuals

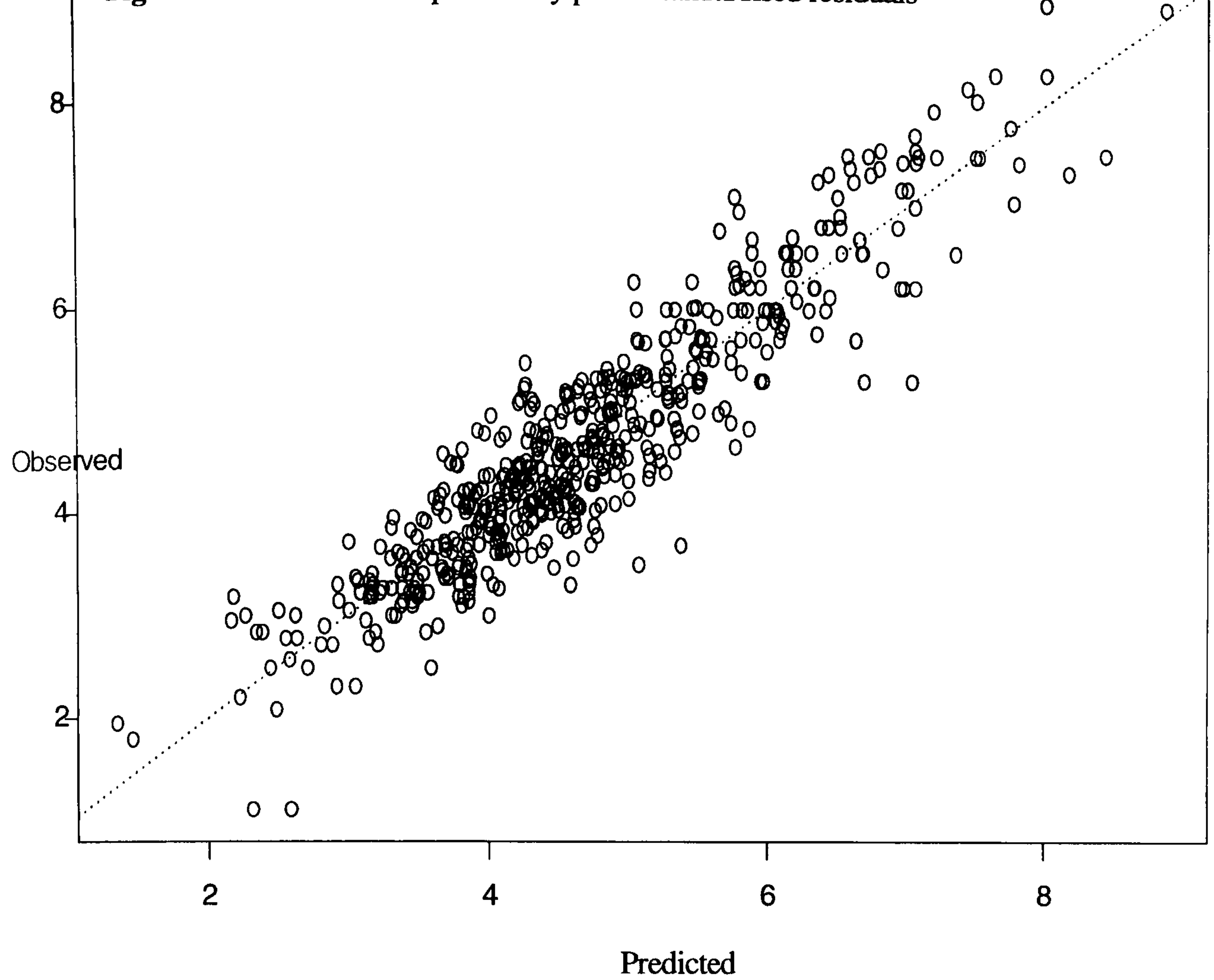


effects in the regression model. Variables such as AGECOMP and CR are less defined, both in slope and scatter of the points, thus explaining its lesser effect in the model (evidenced by smaller coefficient, beta value, and significance level). For all independent variables, no non-linear pattern is shown, thus meeting the assumption of linearity for each independent variable.

Normality

The final assumption we will check is normality of the error term of the regression model with a visual examination of the normal probability plots of the residuals. As shown in Figure 8.4.1.1.B, the values fall along the diagonal with no substantial or systematic departures; the residuals are considered to represent a normal distribution. The regression model, therefore, is found to meet the assumption of normality.

Figure 8.4.1.1.B: Normal probability plots: standardised residuals



8.4.1.2. Identifying outliers as influential observations

For our final analysis, we will identify any observations that are influential (having a disproportionate impact on the regression analysis) and assess their potential impact on the regression results.

Several diagnostic statistics have been employed to assist us identifying outliers, leverage points, and influential observations. These procedures include analysis of residuals (standardised, studentised, and studentised deleted residuals), the hat matrix and Mahalanobis distance statistic, and finally, Cook's distance, COVRATIO and standardised DFFIT statistics[11]. Across all the measures, seven observations have emerged as potentially negative influential points. These observations were consistently identified by all diagnostic tests performed and are deemed to be the cases with the most impact on improving the basic regression model.

[11] For a detailed explanation of these diagnostic tests, see Hair *et al* (1998) and Neter *et al* (1983).

However, after a closely examination of the data, it is ascertained that these observations are not unrepresentative of the general population (to justify elimination), but simply represent an unlikely event. As a result, our decision is not to discard them from the estimation of the regression model.

8.4.2. The nature of auditor effects

Several prior studies, as Chapter III shows, have provided evidence on inter-auditor fee differences generally concluding that the Big-Six auditors as a group receive higher than expected audit fees relative to other auditors (e.g., Palmrose, 1986a; Francis, 1984; Francis and Simon, 1987; Chan *et al*, 1993). The intra-Big Six audit fee differences have also been investigated suggesting that specific large accountancy firms enjoy audit fee premiums (or discounts) in different countries and periods (e.g., Simunic, 1980; Firth, 1985 & 1997a; Simon, 1995; Moizer, 1997).

The approach taken in this study, and as the Table 8.4.A with the regression reports shows, is to classify the audit firms into two distinct groups, as follows:

1. Non-Big Six firms (constant-intercept)
2. Big-Six firms (BIG6 = 1)

As developed in Chapters III and VI, this approach involves a comparison of the prices paid to Big-Six firms relative to other auditors in the UK audit market. However, within these two auditor groups, firms may not be homogeneous (as suggested by prior research); in other words, within these group of auditing firms only certain firms may receive premium (or discounted) audit fees. As a test for homogeneity of the Big-Six firms, therefore, the number of observations, and the mean and standard deviation of the dependent variable, *LnAFEE*, for each individual auditor as well as for the non-Big Six firms as a group (for purposes of comparison), are shown in the Table 8.4.2.A below.

Taking the Big-Six firms as a group, the differences among the means of the dependent variable for the individual firms are not statistically significant at the 0.05

Table 8.4.2.A: Prices charged by various auditors[12]

	Natural Logarithm of Audit fees		No of
Auditor	Mean	Std. Dev.	Observations
CL	4.71	1.45	193
PW	4.70	1.44	143
KPMG	4.64	1.35	250
EY	4.60	1.49	139
TR	4.36	1.24	131
AA	4.30	1.22	69
Non-Big Six	3.54	1.16	313

level in an one-way analysis of variance (F = 0.984)[13]. In other words, there is no large difference between the means for any individual firm in the Table 8.4.2.A (that is, all means are hypothesised to be equal), thus in the regression analyses reported in Table 8.4.A (and subsequently in the following chapter), no audit firm is separated from the other five dominant firms. On this basis, individual audit firm effects on the dependent variable are considered to be unlikely and there is no reason for modifying the model.

[12] The firm effect is only approximated in the Table 8.4.2.A, since the means of the dependent variable, *LnAFEE*, reported in the table are not controlled for any differences in the average values of the other explanatory variables across auditors.

[13] The same holds for the non-Big Six firms (the table with the number of observations, mean and standard deviation of the dependent variable, *LnAFEE*, for each individual non-Big Six auditor is not shown); i.e., the differences among the means for the individual non-Big Six firms are not statistically significant at the 0.05 level in an one-way analysis of variance (F = 1.380).

CHAPTER IX

HYPOTHESES TESTING, ANALYSIS AND RESULTS

Chapter VII explained the reason behind the partition of the sample into small and large companies. It also explained why the cut-off auditee size is taken to be £251 million. This chapter investigates whether the alumni effect is reflected on audit prices. It does that by testing the hypotheses, developed in Chapter VI, in the large companies segment (section 9.1) and the small client segment (section 9.2) of the UK audit market.

9.1. Hypotheses tested in the large companies segment of the market

The hypotheses developed in Chapter VI are restated in the following paragraphs and tested. Hypothesis 1 which is tested in the large clients sub-sample (i.e., a sub-sample of observations on UK listed companies with sales greater than or equal to £251 million) was stated as follows:

H1: for the large companies sub-sample, there will be no differential pricing *of audit services between Big Six and non-Big Six accountancy firms*

Table 9.1.A presents the results of the model of the audit fee in the large clients sub-sample with a dummy variable on the Big-Six audit firms after controlling for the variables hypothesised to affect the level of audit fees discussed in Chapter VI. Hypothesis 1 could not be rejected indicating no audit fee difference in this sample. In other words, the coefficient of BIG6 is positive but insignificant indicating no differential pricing of audit services between Big-Six and non-Big Six audit firms. This result is consistent with the results of prior studies (e.g., Simunic, 1980; Palmore, 1986) which observed no audit fee difference in large companies sub-sample. It is possible that due to the small number of companies audited by the non-Big Six firms with sales greater than £251 million (just eighteen large companies, see Table 7.1.A of Chapter VII), an audit fee difference could not be detected. On the other hand, economies of scale accruing to large accountancy firms in the audits of large clients could offset higher audit fee charges due to a differentiated product. As a result, an insignificant audit firm size variable is observed in the large clients sub-sample.

The overall descriptive validity of the model is maintained with an RSquare of 0.761. The *F* statistic is statistically significant indicating meaningful relationships between the dependent and independent variables. Further, the VIF and tolerance values are in acceptable levels. No VIF value exceeds 10.0 and the tolerance values are quite high indicating little collinearity. The other assumptions of the multivariate analysis are also met[1].

Most of the individual coefficients of the independent variables are highly significant and in the hypothesised direction. The variables controlling for the size and complexity of the large companies' operations (i.e. SALES, SUBS, SIC, DEBTR, INV) are significant. Apart from the variable INV these are all in the hypothesised direction. The financial distress and profitability variables DE and ROCE are significant and not in the hypothesised direction. ROCE and DE coefficients, as in the model for the total sample described in Chapter VIII, should have a different direction as the auditor can be held jointly and severally liable for misleading financial

[1] The model appears to be well specified and the tests described in Chapter VIII indicate no violations of the assumptions of the regression analysis. See section 8.4.1.

statements. AUDQN variable is not significant but in the hypothesised direction. The variable controlling for the level of gearing, LTLBTA, is found positive and significant. The CR variable is significant but not in the hypothesised direction, again

$$\text{[H1]}\quad \ln AFEE = b_1 + b_2\text{AGECOMP} + b_3\text{AUDQN} + b_4\text{BIG6} + b_5\text{BUSY} + b_6\text{GRTLONDN} + b_7\ln CR + b_8\ln DE + b_9\ln DEBTR + b_{10}\ln EARN + b_{11}\ln INV + b_{12}\ln ROCE + b_{13}\ln ROI + b_{14}\ln SALES + b_{15}\text{LTLBTA} + b_{16}\text{NENGLND} + b_{17}\text{SIC} + b_{18}\text{SUBS}^{0.5} + \text{Error}$$

Note: QR variable was highly collinear with the CR variable in this sub-sample, and it was deleted from the model above as a result.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
0.872	0.761	0.727	0.5559	22.469	0.000

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-4.457	0.792		-5.629	0.000		
AGECOMP	0.049	0.132	0.017	0.370	0.712	0.804	1.244
AUDQN	0.021	0.405	0.002	0.051	0.959	0.939	1.065
BIG6	**0.166**	**0.164**	**0.043**	**1.010**	**0.314**	**0.945**	**1.058**
BUSY	-0.021	0.126	-0.008	-0.170	0.866	0.888	1.127
GRTLONDN	0.246	0.098	0.115	2.504	0.013	0.830	1.205
LNCR	0.286	0.137	0.132	2.086	0.039	0.437	2.289
LNDE	-0.113	0.043	-0.175	-2.624	0.010	0.392	2.552
LNDEBTR	0.158	0.049	0.171	3.188	0.002	0.604	1.656
LNEARN	0.111	0.102	0.089	1.088	0.278	0.259	3.861
LNINV	-0.067	0.046	-0.090	-1.445	0.151	0.449	2.228
LNROCE	0.192	0.088	0.132	2.178	0.031	0.477	2.096
LNROI	-0.178	0.078	-0.203	-2.289	0.024	0.221	4.532
LNSALES	0.604	0.054	0.593	11.248	0.000	0.627	1.596
LTLBTA	2.139	0.600	0.273	3.564	0.001	0.296	3.375
NENGLD	-0.646	0.273	-0.108	-2.370	0.019	0.845	1.183
SIC	0.160	0.033	0.231	4.918	0.000	0.787	1.270
SQRTSUBS	0.047	0.024	0.092	1.909	0.058	0.745	1.343

Dependent Variable: lnAFEE

Table 9.1.A: Results of the multiple regression model for the large clients sub-sample (236 observations with Sales >= £251mm), Big-Six *vis-á-vis* non-Big Six firms, Hypothesis 1 tested

as in the total sample model described in Chapter VIII. The variable controlling for the age of the company, AGECOMP, is positive and insignificant in this sub-sample indicating that young (less than 10 years) large companies are charged higher audit fees. BUSY is not in the hypothesised direction (but insignificant) indicating that a higher audit fee is not charged for the large clients whose year-end occurs during the auditor peak season. It appears that audit firms are able to spread the workload evenly throughout the year so peak pricing is not a feature in the large segment of the audit market. Finally, London area companies are charged higher audit fees and North England companies pay lower audit fees in this sub-sample (as in the total sample too).

Testing hypothesis 6:

Hypotheses 2 through 5 refer only to the small companies sub-sample and will discussed in the next section of this chapter. Hypothesis 6 was stated in Chapter VI as follows:

> *H6: the pricing of audit services is related to the pricing of non-audit services*

Table 9.1.B provides the model comparing the audit fee charged by the accountancy firms in the large clients sub-sample when non-audit services are provided by the auditor after controlling for other variables hypothesised to also affect the level of audit fees. Hypothesis 6 could not be rejected indicating an audit fee difference due to provision of non-audit services in this sample. In other words, there is a positive relationship between fees paid for audit services and fees paid for non-audit services. This result is consistent with the results of prior studies (e.g., Simunic, 1984; Ezzamel *et al*, 1996). In this study, the premium[2] charged by the accountancy firms for the joint production of audit and other services to large clients is found to be 29.69%. Thus, the result being a significant non-audit fee variable in the large clients sub-sample.

The overall descriptive validity of the model is increased with an RSquare of 0.803. The standard error of the estimate remains very low indicating no prediction error for the model and the *F* statistic is statistically significant indicating that the independent variables are significant explanatory factors of the variation in the dependent variable. Further, the VIF and tolerance values are in acceptable levels. The other assumptions of the multivariate analysis are also met[3].

[2] Because the model used is a Cobb-Douglas production function, the percentage change in audit fees (d) accruing to incumbent auditor is calculated using the formula $C = \ln(1+d)$ where C represents the value of the coefficient for the ALMNFD variable. See also section 3.3.1.1.1 in Chapter III for further discussion.

[3] The model appears to be well specified and the tests described in Chapter VIII indicate no violations of the assumptions of the regression analysis. See section 8.4.1.

None of the coefficients sign of the other independent variables in the model has changed comparing with the model described earlier for the test of hypothesis 1. The reader, therefore, is advised to see the discussion held for the regression model testing the hypothesis 1.

[H6] $\ln AFEE = b_1 + b_2\text{AGECOMP} + b_3\text{AUDQN} + b_4\text{BIG6} + b_5\text{BUSY} + b_6\text{GRTLONDN} + b_7\ln CR + b_8\ln DE + b_9\ln DEBTR + b_{10}\ln EARN + b_{11}\ln INV + b_{12}\ln ROCE + b_{13}\ln ROI + b_{14}\ln SALES + b_{15}\text{LTLBTA} + b_{16}\text{NENGLND} + b_{17}\text{SIC} + b_{18}\text{SUBS}^{0.5} + b_{19}\ln NAFEE + \text{Error}$

Note: QR variable was highly collinear with the CR variable in this sub-sample, and it was deleted from the model above as a result.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
0.896	0.803	0.773	0.5065	26.983	0.000

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-2.969	0.821		-3.619	0.000		
AGECOMP	0.073	0.126	0.026	0.574	0.567	0.785	1.274
AUDQN	0.024	0.374	0.003	0.064	0.949	0.930	1.075
BIG6	0.070	0.159	0.019	0.438	0.662	0.924	1.082
BUSY	-0.094	0.122	-0.034	-0.774	0.441	0.874	1.144
GRTLONDN	0.225	0.095	0.106	2.367	0.020	0.830	1.204
LNCR	0.375	0.129	0.180	2.908	0.004	0.432	2.313
LNDE	-0.053	0.042	-0.083	-1.263	0.209	0.382	2.619
LNDEBTR	0.131	0.047	0.145	2.786	0.006	0.609	1.642
LNEARN	0.005	0.109	0.004	0.049	0.961	0.290	3.446
LNINV	-0.060	0.043	-0.085	-1.387	0.168	0.445	2.248
LNROCE	0.150	0.085	0.105	1.765	0.080	0.470	2.126
LNROI	-0.105	0.075	-0.112	-1.402	0.163	0.259	3.867
LNSALES	0.429	0.061	0.427	7.053	0.000	0.452	2.212
LTLBTA	1.098	0.591	0.143	1.856	0.066	0.277	3.605
NENGLD	-0.566	0.253	-0.100	-2.232	0.027	0.829	1.206
SIC	0.163	0.032	0.236	5.132	0.000	0.780	1.282
SQRTSUBS	0.042	0.024	0.083	1.772	0.079	0.751	1.332
LNNAFEE	**0.260**	**0.052**	**0.303**	**5.055**	**0.000**	**0.460**	**2.176**

Dependent Variable: lnAFEE

Table 9.1.B: Results of the multiple regression model for the large clients sub-sample (236 observations with Sales >= £251mm), Hypothesis 6 tested

Testing hypothesis 7:

Hypothesis 7 was stated in Chapter VI as follows:

H7: for the large companies sub-sample, it makes no difference on audit fees when any director is an ex-employee of the auditor

Table 9.1.C provides the model comparing the audit fee charged to the large clients that have on their board of directors an alumni of their auditor after controlling for the variables hypothesised to affect the level of audit fees discussed in Chapter VI. Hypothesis 7 could not be rejected indicating no audit fee difference in this sample. Although 1 in 6 directors are alumni of their auditors, this association by itself is not translated into different audit pricing. Neither audit firms benefit from outplacing their

[H7] $\ln AFEE = b_1 + b_2\text{AGECOMP} + b_3\text{AUDQN} + b_4\text{BIG6} + b_5\text{BUSY} + b_6\text{GRTLONDN} + b_7\ln CR + b_8\ln DE + b_9\ln DEBTR + b_{10}\ln EARN + b_{11}\ln INV + b_{12}\ln ROCE + b_{13}\ln ROI + b_{14}\ln SALES + b_{15}\text{LTLBTA} + b_{16}\text{NENGLND} + b_{17}\text{SIC} + b_{18}\text{SUBS}^{0.5} + b_{19}\ln NAFEE + b_{20}\text{ALUMNI} + \text{Error}$

Note: QR variable was highly collinear with the CR variable in this sub-sample, and it was deleted from the model above as a result.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
0.888	0.788	0.771	0.4917	45.232	0.000

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-2.916	0.614		-4.748	0.000		
AGECOMP	0.149	0.095	0.054	1.571	0.118	0.779	1.284
AUDQN	-0.179	0.302	-0.019	-0.592	0.554	0.894	1.118
BIG6	0.074	0.117	0.020	0.630	0.529	0.882	1.134
BUSY	-0.032	0.085	-0.012	-0.369	0.712	0.856	1.168
GRTLONDN	0.300	0.068	0.146	4.401	0.000	0.831	1.203
LNCR	0.393	0.095	0.194	4.148	0.000	0.420	2.379
LNDE	-0.072	0.032	-0.120	-2.215	0.028	0.311	3.215
LNDEBTR	0.101	0.035	0.111	2.854	0.005	0.612	1.634
LNEARN	0.043	0.082	0.032	0.521	0.603	0.251	3.991
LNINV	-0.054	0.033	-0.079	-1.660	0.098	0.402	2.489
LNROCE	0.174	0.059	0.134	2.967	0.003	0.450	2.221
LNROI	-0.127	0.061	-0.140	-2.094	0.037	0.206	4.851
LNSALES	0.399	0.046	0.387	8.667	0.000	0.460	2.173
LTLBTA	1.498	0.459	0.200	3.262	0.001	0.243	4.117
NENGLD	-0.595	0.183	-0.108	-3.251	0.001	0.831	1.203
SIC	0.141	0.025	0.200	5.700	0.000	0.742	1.349
SQRTSUBS	0.060	0.019	0.115	3.222	0.001	0.714	1.401
LNNAFEE	0.268	0.040	0.298	6.666	0.000	0.459	2.179
ALUMNI	**-0.008**	**0.088**	**-0.003**	**-0.088**	**0.930**	**0.916**	**1.092**

Dependent Variable: lnAFEE

Table 9.1.C: Results of the multiple regression model for the large clients sub-sample (420 observations with Sales >= £251mm), Hypothesis 7 tested

alumni by receiving higher audit fees nor the large companies benefit from having as directors alumni of their auditor by receiving a discount on audit fees. In other words, alumni of audit firms do not affect (positive or negative) audit fees when they are employed by the auditor clients. Thus, the result being an insignificant variable.

The overall descriptive validity of the model is maintained with an RSquare of 0.788. The *F* statistic is statistically significant indicating that the independent variables are significant explanatory factors of the variation in the dependent variable. Further, the VIF and tolerance values are all in acceptable levels. The other assumptions of the multivariate analysis are also met[4].

Most of the individual coefficients of the independent variables are highly significant and in the hypothesised direction. As in the two previous models, the variables controlling for the size and complexity are significant and positive as expected, with the INV variable in this model only being significant too. The INV variable is negative indicating lower audit fees when the ratio of total year-end stocks to total year-end assets is high. No explanation is provided for this unexpected result. All the other independent variables have the same significance and sign in their coefficients as in the previous models and, therefore, no further analysis is provided here. Only the AUDQN has a different direction in the sign of the coefficient but it is insignificant in this model as well.

Testing hypothesis 8:

Hypothesis 8 was stated in Chapter VI as follows:

> *H8: for the large companies sub-sample, on average it makes no difference on audit fees when a non-executive director is an ex-employee of the auditor*

Table 9.1.D provides the model comparing the audit fee charged to the large clients that have a non-executive director who is an alumni of their auditor after controlling for other variables hypothesised to also affect the level of audit fees. Hypothesis 8 could not be rejected indicating no audit fee difference in this sample. In other words, it makes no difference on audit fees when a non-executive is an alumni of the

[4] *ibid.*

incumbent auditor in the large client segment of the UK audit market. It is possible that due to the small number of non-executive directors in this sub-sample (only 18.70% of directors are non-executives), an audit fee difference could not be detected.

[H8] $\ln AFEE = b_1 + b_2\text{AGECOMP} + b_3\text{AUDQN} + b_4\text{BIG6} + b_5\text{BUSY} + b_6\text{GRTLONDN} + b_7\ln CR + b_8\ln DE + b_9\ln DEBTR + b_{10}\ln EARN + b_{11}\ln INV + b_{12}\ln ROCE + b_{13}\ln ROI + b_{14}\ln SALES + b_{15}\text{LTLBTA} + b_{16}\text{NENGLND} + b_{17}\text{SIC} + b_{18}\text{SUBS}^{0.5} + b_{19}\ln NAFEE + b_{20}\text{ALUMNI} + b_{21}\text{ALMNEXD} + \text{Error}$

Note: QR variable was highly collinear with the CR variable in this sub-sample, and it was deleted from the model above as a result.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
0.888	0.789	0.771	0.4919	42.985	0.000

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-2.931	0.614		-4.771	0.000		
AGECOMP	0.139	0.096	0.050	1.452	0.148	0.770	1.298
AUDQN	-0.170	0.302	-0.018	-0.564	0.573	0.893	1.119
BIG6	0.069	0.117	0.019	0.586	0.558	0.880	1.136
BUSY	-0.034	0.085	-0.013	-0.395	0.694	0.855	1.169
GRTLONDN	0.301	0.068	0.146	4.406	0.000	0.831	1.203
LNCR	0.385	0.095	0.190	4.052	0.000	0.418	2.395
LNDE	-0.071	0.032	-0.119	-2.192	0.029	0.311	3.216
LNDEBTR	0.101	0.035	0.111	2.868	0.005	0.612	1.634
LNEARN	0.046	0.082	0.034	0.556	0.579	0.250	3.996
LNINV	-0.053	0.033	-0.078	-1.636	0.103	0.402	2.491
LNROCE	0.174	0.059	0.134	2.971	0.003	0.450	2.221
LNROI	-0.128	0.061	-0.141	-2.109	0.036	0.206	4.852
LNSALES	0.402	0.046	0.390	8.721	0.000	0.458	2.185
LTLBTA	1.492	0.459	0.200	3.250	0.001	0.243	4.117
NENGLD	-0.592	0.183	-0.107	-3.233	0.001	0.831	1.204
SIC	0.140	0.025	0.199	5.668	0.000	0.741	1.350
SQRTSUBS	0.060	0.019	0.116	3.225	0.001	0.714	1.401
LNNAFEE	0.266	0.040	0.295	6.590	0.000	0.457	2.187
ALUMNI	0.237	0.253	0.086	0.939	0.349	0.110	9.070
ALMNEXD	**-0.273**	**0.264**	**-0.094**	**-1.033**	**0.303**	**0.110**	**9.085**

Dependent Variable: lnAFEE

Table 9.1.D: Results of the multiple regression model for the large clients sub-sample (420 observations with Sales >= £251mm), Hypothesis 8 tested

Nevertheless, the sign of the coefficient is negative which may indicate that the auditor assesses lower levels of inherent risk and charges lower audit fees as a result of higher monitoring and lower agency costs associated with the presence of non-executive directors (Gul *et al*, 1998).

The overall descriptive validity of the model is maintained with an RSquare of 0.789. The standard error of the estimate remains very low indicating no prediction error for the model and the *F* statistic is statistically significant indicating that there is an underlying significant and linear relationship between the dependent and independent variables. Further, the VIF and tolerance values are all in acceptable levels. The other assumptions of the multivariate analysis are also met[5]. The results in the sign and significance of the other independent variables are the same as discussed in the previous models.

Testing hypothesis 9:

Hypothesis 9 provides further evidence on the "alumni effect" and its interaction with those CADRE who are Finance Directors, Chairmen or Chief Executives in the large clients segment of the UK audit market for publicly traded companies. Hypothesis 9 was stated in Chapter VI as follows:

> *H9: for the large companies sub-sample, there is no audit fee difference when the chairman, chief executive or finance director are an alumni of the auditor*

Table 9.1.E provides the model (No 1) comparing the audit fee charged to the large clients that have a finance director, chairman and/or chief executive who is(are) an alumni of their auditor after controlling for the variables hypothesised to affect the level of audit fees discussed in Chapter VI. Hypothesis 9 could not be accepted indicating an audit fee difference in this sample. The human capital investment made by audit firms in training chartered accountants is paid off when their alumni become members of the boards of directors of their clients. This finding, however, is correct only for those chartered accountants who become Finance Directors, Chairmen or Chief Executives in the boards of the clients of their ex-employer (i.e. of the incumbent auditor). This finding does not hold for all alumni of audit firms who become CADRE, as we have seen when we tested the hypothesis 7 earlier in this chapter. Further, the ALMNFD variable is positive (and significant at 0.073 level)

[5] *ibid.*

Table 9.1.E: Results of the multiple regression model for the large clients sub-sample (420 observations with Sales >= £251mm), Hypothesis 9 tested

	Model 1		Model 2	
	B *t* value	p value	B *t* value	p value
(Constant)	-2.940 *-4.809*	0.000	-2.922 *-4.826*	0.000
AGECOMP	0.130 *1.363*	0.174	0.138 *1.462*	0.145
AUDQN	-0.157 *-0.524*	0.601	-0.121 *-0.404*	0.686
BIG6	0.090 *0.771*	0.442	0.119 *1.025*	0.307
BUSY	-0.051 *-0.596*	0.552	-0.061 *-0.721*	0.471
GRTLONDN	0.310 *4.550*	0.000	0.292 *4.308*	0.000
LNCR	0.390 *4.126*	0.000	0.385 *4.104*	0.000
LNDE	-0.068 *-2.101*	0.037	-0.068 *-2.133*	0.034
LNDEBTR	0.097 *2.755*	0.006	0.100 *2.852*	0.005
LNEARN	0.040 *0.493*	0.623	0.036 *0.447*	0.655
LNINV	-0.052 *-1.592*	0.113	-0.048 *-1.501*	0.135
LNROCE	0.174 *2.995*	0.003	0.180 *3.120*	0.002
LNROI	-0.124 *-2.049*	0.042	-0.127 *-2.115*	0.035
LNSALES	0.398 *8.671*	0.000	0.397 *8.727*	0.000
LTLBTA	1.465 *3.203*	0.002	1.490 *3.289*	0.001
NENGLD	-0.603 *-3.308*	0.001	-0.590 *-3.266*	0.001
SIC	0.139 *5.642*	0.000	0.138 *5.656*	0.000
SQRTSUBS	0.060 *3.260*	0.001	0.060 *3.266*	0.001
LNNAFEE	0.277 *6.813*	0.000	0.283 *7.015*	0.000
ALUMNI	0.238 *0.947*	0.345	0.166 *0.659*	0.510
ALMNEXD	-0.381 *-1.413*	0.159	-0.355 *-1.330*	0.185
ALMNFD	**0.314** ***1.802***	**0.073**	**0.460** ***2.506***	**0.013**
FD	-----	-----	**-0.158** ***-2.342***	**0.020**

Dependent Variable: lnAFEE

Figures in *italics* are *t*-statistics.

Model 1 - H9

$\ln AFEE = b_1 + b_2AGECOMP + b_3AUDQN + b_4BIG6 + b_5BUSY + b_6GRTLONDN + b_7\ln CR + b_8\ln DE + b_9\ln DEBTR + b_{10}\ln EARN + b_{11}\ln INV + b_{12}\ln ROCE + b_{13}\ln ROI + b_{14}\ln SALES + b_{15}LTLBTA + b_{16}NENGLND + b_{17}SIC + b_{18}SUBS^{0.5} + b_{19}\ln NAFEE + b_{20}ALUMNI + b_{21}ALMNEXD + b_{22}ALMNFD + Error$

R	0.890
R Square	0.791
Adjusted R Square	0.772
Std. Error of the Estimate	0.4901
F	41.364
Sig.	< 0.001

Model 2 - H9

$\ln AFEE = b_1 + b_2AGECOMP + b_3AUDQN + b_4BIG6 + b_5BUSY + b_6GRTLONDN + b_7\ln CR + b_8\ln DE + b_9\ln DEBTR + b_{10}\ln EARN + b_{11}\ln INV + b_{12}\ln ROCE + b_{13}\ln ROI + b_{14}\ln SALES + b_{15}LTLBTA + b_{16}NENGLND + b_{17}SIC + b_{18}SUBS^{0.5} + b_{19}\ln NAFEE + b_{20}ALUMNI + b_{21}ALMNEXD + b_{22}ALMNFD + b_{23}FD + Error$

R	0.893
R Square	0.797
Adjusted R Square	0.777
Std. Error of the Estimate	0.4846
F	40.680
Sig.	< 0.001

indicating that when the Finance Director, Chairman or Chief Executive is/are alumni of the incumbent auditor then this relationship leads to higher audit fees, i.e. the auditor earns a 36.89% premium. Thus, the result being a significant (given the increase in R^2) moderator (interaction) effect and a significant alumni variable.

The overall descriptive validity of the model is maintained with an RSquare of 0.791. The standard error of the estimate remains very low indicating no prediction error for the model and the F statistic is statistically significant indicating that there is an underlying significant and linear relationship between the dependent and independent variables. Further, the VIF and tolerance values are all in acceptable levels. The other assumptions of the multivariate analysis are also met[6]. The results in the sign and significance of the other independent variables are the same as discussed in the previous models.

A very interesting finding comes from the model 2 in Table 9.1.E. Model 2 extends the analysis of the "alumni effect" and considers whether there is any differential pricing of audit services when <u>all</u> Finance Directors, Chairmen and Chief Executives enter the equation, irrespective the fact of being an alumni of the existing firm of auditors (as in model 1). This independent categorical variable in model 2 (i.e. the FD variable) is significant at the 0.020 level and negative indicating that large companies pay lower audit fees when all CADRE who are Finance Directors, Chairmen or Chief Executives are considered (i.e. a 17.12% discount is offered). This result is very interesting. It implies that when the Finance Directors, Chairmen or Chief Executives have not qualified with the incumbent auditor but with another accountancy firm then this relationship leads to lower audit fees. However, when the Finance Directors, Chairmen or Chief Executives have trained and qualified with the auditor then this relationship drives the audit fees higher (see model 1 in Table 9.1.E). No other independent variable in model 2 differs from the previous models to require further discussion here.

Testing hypothesis 10:

Hypothesis 10 provides further evidence on the "alumni effect" and its influence with regard to the age of the CADRE. Hypothesis 10 was stated in Chapter VI as follows:

H10: for the large companies sub-sample, the audit fee charged will not be lower or higher as the CADRE becomes older

Table 9.1.F provides the model comparing the audit fee charged to the large clients that have older CADRE on their boards after controlling for other variables hypothesised to also affect the level of audit fees. Hypothesis 10 could not be rejected indicating no audit fee difference in this sample. In other words, the coefficient of AGECADRE is positive but insignificant indicating no differential pricing of audit services while the CADRE becomes older. As a result, an insignificant alumni variable is observed in the large clients sub-sample.

The overall descriptive validity of the model is maintained with an RSquare of 0.798. The standard error of the estimate remains very low indicating no prediction error for the model and the *F* statistic is statistically significant indicating meaningful relationships between the dependent and independent variables. Further, the VIF and tolerance values are in acceptable levels. The other assumptions of the multivariate analysis are also met[7].

None of the coefficients sign of the other independent variables in the model has changed comparing with the models described earlier for the test of hypotheses. The reader, therefore, is advised to see the discussion held for the regression model testing the hypothesis 1.

Testing hypothesis 11:

Hypothesis 11 provides further evidence on the "alumni effect" and its interaction with the fees paid for the provision of non-audit services. Hypothesis 11 was stated in Chapter VI as follows:

H11: there is no different relationship between audit and non-audit fee because of existence of auditor alumni

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[6] *ibid.*

$$\ln AFEE = b_1 + b_2AGECOMP + b_3AUDQN + b_4BIG6 + b_5BUSY + b_6GRTLONDN + b_7\ln CR + b_8\ln DE + b_9\ln DEBTR + b_{10}\ln EARN + b_{11}\ln INV + b_{12}\ln ROCE + b_{13}\ln ROI + b_{14}\ln SALES + b_{15}LTLBTA + b_{16}NENGLND + b_{17}SIC + b_{18}SUBS^{0.5} + b_{19}\ln NAFEE + b_{20}ALUMNI + b_{21}ALMNEXD + b_{22}ALMNFD + b_{23}FD + b_{24}AGECADRE + Error \quad [H10]$$

Note: QR variable was highly collinear with the CR variable in this sub-sample, and it was deleted from the model above as a result.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
0.893	0.798	0.777	0.4847	38.933	0.000

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-3.041	0.618		-4.917	0.000		
AGECOMP	0.133	0.095	0.048	1.401	0.162	0.764	1.309
AUDQN	-0.141	0.299	-0.015	-0.471	0.638	0.886	1.129
BIG6	0.124	0.117	0.034	1.061	0.290	0.860	1.163
BUSY	-0.060	0.085	-0.023	-0.712	0.477	0.842	1.187
GRTLONDN	0.295	0.068	0.144	4.345	0.000	0.815	1.228
LNCR	0.378	0.094	0.186	4.013	0.000	0.414	2.414
LNDE	-0.070	0.032	-0.117	-2.180	0.030	0.309	3.235
LNDEBTR	0.105	0.035	0.115	2.960	0.003	0.595	1.680
LNEARN	0.045	0.081	0.033	0.547	0.585	0.247	4.049
LNINV	-0.049	0.032	-0.071	-1.512	0.132	0.400	2.498
LNROCE	0.179	0.058	0.138	3.100	0.002	0.449	2.226
LNROI	-0.133	0.060	-0.146	-2.203	0.029	0.203	4.916
LNSALES	0.398	0.046	0.386	8.739	0.000	0.456	2.191
LTLBTA	1.495	0.453	0.200	3.300	0.001	0.242	4.125
NENGLD	-0.597	0.181	-0.108	-3.300	0.001	0.828	1.208
SIC	0.136	0.024	0.194	5.571	0.000	0.736	1.358
SQRTSUBS	0.057	0.018	0.111	3.113	0.002	0.702	1.425
LNNAFEE	0.280	0.040	0.311	6.952	0.000	0.444	2.250
ALUMNI	0.162	0.251	0.058	0.645	0.520	0.109	9.213
ALMNEXD	-0.332	0.268	-0.115	-1.239	0.217	0.104	9.652
ALMNFD	0.453	0.184	0.098	2.466	0.014	0.565	1.769
FD	-0.151	0.068	-0.073	-2.221	0.027	0.833	1.200
AGECADRE	**0.003**	**0.003**	**0.030**	**0.949**	**0.344**	**0.871**	**1.148**

Dependent Variable: lnAFEE

Table 9.1.F: Results of the multiple regression model for the large clients sub-sample (420 observations with Sales >= £251mm), Hypothesis 10 tested

Table 9.1.G provides the model comparing the audit fee charged when there is purchase of non-audit services as well as an auditor alumni on the board of directors in the large clients sub-sample after controlling for other variables hypothesised to also affect the level of audit fees. Hypothesis 11 could not be rejected indicating no

[7] *ibid.*

audit fee difference in this sample. In other words, the coefficient of ALMNNAFE is negative but insignificant indicating no differential pricing of audit services when there is a provision of non-audit services by the auditor and simultaneously there is an alumni of the auditor on the board. As a result, an insignificant variable is observed in the large clients sub-sample.

$$\begin{aligned}[H11]\quad &\ln AFEE = b_1 + b_2AGECOMP + b_3AUDQN + b_4BIG6 + b_5BUSY + \\ &b_6GRTLONDN + b_7\ln CR + b_8\ln DE + b_9\ln DEBTR + b_{10}\ln EARN + b_{11}\ln INV + \\ &b_{12}\ln ROCE + b_{13}\ln ROI + b_{14}\ln SALES + b_{15}LTLBTA + b_{16}NENGLND + b_{17}SIC \\ &+ b_{18}SUBS^{0.5} + b_{19}\ln NAFEE + b_{20}ALUMNI + b_{21}ALMNEXD + b_{22}ALMNFD \\ &+ b_{23}FD + b_{24}AGECADRE + b_{25}ALMNNAFE + Error\end{aligned}$$

Note: QR variable was highly collinear with the CR variable in this sub-sample, and it was deleted from the model above as a result.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
0.894	0.800	0.779	0.4831	37.661	0.000

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-3.195	0.624		-5.119	0.000		
AGECOMP	0.145	0.095	0.052	1.535	0.126	0.759	1.318
AUDQN	-0.140	0.298	-0.015	-0.471	0.638	0.886	1.129
BIG6	0.136	0.117	0.037	1.164	0.245	0.856	1.168
BUSY	-0.064	0.085	-0.024	-0.753	0.452	0.842	1.188
GRTLONDN	0.302	0.068	0.147	4.456	0.000	0.811	1.233
LNCR	0.374	0.094	0.185	3.992	0.000	0.414	2.415
LNDE	-0.068	0.032	-0.113	-2.111	0.036	0.308	3.242
LNDEBTR	0.094	0.036	0.103	2.632	0.009	0.575	1.738
LNEARN	0.048	0.081	0.036	0.593	0.554	0.247	4.053
LNINV	-0.041	0.032	-0.061	-1.277	0.203	0.392	2.549
LNROCE	0.184	0.058	0.142	3.190	0.002	0.448	2.233
LNROI	-0.136	0.060	-0.149	-2.258	0.025	0.203	4.921
LNSALES	0.399	0.045	0.387	8.783	0.000	0.456	2.191
LTLBTA	1.477	0.452	0.198	3.270	0.001	0.242	4.128
NENGLD	-0.608	0.180	-0.110	-3.370	0.001	0.826	1.210
SIC	0.136	0.024	0.194	5.606	0.000	0.736	1.358
SQRTSUBS	0.057	0.018	0.110	3.103	0.002	0.701	1.426
LNNAFEE	0.299	0.042	0.332	7.139	0.000	0.410	2.438
ALUMNI	0.215	0.253	0.078	0.852	0.395	0.107	9.380
ALMNEXD	-0.317	0.267	-0.110	-1.186	0.237	0.103	9.664
ALMNFD	0.490	0.185	0.106	2.654	0.009	0.556	1.798
FD	-0.147	0.068	-0.071	-2.168	0.031	0.832	1.202
AGECADRE	0.003	0.003	0.034	1.050	0.295	0.868	1.152
ALMNNAFE	**-0.0001**	**0.0001**	**-0.060**	**-1.580**	**0.115**	**0.622**	**1.609**

Dependent Variable: lnAFEE

Table 9.1.G: Results of the multiple regression model for the large clients sub-sample (420 observations with Sales >= £251mm), Hypothesis 11 tested

The overall descriptive validity of the model is maintained with an RSquare of 0.800. The F statistic is statistically significant indicating meaningful relationships between the dependent and independent variables. Further, the VIF and tolerance values are in acceptable levels. The other assumptions of the multivariate analysis are also met[8]. The results in the sign and significance of the other independent variables are the same as discussed in the previous models.

9.2. Hypotheses tested in the small companies segment of the market

Hypothesis 1 is tested only in the large client sub-sample and was discussed in the preceding section 9.1. Hypotheses 2 through 5 are tested only in the small clients sub-sample (i.e., a sub-sample of observations on UK listed companies with sales less than £251 million).

Testing hypothesis 2: (Big Six *vis-à-vis* non-Big Six firms)

Hypothesis 2 was stated in Chapter VI as follows:

> *H2: for the small companies sub-sample, the Big Six charge lower audit fee than (or equal to) the non-Big Six firms.*

Table 9.2.A provides the model comparing the audit fee charged by the Big-Six audit firms to that of non-Big Six firms in the small companies sub-sample after controlling for the variables hypothesised to affect the level of audit fees discussed in Chapter VI[9]. Hypothesis 2 was rejected. The audit firm size coefficient (coded "1" for Big-Six and "0" for non-Big Six firm) is positive and significant at less than 0.001 level indicating higher audit fees charged by the Big-Six than non-Big Six firms in the small client market. That is, the audit fee premium earned by the Big-Six auditing firms in this study is 22%. This result is consistent with the existence of a Big-Six auditor premium being observed in other studies (Francis, 1984; Chan *et al*, 1993; Francis and Stokes, 1986; Palmrose, 1986) of small companies segment. As a result, a significant audit firm size variable is observed in the small clients sub-sample.

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[8] *ibid.*

[9] This model includes all the 936 observations in the small companies segment of the market.

The overall descriptive validity of the model is maintained with an RSquare of 0.684. The standard error of the estimate remains very low indicating no prediction error for the model and the *F* statistic is statistically significant indicating meaningful relationships between the dependent and independent variables. Further, the VIF and tolerance values are in acceptable levels. No VIF value exceeds 10.0 and the tolerance values are quite high indicating little collinearity. The other assumptions of the multivariate analysis are also met[10].

[H2]
$$\ln AFEE = b_1 + b_2\text{AGECOMP} + b_3\text{AUDQN} + b_4\text{BIG6} + b_5\text{BUSY} + b_6\text{GRTLONDN} + b_7\ln CR + b_8\ln DE + b_9\ln DEBTR + b_{10}\ln EARN + b_{11}\ln INV + b_{12}\ln ROCE + b_{13}\ln ROI + b_{14}\ln SALES + b_{15}\text{LTLBTA} + b_{16}\text{SIC} + b_{17}\text{SUBS}^{0.5} + b_{18}\text{SWEST} + \text{Error}$$

Note: QR variable was highly collinear with the CR variable in this sub-sample, and it was deleted from the model above as a result.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
0.827	0.684	0.672	0.4876	54.522	0.000

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-1.969	0.346		-5.688	0.000		
AGECOMP	-0.107	0.057	-0.055	-1.884	0.060	0.874	1.144
AUDQN	0.411	0.225	0.051	1.826	0.069	0.947	1.056
BIG6	**0.199**	**0.054**	**0.105**	**3.662**	**0.000**	**0.906**	**1.104**
BUSY	0.088	0.052	0.047	1.690	0.092	0.963	1.038
GRTLONDN	0.271	0.049	0.157	5.491	0.000	0.906	1.103
LNCR	0.122	0.053	0.075	2.315	0.021	0.699	1.431
LNDE	-0.027	0.022	-0.056	-1.250	0.212	0.371	2.695
LNDEBTR	0.064	0.024	0.098	2.678	0.008	0.550	1.818
LNEARN	0.110	0.046	0.119	2.394	0.017	0.299	3.340
LNINV	-0.028	0.019	-0.051	-1.459	0.145	0.601	1.664
LNROCE	-0.019	0.041	-0.021	-0.468	0.640	0.372	2.686
LNROI	-0.056	0.038	-0.079	-1.471	0.142	0.256	3.904
LNSALES	0.506	0.025	0.676	19.958	0.000	0.643	1.555
LTLBTA	0.841	0.309	0.142	2.727	0.007	0.272	3.672
SIC	0.053	0.020	0.078	2.587	0.010	0.822	1.217
SQRTSUBS	0.100	0.022	0.139	4.492	0.000	0.775	1.290
SWEST	-0.231	0.082	-0.065	-2.837	0.005	0.926	1.080

Dependent Variable: lnAFEE

Table 9.2.A: Results of the multiple regression model for the small clients sub-sample (936 observations with Sales < £251mm), Big-Six *vis-á-vis* non-Big Six firms, Hypothesis 2 tested

[10] The model appears to be well specified and the tests described in Chapter VIII indicate no violations of the assumptions of the regression analysis.

Most of the individual coefficients of the independent variables are highly significant and in the hypothesised direction. Four of the five variables controlling for the size and complexity of the small companies' operations (i.e. SALES, SUBS, SIC, DEBTR) are significant and in the hypothesised direction. Only the variable INV is insignificant and not in the hypothesised direction. The variables measuring the profitability and financial distress of the small companies give contrast results. AUDQN is for the first time significant at 0.069 level and positive indicating higher audit fees when the auditor client has received a qualified audit report, as expected. EARN is another significant variable but not in the hypothesised direction. No explanation can be offered for this result. ROI and ROCE are both not significant but in the hypothesised direction. DE is not significant and not in the hypothesised direction. The variable controlling for the level of gearing, LTLBTA, is found positive and significant as expected. The CR variable is significant but not in the hypothesised direction[11].

The variable controlling for the age of the company, AGECOMP, is significant (at the 0.060 level) but not in the hypothesised direction for this sub-sample. The coefficient is negative indicating that small companies incorporated for less than 10 years pay lower audit fees than companies which are in business for more than 10 years. This result is quite opposite to our expectation and no explanation is provided. The variable controlling for peak pricing, BUSY, is in the hypothesised direction and also significant (p = 0.092) indicating peakload audit pricing is indeed occurring in the small companies sub-sample. Finally, London area companies are charged higher audit fees and the NENGLD variable is not significant in this sub-sample. Instead, the SWEST categorical variable appears to be significant indicating lower audit fees are charged in this region to the UK small companies.

Testing hypothesis 3: (Big Six *vis-á-vis* second-tier firms)

Hypotheses 3 through 5 which follow are tested by further partitioning the small clients segment of the UK audit market. Hypothesis 3 refers only to the audit fees

[11] For a detailed analysis of the multiple regression results, see discussion of the "basic" model results held in Chapter VIII.

charged by the Big-Six and second-tier audit firms. Hypothesis 3 was stated in Chapter VI as follows:

H3: for the small companies sub-sample, the Big Six charge lower audit fee than (or equal to) the second-tier accountancy firms.

Table 9.2.B provides the model comparing the audit fee charged by the Big-Six audit firms to that of second-tier firms in the small companies sub-sample after controlling for other variables hypothesised to also affect the level of audit fees[12]. Hypothesis 3

$$\text{[H3]}\quad \ln AFEE = b_1 + b_2AGECOMP + b_3AUDQN + b_4B6B14 + b_5BUSY + b_6GRTLONDN + b_7\ln CR + b_8\ln DE + b_9\ln DEBTR + b_{10}\ln EARN + b_{11}\ln INV + b_{12}\ln ROCE + b_{13}\ln ROI + b_{14}\ln SALES + b_{15}LTLBTA + b_{16}SIC + b_{17}SUBS^{0.5} + b_{18}SWEST + Error$$

Note: QR variable was highly collinear with the CR variable in this sub-sample, and it was deleted from the model above as a result.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
0.808	0.653	0.644	0.4858	67.721	0.000

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-2.189	0.299		-7.328	0.000		
AGECOMP	-0.099	0.049	-0.052	-2.033	0.042	0.857	1.166
AUDQN	0.363	0.192	0.047	1.895	0.059	0.929	1.076
B6B14	**0.174**	**0.050**	**0.086**	**3.496**	**0.001**	**0.941**	**1.063**
BUSY	0.124	0.043	0.070	2.873	0.004	0.957	1.045
GRTLONDN	0.245	0.042	0.147	5.779	0.000	0.880	1.137
LNCR	0.172	0.047	0.108	3.674	0.000	0.659	1.518
LNDE	-0.046	0.019	-0.098	-2.407	0.016	0.343	2.912
LNDEBTR	0.078	0.021	0.126	3.817	0.000	0.525	1.906
LNEARN	0.048	0.042	0.049	1.138	0.255	0.304	3.294
LNINV	-0.040	0.018	-0.071	-2.241	0.025	0.559	1.788
LNROCE	0.003	0.036	0.003	0.076	0.939	0.367	2.728
LNROI	-0.026	0.032	-0.037	-0.792	0.429	0.267	3.749
LNSALES	0.520	0.022	0.681	23.828	0.000	0.694	1.440
LTLBTA	1.004	0.257	0.187	3.908	0.000	0.249	4.018
SIC	0.036	0.017	0.057	2.131	0.033	0.796	1.257
SQRTSUBS	0.095	0.018	0.142	5.202	0.000	0.763	1.311
SWEST	-0.262	0.085	-0.077	-3.089	0.002	0.921	1.086

Dependent Variable: lnAFEE

Table 9.2.B: Results of the multiple regression model for the small clients sub-sample (818 observations with Sales < £251mm), Big-Six *vis-á-vis* second-tier firms, Hypothesis 3 tested

[12] The local/regional audit firms are excluded from this model. This model includes only the Big-Six and second-tier firms, i.e. 818 observations in the small companies segment of the market.

was rejected. The audit firm size coefficient (coded "1" for Big-Six and "0" for second-tier firms) is positive and significant at 0.001 level indicating higher audit fees charged by the Big-Six than second-tier firms in the small client segment of the UK audit market for publicly traded companies. That is, the audit fee premium earned by the Big-Six auditing firms is 19%. This result is consistent with the study of Francis and Simon (1987) which represents the first study to use three classes of audit firm size in addition to the Big-Six/non-Big Six dichotomy[13]. Francis and Simon (1987) provide evidence to support the existence of a significant Big-Eight price premium over second-tier accountancy firms (of 29.7%) of as well as other local/regional firms (of 27.1%). Furthermore, they found no evidence of a second-tier firms price premium over the local/regional auditors when their model was run on a sub-sample of companies having only second-tier or local/regional accountancy firms. Our findings are consistent with Francis and Simon's results. See tests of hypotheses 4 and 5 below as well. The results in the sign and significance of the independent variables are the same as discussed in the previous model.

Testing hypothesis 4: (Big Six *vis-á-vis* local/regional firms)
Hypothesis 4 refers only to the audit fees charged by the Big-Six and other local/regional audit firms. Hypothesis 4 was stated in Chapter VI as follows:

H4: for the small companies sub-sample, the Big Six charge lower audit fee than (or equal to) the local/regional accountancy firms.

Table 9.2.C provides the model comparing the audit fee charged by the Big-Six audit firms to that of local/regional firms in the small companies sub-sample after controlling for other variables hypothesised to also affect the level of audit fees[14]. Hypothesis 4 was rejected. The audit firm size coefficient (coded "1" for Big-Six and "0" for local/regional firms) is positive and significant at less than 0.001 level indicating higher audit fees charged by the Big-Six than local/regional audit firms in the small client segment of the UK audit market for publicly traded companies. That is, the audit fee premium charged by the Big-Six accountancy firms is 26.36%. This

[13] Francis and Simon (1987) have used the Big-Eight vs. non-Big Eight categorical (dummy) variable instead of Big-Six vs. non-Big Six audit firms.
[14] The second-tier audit firms are excluded from this model. This model includes only the Big-Six and local/regional firms, i.e. 779 observations in the small companies segment of the market.

result is consistent with the study of Francis and Simon (1987) as indicated above.

$$\text{[H4]}\quad \begin{aligned} \ln AFEE &= b_1 + b_2\text{AGECOMP} + b_3\text{AUDQN} + b_4\text{B6OTHER} + b_5\text{BUSY} + \\ & b_6\text{GRTLONDN} + b_7\ln CR + b_8\ln DE + b_9\ln DEBTR + b_{10}\ln EARN + \\ & b_{11}\ln INV + b_{12}\ln ROCE + b_{13}\ln ROI + b_{14}\ln SALES + b_{15}\text{LTLBTA} + \\ & b_{16}\text{SIC} + b_{17}\text{SUBS}^{0.5} + b_{18}\text{SWEST} + \text{Error} \end{aligned}$$

Note: QR variable was highly collinear with the CR variable in this sub-sample, and it was deleted from the model above as a result.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
0.796	0.634	0.622	0.4919	56.439	0.000

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-1.863	0.319		-5.840	0.000		
AGECOMP	-0.082	0.050	-0.045	-1.639	0.102	0.874	1.144
AUDQN	0.348	0.224	0.041	1.554	0.121	0.971	1.030
B6OTHER	**0.234**	**0.066**	**0.096**	**3.566**	**0.000**	**0.912**	**1.096**
BUSY	0.095	0.047	0.054	2.038	0.042	0.945	1.058
GRTLONDN	0.241	0.045	0.146	5.327	0.000	0.879	1.138
LNCR	0.101	0.051	0.063	1.990	0.047	0.652	1.534
LNDE	-0.045	0.019	-0.096	-2.312	0.021	0.381	2.627
LNDEBTR	0.065	0.022	0.103	2.941	0.003	0.539	1.855
LNEARN	0.099	0.040	0.118	2.453	0.014	0.285	3.511
LNINV	-0.010	0.019	-0.017	-0.502	0.616	0.560	1.785
LNROCE	-0.002	0.036	-0.002	-0.043	0.966	0.394	2.541
LNROI	-0.057	0.035	-0.085	-1.660	0.097	0.250	3.992
LNSALES	0.491	0.023	0.643	21.046	0.000	0.708	1.413
LTLBTA	1.040	0.273	0.187	3.809	0.000	0.275	3.638
SIC	0.026	0.018	0.040	1.429	0.154	0.831	1.203
SQRTSUBS	0.111	0.019	0.173	5.900	0.000	0.771	1.297
SWEST	-0.207	0.087	-0.064	-2.373	0.018	0.916	1.092

Dependent Variable: lnAFEE

Table 9.2.C: Results of the multiple regression model for the small clients sub-sample (779 observations with Sales < £251mm), Big-Six *vis-á-vis* local/regional firms, Hypothesis 4 tested

Testing hypothesis 5: (Second-tier *vis-á-vis* local/regional firms)

Hypothesis 5 refers only to the audit fees charged by the second-tier and local/regional audit firms. Hypothesis 5 was stated in Chapter VI as follows:

H5: for the small companies sub-sample, the second-tier firms charge lower audit fee than (or equal) to the local/regional accountancy firms.

Table 9.2.D provides the model comparing the audit fee charged by the second-tier audit firms to that of local/regional firms in the small companies sub-sample after controlling for the variables hypothesised to affect the level of audit fees discussed in Chapter VI[15]. Hypothesis 5 could not be rejected. The audit firm size coefficient (coded "1" for second-tier and "0" for local/regional firms) is not significant indicating no audit fee difference between second-tier and local/regional auditors in the small client segment of the UK audit market for publicly traded companies. Again, this result is consistent with the study of Francis and Simon (1987).

[H5] $\ln AFEE = b_1 + b_2\text{AGECOMP} + b_3\text{AUDQN} + b_4\text{B14OTHER} + b_5\text{BUSY} + b_6\text{GRTLONDN} + b_7\ln CR + b_8\ln DE + b_9\ln DEBTR + b_{10}\ln EARN + b_{11}\ln INV + b_{12}\ln ROCE + b_{13}\ln ROI + b_{14}\ln SALES + b_{15}\text{LTLBTA} + b_{16}\text{SIC} + b_{17}\text{SUBS}^{0.5} + b_{18}\text{SWEST} + \text{Error}$

Note: QR variable was highly collinear with the CR variable in this sub-sample, and it was deleted from the model above as a result.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
0.879	0.772	0.750	0.4687	35.455	0.000

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-2.901	0.523		-5.542	0.000		
AGECOMP	-0.319	0.100	-0.138	-3.209	0.002	0.697	1.435
AUDQN	0.433	0.415	0.047	1.043	0.298	0.644	1.553
B14OTHER	**0.058**	**0.074**	**0.030**	**0.785**	**0.433**	**0.883**	**1.132**
BUSY	0.170	0.074	0.085	2.296	0.023	0.936	1.069
GRTLONDN	0.185	0.074	0.099	2.492	0.014	0.817	1.224
LNCR	0.138	0.081	0.077	1.699	0.091	0.619	1.615
LNDE	-0.014	0.033	-0.028	-0.433	0.666	0.302	3.317
LNDEBTR	0.004	0.037	0.005	0.104	0.917	0.494	2.026
LNEARN	-0.071	0.071	-0.073	-1.002	0.318	0.241	4.151
LNINV	-0.026	0.027	-0.044	-0.976	0.330	0.639	1.565
LNROCE	0.038	0.064	0.037	0.596	0.552	0.327	3.058
LNROI	0.073	0.059	0.098	1.237	0.218	0.203	4.933
LNSALES	0.596	0.041	0.792	14.469	0.000	0.428	2.339
LTLBTA	0.661	0.486	0.103	1.360	0.176	0.223	4.481
SIC	0.094	0.029	0.135	3.240	0.001	0.739	1.354
SQRTSUBS	-0.004	0.038	-0.005	-0.105	0.917	0.581	1.722
SWEST	-0.132	0.191	-0.026	-0.692	0.490	0.896	1.116

Dependent Variable: lnAFEE

Table 9.2.D: Results of the multiple regression model for the small clients sub-sample (291 observations with Sales < £251mm), Second-tier *vis-á-vis* local/regional firms, Hypothesis 5 tested

[15] The Big-Six audit firms are excluded from this model. This model includes only the second-tier and local/regional firms, i.e. 291 observations in the small companies segment of the market.

Table 9.2.E: Summary of regression estimates, Hypotheses 2 through 5

	B coefficient/ *t* value	Sig.	B coefficient/ *t* value	Sig.	B coefficient/ *t* value	Sig.	B coefficient/ *t* value	Sig.
	H2		H3		H4		H5	
(Constant)	-1.969 *-5.688*	0.000	-2.189 *-7.328*	0.000	-1.863 *-5.840*	0.000	-2.901 *-5.542*	0.000
AGECOMP	-0.107 *-1.884*	0.060	-0.099 *-2.033*	0.042	-0.082 *-1.639*	0.102	-0.319 *-3.209*	0.002
AUDQN	0.411 *1.826*	0.069	0.363 *1.895*	0.059	0.348 *1.554*	0.121	0.433 *1.043*	0.298
BUSY	0.088 *1.690*	0.092	0.124 *2.873*	0.004	0.095 *2.038*	0.042	0.170 *2.296*	0.023
GRTLONDN	0.271 *5.491*	0.000	0.245 *5.779*	0.000	0.241 *5.327*	0.000	0.185 *2.492*	0.014
LNCR	0.122 *2.315*	0.021	0.172 *3.674*	0.000	0.101 *1.990*	0.047	0.138 *1.699*	0.091
LNDE	-0.027 *-1.250*	0.212	-0.046 *-2.407*	0.016	-0.045 *-2.312*	0.021	-0.014 *-0.433*	0.666
LNDEBTR	0.064 *2.678*	0.008	0.078 *3.817*	0.000	0.065 *2.941*	0.003	0.004 *0.104*	0.917
LNEARN	0.110 *2.394*	0.017	0.048 *1.138*	0.255	0.099 *2.453*	0.014	-0.071 *-1.002*	0.318
LNINV	-0.028 *-1.459*	0.145	-0.040 *-2.241*	0.025	-0.010 *-0.502*	0.616	-0.026 *-0.976*	0.330
LNROCE	-0.019 *-0.468*	0.640	0.003 *0.076*	0.939	-0.002 *-0.043*	0.966	0.038 *0.596*	0.552
LNROI	-0.056 *-1.471*	0.142	-0.026 *-0.792*	0.429	-0.057 *-1.660*	0.097	0.073 *1.237*	0.218
LNSALES	0.506 *19.958*	0.000	0.520 *23.828*	0.000	0.491 *21.046*	0.000	0.596 *14.469*	0.000
LTLBTA	0.841 *2.727*	0.007	1.004 *3.908*	0.000	1.040 *3.809*	0.000	0.661 *1.360*	0.176
SIC	0.053 *2.587*	0.010	0.036 *2.131*	0.033	0.026 *1.429*	0.154	0.094 *3.240*	0.001
SQRTSUBS	0.100 *4.492*	0.000	0.095 *5.202*	0.000	0.111 *5.900*	0.000	-0.004 *-0.105*	0.917
SWEST	-0.231 *-2.837*	0.005	-0.262 *-3.089*	0.002	-0.207 *-2.373*	0.018	-0.132 *-0.692*	0.490
BIG6	0.199 *3.662*	0.000	-----		-----		-----	
B6B14	-----		0.174 *3.496*	0.001	-----		-----	
B6OTHER	-----		-----		0.234 *3.566*	0.000	-----	
B14OTHER	-----		-----		-----		0.058 *0.785*	0.433
R	0.827		0.808		0.796		0.879	
R Square	0.684		0.653		0.634		0.772	
Adjusted R Square	0.672		0.644		0.622		0.750	
F	54.522⁺		67.721⁺		56.439⁺		35.455⁺	
Sample size	936		818		779		291	

Figures in *italics* are *t*-statistics. ⁺ indicates the F-value is significant at the 0.01% level.

Table 9.2.E summarises the regression results from testing the hypotheses 2 through 5. The evidence from the Table 9.2.E supports the existence of a Big-Six price premium over all other auditors in the small client segment of the UK audit market. The findings imply price competition in small companies market with differentiatied product to the Big-Six audit firms[16]. Price competition is assumed in the small companies segment due to large number of suppliers (see analysis of concentration ratios in Chapter VII). Big-Six product differentiation is inferred because of the positive (and significant) coefficients of the different auditor variables.

Hypothesis 6

Hypothesis 6 has already been tested for the large companies segment of the market. The finding in the large client segment of the UK audit market for publicly traded companies was that there is a positive relationship between fees paid for audit services and fees paid for non-audit services. We test here whether the same finding prevails in the small client sub-sample. Hypothesis 6 was stated as follows:

> *H6: the pricing of audit services is related to the pricing of non-audit services*

Table 9.2.F provides the model comparing the audit fee charged by the accountancy firms in the small clients sub-sample when non-audit services are provided by the auditor after controlling for other variables hypothesised to also affect the level of audit fees. Hypothesis 6 could not be rejected indicating an audit fee difference due to provision of non-audit services in this sample. In other words, there is a positive relationship between fees paid for audit services and fees paid for non-audit services in the small clients segment of the UK audit market. This result is consistent with the results of prior studies (e.g., Simunic, 1984; Ezzamel *et al*, 1998, among others). Accountancy firms charge a premium of 18.4% for the joint production of audit and other services to small clients. Thus, the result being a significant non-audit fee variable in the small client sub-sample as well as in the large clients segment.

[16] See also Table 3.2.A in Chapter III.

$$\ln AFEE = b_1 + b_2\text{AGECOMP} + b_3\text{AUDQN} + b_4\text{BIG6} + b_5\text{BUSY} + b_6\text{GRTLONDN} + b_7\ln CR + b_8\ln DE + b_9\ln DEBTR + b_{10}\ln EARN + b_{11}\ln INV + b_{12}\ln ROCE + b_{13}\ln ROI + b_{14}\ln SALES + b_{15}\text{LTLBTA} + b_{16}\text{NENGLND} + b_{17}\text{SIC} + b_{18}\text{SUBS}^{0.5} + b_{19}\ln NAFEE + \text{Error} \quad \text{[H6]}$$

Note: QR variable was highly collinear with the CR variable in this sub-sample, and it was deleted from the model above as a result.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
0.837	0.700	0.692	0.4539	80.937	0.000

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-1.630	0.277		-5.880	0.000		
AGECOMP	-0.087	0.046	-0.046	-1.914	0.056	0.842	1.188
AUDQN	0.160	0.207	0.017	0.771	0.441	0.966	1.035
BIG6	0.120	0.043	0.066	2.811	0.005	0.879	1.137
BUSY	0.134	0.040	0.075	3.333	0.001	0.939	1.064
GRTLONDN	0.196	0.039	0.118	5.004	0.000	0.872	1.147
LNCR	0.068	0.043	0.042	1.583	0.114	0.672	1.487
LNDE	-0.052	0.017	-0.112	-3.119	0.002	0.370	2.704
LNDEBTR	0.074	0.019	0.116	3.859	0.000	0.530	1.888
LNEARN	0.047	0.035	0.054	1.341	0.181	0.302	3.312
LNINV	0.001	0.016	0.002	0.080	0.936	0.602	1.661
LNROCE	0.021	0.033	0.023	0.636	0.525	0.369	2.710
LNROI	-0.014	0.029	-0.020	-0.465	0.642	0.262	3.814
LNSALES	0.421	0.022	0.548	19.498	0.000	0.608	1.645
LTLBTA	1.129	0.240	0.201	4.708	0.000	0.265	3.779
SIC	0.037	0.016	0.056	2.302	0.022	0.810	1.235
SQRTSUBS	0.074	0.017	0.111	4.374	0.000	0.750	1.334
SWEST	-0.279	0.081	-0.079	-3.433	0.001	0.917	1.090
LNNAFEE	**0.184**	**0.019**	**0.251**	**9.774**	**0.000**	**0.728**	**1.374**

Dependent Variable: lnAFEE

Table 9.2.F: Results of the multiple regression model for the small clients sub-sample (936 observations with Sales < £251mm), Hypothesis 6 tested

Hypothesis 7

Hypotheses 7 through 11 have already been tested for the large companies segment of the market. Hypotheses 7 through 11 refer to the existence of an "alumni effect" in the UK audit market. Only hypothesis 9 found to be significant in the large clients sub-sample, that is the audit fees charged are higher when the Finance Director, Chairman or Chief Executive is/are alumni of the incumbent auditor. We test here whether an "alumni effect" exists in the small client segment of the UK audit market. Hypothesis 7 was stated as follows:

H7: for the small companies sub-sample, it makes no difference on audit fees when any director is an ex-employee of the auditor

Table 9.2.G provides the model comparing the audit fee charged to the small clients that have on their board of directors an alumni of their auditor after controlling for the variables hypothesised to affect the level of audit fees discussed in Chapter VI. Hypothesis 7 could not be rejected indicating no audit fee difference in this sample. Although 1 in 6 directors are alumni of their auditors, this association is not translated into different audit pricing in small companies segment. Neither audit firms benefit

$$\text{[H7]}\quad \ln AFEE = b_1 + b_2AGECOMP + b_3AUDQN + b_4BIG6 + b_5BUSY + b_6GRTLONDN + b_7\ln CR + b_8\ln DE + b_9\ln DEBTR + b_{10}\ln EARN + b_{11}\ln INV + b_{12}\ln ROCE + b_{13}\ln ROI + b_{14}\ln SALES + b_{15}LTLBTA + b_{16}NENGLND + b_{17}SIC + b_{18}SUBS^{0.5} + b_{19}\ln NAFEE + b_{20}ALUMNI + Error$$

Note: QR variable was highly collinear with the CR variable in this sub-sample, and it was deleted from the model above as a result.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
0.837	0.700	0.691	0.4541	76.291	0.000

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-1.635	0.277		-5.894	0.000		
AGECOMP	-0.090	0.046	-0.047	-1.979	0.048	0.838	1.193
AUDQN	0.162	0.207	0.017	0.781	0.435	0.966	1.036
BIG6	0.124	0.043	0.068	2.884	0.004	0.873	1.146
BUSY	0.135	0.040	0.076	3.350	0.001	0.939	1.065
GRTLONDN	0.195	0.039	0.117	4.982	0.000	0.871	1.148
LNCR	0.069	0.043	0.043	1.588	0.113	0.672	1.487
LNDE	-0.054	0.017	-0.116	-3.190	0.001	0.368	2.717
LNDEBTR	0.075	0.019	0.119	3.919	0.000	0.528	1.895
LNEARN	0.047	0.035	0.053	1.329	0.184	0.301	3.319
LNINV	0.001	0.016	0.002	0.062	0.951	0.602	1.661
LNROCE	0.023	0.033	0.024	0.676	0.500	0.369	2.713
LNROI	-0.013	0.029	-0.019	-0.450	0.653	0.261	3.825
LNSALES	0.422	0.022	0.550	19.503	0.000	0.608	1.645
LTLBTA	1.159	0.241	0.206	4.805	0.000	0.262	3.812
SIC	0.037	0.016	0.057	2.342	0.020	0.808	1.238
SQRTSUBS	0.073	0.017	0.109	4.285	0.000	0.749	1.335
SWEST	-0.282	0.081	-0.080	-3.469	0.001	0.916	1.091
LNNAFEE	0.184	0.019	0.251	9.752	0.000	0.729	1.372
ALUMNI	**-0.056**	**0.050**	**-0.025**	**-1.127**	**0.260**	**0.968**	**1.033**

Dependent Variable: lnAFEE

Table 9.2.G: Results of the multiple regression model for the small clients sub-sample (1396 observations with Sales < £251mm), Hypothesis 7 tested

from outplacing their alumni by receiving higher audit fees nor the small companies benefit from having as directors alumni of their auditor by receiving a discount on audit fees. In other words, alumni of audit firms do not affect (positive or negative) audit fees when they are employed by the auditor clients. This conclusion holds for the large companies segment of the UK audit market too (see test of the same hypothesis for the large companies sub-sample in section 9.1 of this chapter).

Testing hypothesis 8:

Hypothesis 8 was stated in Chapter VI as follows:

> *H8: for the small companies sub-sample, on average it makes no difference on audit fees when a non-executive director is an ex-employee of the auditor*

Table 9.2.H provides the model comparing the audit fee charged to the small clients that have a non-executive director who is an alumni of their auditor after controlling for other variables hypothesised to also affect the level of audit fees. Hypothesis 8 could not be rejected indicating no audit fee difference in this sample. In other words, it makes no difference on audit fees when a non-executive is an alumni of the incumbent auditor in the small client segment of the UK audit market, as expected. It is possible that due to the small number of non-executive directors in this sub-sample (only 23.60% of directors are non-executives), an audit fee difference could not be detected.

Testing hypothesis 9:

Hypothesis 9 provides further evidence on the "alumni effect" and its interaction with those CADRE who are Finance Directors, Chairmen or Chief Executives in the small clients sub-sample. Hypothesis 9 was stated in Chapter VI as follows:

> *H9: for the small companies sub-sample, there is no audit fee difference when the chairman, chief executive or finance director are an alumni of the auditor*

Table 9.2.I provides the model comparing the audit fee charged to the small clients that have a finance director, chairman and/or chief executive who is(are) an alumni of their auditor after controlling for the variables hypothesised to affect the level of audit fees discussed in Chapter VI. Hypothesis 9 could not be rejected indicating no

$$\begin{aligned}[H8]\quad & \ln AFEE = b_1 + b_2 AGECOMP + b_3 AUDQN + b_4 BIG6 + b_5 BUSY + \\ & b_6 GRTLONDN + b_7 \ln CR + b_8 \ln DE + b_9 \ln DEBTR + b_{10} \ln EARN + \\ & b_{11} \ln INV + b_{12} \ln ROCE + b_{13} \ln ROI + b_{14} \ln SALES + b_{15} LTLBTA + \\ & b_{16} NENGLND + b_{17} SIC + b_{18} SUBS^{0.5} + b_{19} \ln NAFEE + b_{20} ALUMNI + \\ & b_{21} ALMNEXD + Error\end{aligned}$$

Note: QR variable was highly collinear with the CR variable in this sub-sample, and it was deleted from the model above as a result.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
0.837	0.700	0.691	0.4542	72.474	0.000

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-1.627	0.278		-5.861	0.000		
AGECOMP	-0.091	0.046	-0.048	-1.988	0.047	0.838	1.193
AUDQN	0.158	0.208	0.017	0.763	0.446	0.965	1.036
BIG6	0.123	0.043	0.067	2.854	0.004	0.872	1.147
BUSY	0.135	0.040	0.076	3.340	0.001	0.939	1.065
GRTLONDN	0.196	0.039	0.117	4.982	0.000	0.871	1.148
LNCR	0.068	0.043	0.042	1.576	0.116	0.672	1.487
LNDE	-0.054	0.017	-0.117	-3.217	0.001	0.368	2.720
LNDEBTR	0.076	0.019	0.120	3.962	0.000	0.526	1.903
LNEARN	0.046	0.035	0.052	1.288	0.198	0.301	3.326
LNINV	0.001	0.016	0.001	0.033	0.974	0.601	1.663
LNROCE	0.021	0.033	0.023	0.625	0.532	0.367	2.722
LNROI	-0.012	0.029	-0.017	-0.405	0.686	0.261	3.836
LNSALES	0.422	0.022	0.550	19.494	0.000	0.608	1.645
LTLBTA	1.163	0.241	0.207	4.820	0.000	0.262	3.813
SIC	0.037	0.016	0.057	2.317	0.021	0.807	1.239
SQRTSUBS	0.073	0.017	0.109	4.291	0.000	0.749	1.335
SWEST	-0.283	0.081	-0.080	-3.482	0.001	0.916	1.092
LNNAFEE	0.184	0.019	0.251	9.747	0.000	0.729	1.372
ALUMNI	-0.155	0.129	-0.069	-1.202	0.230	0.147	6.815
ALMNEXD	**0.113**	**0.136**	**0.048**	**0.829**	**0.407**	**0.147**	**6.798**

Dependent Variable: lnAFEE

Table 9.2.H: Results of the multiple regression model for the small clients sub-sample (1396 observations with Sales < £251mm), Hypothesis 8 tested

audit fee difference in this sample. Although the finance director, chairman and/or chief executive are responsible for the appointment of the auditor and negotiations over the audit fee charged, the fact that these directors are alumni of the current auditor makes no difference on the audit fee in the small companies segment of the UK audit market for publicly traded companies.

Furthermore, when the variable FD entered in the model, its coefficient was not significant in the small clients sub-sample, as it was in the large companies market (see section 9.1 of this chapter).

$$[H9]\quad \ln AFEE = b_1 + b_2 AGECOMP + b_3 AUDQN + b_4 BIG6 + b_5 BUSY + b_6 GRTLONDN + b_7 \ln CR + b_8 \ln DE + b_9 \ln DEBTR + b_{10} \ln EARN + b_{11} \ln INV + b_{12} \ln ROCE + b_{13} \ln ROI + b_{14} \ln SALES + b_{15} LTLBTA + b_{16} NENGLND + b_{17} SIC + b_{18} SUBS^{0.5} + b_{19} \ln NAFEE + b_{20} ALUMNI + b_{21} ALMNEXD + b_{22} ALMNFD + Error$$

Note: QR variable was highly collinear with the CR variable in this sub-sample, and it was deleted from the model above as a result.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
0.837	0.701	0.691	0.4538	69.233	0.000

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-1.604	0.278		-5.771	0.000		
AGECOMP	-0.093	0.046	-0.049	-2.045	0.041	0.837	1.195
AUDQN	0.171	0.208	0.018	0.822	0.412	0.964	1.038
BIG6	0.126	0.043	0.069	2.930	0.004	0.869	1.151
BUSY	0.128	0.041	0.072	3.161	0.002	0.927	1.078
GRTLONDN	0.193	0.039	0.116	4.925	0.000	0.870	1.150
LNCR	0.068	0.043	0.042	1.570	0.117	0.672	1.487
LNDE	-0.054	0.017	-0.117	-3.219	0.001	0.368	2.720
LNDEBTR	0.076	0.019	0.120	3.955	0.000	0.526	1.903
LNEARN	0.046	0.035	0.052	1.299	0.195	0.301	3.326
LNINV	0.000	0.016	0.001	0.021	0.983	0.601	1.663
LNROCE	0.020	0.033	0.022	0.604	0.546	0.367	2.723
LNROI	-0.012	0.029	-0.017	-0.400	0.689	0.261	3.836
LNSALES	0.420	0.022	0.548	19.421	0.000	0.607	1.649
LTLBTA	1.153	0.241	0.205	4.778	0.000	0.262	3.817
SIC	0.038	0.016	0.058	2.367	0.018	0.806	1.240
SQRTSUBS	0.073	0.017	0.108	4.262	0.000	0.749	1.335
SWEST	-0.287	0.081	-0.081	-3.528	0.000	0.915	1.093
LNNAFEE	0.184	0.019	0.251	9.754	0.000	0.729	1.372
ALUMNI	-0.155	0.128	-0.069	-1.206	0.228	0.147	6.815
ALMNEXD	0.183	0.144	0.077	1.266	0.206	0.130	7.695
ALMNFD	**-0.140**	**0.098**	**-0.043**	**-1.423**	**0.155**	**0.521**	**1.918**

Dependent Variable: lnAFEE

Table 9.2.I: Results of the multiple regression model for the small clients sub-sample (1396 observations with Sales < £251mm), Hypothesis 9 tested

Testing hypothesis 10:

Hypothesis 10 provides further evidence on the "alumni effect" and its influence with regard to the age of the CADRE. Hypothesis 10 was stated in Chapter VI as follows:

H10: for the small companies sub-sample, the audit fee charged will not be lower or higher as the CADRE becomes older

Table 9.2.J provides the model comparing the audit fee charged to the auditor small clients that have older CADRE on their boards after controlling for other variables

[H10] $\ln AFEE = b_1 + b_2\text{AGECOMP} + b_3\text{AUDQN} + b_4\text{BIG6} + b_5\text{BUSY} + b_6\text{GRTLONDN} + b_7\ln CR + b_8\ln DE + b_9\ln DEBTR + b_{10}\ln EARN + b_{11}\ln INV + b_{12}\ln ROCE + b_{13}\ln ROI + b_{14}\ln SALES + b_{15}\text{LTLBTA} + b_{16}\text{NENGLND} + b_{17}\text{SIC} + b_{18}\text{SUBS}^{0.5} + b_{19}\ln NAFEE + b_{20}\text{ALUMNI} + b_{21}\text{ALMNEXD} + b_{22}\text{ALMNFD} + b_{23}\text{AGECADRE} + \text{Error}$

Note: QR variable was highly collinear with the CR variable in this sub-sample, and it was deleted from the model above as a result.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
0.839	0.703	0.693	0.4526	66.648	0.000

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-1.762	0.287		-6.135	0.000		
AGECOMP	-0.085	0.046	-0.045	-1.870	0.062	0.831	1.203
AUDQN	0.162	0.207	0.017	0.782	0.435	0.963	1.038
BIG6	0.131	0.043	0.072	3.060	0.002	0.866	1.155
BUSY	0.128	0.040	0.072	3.157	0.002	0.927	1.079
GRTLONDN	0.197	0.039	0.119	5.040	0.000	0.868	1.153
LNCR	0.059	0.043	0.036	1.355	0.176	0.665	1.503
LNDE	-0.059	0.017	-0.126	-3.469	0.001	0.362	2.766
LNDEBTR	0.077	0.019	0.120	3.988	0.000	0.526	1.903
LNEARN	0.045	0.035	0.051	1.283	0.200	0.301	3.326
LNINV	0.003	0.016	0.006	0.212	0.832	0.596	1.677
LNROCE	0.022	0.033	0.024	0.657	0.511	0.367	2.725
LNROI	-0.012	0.029	-0.017	-0.405	0.685	0.261	3.836
LNSALES	0.418	0.022	0.545	19.359	0.000	0.605	1.652
LTLBTA	1.207	0.242	0.215	4.988	0.000	0.259	3.861
SIC	0.038	0.016	0.058	2.366	0.018	0.806	1.240
SQRTSUBS	0.071	0.017	0.106	4.183	0.000	0.748	1.338
SWEST	-0.295	0.081	-0.083	-3.629	0.000	0.913	1.095
LNNAFEE	0.185	0.019	0.253	9.855	0.000	0.728	1.374
ALUMNI	-0.189	0.129	-0.084	-1.466	0.143	0.144	6.927
ALMNEXD	0.236	0.146	0.100	1.614	0.107	0.126	7.935
ALMNFD	-0.131	0.098	-0.041	-1.340	0.181	0.520	1.922
AGECADRE	**0.003**	**0.002**	**0.049**	**2.096**	**0.037**	**0.893**	**1.120**

Dependent Variable: lnAFEE

Table 9.2.J: Results of the multiple regression model for the small clients sub-sample (1396 observations with Sales < £251mm), Hypothesis 10 tested

hypothesised to also affect the level of audit fees. Hypothesis 10 was rejected indicating an audit fee difference in this sample. In other words, the coefficient of AGECADRE is positive and significant at 0.037 level indicating differential pricing of audit services while the CADRE becomes older. This finding is contrary to the finding about the AGECADRE variable in the large clients segment of the audit market.

Testing hypothesis 11:

Hypothesis 11 provides further evidence on the "alumni effect" and its interaction with the fees paid for the provision of non-audit services. Hypothesis 11 was stated in Chapter VI as follows:

> *H11: there is no different relationship between audit and non-audit fee because of existence of auditor alumni*

Table 9.2.K provides the model comparing the audit fee charged when there is purchase of non-audit services as well as an auditor alumni on the board of directors in the small client segment of the market after controlling for other variables hypothesised to also affect the level of audit fees. Hypothesis 11 could not be rejected indicating no audit fee difference in this sample. In other words, the coefficient of ALMNNAFE is negative but insignificant indicating no differential pricing of audit services when there is a provision of non-audit services by the auditor and simultaneously there is an alumni of the incumbent auditor on the board of directors. As a result, an insignificant variable is observed in the small clients sub-sample. The same finding holds for the large companies market segment.

9.2.1. A final note in the small companies segment

In the light of the contradictory results in Simunic (1980) and Palmrose (1986) about a Big-Eight auditor price premium in the small client segment of the US audit market for publicly-traded companies, Francis and Simon (1987) used three auditor size classes to test the association between auditor size and audit fees. Their study reported a Big-Eight premium that exists with respect to both second-tier and local/regional firms. They provided no evidence of a second-tier price premium with respect to local/regional auditors.

$$\begin{aligned}[H11]\quad & \ln AFEE = b_1 + b_2\text{AGECOMP} + b_3\text{AUDQN} + b_4\text{BIG6} + b_5\text{BUSY} + \\ & b_6\text{GRTLONDN} + b_7\ln CR + b_8\ln DE + b_9\ln DEBTR + b_{10}\ln EARN + b_{11}\ln INV + \\ & b_{12}\ln ROCE + b_{13}\ln ROI + b_{14}\ln SALES + b_{15}\text{LTLBTA} + b_{16}\text{NENGLND} + b_{17}\text{SIC} \\ & + b_{18}\text{SUBS}^{0.5} + b_{19}\ln NAFEE + b_{20}\text{ALUMNI} + b_{21}\text{ALMNEXD} + b_{22}\text{ALMNFD} \\ & + b_{23}\text{AGECADRE} + b_{24}\text{ALMNNAFE} + \text{Error}\end{aligned}$$

Note: QR variable was highly collinear with the CR variable in this sub-sample, and it was deleted from the model above as a result.

R	R Square	Adjusted R Square	Std. Error of the Estimate	F	Sig.
0.839	0.705	0.693	0.4522	63.959	0.000

	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	-1.740	0.287		-6.052	0.000		
AGECOMP	-0.094	0.046	-0.050	-2.047	0.041	0.817	1.224
AUDQN	0.127	0.208	0.014	0.611	0.542	0.951	1.052
BIG6	0.133	0.043	0.073	3.095	0.002	0.865	1.155
BUSY	0.127	0.040	0.071	3.138	0.002	0.927	1.079
GRTLONDN	0.194	0.039	0.117	4.959	0.000	0.865	1.156
LNCR	0.060	0.043	0.037	1.376	0.169	0.665	1.503
LNDE	-0.060	0.017	-0.128	-3.523	0.000	0.361	2.769
LNDEBTR	0.076	0.019	0.119	3.929	0.000	0.525	1.906
LNEARN	0.046	0.035	0.052	1.295	0.196	0.301	3.326
LNINV	0.004	0.016	0.006	0.228	0.820	0.596	1.678
LNROCE	0.022	0.033	0.024	0.654	0.514	0.367	2.725
LNROI	-0.013	0.029	-0.019	-0.435	0.664	0.261	3.838
LNSALES	0.419	0.022	0.546	19.404	0.000	0.605	1.653
LTLBTA	1.201	0.242	0.214	4.969	0.000	0.259	3.862
SIC	0.037	0.016	0.056	2.302	0.022	0.805	1.243
SQRTSUBS	0.070	0.017	0.104	4.098	0.000	0.745	1.342
SWEST	-0.292	0.081	-0.082	-3.596	0.000	0.913	1.096
LNNAFEE	0.178	0.019	0.243	9.157	0.000	0.680	1.472
ALUMNI	-0.258	0.137	-0.115	-1.877	0.061	0.127	7.844
ALMNEXD	0.228	0.146	0.096	1.559	0.120	0.126	7.947
ALMNFD	-0.122	0.098	-0.038	-1.242	0.215	0.518	1.930
AGECADRE	0.003	0.002	0.049	2.111	0.035	0.893	1.120
ALMNNAFE	**0.001**	**0.001**	**0.047**	**1.457**	**0.146**	**0.460**	**2.176**

Dependent Variable: lnAFEE

Table 9.2.K: Results of the multiple regression model for the small clients sub-sample (1396 observations with Sales < £251mm), Hypothesis 11 tested

The current study has replicated Francis and Simon tests using as well three auditor size classes in the small clients segment. This has been done, as we have explained at the beginning of this chapter and Chapter VI, in order to better control for the association between alumni and audit firms. The replicated models for testing the hypotheses 3 through 5 have been discussed in the last section. In addition, three extra regression models are considered in this section. Each of these models uses a different auditor size class each time and also all the alumni variables that used in testing the hypothesis 11. The empirical results from these tests are presented in the Table 9.3.C at the end of the chapter. So, for example, H11(1) in Table 9.3.C represents the test of hypothesis 11 using only the Big-Six and second-tier audit firms (i.e. 818 firms); H11(2) represents the test of hypothesis 11 using only the Big-Six and local/regional accountancy firms (i.e. 779 observations); and, H11(3) represents the test of hypothesis 11 using only the second-tier and other local/regional accountancy practices (i.e. 291 firms).

From the empirical results shown in Table 9.3.C at the end of the chapter, it is worth mentioning the following: when the H11(2) is tested, the ALUMNI variable is significant and negative indicating that the small companies benefit from having as directors alumni of their auditor by receiving a discount of 29.56% on audit fees. Although testing the hypothesis 4, we concluded that the Big-Six firms charge a premium of 26.36% comparing with the local/regional firms prices, however, this Big-Six premium seems to evaporate when there is an alumni of the incumbent auditor on the boards of directors of the small publicly traded companies. Further, testing the H11(3), the ALMNEXD is significant indicating a positive audit fee difference of 69% in the presence of non-executive directors. This may be interpreted as non-executive directors having a more important role in the everyday management of the business and thus, being able to negotiate and decide the level of audit fees paid to auditor. A more likely explanation seems to be, however, the small number of non-executive directors on the small companies boardrooms. The minor role and lower monitoring power of non-executives, therefore, may lead the auditor to assess higher levels of inherent risk and as a result to charge higher audit fees. Finally, the age of the CADRE is significant and positive in testing the hypotheses H11(1) and H11(2), although the coefficients are marginally above zero. This indicates a pricing differential of audit services while the CADRE becomes older. No other alumni variables are significant in testing the H11(1), H11(2) and H11(3).

9.3. Summary of regression results

Tables 9.3.A and 9.3.B summarise the results taken from the regression models when the hypotheses of this study were tested in the two preceding sections of this chapter. The hypotheses which were developed in Chapter VI were tested in two different sub-samples, that is the large companies and the small companies segment of the UK audit market for the publicly traded companies.

Briefly speaking here the results indicate a significant difference between audit prices, or fees, charged by the Big-Six and those charged by the non-Big Six accounting firms. A summary and implications of these results together with a discussion of the best way or ways to explain the pricing differential follows in the next chapter.

[illegible]A: Summary of regression estimates for large clients sub-sample

	B Coefficient *t* value							
	H1	H6	H7	H8	H9(1)	H9(2)	H10	H11
(Constant)	-4.457*	-2.969*	-2.916*	-2.931*	-2.940*	-2.922*	-3.041*	-3.195*
	-5.629	*-3.619*	*-4.748*	*-4.771*	*-4.809*	*-4.826*	*-4.917*	*-5.119*
AGECOMP	0.049	0.073	0.149	0.139	0.130	0.138	0.133	0.145
	0.370	*0.574*	*1.571*	*1.452*	*1.363*	*1.462*	*1.401*	*1.535*
AUDQN	0.021	0.024	-0.179	-0.170	-0.157	-0.121	-0.141	-0.140
	0.051	*0.064*	*-0.592*	*-0.564*	*-0.524*	*-0.404*	*-0.471*	*-0.471*
BIG6	0.166	0.070	0.074	0.069	0.090	0.119	0.124	0.136
	1.010	*0.438*	*0.630*	*0.586*	*0.771*	*1.025*	*1.061*	*1.164*
BUSY	-0.021	-0.094	-0.032	-0.034	-0.051	-0.061	-0.060	-0.064
	-0.170	*-0.774*	*-0.369*	*-0.395*	*-0.596*	*-0.721*	*-0.712*	*-0.753*
GRTLONDN	0.246**	0.225**	0.300*	0.301*	0.310*	0.292*	0.295*	0.302*
	2.504	*2.367*	*4.401*	*4.406*	*4.550*	*4.308*	*4.345*	*4.456*
LNCR	0.286**	0.375*	0.393*	0.385*	0.390*	0.385*	0.378*	0.374*
	2.086	*2.908*	*4.148*	*4.052*	*4.126*	*4.104*	*4.013*	*3.992*
LNDE	-0.113*	-0.053	-0.072**	-0.071**	-0.068**	-0.068**	-0.070**	-0.068**
	-2.624	*-1.263*	*-2.215*	*-2.192*	*-2.101*	*-2.133*	*-2.180*	*-2.111*
LNDEBTR	0.158*	0.131*	0.101*	0.101*	0.097*	0.100*	0.105*	0.094*
	3.188	*2.786*	*2.854*	*2.868*	*2.755*	*2.852*	*2.960*	*2.632*
LNEARN	0.111	0.005	0.043	0.046	0.040	0.036	0.045	0.048
	1.088	*0.049*	*0.521*	*0.556*	*0.493*	*0.447*	*0.547*	*0.593*
LNINV	-0.067	-0.060	-0.054	-0.053	-0.052	-0.048	-0.049	-0.041
	-1.445	*-1.387*	*-1.660*	*-1.636*	*-1.592*	*-1.501*	*-1.512*	*-1.277*
LNROCE	0.192**	0.150***	0.174*	0.174*	0.174*	0.180*	0.179*	0.184*
	2.178	*1.765*	*2.967*	*2.971*	*2.995*	*3.120*	*3.100*	*3.190*
LNROI	-0.178**	-0.105	-0.127**	-0.128**	-0.124**	-0.127**	-0.133**	-0.136**
	-2.289	*-1.402*	*-2.094*	*-2.109*	*-2.049*	*-2.115*	*-2.203*	*-2.258*
LNSALES	0.604*	0.429*	0.399*	0.402*	0.398*	0.397*	0.398*	0.399*
	11.248	*7.053*	*8.667*	*8.721*	*8.671*	*8.727*	*8.739*	*8.783*
LTLBTA	2.139*	1.098***	1.498*	1.492*	1.465*	1.490*	1.495*	1.477*
	3.564	*1.856*	*3.262*	*3.250*	*3.203*	*3.289*	*3.300*	*3.270*
NENGLD	-0.646*	-0.566**	-0.595*	-0.592*	-0.603*	-0.590*	-0.597*	-0.608*
	-2.370	*-2.232*	*-3.251*	*-3.233*	*-3.308*	*-3.266*	*-3.300*	*-3.370*
SIC	0.160*	0.163*	0.141*	0.140*	0.139*	0.138*	0.136*	0.136*
	4.918	*5.132*	*5.700*	*5.668*	*5.642*	*5.656*	*5.571*	*5.606*
SQRTSUBS	0.047***	0.042***	0.060*	0.060*	0.060*	0.060*	0.057*	0.057*
	1.909	*1.772*	*3.222*	*3.225*	*3.260*	*3.266*	*3.113*	*3.103*
LNNAFEE	-----	0.260*	0.268*	0.266*	0.277*	0.283*	0.280*	0.299*
		5.055	*6.666*	*6.590*	*6.813*	*7.015*	*6.952*	*7.139*
ALUMNI	-----	-----	-0.008	0.237	0.238	0.166	0.162	0.215
			-0.088	*0.939*	*0.947*	*0.659*	*0.645*	*0.852*
ALMNEXD	-----	-----	-----	-0.273	-0.381	-0.355	-0.332	-0.317
				-1.033	*-1.413*	*-1.330*	*-1.239*	*-1.186*
ALMNFD	-----	-----	-----	-----	0.314***	0.460**	0.453**	0.490*
					1.802	*2.506*	*2.466*	*2.654*
FD	-----	-----	-----	-----	-----	-0.158**	-0.151**	-0.147**
						-2.342	*-2.221*	*-2.168*
AGECADRE	----	-----	-----	-----	-----	-----	0.003	0.003
							0.949	*1.050*
ALMNNAFE	----	-----	-----	-----	-----	-----	-----	0.000
								-1.580
R	0.872	0.896	0.888	0.888	0.890	0.893	0.893	0.894
R Square	0.761	0.803	0.788	0.789	0.791	0.797	0.798	0.800
Adj R Square	0.727	0.773	0.771	0.771	0.772	0.777	0.777	0.779
F	22.469+	25.818+	45.232+	42.985+	41.364+	40.680+	38.933+	37.661+

Figures in *italics* are *t*-statistics. *, **, *** indicates the *t*-value of coefficients are significant at the 1%, 5%, and
spectively (two-tailed test). + indicates the F-value is significant at the 0.01% level.

Table 9.3.B: Summary of regression estimates for small clients sub-sample

	B Coefficient *t* value						
	H2	H6	H7	H8	H9	H10	H11
(Constant)	-1.969*	-1.630*	-1.635*	-1.627*	-1.604*	-1.762*	-1.740*
	-5.688	*-5.880*	*-5.894*	*-5.861*	*-5.771*	*-6.135*	*-6.052*
AGECOMP	-0.107***	-0.087***	-0.090**	-0.091**	-0.093**	-0.085***	-0.094**
	-1.884	*-1.914*	*-1.979*	*-1.988*	*-2.045*	*-1.870*	*-2.047*
AUDQN	0.411***	0.160	0.162	0.158	0.171	0.162	0.127
	1.826	*0.771*	*0.781*	*0.763*	*0.822*	*0.782*	*0.611*
BUSY	0.088***	0.134*	0.135*	0.135*	0.128*	0.128*	0.127*
	1.690	*3.333*	*3.350*	*3.340*	*3.161*	*3.157*	*3.138*
GRTLONDN	0.271*	0.196*	0.195*	0.196*	0.193*	0.197*	0.194*
	5.491	*5.004*	*4.982*	*4.982*	*4.925*	*5.040*	*4.959*
LNCR	0.122**	0.068	0.069	0.068	0.068	0.059	0.060
	2.315	*1.583*	*1.588*	*1.576*	*1.570*	*1.355*	*1.376*
LNDE	-0.027	-0.052*	-0.054*	-0.054*	-0.054*	-0.059*	-0.060*
	-1.250	*-3.119*	*-3.190*	*-3.217*	*-3.219*	*-3.469*	*-3.523*
LNDEBTR	0.064*	0.074*	0.075*	0.076*	0.076*	0.077*	0.076*
	2.678	*3.859*	*3.919*	*3.962*	*3.955*	*3.988*	*3.929*
LNEARN	0.110**	0.047	0.047	0.046	0.046	0.045	0.046
	2.394	*1.341*	*1.329*	*1.288*	*1.299*	*1.283*	*1.295*
LNINV	-0.028	0.001	0.001	0.001	0.000	0.003	0.004
	-1.459	*0.080*	*0.062*	*0.033*	*0.021*	*0.212*	*0.228*
LNROCE	-0.019	0.021	0.023	0.021	0.020	0.022	0.022
	-0.468	*0.636*	*0.676*	*0.625*	*0.604*	*0.657*	*0.654*
LNROI	-0.056	-0.014	-0.013	-0.012	-0.012	-0.012	-0.013
	-1.471	*-0.465*	*-0.450*	*-0.405*	*-0.400*	*-0.405*	*-0.435*
LNSALES	0.506*	0.421*	0.422*	0.422*	0.420*	0.418*	0.419*
	19.958	*19.498*	*19.503*	*19.494*	*19.421*	*19.359*	*19.404*
LTLBTA	0.841*	1.129*	1.159*	1.163*	1.153*	1.207*	1.201*
	2.727	*4.708*	*4.805*	*4.820*	*4.778*	*4.988*	*4.969*
SIC	0.053*	0.037**	0.037**	0.037**	0.038**	0.038**	0.037**
	2.587	*2.302*	*2.342*	*2.317*	*2.367*	*2.366*	*2.302*
SQRTSUBS	0.100*	0.074*	0.073*	0.073*	0.073*	0.071*	0.070*
	4.492	*4.374*	*4.285*	*4.291*	*4.262*	*4.183*	*4.098*
SWEST	-0.231*	-0.279*	-0.282*	-0.283*	-0.287*	-0.295*	-0.292*
	-2.837	*-3.433*	*-3.469*	*-3.482*	*-3.528*	*-3.629*	*-3.596*
BIG6	0.199*	0.120*	0.124*	0.123*	0.126*	0.131*	0.133*
	3.662	*2.811*	*2.884*	*2.854*	*2.930*	*3.060*	*3.095*
LNNAFEE	-----	0.184*	0.184*	0.184*	0.184*	0.185*	0.178*
		9.774	*9.752*	*9.747*	*9.754*	*9.855*	*9.157*
ALUMNI	-----	-----	-0.056	-0.155	-0.155	-0.189	-0.258***
			-1.127	*-1.202*	*-1.206*	*-1.466*	*-1.877*
ALMNEXD	-----	-----	-----	0.113	0.183	0.236	0.228
				0.829	*1.266*	*1.614*	*1.559*
ALMNFD	-----	-----	-----	-----	-0.140	-0.131	-0.122
					-1.423	*-1.340*	*-1.242*
AGECADRE	-----	-----	-----	-----	-----	0.003**	0.003**
						2.096	*2.111*
ALMNNAFE	----	-----	-----	-----	-----	-----	0.001
							1.457
R	0.827	0.837	0.837	0.837	0.837	0.839	0.839
R Square	0.684	0.700	0.700	0.700	0.701	0.703	0.705
Adjusted R Square	0.672	0.692	0.691	0.691	0.691	0.693	0.693
F	54.522^{+}	80.937^{+}	76.291^{+}	72.474^{+}	69.233^{+}	66.648^{+}	63.959^{+}

Figures in *italics* are *t*-statistics. *, **, *** indicates the *t*-value of coefficients are significant at the 1%, 5%, and 10% levels respectively (two-tailed test). $^{+}$ indicates the F-value is significant at the 0.01% level.

C: Regression estimates of hypotheses 3-5 for small clients sub-sample incorporating the alumni variables

	H3	H4	H5	H11(1)	H11(2)	H11(3)
(Constant)	-2.189*	-1.863*	-2.901*	-1.917*	-1.568*	-1.688*
	-7.328	*-5.840*	*-5.542*	*-6.305*	*-4.858*	*-2.941*
AGECOMP	-0.099**	-0.082	-0.319*	-0.089***	-0.064	-0.261*
	-2.033	*-1.639*	*-3.209*	*-1.843*	*-1.280*	*-2.637*
AUDQN	0.363***	0.348	0.433	0.151	0.119	------
	1.895	*1.554*	*1.043*	*0.728*	*0.565*	
BUSY	0.124*	0.095**	0.170**	0.127*	0.119*	0.167**
	2.873	*2.038*	*2.296*	*2.990*	*2.587*	*2.350*
GRTLONDN	0.245*	0.241*	0.185**	0.217*	0.212*	0.051
	5.779	*5.327*	*2.492*	*5.235*	*4.820*	*0.673*
LNCR	0.172*	0.101**	0.138***	0.096**	0.032	0.081
	3.674	*1.990*	*1.699*	*2.077*	*0.651*	*1.026*
LNDE	-0.046**	-0.045**	-0.014	-0.061*	-0.065*	0.009
	-2.407	*-2.312*	*-0.433*	*-3.302*	*-3.444*	*0.294*
LNDEBTR	0.078*	0.065*	0.004	0.089*	0.075*	0.017
	3.817	*2.941*	*0.104*	*4.408*	*3.426*	*0.475*
LNEARN	0.048	0.099**	-0.071	0.019	0.071***	0.025
	1.138	*2.453*	*-1.002*	*0.469*	*1.858*	*0.372*
LNINV	-0.040**	-0.010	-0.026	-0.020	0.016	0.008
	-2.241	*-0.502*	*-0.976*	*-1.088*	*0.870*	*0.308*
LNROCE	0.003	-0.002	0.038	0.038	0.011	0.031
	0.076	*-0.043*	*0.596*	*1.042*	*0.313*	*0.508*
LNROI	-0.026	-0.057***	0.073	-0.004	-0.033	0.057
	-0.792	*-1.660*	*1.237*	*-0.134*	*-1.004*	*0.996*
LNSALES	0.520*	0.491*	0.596*	0.426*	0.403*	0.463*
	23.828	*21.046*	*14.469*	*18.747*	*17.027*	*9.810*
LTLBTA	1.004*	1.040*	0.661	1.189*	1.289*	0.341
	3.908	*3.809*	*1.360*	*4.652*	*4.788*	*0.726*
SIC	0.036**	0.026	0.094*	0.032***	0.017	0.103*
	2.131	*1.429*	*3.240*	*1.932*	*0.942*	*3.526*
SQRTSUBS	0.095*	0.111*	-0.004	0.078*	0.081*	-0.034
	5.202	*5.900*	*-0.105*	*4.392*	*4.376*	*-0.930*
SWEST	-0.262*	-0.207**	-0.132	-0.323*	-0.271*	-0.173
	-3.089	*-2.373*	*-0.692*	*-3.809*	*-3.087*	*-0.977*
B6B14	0.174*	-----	-----	0.104**	-----	-----
	3.496			*2.038*		
B6OTHER	-----	0.234*	-----	------	0.164**	-----
		3.566			*2.549*	
B14OTHER	-----	-----	0.058	------	-----	0.051
			0.785			*0.688*
LNNAFEE	-----	-----	-----	0.179*	0.176*	0.206*
				8.625	*7.977*	*5.786*
ALUMNI	-----	-----	-----	-0.145	-0.259***	-0.621**
				-0.972	*-1.702*	*-2.512*
ALMNEXD	-----	-----	-----	0.095	0.255	0.525***
				0.608	*1.590*	*1.753*
ALMNFD	-----	-----	-----	-0.112	-0.147	0.091
				-1.121	*-1.395*	*0.309*
AGECADRE	-----	-----	-----	0.003***	0.004**	0.001
				1.864	*2.044*	*0.339*
ALMNNAFE	-----	-----	-----	0.001	0.001	0.003
				1.281	*1.245*	*0.890*
R	0.808	0.796	0.879	0.830	0.826	0.897
R Square	0.653	0.634	0.772	0.689	0.682	0.805
Adjusted R Square	0.644	0.622	0.750	0.676	0.667	0.777
F	67.721+	56.439+	35.455+	53.210+	47.038+	28.837+

Figures in *italics* are *t*-statistics. *, **, *** indicates the *t*-value of coefficients are significant at the 1%, 5%, and 10% levels respectively (two-tailed test). + indicates the F-value is significant at the 0.01% level. In H11(3), audit qualification variable is deleted from the estimated model as it became a constant.

CHAPTER X

SYMMARY, DISCUSSION, AND CONCLUSIONS

This final chapter provides a brief summary and discussion of the principal findings of the research. The market structure for the audits is offered as an explanation of the audit pricing differences observed in the UK audit market. In addition, the implications of the findings and limitations of the study are also discussed. In the last section of this chapter, I suggest possible areas for future research to extend the present results.

10.1. Summary of the study

Researchers have examined the form of the auditor fee function in many studies over the last two decades. These studies use data samples mainly from the United States, the United Kingdom, and Australia. Generally, the results are consistent with the audit fee being a function of client factors, such as size and complexity, client risk to fail, and audit firm factors such as size, tenure, specialisation, provision of non-audit services. These factors are related to the audit fees through their influence on the costs of delivering the audit.

While prior research has thoroughly examined most of the possible factors affecting the audit fee, none of the previous studies has looked at the possible interaction between the audit fee and the alumni of the accounting firms. That is, whether a director(s), who is(are) simultaneously chartered accountant(s) qualified with an accountancy firm, is(are) associated with the audit fee. This association would exist if the director-chartered accountant's (i.e. the CADRE's) present employer uses as auditor the CADRE's alma mater (i.e. CADRE's qualifying audit firm). Such an association may affect the costs of delivering an audit and those costs may be passed to the client in the audit fee. This study contributes to the existing auditor fee function literature by trying to establish the existence of this association. The results of this study provide some evidence that these factors, which have to do with the internal structure of the large accountancy firms and their high staff turnover, are associated with the audit fee. This study examines the association of auditors' alumni with their alma mater and how this association may affect the audit fee. This study is also the first to use particular measures of this variable.

Prior to testing the specific hypotheses of this study on main effects as well as interaction effects in Chapter IX, Chapter II provided a theoretical analysis and explanation of the "alumni effect" as well as insights into the direction of the sign of the "alumni effect" in relation to the setting of audit fees level. Chapter II has described how the internal structure of the accountancy firms is tied together due to the existence of a profit sharing model, up-or-out personnel policy and firm-specific human capital. It also showed theoretically why the alumni of the audit firms might continue an association with their alma mater years after having been outplaced by drawing on sociological and psychological research. Finally, Chapter II has illustrated how the bond potentially formed between trainee and firm is then maintained to translate into action with certain economic effects years later. Chapter III offered a review of the audit market research and the factors found to affect audit fees. The time consuming steps in the process of collecting and building the dataset are described in Chapter IV. In the same chapter some descriptive statistics about the CADRE and a historical reference to Big-Six predecessor firms are made. Having identified the importance of the alumni for the audit firms from a theoretical, human capital and managerial incentives perspective (Chapter II), and having reviewed the relevant audit fee literature (Chapter III), Chapter V explored whether any "alumni effect" is reflected in audit prices. Specifically, it investigated the association between CADRE's auditor and CADRE's ALMA MATER for different definitions of CADRE and ALMA MATER. The results are consistent among the different definitions. The major finding is that such an association does exist in the UK audit market for publicly traded companies. In other words, an "alumni effect" prevails the UK market for accountancy and audit services. The question of whether this association leads to higher or lower audit fees or does not influence the audit fee charged at all was asked in Chapter IX (see below). Meanwhile, Chapter VI offered the formulation of hypotheses to be tested in this study and a description of the variables selected to test the hypotheses.

Chapter VII provided descriptive statistics by auditee size sub-samples and by auditor group (i.e. Big-Six vs. non-Big Six firms) sub-samples. The large companies sub-sample of the current study was defined as auditees with sales greater than or equal to £251 million, whereas the small client market segment was defined as companies with sales less than £251 million. This is consistent with the sharp increase of the Herfindahl Index around the boundary of £251 million. See Tables 7.2.1.A and 7.2.2.A of Chapter VII for a summary of the descriptive statistics.

The development of the research design and the tests performed to detect violations of assumptions underlying the multiple regression analysis were presented in Chapter VIII. The "basic" regression model was applied to the total sample of observations to assess its descriptive validity prior to using the model on client size sub-samples to test the specific hypotheses of this study. Table 8.4.A of Chapter VIII presents the "basic" multiple regression model for the total sample. The model supports the overall descriptive validity of the variables used to explain the level of external audit fees. The model explains 85.40% of the variability in audit fees. Most of the variables are individually significant and in the hypothesised direction, except as discussed in that section (i.e. section 8.4 of Chapter VIII). Further, the examination of the residuals and identification of outliers as influential observations did not provide evidence to indicate the assumptions underlying the multivariate analysis were seriously violated. Furthermore, the variance inflation factors (VIF) and the correlation matrix were examined and did not detect existence of multicollinearity. See the correlation matrices in Tables 8.3.A and 8.3.B and VIF measures in Table 8.4.A of Chapter VIII.

The main hypotheses developed in Chapter VI were tested in client size sub-samples in Chapter IX. The basic method of data analysis in the research is a series of regressions of observed audit prices (i.e. fees paid to auditors) on a set of hypothesised explanatory variables. Table 10.1.A below provides a summary of the hypotheses tested in the current study. Hypotheses 1 through 6 are a replication, while hypotheses 7 through 11 are the main hypotheses of the thesis[1]. Hypothesis 1 was accepted indicating no audit fee difference among the Big-Six and non-Big Six firms in the large companies market segment. See Table 9.1.A of Chapter IX for the model used to test the hypothesis 1. Hypotheses 2 through 5 were tested only in the small client segment of the UK audit market. Hypothesis 2 was rejected, with a positive and significant (p value < 0.001) audit firm size coefficient, indicating that there is a Big-Six audit fee premium over the non-Big Six firms charged to small quoted companies in the small client sub-sample. See Table 9.2.A of Chapter IX for the model used to test the hypothesis 2. Hypotheses 3 through 5 provided a richer test of the association between auditor size and audit fee in the small client segment by using three audit firm size categories. The non-Big Six accountancy firm category was partitioned further into the second-tier audit firms and all other firms having local or regional offices/practices. Hypotheses 3 and 4 were rejected at less than 0.001 significance level indicating that the Big-Six firms charge a premium over the second-tier firms as well as over the local/regional firms in the small audit market. See Tables 9.2.B and 9.2.C of Chapter IX for the models used to test the hypotheses 3 and 4 respectively. Hypothesis 5 could not be rejected, with a p value of 0.433, indicating no second-tier firms price premium over the local/regional accounting practices. See Table 9.2.D of Chapter IX for the model used to test the hypothesis 5. Hypothesis 6 was accepted at less than 0.001 significance level in both large and small client sub-samples indicating an audit fee difference due to provision of non-audit services. See Tables 9.1.B and

9.2.F of Chapter IX for the models used to test the hypothesis 6 in the large and small company audits respectively.

Table 10.1.A: Summary and results of hypotheses tested

		Findings in	
	Hypotheses	*Large clients sub-sample*	*Small clients sub-sample*
H1	there will be no differential pricing of audit services between Big Six and non-Big Six accountancy firms.	accepted	not tested
H2	the Big Six charge lower audit fee than (or equal to) the non-Big Six firm.	not tested	rejected
H3	the Big Six charge lower audit fee than (or equal to) the second-tier accountancy firms.	not tested	rejected
H4	the Big Six charge lower audit fee than (or equal to) the local/regional accountancy firms.	not tested	rejected
H5	the second-tier firms charge lower audit fee than (or equal to) the local/regional accountancy firms.	not tested	accepted
H6	the pricing of audit services is related to the pricing of non-audit services.	accepted	accepted
H7	it makes no difference on audit fees when <u>any</u> director is an ex-employee of the auditor.	accepted	accepted
H8	on average it makes no difference on audit fees when a non-executive director is an ex-employee of the auditor.	accepted	accepted
H9	there is no audit fee difference when the chairman, chief executive or finance director are an alumni of the auditor.	rejected	accepted
H10	the audit fee charged will not be lower or higher as the CADRE becomes older.	accepted	rejected
H11	there is no different relationship between audit and non-audit fee because of existence of auditor alumni.	accepted	accepted

Hypotheses 7 through 11 refer to the existence of the "alumni effect" on audit fees. Chapter V has shown that there is an "alumni effect" in the UK audit market, in other

[1] See Chapter VI for a discussion of the hypotheses.

words that there is an association between CADRE's auditor and CADRE's alma mater. However, this association does not appear to have an influence on the audit fees charged in both small and large client segment of the audit market. As a result, hypothesis 7 could not be rejected in both sub-samples. See Tables 9.1.C and 9.2.G of Chapter IX for the models used to test the hypothesis 7. Hypothesis 8 could not be rejected in both sub-samples too indicating no audit fee difference when a non-executive is an alumni of the incumbent auditor in both small and large client segment of the UK audit market. See Tables 9.1.D and 9.2.H of Chapter IX for the models used to test the hypothesis 8.

Contrary outputs were given when the hypothesis 9 and 10 were tested in the two sub-samples. Hypothesis 9 relating to the "alumni effect" and its interaction with those CADRE who are finance directors, chairmen and chief executives was rejected in the large companies sub-sample. The variable ALMNFD was found to be significant (at the 0.073 level) and positive indicating higher audit fees when the finance director and/or chairman and/or chief executive turn(s) out to be an alumni of the incumbent auditor. However, hypothesis 9 was not rejected in the small client segment of the market. See Tables 9.1.E and 9.2.I of Chapter IX for the models used to test the hypothesis 9. Hypothesis 10 was rejected in the small auditee sub-sample at the 0.037 level of significance indicating an audit fee difference while the CADRE becomes older. However, hypothesis 10 was not rejected in the large client segment of the UK audit market. See Tables 9.1.F and 9.2.J of Chapter IX for the models used to test the hypothesis 10. Finally, hypothesis 11 could not be rejected in both sub-samples of the audit market indicating no audit fee difference when there is purchase of non-audit services and at the same time there is an alumni of the incumbent auditor on the board of directors. See Tables 9.1.G and 9.2.K of Chapter IX for the models used to test the hypothesis 11.

In addition, hypothesis 11 was tested in Chapter IX by incorporating the three different auditor size classes used in testing the hypotheses 3 through 5. This has been done in order to examine the direction and significance of the alumni variables in different auditor settings. The main findings are: When the Big-Six and local/regional firms were included in the model the ALUMNI variable was significant and negative indicating an audit fee difference in the small client segment of the UK audit market. The same result was found when the second-tier and local/regional accountancy practices were incorporated in the regression model. In this last model the ALMNEXD variable was also significant and positive indicating higher audit fees in the presence of non-executive directors. The empirical results from these models can be seen in Table 9.3.C of Chapter IX.

10.2. The market structure for audits[2]

The results of this study indicate significant different audit prices (or fees) in the UK audit market when different factors hypothesised to affect audit fees are taken into consideration. This pricing differential may be explained in four ways:

(1) it reflects pricing collusion among the Big-Six audit firms,

(2) it reflects barriers to entry by the non-Big Six firms into the Big-Six firms audit segment,

(3) it reflects successful product differentiation of the Big-Six relative to non-Big Six audit firms, and/or

(4) it reflects the existence of alumni of the accountancy firms on the boards of companies.

Following is a discussion of the best way or ways to explain the audit pricing differential (or no differential).

10.2.1. The collusion explanation

A collusion explanation of the Big-Six firms pricing differential consists of four propositions: (i) The audit market is highly concentrated. Ninety-seven percent of public companies with sales greater then £2 billion and eighty-two percent of companies with sales between £251 and £1,900 million were audited by the Big-Six

[2] See also Yardley *et al* (1992) for a specific discussion on the structure of market for audit services, and Scherer and Ross (1990), Waterson (1985), Cubbin (1988) for a general discussion on the market structure and industrial organisation.

firms in 1996[3]. (ii) Since the likelihood of collusion (i.e. co-operative pricing) increases with the concentration ratio, there must be a presumption that the Big-Six firms engage in collusive pricing. (iii) This collusion in turn can be presumed to lead to price-setting power above marginal cost; or, as it is sometimes put, to excess "monopoly" profits. (iv) The collusion can also be presumed to make it possible only for the Big-Six firms to charge higher prices than the non-Big Six firms.

Proposition two is at best problematical with industrial organisation economists viewing sceptically its validity. The positive association between industry profitability and seller concentration has been spurious (Scherer and Ross, 1990), meaning that high concentration does not necessarily leads to collusive behaviour.

The third proposition is also problematical. Above cost pricing[4], or monopoly pricing, is a function not only of the combined market share of leading dominant firms (i.e. the Big-Six audit firms), but also of potential supply from either smaller existing rival companies or new competitors that could enter the industry. As Samuelson (1965) pointed out, a one-firm industry's concentration ratio would be 100 percent, and yet the ability to hold prices above marginal cost of that one-firm could be zero if the potential supply elasticity were great enough. In other words, the fact that the incumbents (i.e. a cartel of large auditors) may co-ordinate their behaviour (i.e. collude) does not necessarily mean that above cost pricing will occur.

Finally, the fourth proposition does not hold too. If the Big-Six and the non-Big Six accountancy firms sell audit services in the same concentrated market, the non-Big Six firms are free to match the prices charged by the Big-Six firms. There is nothing in the nature of collusion that says only the big players (i.e. Big-Six auditors) can enjoy the fruits of collusion. In fact, monopoly (that is, joint profit-maximising) prices are "umbrella" prices. Everybody gets to charge them. Indeed, as we just saw, that is why the third proposition does not follow.

[3] These percentages are based on our sample. See section 7.1.1 of Chapter VII for a complete table of the UK Big-Six auditor concentration ratios. These percentages do not differ from other studies'.
[4] Above cost pricing refers to pricing with profits greater than normal profits.

In summary, the collusive explanation is clearly a weak explanation of audit fee differential.

10.2.2. The barriers to entry explanation

The barriers to entry explanation of the pricing differential in the UK audit market tells a different story than the collusion explanation. The barriers to entry explanation requires the following propositions: (i) The large audit (i.e. the Big-Six) firms increasingly dominate large company audits and this fact may be explained by two major cost advantages that Big-Six firms enjoy over the prospective non-Big Six entrants into the market for audit services to large companies segment[5]. The first advantage is that Big-Six firms have already expended the capital necessary to produce these services[6]. The second advantage is the accumulation of goodwill or brand "image" or reputation that Big-Six firms have succeeded over the years. (ii) These competitive advantages cannot be overcome unless comparable investment of capital and expenditures necessary for name recognition to be built are made by each non-Big Six audit firm. (iii) The prospective non-Big Six firms do not enter the large companies segment of the market since they do not have the resources to meet the above requirements. (iv) Given these barriers into the market, the Big-Six auditors are free to raise audit prices significantly above cost without attracting entry. (v) If no pricing above cost occurs, then the established Big-Six firms may enjoy certain economies of scale which at least partially are passed through in the form of lower prices to clients.

With regard to the second proposition, it is argued that the long history of each of the Big-Six firms together with their heavy advertising expenditure[7] facilitate the building up of the consumer loyalty to their products, and that the loyalty created in this way makes entry difficult for newcomers or smaller existing players (Waterson, 1985; Scherer and Ross, 1990). Also, advertising contributes to brand image formation

[5] Other categories of barriers (apart from legal exclusions) are product differentiation advantages and economies of scale (Waterson, 1985; Scherer and Ross, 1990). Product differentiation will be discussed in the next section. We do not follow Stigler's (1968) definition which is also adopted by Dopuch and Simunic (1982) and which in essence precludes economies of scale as barriers to entry.

[6] Capital costs may include costs such as offices, libraries, training centres, and so on, and also transaction costs for recruitment, training and communication networks.

which in turn may create monopoly power. Further, no other accounting firm appears to have reached the world-wide "credibility" image of the Big-Six firms and the reason for this inequality, implied by Dopuch and Simunic (1980), is that the formation of each of the Big-Six firms preceded the adoption of the advertising prohibition rule.

Nevertheless, this restriction in advertising has been lifted nowadays and remains to see whether other accountancy firm(s) will join the dominant tier[8]. Non-Big Six firms are legally capable[9] and also appear to be financially capable of entering the large client segment of the market which is dominated by the large audit firms. Moreover, from the data in Table 7.2.2.A of Chapter VII, where the descriptive statistics are provided, is evident that there is much crossover between the Big-Six and non-Big Six clients and the non-Big Six audit firms are in market for large client audits. Thus, the third proposition is still questionable.

The fourth proposition is also problematical. Even if we grant the fact that there are barriers to entry into the large companies segment of the UK audit market and, therefore, the large established (i.e. Big-Six) firms are permitted to hold prices above their own costs without attracting new entrants or fringe rival expansion (i.e. non-Big Six audit firms) (Scherer and Ross, 1990; McConnell and Brue, 1993), the evidence from testing the hypothesis 1 in Chapter IX suggests that there is not differential pricing of audit services between Big-Six and non-Big Six audit firms in the large clients market segment.

Finally, proposition five may explain the existence of no differential pricing of audit services in the large company audits. Each of the Big-Six firms have built strong brand names and loyalties (Craswell *et al*, 1995), and also have succeeded in

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[7] Especially after the easing of the accountancy profession's restrictions on member firms advertising in 1983.
[8] Craswell *et al* (1997) also suggest that the changes in professional rules (i.e. removing the ban on advertising) should have reduced the ability of the Big-Eight firms to charge a premium. Their evidence does not support their argument though. Conversely, Davis *et al* (1999) find a reduction in the Big-Six firms fee premium in the mid-1980's when the relaxation of the restrictive regulations took place.
[9] In both the UK and the USA, the legal requirement to render audit services as a sole practitioner or a firm partner is a certification through examination of competence and the fulfilment of experience requirements necessary to obtain certification or licencing.

differentiating their audits relative to the audits of the non-Big Six firms[10]. Both these elements may permit Big-Six auditors to charge higher audit prices and entry barriers to be emerged, according to the industrial economics theory. Yet due to the existence of scale economies accruing to large dominant accountancy firms in the audits of large clients, higher audit fee charges due to product differentiation and brand name recognition are offset resulting in observing no audit fee difference between Big-Six and non-Big Six audit firms in the large companies segment of the UK audit market. Put another way, non-Big Six diseconomies of scale in the large company audits offset Big-Six premiums (due to product differentiation and brand name recognition) resulting in no significant differences in audit fees. Moreover, the same brand loyalties and economies of scale in product differentiation may raise barriers to entry of new competition, explaining perhaps the dominance (i.e. high market shares) of the Big-Six firms in the large company audits overtime.

In conclusion, the barrier to entry explanation appears to be better than the collusion explanation in describing the lack of differential pricing in the large company segment between the Big-Six and non-Big Six accountancy firms.

10.2.3. The product differentiation explanation

The product differentiation explanation of the pricing differential in the UK audit market consists of four propositions: (i) For the purposes of understanding the Big-Six firms pricing differential in the small company audits it is best to think of the audit services market as essentially homogeneous[11]. (ii) In this market the Big-Six audit firms succeed in differentiating the audit (and non-audit) services they provide relative to the services of the non-Big Six firms. Big-Six auditors manage to do this by adding "features" to their product, for example maintain large and well-trained staff, supply enhanced accounting and auditing knowledge which includes industry expertise, offer world-wide "locational" convenience. Also, Big-Six firms differentiate their products by aggressively promoting the product by some combination of direct selling and

[10] See next section below for further discussion on Big-Six product differentiation.
[11] Product or service homogeneity prevails when the offerings of competing sellers (i.e. provision of audit services by the accountancy firms) are alike so that they are virtually perfect substitutes in the mind of consumers (i.e. auditors' clients).

advertising and in effect they impose the subjective image which in turn is impressed on the client's mind. The effect of this differentiation is to increase the demand for the Big-Six product relative to what it would otherwise be[12]. (iii) The Big-Six firms choose to exploit their successful product differentiation effort by charging a premium relative to the price charged by the non-Big Six firms for their product[13]. (iv) Whether this premium charged by the Big-Six firms results in a significant mark-up of prices over costs depends on the additions to these costs generated by the differentiation effort.

Proposition three may explain the audit price premium found in the small client market segment of this study. That is, the Big-Six and non-Big Six audit firms have differentiated products and the Big-Six charge a premium for their product. On the other hand, buyers (i.e. audit clients) are willing to pay a higher price for that Big-Six firms' differentiated products than they would for the otherwise comparable products of new entrants or fringe small audit firms.

With regard to the fourth proposition, we argue that the existence of audit price differential reflects product differentials but not necessarily profit above zero for the Big-Six accounting firms. There may be costs associated with the Big-Six firms' product differentiation. These costs may result in cost function differences between the Big-Six and the non-Big Six firms, making it necessary for the Big-Six firms to charge a premium than non-Big Six firms while both may realise zero profits. This costly product differentiation allows for price differences but not necessarily profit differences between the Big-Six and the non-Big Six firms. The Big-Six firms would charge more than the non-Big Six firms because of their higher costs[14]. This explains a price differential without, however, an above cost price.

There are two alternative explanations concerning the fourth proposition. The first argument, explained in the preceding paragraph, illustrates that there is competition in

[12] Note here that the "lemons problem" may arise if the Big-Six accountancy firms cannot distinguish themselves from the non-Bix Six and consequently the non-Bix Six firms hide the quality of their product (because they find it in their interest) (Akerlof, 1970; Wilson, 1980).

[13] Klein and Leffler (1981) explain the fee premium as product superiority.

[14] See next section for a discussion of the reasons cited as explanation for the Big-Six firms having higher audit costs.

the small company market segment with differentiated product to the Big-Six firms which nevertheless have a different cost function from the non-Big Six firms (due to the costs of product differentiation). This allows for price differences but not necessarily profits above zero for the Big-Six firms. The other alternative talks about product differentiation with the Big-Six and non-Big Six firms having the same cost function. This alternative allows for price differentials <u>and</u> profits above zero for the Big-Six auditors.

It must be noted here that the above two alternatives cannot be tested due to the lack of availability of cost data for the accountancy firms. We have postulated that the Big-Six audit firms may have a higher cost per unit of audit for the differentiated service they provide necessitating higher audit prices to cover the costs. The following section cites the reasons to justify our belief that the Big-Six audit firms may have higher audit costs.

<u>10.2.3.1. Big-Six firms associated with higher audit costs</u>

This section mentions possible (anecdotal) reasons why the Big-Six accountancy firms may have higher audit costs than the non-Big Six firms.

The Big-Six audit firms market and maintain industry expertise. This requires extensive marketing costs such as brochures, seminars, attendance at meetings, newsletters and so on. This industry specialisation must be demonstrated as well, which requires the Big-Six auditors to have extensively trained employees with industry specific knowledge and experience, requiring larger and specialised training and recruiting costs. This industry expertise must be kept up to date too, which requires the Big-Six auditors to develop and maintain valuable communications networks including interpersonal communications with clients, government officials, and educators.

The Big-Six audit firms are trying to develop new business opportunities. They are able to do so by marketing their ability to deal with complex accounting transactions (for example, sophisticated accounting, auditing and information systems matters, etc.) and offering other services (for example, corporate planning, international tax, pensions, insolvency, actuarial services, etc.)[15]. Companies themselves grow and demand expanded services from their advisors. Companies select the Big-Six firms for their ability, knowledge and facilities to provide the audit and other services demanded. For the Big-Six auditors to obtain and maintain such an unmatched expertise requires them to have specialised staff with the resulting training and recruiting costs.

The Big-Six firms market their ability to provide timely (as soon after year-end as possible) audit reports to their clients. Timeliness of information is important to clients' management and shareholders but may be costly for accounting firms to provide. It is necessary to maintain peak season staffing year around which may result in costly under-utilised staff during non-busy periods. On the other hand, the non-Big Six firms may target clients that are relatively less demanding about the timeliness of the audit report allowing for a more uniform workload throughout the year which in turn may result in lower costs. In this study the year-end variable, BUSY, is indeed significant and positive in the small client segment of the UK audit market.

The Big-Six accountancy practices have intense global coverage and provide services to clients with diverse geographical locations (Noyelle and Dutka, 1986). Our sample companies have on average eleven subsidiaries and operate on average into two different industrial sectors[16]. The multiple location audits may be more costly to co-ordinate and conduct. Also, multiple location require costly quality controls to ensure a constant level of audit quality and a single world-wide audit technique across different offices and countries.

Finally, the Big-Six professional firms have cultivated a world-wide "premium" image and established credibility in the market. It needs time and is costly for the large dominant firms to maintain their reputation. The Big-Six firms have extensive public relations and advertising campaigns such as providing seminars, organising

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[15] Another example that the large accounting firms diversify their offerings is Belgium where the practice of legal counsel is largely unregulated and the Big-Six firms have developed in-house legal departments to advise clients on legal matters (Noyelle and Dutka, 1986).

[16] See the descriptive statistics on Table 7.2.2.A of Chapter VII.

conferences, offering research grants and seminars for academics, and attending social gatherings to market their existing clients and attract potential ones.

In summary, the Big-Six firms appear to have higher costs in producing differentiated products and as a result, they charge more than the non-Big Six to cover their costs. This would explain the Big-Six premium observed in the small client segment of the UK audit market without, however, necessarily indicating above cost pricing.

10.2.4. The "alumni effect" explanation

The "alumni effect" explanation of the pricing differential in the UK audit market tells a different story than the collusion explanation, barriers to entry explanation and product differentiation explanation discussed in the preceding sections. The "alumni effect" explanation requires the following propositions: (i) Accounting firms devise and implement an effective alumni policy. By saying this, we mean that the accounting firms maintain contact and make every effort to keep in touch with their alumni (Denney, 1983). We can also speculate on the sincere and continuous effort the audit firms make to continue some kind of pleasant and constructive relationship with their alumni. (ii) Since accounting firms' alumni become potential clients (because of the existence of alumni policy), there must be a presumption that the accountancy firms expect to be benefited by their alumni. (iii) The alumni in turn can be presumed to lead to higher audit prices, or fees, for the accountancy firms relative to what it would otherwise be.

With regard to the first proposition, accountancy firms have a large number of alumni as a result of the high staff turnover which in turn is due to the up-or-out policy implemented by the accountancy firms[17]. Accountancy firm alumni are important assets for audit firms. Some of the alumni may wind up as prospects or clients, others could be excellent sources of information. If a firm burns its bridges with its alumni, it will someday also see some new business go up in smoke as a result (Denney, 1983). Accounting firms themselves do recognise the marketing potential associated with

[17] Detailed discussion why the accountancy firms choose to apply an up-or-out employment policy can be found in Chapter II.

their alumni and they expend time and resources to develop and maintain their links with the alumni (Iyer *et al*, 1997; Iyer, 1998).

Proposition number two is the key proposition in the "alumni effect" explanation. Recent literature (for example, Marxen, 1996; Iyer *et al*, 1997) has identified the predisposition of accountancy firms' alumni to benefit their past employer (i.e. alumni's alma mater). Accountancy firms' alumni are prospective customers of the audit firms and they will, soon or later, help bring additional business to the firm. It seems that accountancy firms themselves appear to realise that and exploit their ability to manage their alumni asset in order, in the short or long term, to maximise the benefits derived from their alumni base.

On the other hand, employees working for accountancy firms are also benefited. Apart from gaining the qualification of being chartered accountants and becoming a professional, the wealth of the audit firms' experience is used as a stepping stone in a career path to other positions in private industry, academia, or commerce (Marxen, 1996). The accountancy training gives them the mobility to move into highly qualified and sought after jobs. Accountants are normally well outplaced when they leave the accountancy profession and this can only create positive feelings toward their alma mater. Moreover, the processes of socialisation inside the audit firms and the alumni relations programmes incorporated by these firms make sure that an organisational identity is created and established for the audit firms' employees. The stronger the alumni's identification with their former accounting firm, the higher the likelihood the alumni will benefit the audit firm when the opportunity arises.

The findings in this study are consistent with the "alumni effect" explanation. Those alumni, who become Finance Directors, Chairmen or Chief Executives in the UK large quoted companies (with sales greater than £251 million) and simultaneously have as their auditor the accountancy firm that they have qualified with, benefit their alma mater by agreeing to pay higher audit fees than otherwise be. Propositions two primarily and three, therefore, may explain the audit price difference found in this study.

Summarising overall this section, the market structure for audits has been discussed and the audit price difference found in this study is explained by: (1) Collusive behaviour and pricing among the Big-Six audit firms in the large company audits. This does not seem feasible explanation (as discussed in subsection 10.2.1. above), and collusion alone would not necessarily allow for audit price differential. (2) Barriers to entry for the non-Big Six firms into the large company segment of the audit market which is dominated by the Big-Six firms. There does not appear to be significant barriers to entry to the non-Big Six firms to prevent them from entering the large company segment of the market and the barriers to entry explanation alone seems to be a weak explanation. However, the barriers to entry explanation combined with the existence of economies of scale accruing to the Big-Six firms in the audits of large clients help explain the audit fee indifference observed between the Big-Six and non-Big Six firms in the large companies segment of this study. (3) Product differentiation with the Big-Six firms charging a premium for their product. The Big-Six firms may be producing a different product from the non-Big Six firms and may have a higher cost per unit of audit for this product necessitating higher audit prices to cover the costs. This explanation appears to be a strong candidate in explaining the price premium detected in the small client segment of the UK audit market. (4) Finally, the alumni of the accountancy firms who have an inclination to benefit their alma mater. This explanation seems to be persuasive enough and the findings of this study support the existence of audit fee differences in the large client audits due to the placement of audit firms' alumni on the boards of large clients.

10.3. Conclusions

Before we embarked on the current investigation, we knew that this was a novel investigation. There had been no serious empirical investigation in the past in the manner we were proposing to suggest an "alumni effect" would be found. It was pure curiosity driven piece of research. Neither were we aware that there was any current theory predicting that alumni relationships would have any commercial or economic importance. At that point there was only anecdotal evidence and supposition that professional and social relationships ought to be a factor in the market for accountancy services. We have attempted to measure whether there are any overall patterns in the association of CADRE with their ALMA MATER and whether these patterns translate into price effects.

Subsequently we put together different existing theories of economics and industrial organisation as well as theories on sociology and psychology, and we succeeded in building an explicit theoretical framework which explains how the particular organisational structure of the accountancy firms may help them to undertake continuing connections with their alumni, and why the accountancy firms ought to regard their alumni as significant and important source of future business. Our theory also predicts that there might be asymmetrical advantages from the alumni effect in the price of audit services provided by the accountancy firms.

The findings of the current study are somewhat mixed. Although the investigation has revealed that there is an "alumni effect", that is there are strong associations between alumni and accountancy firms, it has also shown that not all these associations are priced. In particular, it has shown that on average it makes a difference in audit fees when a finance director, chairman or chief executive deal with their former audit firm in obtaining audit services. That is to say, the fact of this relationship is to mean that the audit firm exploits its client when a finance director, chairman or chief executive's personal preferences and associations are entered in the equation.

On the other hand, however, no alumni impact has been found when <u>all</u> the UK chartered accountants-directors were considered. That is, the competitive outcomes are no different although there is evidence of an association between auditor and client.

Clearly the non-price aspect of competition, that is the "alumni effect", has proved to have a more important role in accountancy practice development than it was thought before. The returns from training chartered accountants would need to be re-considered by the accountancy firms, and to explicitly implement an alumni policy. Small audit firms are at a competitive disadvantage because of the lack of an influential body of alumni. These firms need to re-evaluate their human resource policies, in view of the evidence of networking in marketing.

Further, personal and professional networks have proved to be an important aspect of business life. Personal friendships between auditor and clients may stave off other audit firms without the equivalent established client networking from obtaining new clients. For example, the chartered accountant-finance director is more likely to prefer his/her alma mater. S/he does that because s/he knows the audit approach of his/her alma mater and, therefore, s/he would be better placed to know what can be "got away with". The alma mater is also preferred because the finance director knows more about his/her alma mater than any other audit firm and thus, feels that there is less risk in employing the "devil that you know". Of course the above are speculations beyond the statistical evidence. However, it has been proved in this study that the "alumni effect", a non-price factor, is important and significant, and the accountancy profession may find necessary to assess the implications. This study also provides evidence which may be used to support calls for more independent regulation of the audit profession, and/or for a ban on non-audit services from the incumbent auditors, and/or for automatic rotation of auditors.

As a final comment, the findings of this study suggest that researchers may need to control for the "alumni effect" variable in the analysis of audit fee determinants.

10.4. Limitations of the study

The following are offered as limitations of the current study:

1. The study underestimates the "alumni effect". A number of chartered accountants-directors have trained and qualified with small firms of accountants, moving for post-qualifying experience to the larger accountancy firms. The research design of the present study has only identified the initial training firm, and consequently under-estimates the association with larger accountancy firms. This research design under-estimates any effect.

In other words, this study has found that there is an "alumni effect" between accountancy firms and their clients, and *ceteris paribus* this effect will be stronger in the real world, since there are accountants-directors in the sample who have been qualified with small accountancy firms and have also been associated later in their career with larger accountancy firms, but as a result of the research design, they have been listed only against the first training firms.

2. The research design of the present study has not detected an "anti-alumni effect", in which a CADRE is not merely indifferent to the accountancy firm he/she once worked for, but has a negative preference.

3. The study has not shown whether the alumni just help bring additional business to their alma mater. The study has provided no evidence of an "alumni effect" when all CADRE were considered. In other words, there is no audit fee difference irrespective of the fact that chartered accountants sit on the boards of the incumbent auditor clients. However, this does not necessarily imply that there is no change in auditor when there is a change of director, and although there may be no change in audit fees from a client perspective, the CADRE may help the alma mater to receive an additional client.

4. The present study has not measured the number of years that CADRE have worked for the accountancy firm before leaving public practice for a business career. Tenure is hypothesised to affect alumni perceptions about the employer (Iyer *et al*, 1997) and, therefore, a strong association between CADRE and alma mater is expected the longer CADRE have stayed in the accountancy profession.

Allowing for the above limitations, the evidence presented in this study must be viewed as indicative rather than conclusive. Further research is needed to corroborate that the professional allegiance of the accounting firm alumni has indeed a measurable influence on the market for accountancy and audit services.

10.5. Suggestions for future research

This research project is the first one to systematically investigate the links between the training of chartered accountants, their subsequent advancement in industry and commerce and whether they act to advance the interests of the firm which trained them. Future research is surely needed to assess whether other non-price aspects of competition play an important role in determining the level of audit fees, how audit firms are chosen by their clients, how auditors are appointed and re-appointed and perhaps more significantly how they retain the audit.

More specifically, during the course of this research project, several interesting and related topics for future research emerged. The following suggestions, therefore, are offered:

(1) Directors may have multiple affiliations gained post-qualifying. A number of accountant-directors have trained and qualified with small firms of accountants, moving for post-qualifying experience to larger accountancy firms. Instead of using the initial training firm to explore the auditor-director relationship, future research could seek details of any post-qualifying affiliation.

Using in-house alumni records it would be possible to identify former employees who joined post-qualifying, and who are now on boards of companies. The estimation of the alumni effect in this manner would require access to the records of a number of accountancy firms. Or alternatively, the researcher could directly make a search for any prior audit firm affiliation from a sample of company directors.

(2) Competition in the market for accountancy services has also been studied in respect of auditor switching decisions. The literature deals mainly with the US market. Explanatory variables examined include changes in auditor cost structures (Johnson and Lys, 1990), auditors pressurised to suppress financial data (Knapp and Elikai, 1990), disagreements (McConnell, 1984), qualified audit opinions (Chow and Rice, 1982; Smith, 1986; Craswell, 1988), financial distress (Schwartz and Menon, 1985), fee levels (Eichenseher and Shields, 1983; Simon and Francis, 1988), agency costs (Francis and Wilson, 1988; De Frond, 1992; Albrecht *et al*, 1993), length of tenure

(Williams, 1988; Levinthal and Fichman, 1988), and initial public offerings (Menon and Williams, 1991; Firth and Smith, 1992). Haskins and Williams (1990) built a contingent model for intra-Big Eight auditor changes. Healy and Lys (1986) investigated audit firms mergers and subsequent auditor switches. UK studies include Moizer and Turley (1989), Citron and Taffler (1992), Beattie and Fearnley (1993; 1995; 1998). The questions are here: How are alumni factors implicated in auditor (non)switching decisions? Is change of director associated with change of auditor? Do replacement directors have the same professional associations as retiring directors? Of interest would also be which accountancy firms were losing clients and which firms were gaining clients.

(3) Another area for future research is to measure the reverse "alumni effect", i.e. the accountant leaving the accountancy profession is more likely to join a client than a non-client, making use of his personal (and the firm's) network. The researcher can track who the auditors of the company were when the chartered accountant joined that company. Some client personnel are recruited at a relatively junior level and ideally, the research should match the auditor of the company with the initial/first job of the chartered accountant after s/he left the profession.

(4) Finally, future research may assess other non-price aspects of competition such as the clients' respect for auditor non-audit activities. For example, the accountancy firm that assists heavily in community services, charity fund drives, educational support, etc. may be able to charge higher audit prices or to stave off other competitors who do not attain such a high image for non-audit activities.

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\APPENDIX I:

)verview of prior studies' hypothesised explanatory variables*

\NS	= non-significant
+	= positive and significant sign of coefficient
·	= negative and significant sign of coefficient
ank	= not tested in the study

TEXT BOUND INTO

THE SPINE

	Brinn, Peel + Roberts (1994); UK; 1988 data	Chan, Ezzamel + Gwilliam (1993); UK; 1989 data#	DeFond (1992); USA; 1979-1983 data	Ettredge + Greenberg (1990); USA; 1984-1987 data	Ezzamel, Gwilliam + Holland (1996); UK; 1992-1993 data	Palmrose (1986); USA; 1980-1981 data	Pong + Whittington (1994); UK; 1981-1988 data	Simon (1985); USA; 1978-1983 data
endent Variable	Audit Fees	Audit Fees	Audit Quality	% change in audit fee	Audit Fees	Audit Fees	Audit Fees	audit fees/SQRT(t. assets)
ple size	154	985 (reduced to 280)	1861 (reduced to 130)	389	361 (reduced to 314)	298	3349 (reduced to 577)	79
es		+			+		+	
l Assets	+	NS		+		+	+	
or Qualification				+		+		+
itor (1=B8, 0=NB8)	NS	+		+	+	+	+	NS
stry					- (regulated or not)	+		
audit fees					+	+		+ Nadtfee/SQR
of Subsidiaries		+		+			+	+
of Subsidiaries (UK subs)	+				+			
of Subsidiaries (overseas subs)					+			+
ign Subsidiaries/total subs				+				
ign subs/total assets								
of SIC Codes	+							+
ks/Total Assets	NS	NS		+				
ign assets/total assets								
rn on Assets								+
rn on Total Assets	NS							
rn on Capital Employed	NS				-			
l Liabilities/ Total Assets	NS							
-term Liabilities/ Total Assets	NS							
d Ratio	NS							
ent ratio	NS						-	
this Period								
previous period								
in both this & previous period	NS							
age	NS							
timing-busy period	NS	NS						
graphical location	+ (London/SE)	+ (only London)			+ (only London)	+		
ing status (public-non public)		+				+		
sification measure (Herfindahl)		-			-			
rn on Shareholders Equity		-						
ors/Total Assets		NS						
-term debt/total assets			+					
ivables+stock-payables)/total ts			-					
l assets growth			+					
score				-				
ax profit							NS	
or change (1=change to B8, nge to NB8)							+	
- debtors								
nt assets/total assets								
(1), continuing (0) audit ement								
debt ratio								
additional audit reports		NS				+		
of audit report		+			+			
r being industry specialist						NS		
l audit								

	Simon + Francis (1988); USA; 1979-1984 data	Simunic (1984); USA; 1976-1977data	Turpen (1990); USA; 1982-1984 data	Craswell, Francis + Sneddon (1996); Australia; 1987 data	Francis (1984); Australia; 1974-1978 data	Francis + Simon (1987); USA; 1984-1985 data	Francis + Stokes (1986); Australia; 1983 data	Johnson, Walker + Westeryaard (1995); N Zealana; 1989 data
...endent Variable	Audit Fees	audit fees/SQRT(t. assets)	audit fees	audit fees	audit fees	audit fees	audit fees	audit fees
...e size	440	397 (reduced to 263)	654 (reduced to 146)	1569 (reduced to 1468)	136	906 (reduced to 208)	96	259 (reduced to 179)
...es								
...Assets	+		+	-	+	+	+	+
...or Qualification	+	NS	NS	+	NS	+	+ & NS	NS
...or (1=B8, 0=NB8)	+		+	+	+	+	+ & NS	+
...ustry	NS	- (only banks)	- (regulated or not)					
...audit fees		+ (divided with SQRT of	+	NS				
...of Subsidiaries	+	+	+	+ (SQRT)	+ (SQRT)	+ (SQRT)	+ (SQRT)	+ (SQRT)
...of Subsidiaries (UK subs)								
...of Subsidiaries (overseas subs)	+							
...ign Subsidiaries/total subs	+		+	NS		+		
...eign subs/total assets								
...of SIC Codes		+						
...cks/Total Assets	+	+				+	+	+
...ign assets/total assets		+	+					
...rn on Assets								
...rn on Total Assets				-				
...rn on Capital Employed								
...l Liabilities/ Total Assets								
...-term Liabilities/ Total Assets								
...id Ratio				-	NS		NS	
...ent ratio								
...this Period								
...previous period					NS			NS
...in both this & previous period			+	-			NS	
...nt age								
...timing-busy period				NS	NS		NS	
...graphical location								
...ing status (public-non public)								+
...rsification measure (Herfindahl ...)								
...rn on Shareholders Equity								
...ors/Total Assets								
...-term debt/total assets				+				
...ivables+stock-payables)/total ...s								+
...l assets growth								
...it score	-							
...tax profit								
...or change (1=change to B8, ...nge to NB8)	-							
...k + debtors								
...nt assets/total assets			NS	+	+			
... (1), continuing (0) audit ...gement			-	-				NS
...-debt ratio					NS		NS/-	
					NS		NS/+	
...E								
...additional audit reports								NS
...of audit report								
...r being industry specialist								
...audit								NS

	Palmrose (1986); USA; 1980-1981 data	Simunic (1980); USA; 1976 data	Taffler + Ramalinggam (1982); UK; 1976-1977 data	Chung & Lindsay (1988); Canada; 1979-1980 data	Firth (1985); New Zealand; 1981 data	Ezzamel, Gwilliam + Holland (1998); UK; 1992-1993 data	Gul et al (1997); Hong Kong; 1993-1994 data	Gul (1999); Hong Kong; 1993 data
endent Variable	audit fees	audit fees/SQRT(t. assets)	audit fees	audit fees/SQRT(t. assets)	audit fees	audit fees	audit fees	audit fee
ple size	1186 (reduced to 361)	1207 (reduced to 397)	192	233	96	193	67	345
s			+			+	+	
l Assets	+	+			+ (SQRT)			+
or Qualification	+	+						
itor (1=B8, 0=NB8)	+	-	- (1=NB8)	NS	NS	NS	NS	
stry	-/+	- (banks & utility)				- (regulated or not)		
audit fees	+					+		
l Subsidiaries		+ (SQRT)		+	NS			+
l Subsidiaries (UK subs)						+		
l Subsidiaries (overseas subs)						+	+	-/+
ign Subsidiaries/total subs								
ign subs/total assets		+		+				
l SIC Codes	+	+	+	NS				
ks/Total Assets		+	NS	+	NS			
ign assets/total assets		+						
rn on Assets							-	
rn on Total Assets								
rn on Capital Employed				NS		NS		
l Liabilities/ Total Assets								
-term Liabilities/ Total Assets								
id Ratio								-
ent ratio								NS
this Period								
previous period								
in both this & previous period		+		NS	NS			
t age								
timing-busy period							NS	-
graphical location								
ng status (public-non public)	+						-	
sification measure (Herfindahl)						-		
rn on Shareholders Equity								
rs/Total Assets		+	NS	+	+			
term debt/total assets							NS	NS
vables+stock-payables)/total								
assets growth								
lt score								
ax profit								
or change (1=change to B8, nge to NB8)								
- debtors								
nt assets/total assets								
(1), continuing (0) audit gement								
-debt ratio								-
		NS		NS				
				NS				
dditional audit reports	+							
of audit report						NS		+
r being industry specialist	NS							
audit	-							

	Pearson+Trompter (1994); USA; 1982-1986 data	Davis et al (1999); UK; 1982-1988 data	Walker and Casterella (1998); USA; 1993 data	Low et al (1990); Singapore; 1986 data	Craswell + Francis (1999); Australia; 1987 data	Gist (1994); USA; 1983-1985 data	Karim + Moizer (1996); Bangladesh; 1991 data	Che-Ahmad and Houghton (1996); UK; 1990 data
pendent Variable	audit fee	audit fee	audit fee	audit fee	Audit Fee	Audit fee	audit fee	audit fee
e size	241	3103	80	157	1569 (reduced to 1468)	263	157	84
s								
Assets	+	+	+	+	+	+	+	+
itor Qualification		NS		NS	+	NS		
itor (1=B8, 0=NB8)		+/NS			+	+	+	NS
stry						- (regulated or not)		
n-audit fees								
of Subsidiaries			+		+ (SQRT)	+ (SQRT)		
of Subsidiaries (UK subs)								+
of Subsidiaries (overseas subs)								
eign Subsidiaries/total subs			+		NS			
ign subs/total assets						NS		
of SIC Codes				+				
cks/Total Assets				NS				
eign assets/total assets								
rn on Assets								
rn on Total Assets								
rn on Capital Employed								
l Liabilities/ Total Assets								
g-term Liabilities/ Total Assets								
ck Ratio					-			
rent ratio				NS				
this Period							NS	
previous period		NS						
in both this & previous period				+	-			
t age								
t timing-busy period						+	NS	NS
graphical location								+
ing status (public-non public)	+	+						
ersification measure (Herfindahl								
rn on Shareholders Equity								
tors/Total Assets				NS				
-term debt/total assets					+	NS		
eivables+stock-payables)/total ets		+	+					
l assets growth								
t score								
tax profit								
r change (1=change to B8, ange to NB8)								
- debtors								
nt assets/total assets					+			
(1), continuing (0) audit gement		-			-			
y-debt ratio								
					-	NS		
E					NS			
f additional audit reports								
y of audit report								
r being industry specialist	NS	-						
al audit			+					

APPENDIX II:

Disappeared firms table

Table 1

CADRE qualified with a DISAPPEARED accountancy firm*

DISAPPEARED FIRMS											
			AUDITORS OF PUBLIC COMPANIES								
		AA	CL	EY	KPMG	PW	TR	*Big-6 Subtotal*	Other	No Auditor	*TOTAL*
	AA	**1**	5	1	3	3	0	*13*	3	0	16
ALMA	CL	7	**41**	13	24	16	7	*108*	34	3	145
MATER	EY	6	26	**34**	20	11	15	*112*	22	2	136
	KPMG	6	16	9	**27**	11	4	*73*	13	0	86
	PW	0	3	1	1	**3**	2	*10*	5	1	16
	TR	2	8	6	15	8	**18**	*57*	11	1	69
	TOTAL	22	99	64	90	52	46	*373*	88	7	468

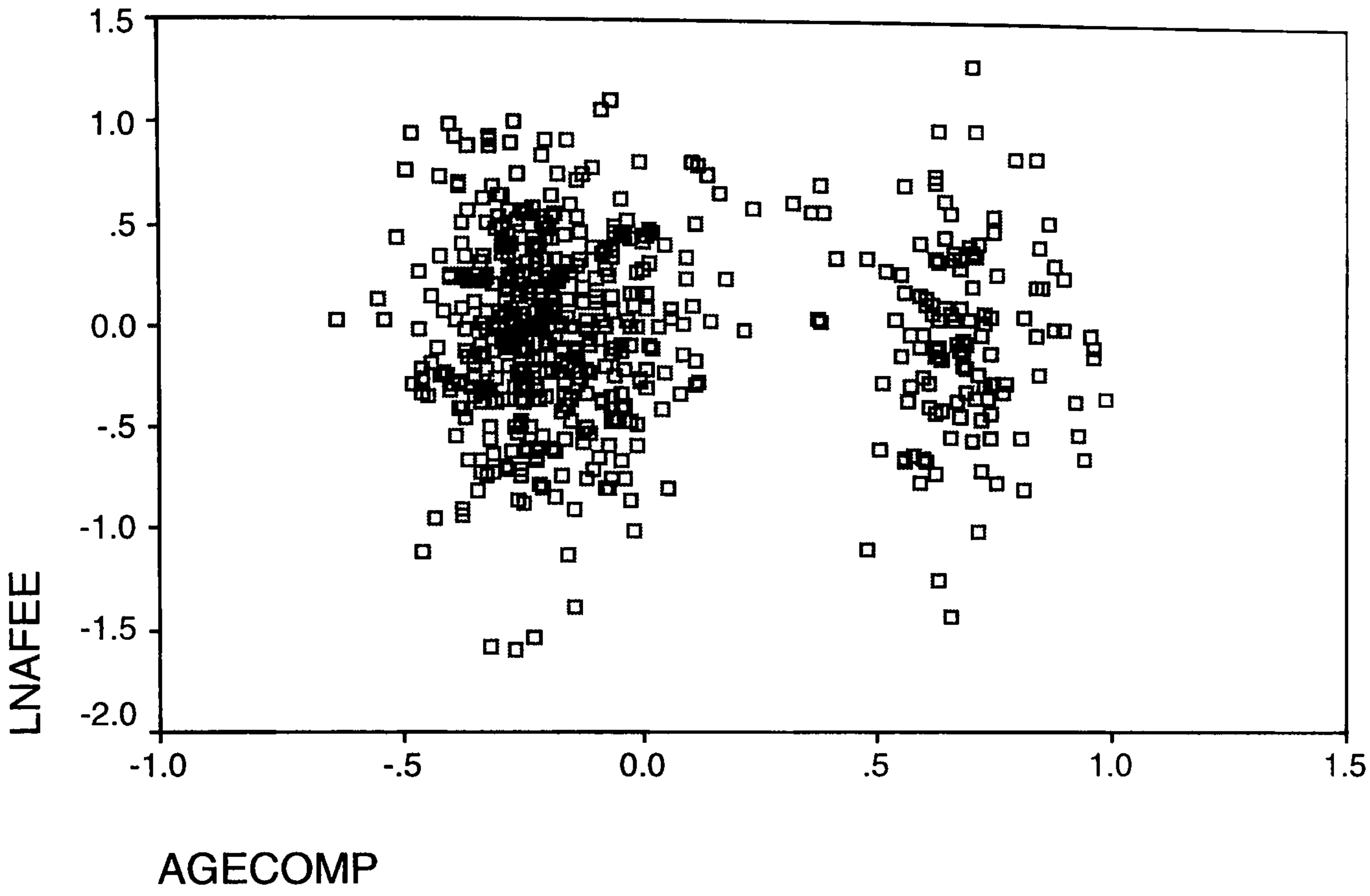
* The rows give the number of CADRE who qualified with a disappeared firm, i.e. with a predecessor of the Big-Six audit firms. The columns do not necessarily give the actual number of auditors or public companies, as some companies have more than one CADRE on their boards.

APPENDIX III:

Partial regression plots of the "basic" regression model

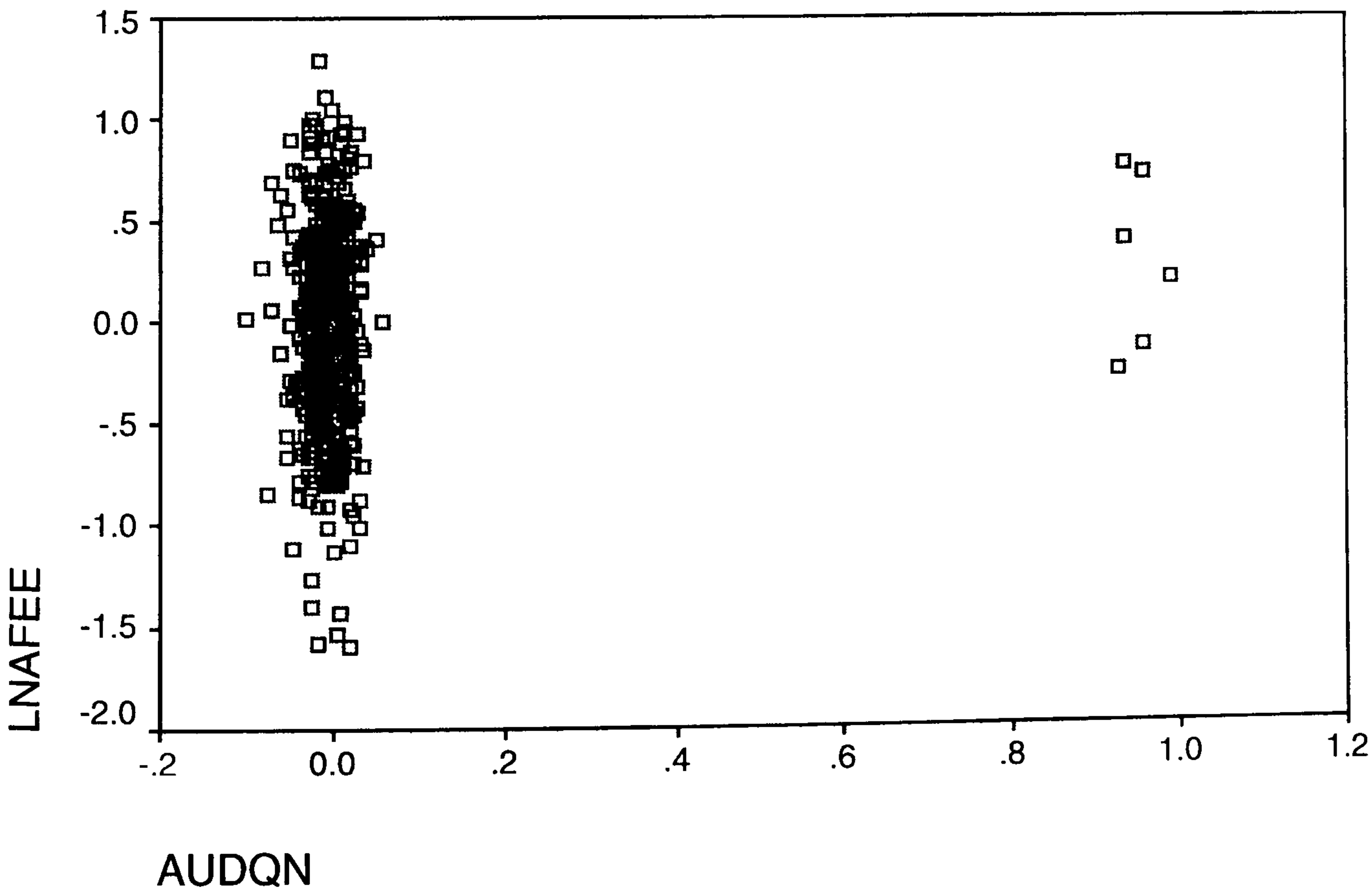
Partial Regression Plot

Dependent Variable: LNAFEE



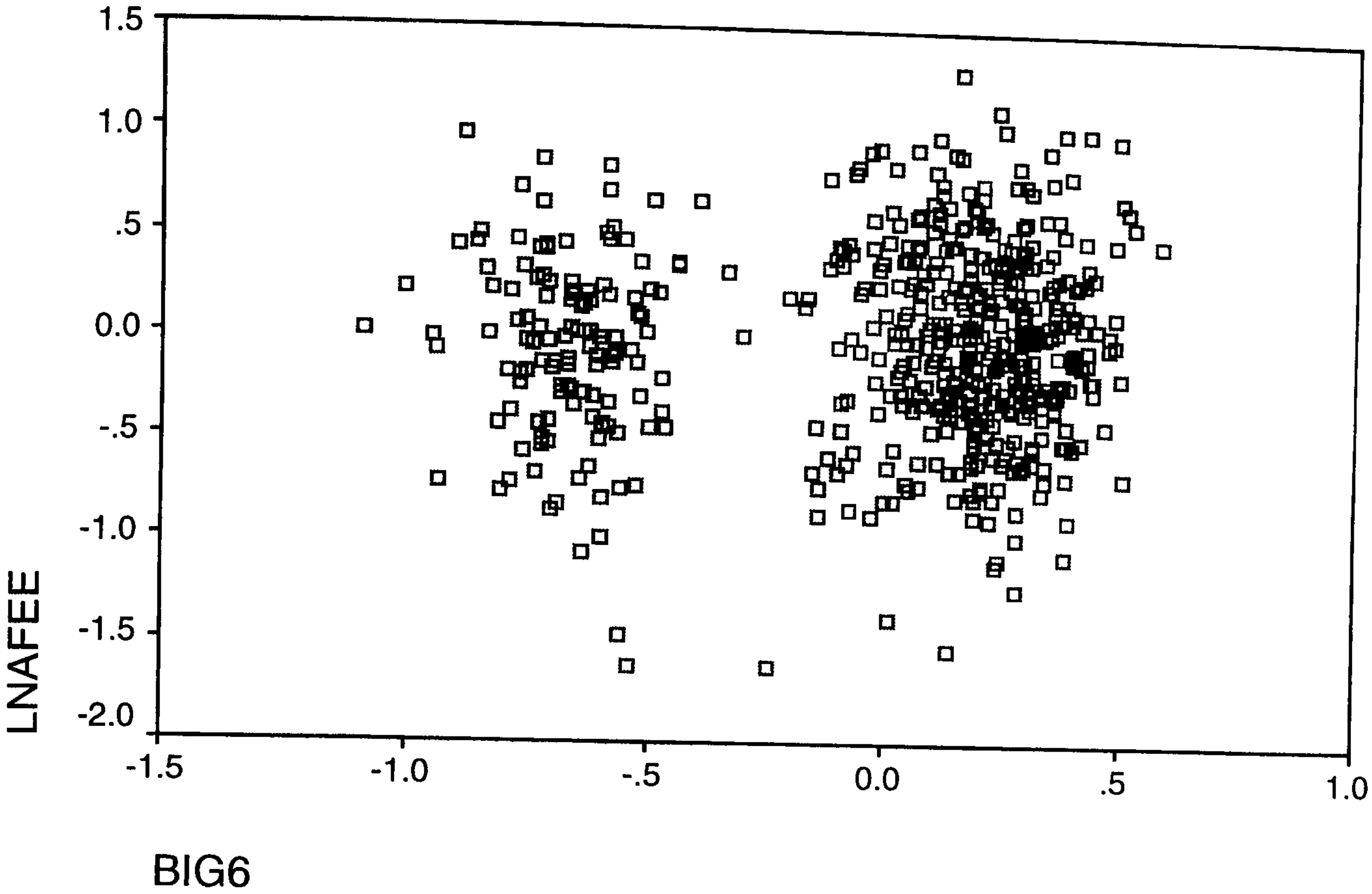
Partial Regression Plot

Dependent Variable: LNAFEE



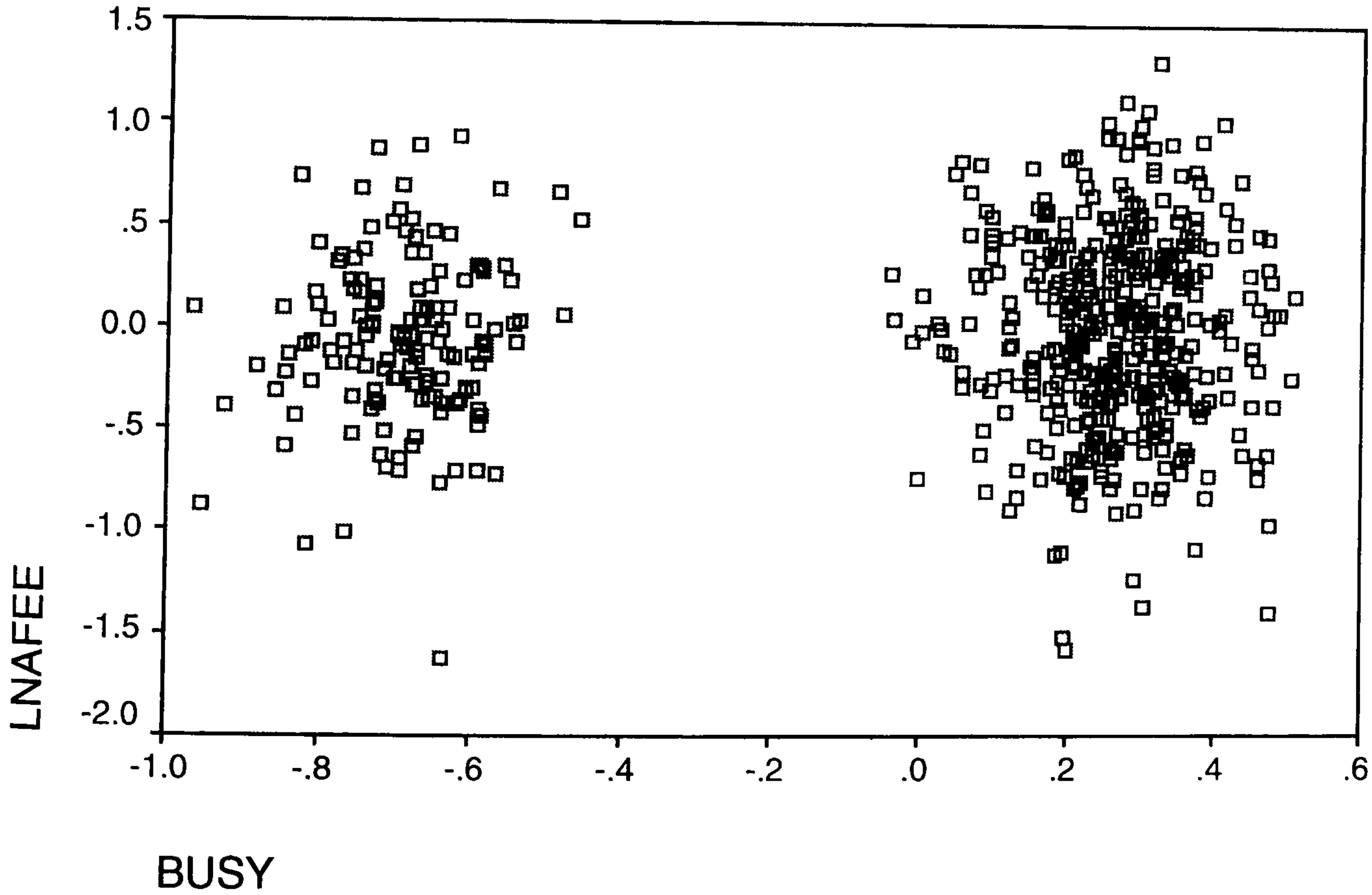
Partial Regression Plot

Dependent Variable: LNAFEE



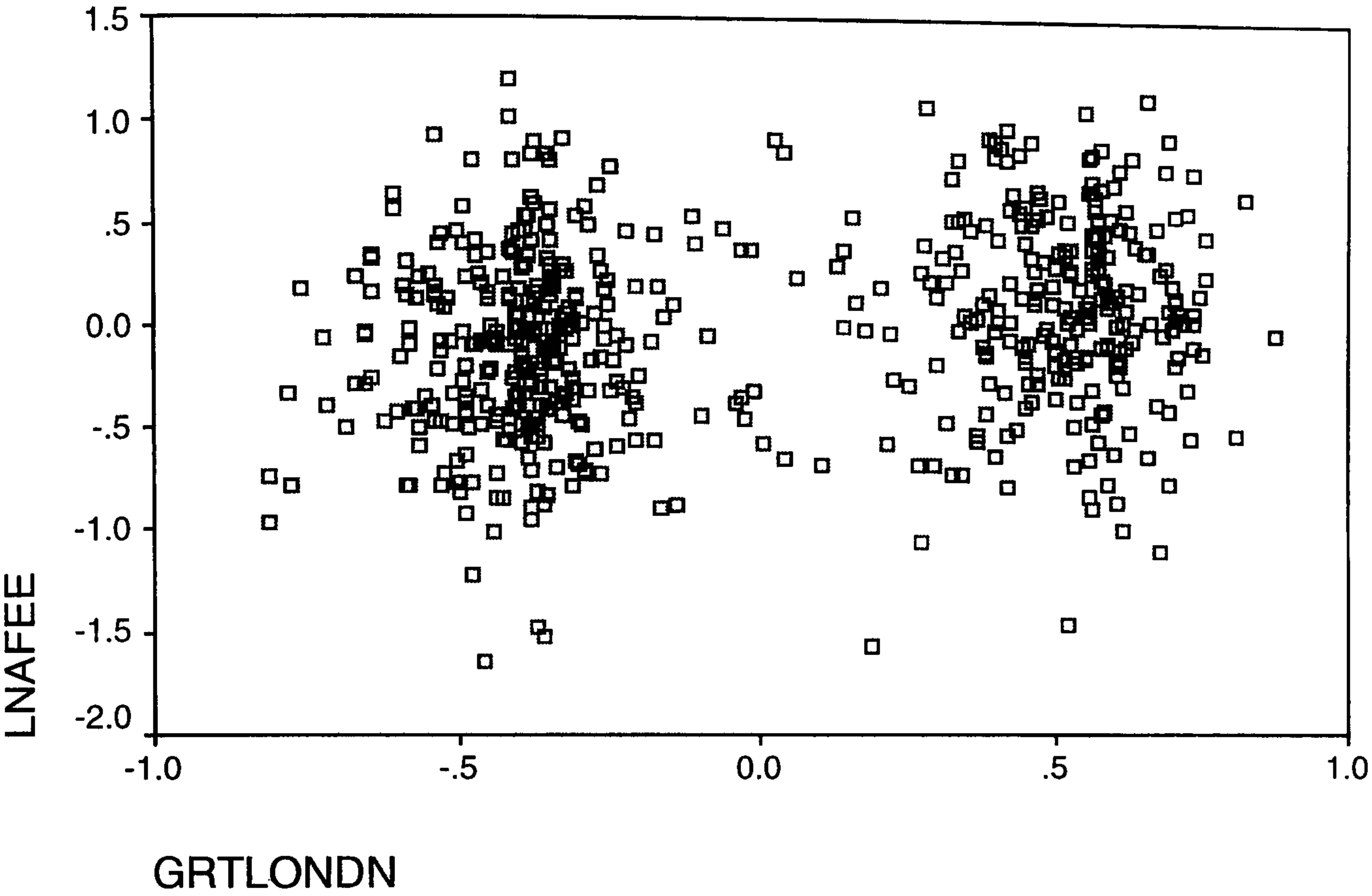
Partial Regression Plot

Dependent Variable: LNAFEE



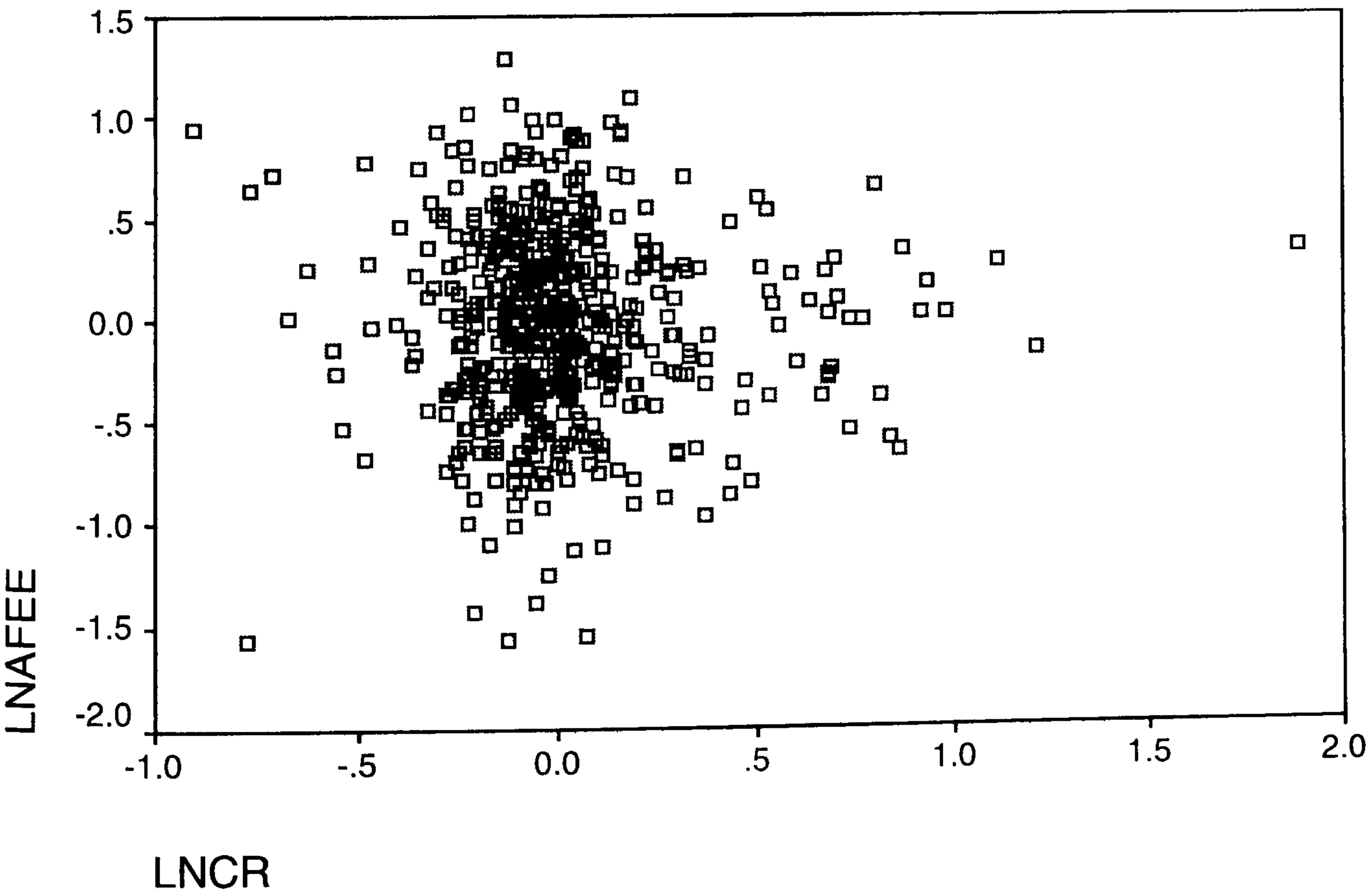
Partial Regression Plot

Dependent Variable: LNAFEE



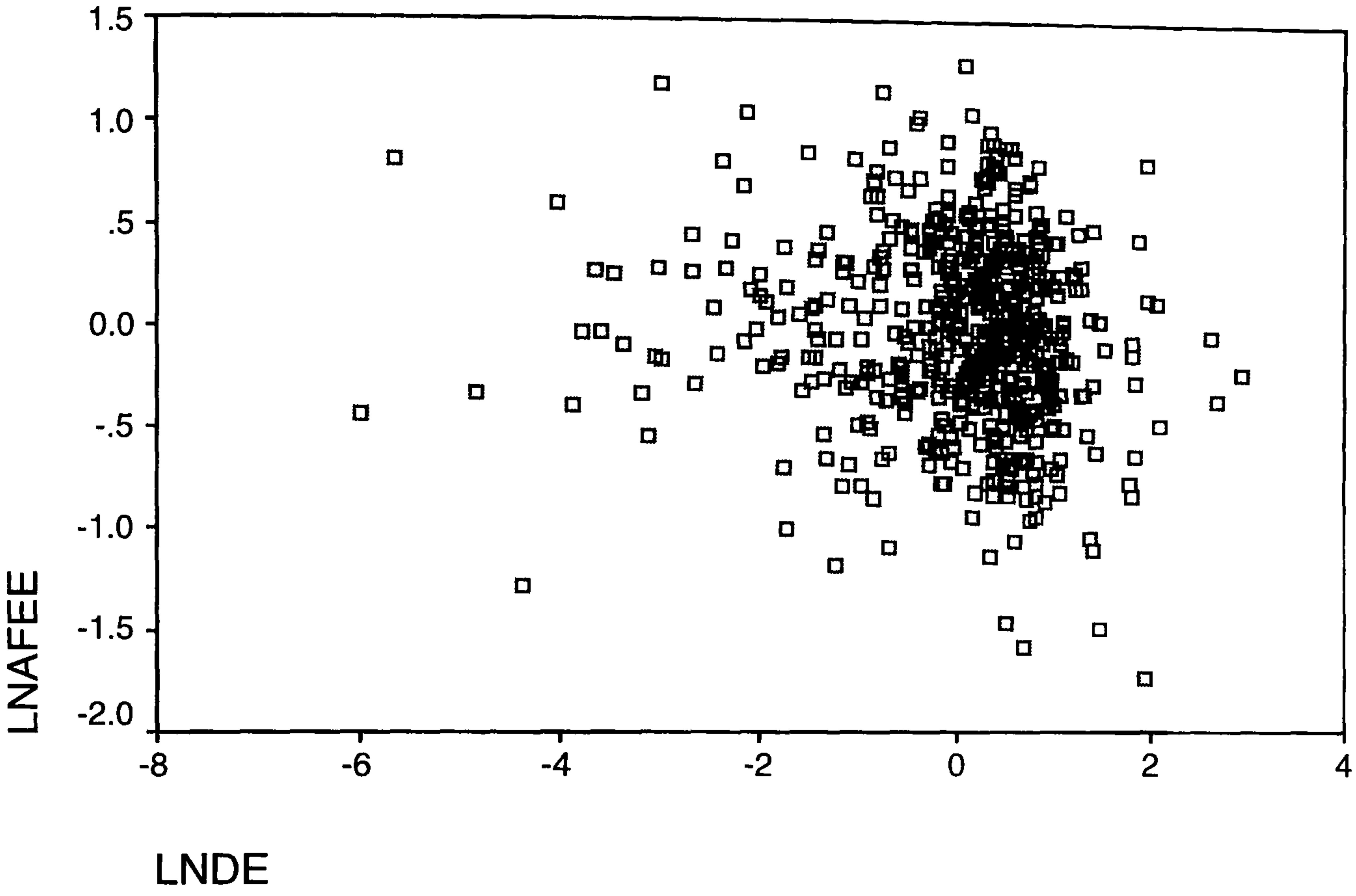
Partial Regression Plot

Dependent Variable: LNAFEE



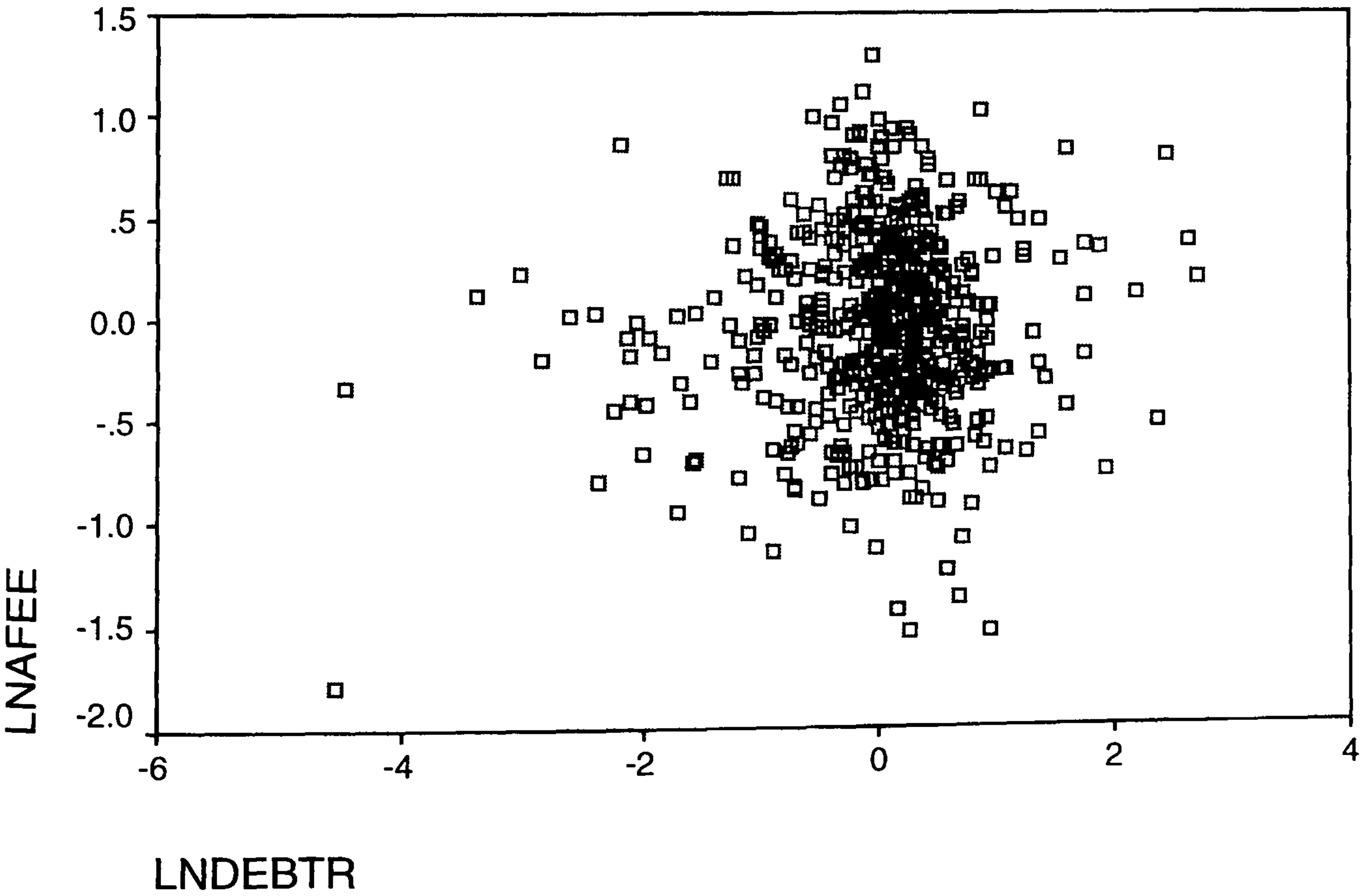
Partial Regression Plot

Dependent Variable: LNAFEE



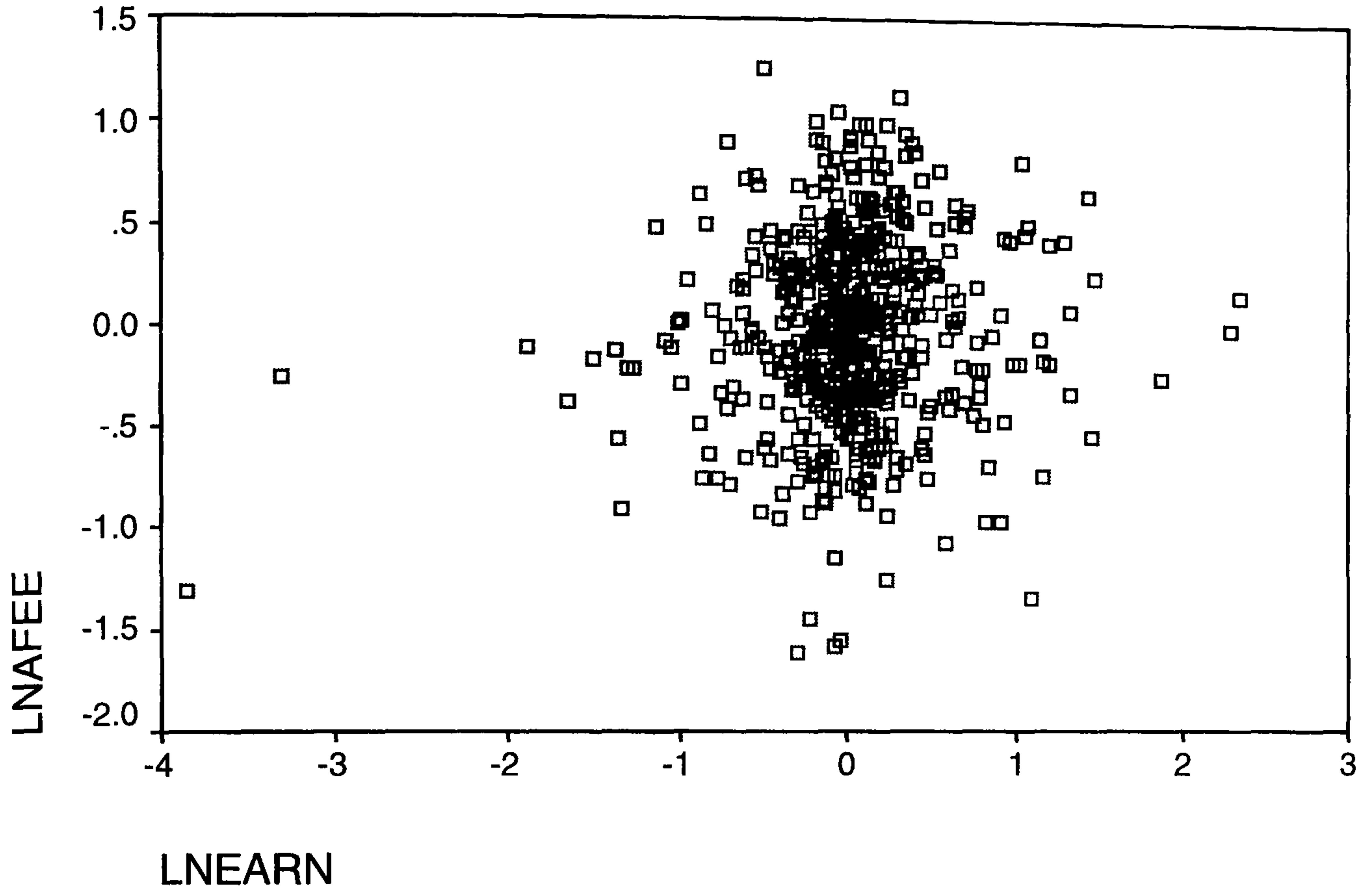
Partial Regression Plot

Dependent Variable: LNAFEE



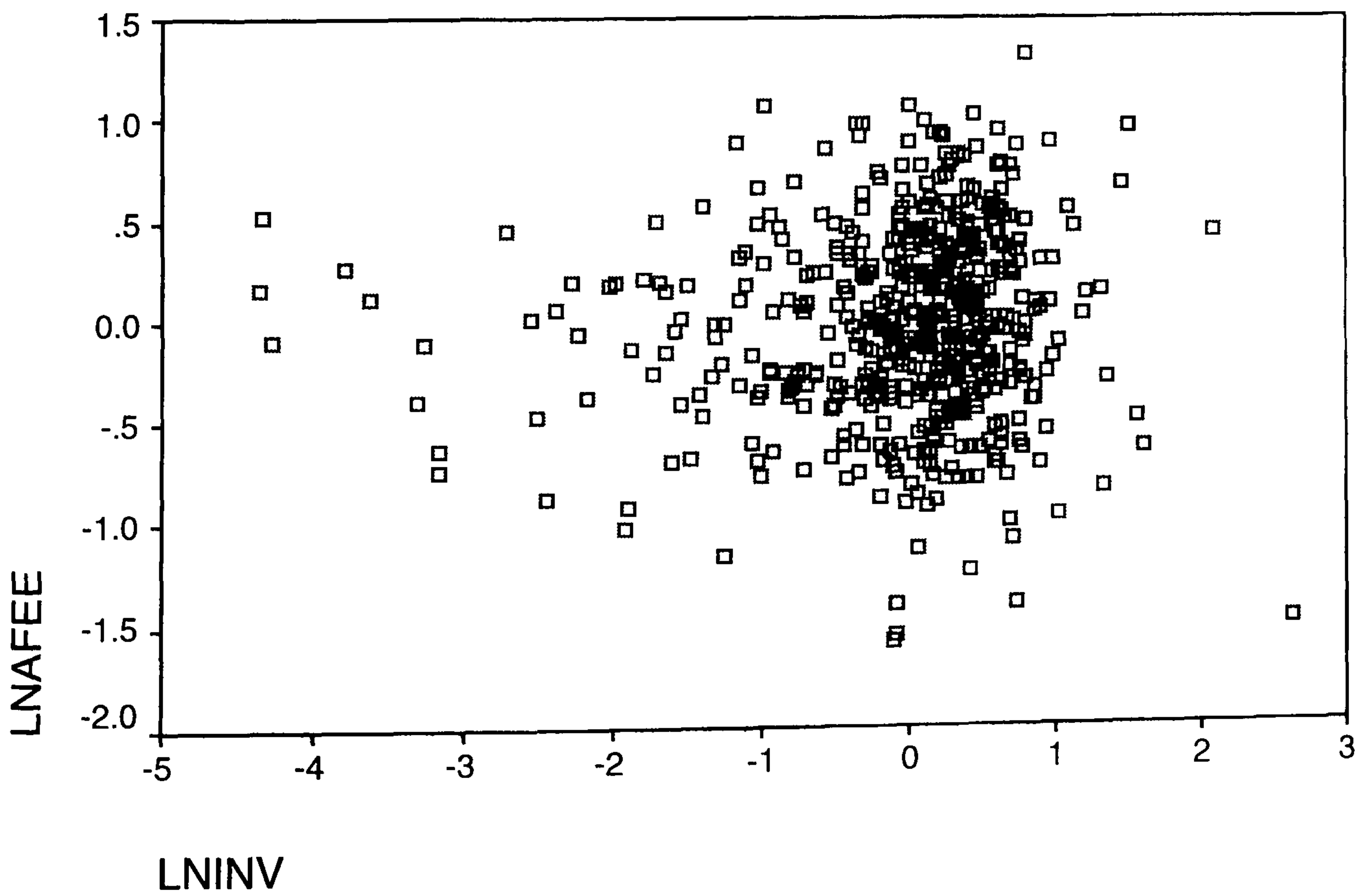
Partial Regression Plot

Dependent Variable: LNAFEE



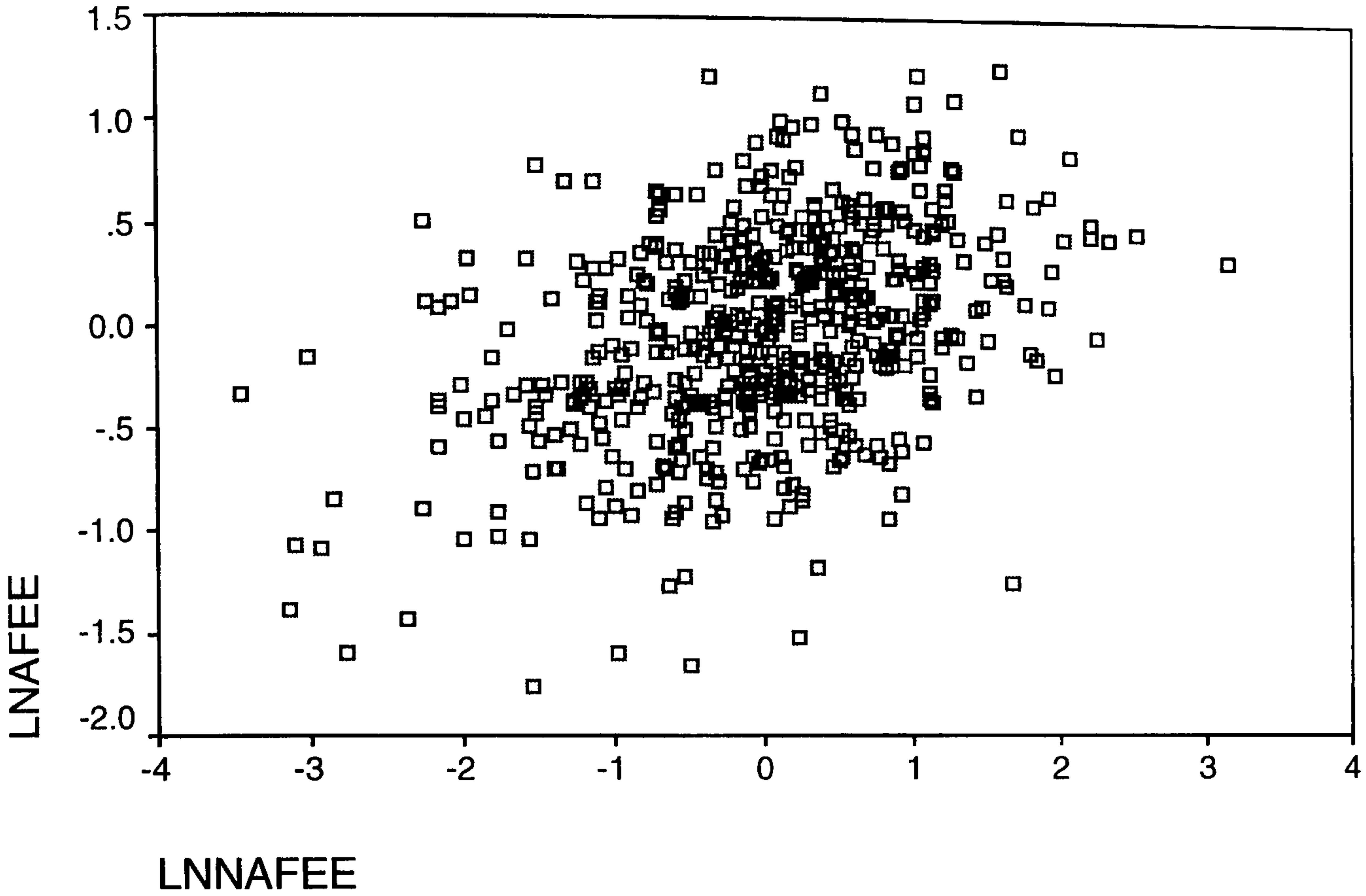
Partial Regression Plot

Dependent Variable: LNAFEE



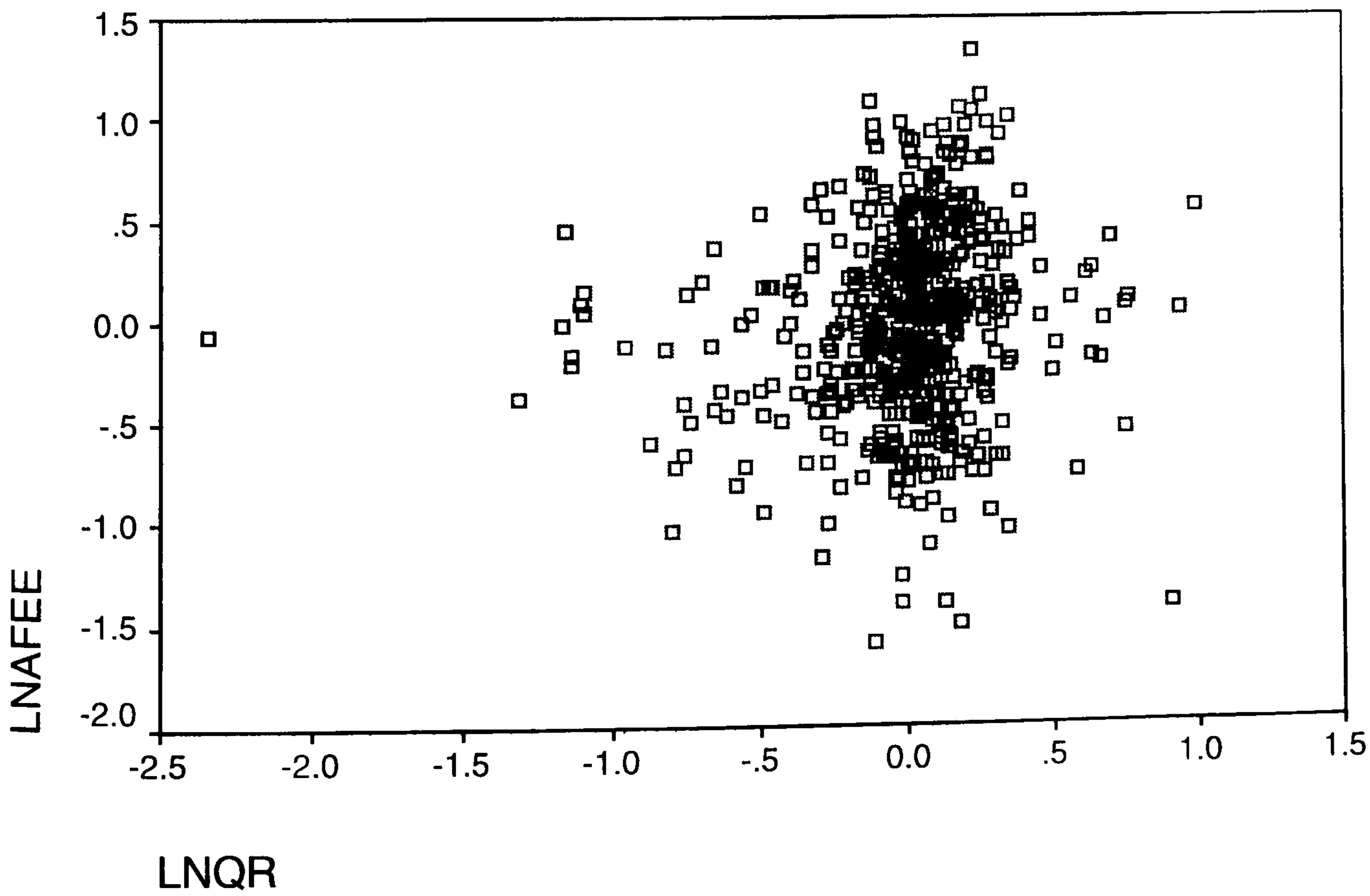
Partial Regression Plot

Dependent Variable: LNAFEE



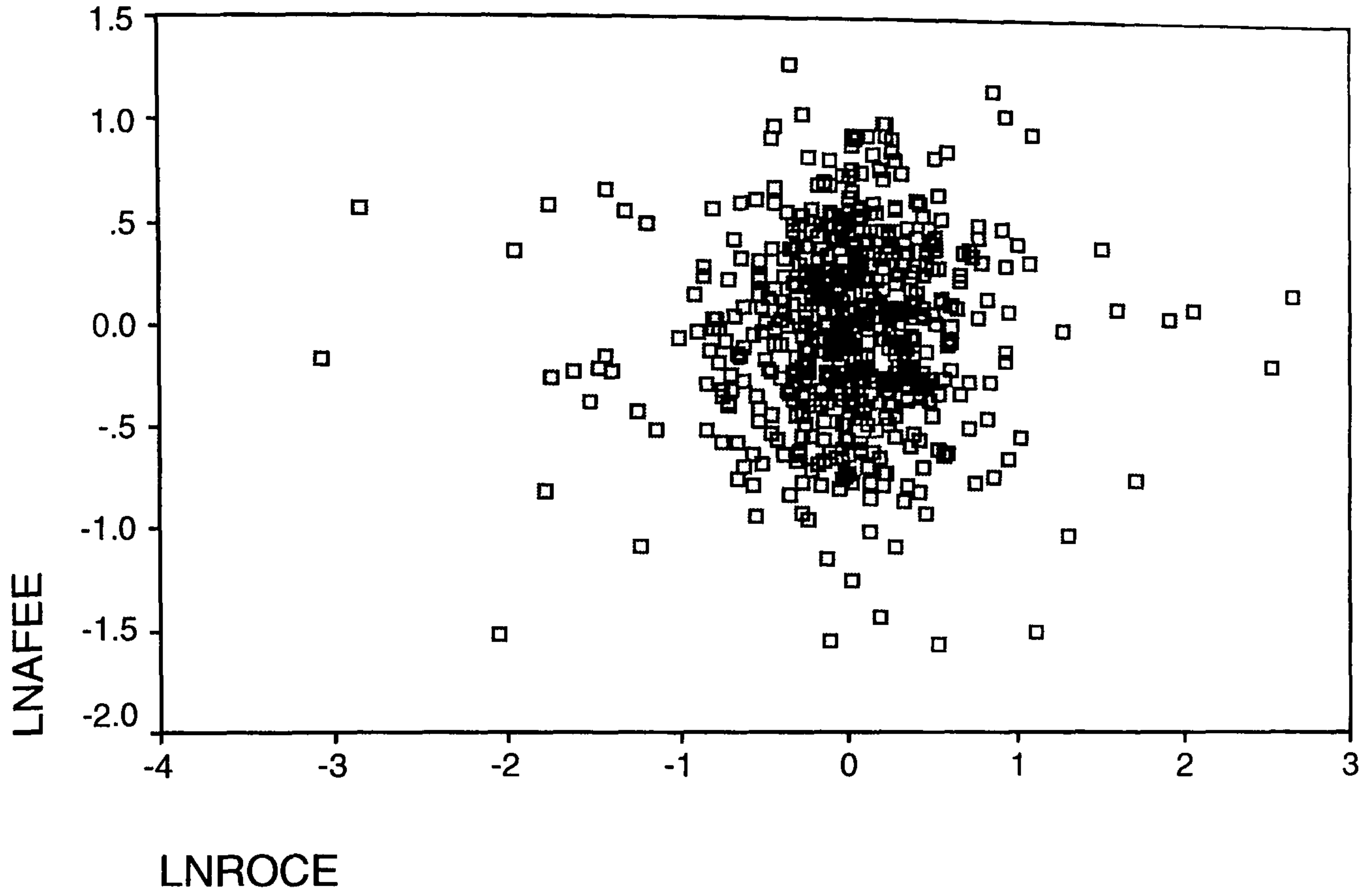
Partial Regression Plot

Dependent Variable: LNAFEE



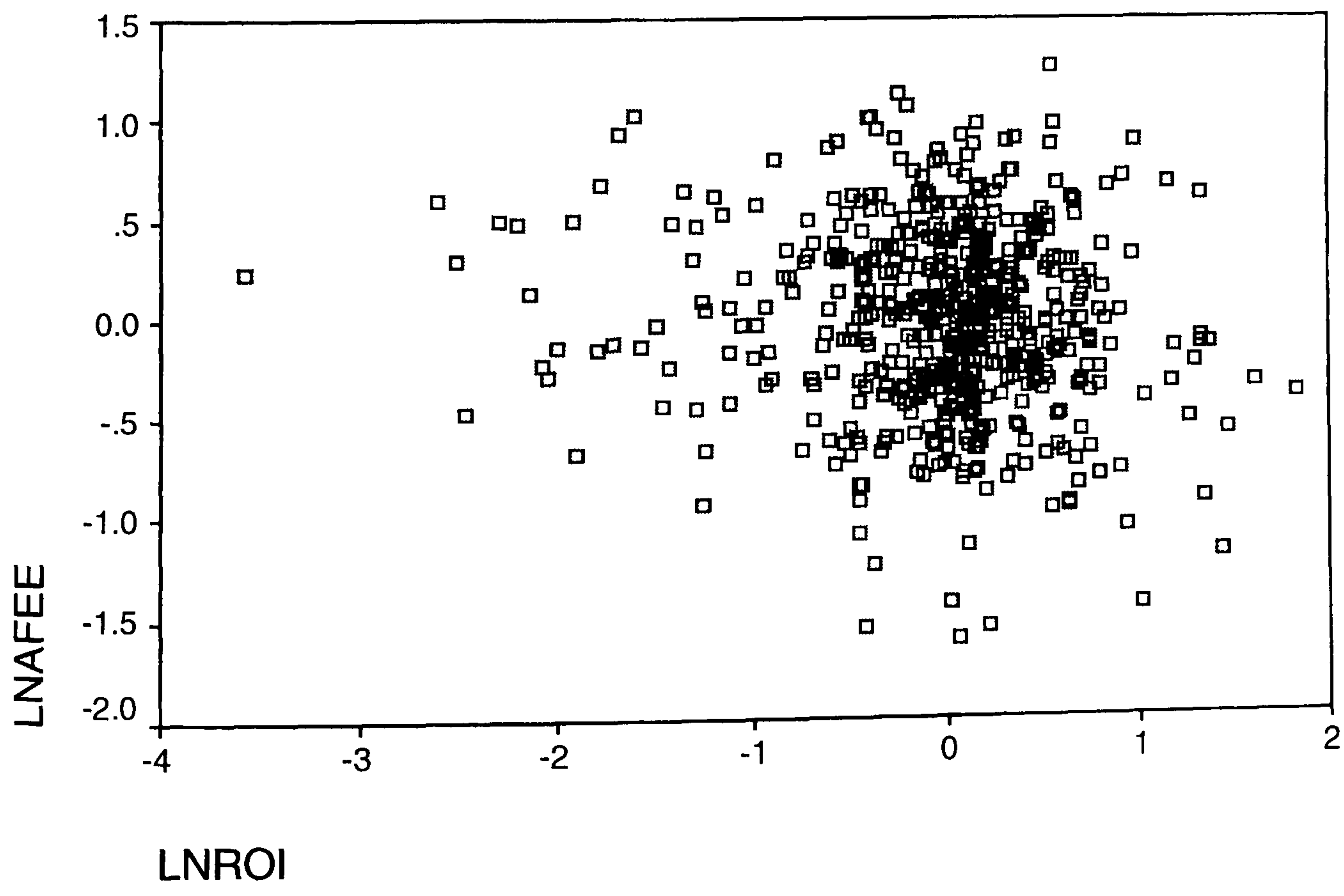
Partial Regression Plot

Dependent Variable: LNAFEE



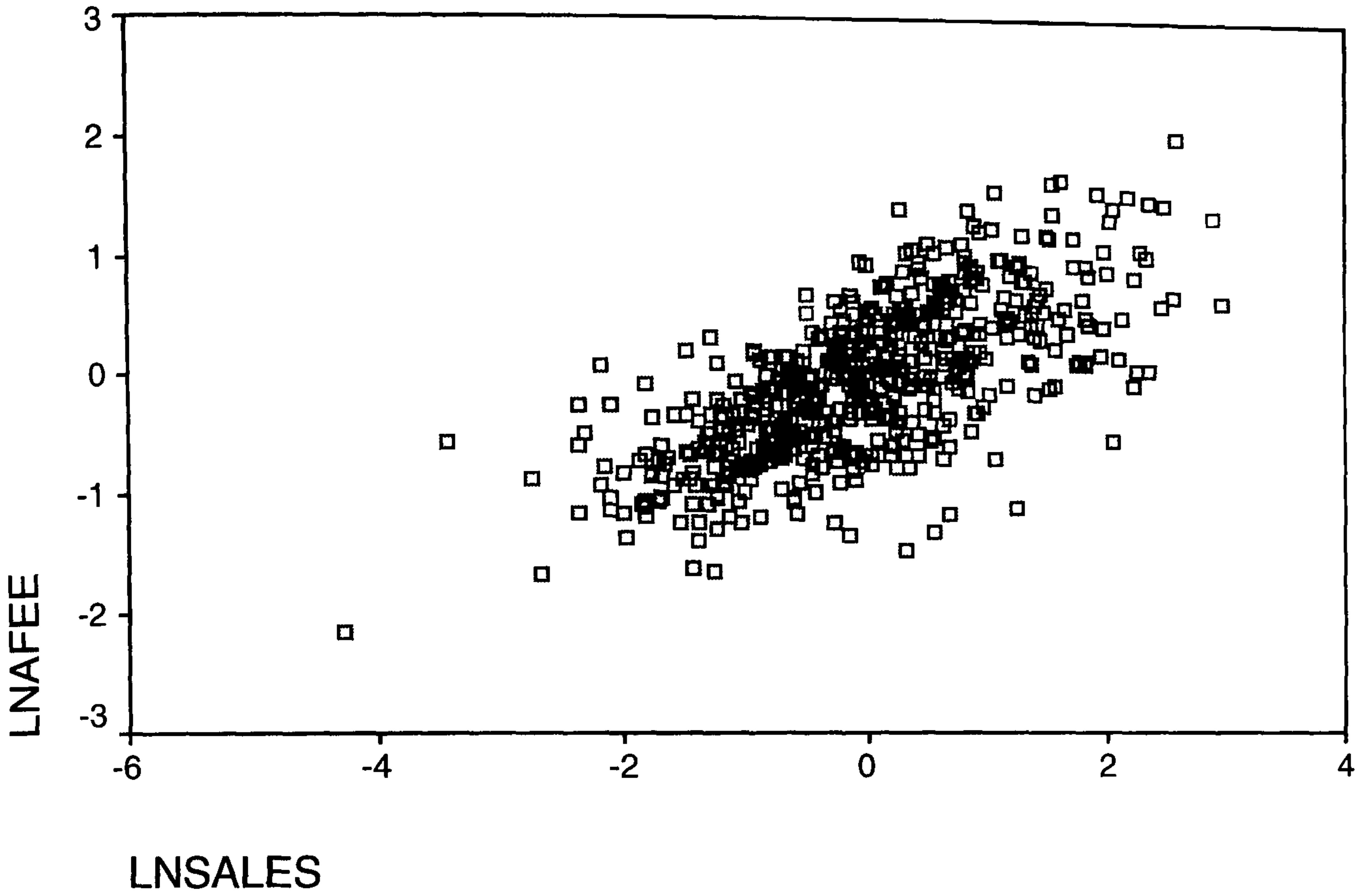
Partial Regression Plot

Dependent Variable: LNAFEE



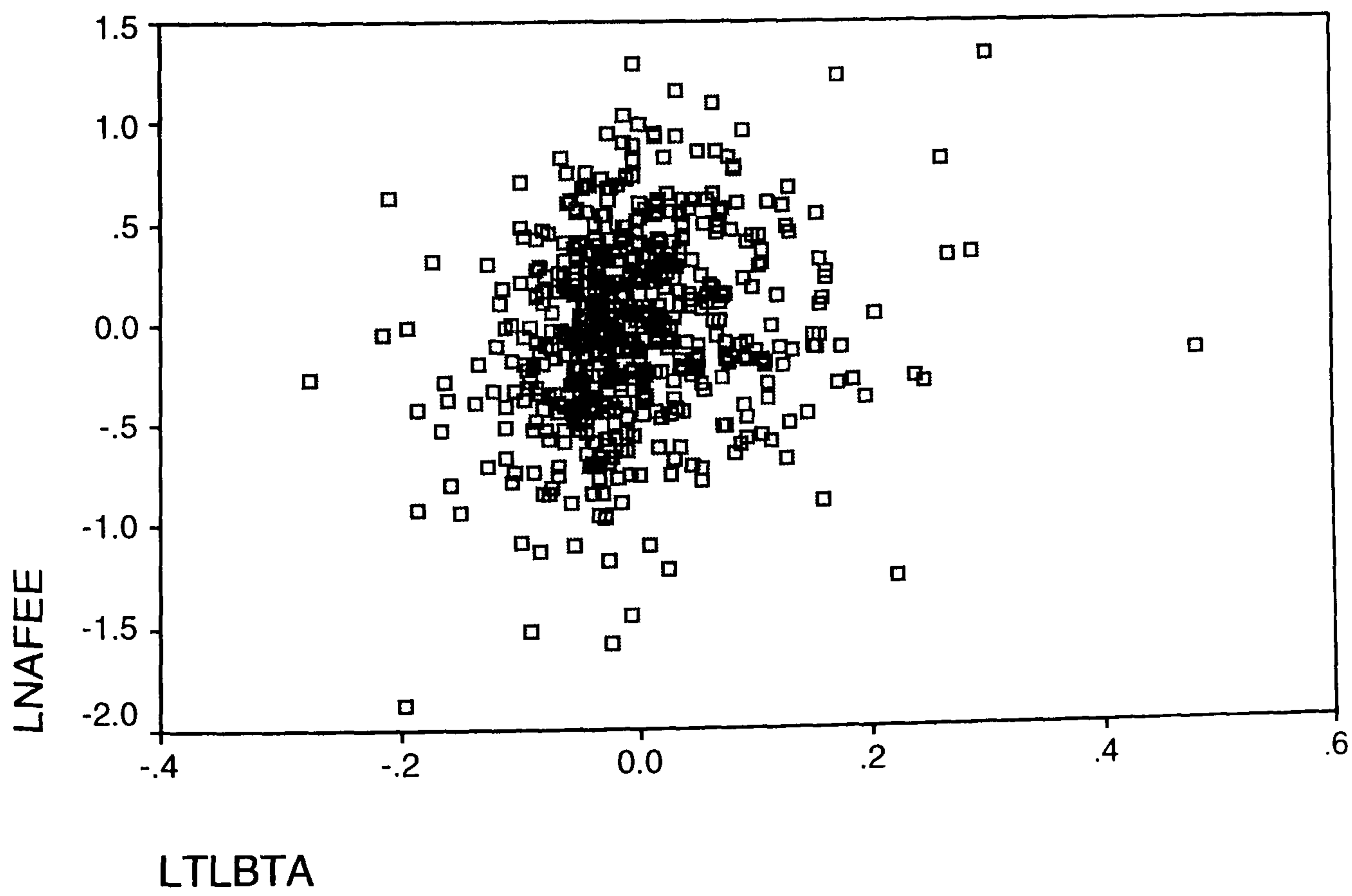
Partial Regression Plot

Dependent Variable: LNAFEE



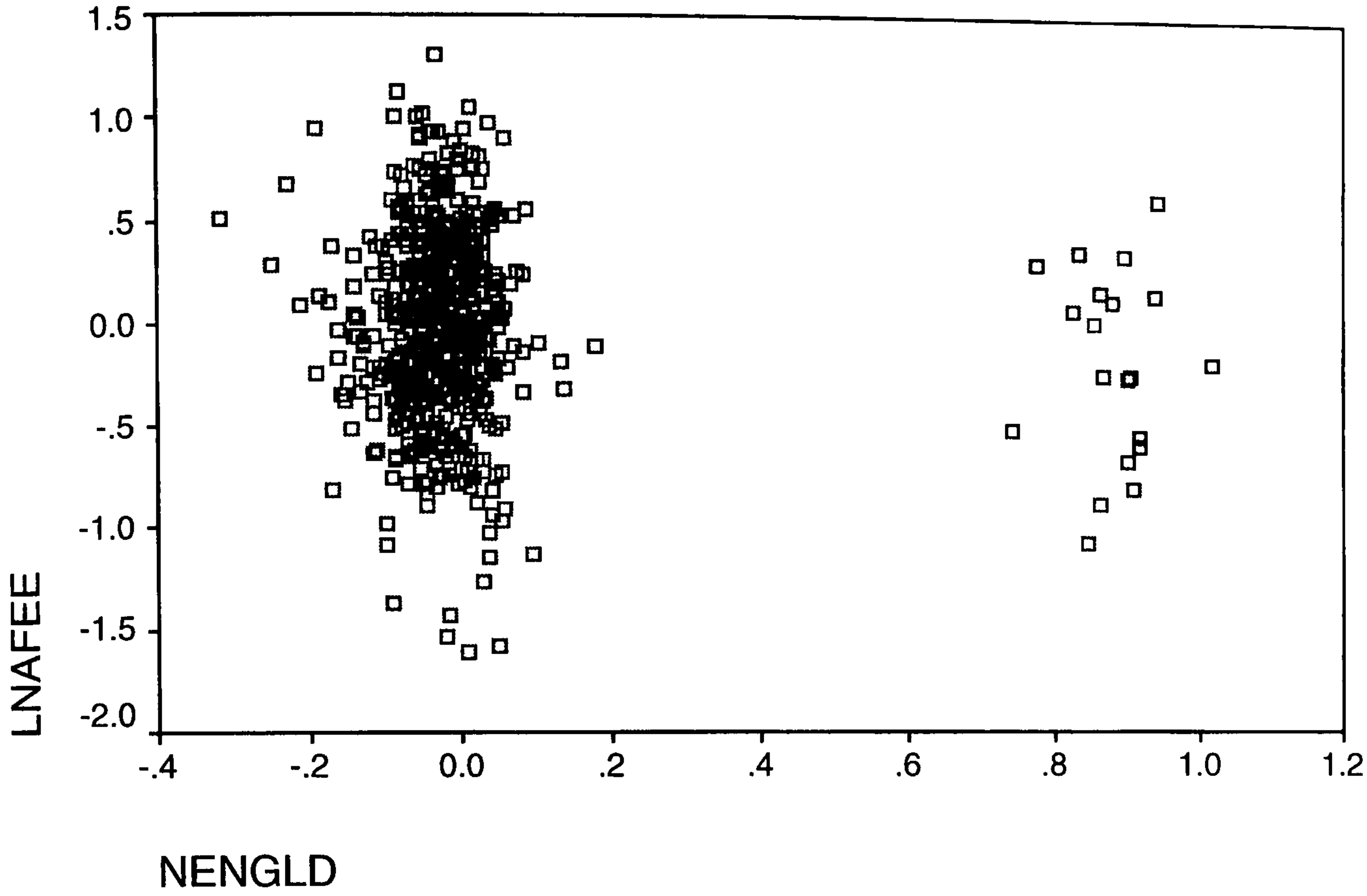
Partial Regression Plot

Dependent Variable: LNAFEE



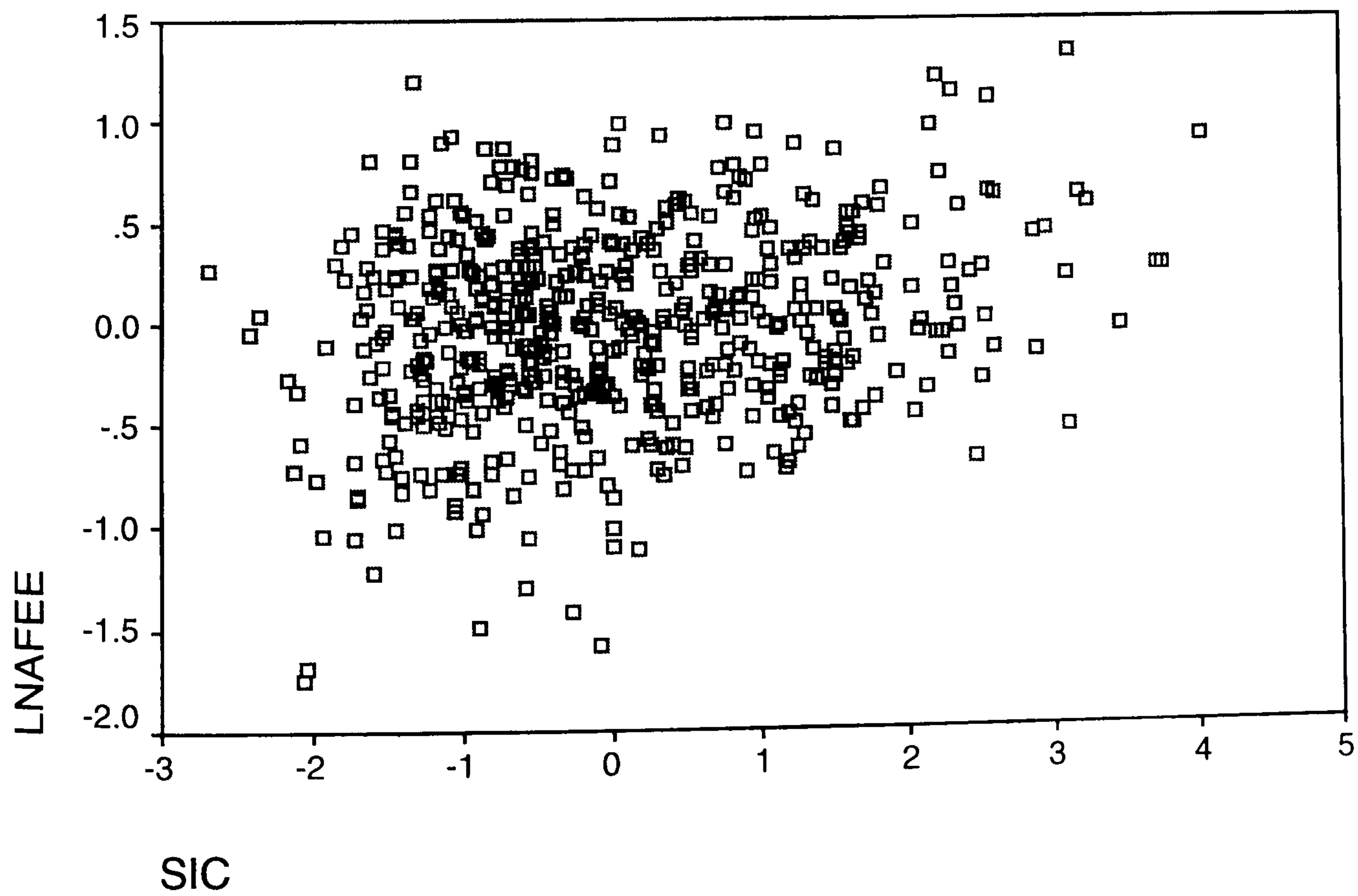
Partial Regression Plot

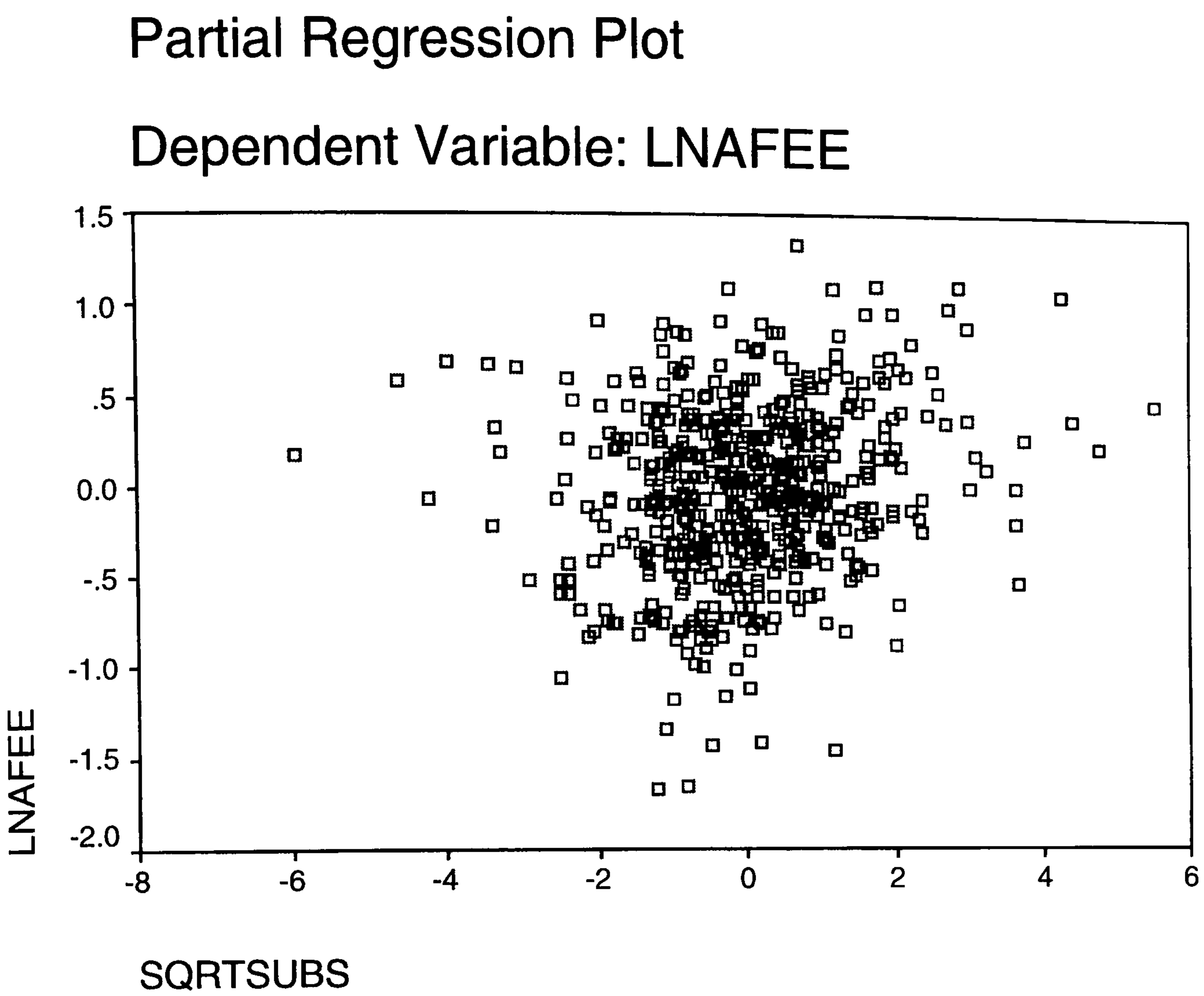
Dependent Variable: LNAFEE



Partial Regression Plot

Dependent Variable: LNAFEE




Partial Regression Plot
Dependent Variable: LNAFEE
1.5
1.0
.5
0.0
-.5
-1.0
-1.5
-2.0
LNAFEE
-8
-6
-4
-2
0
2
4
6
SQRTSUBS

APPENDIX IV:

List of accountancy firms that have trained the CADRE of the data sample

ACCYF3 ACCYFIRM2 (consolidation of duplicate na

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1	212	10.8	10.8	10.8
Abey & Lish	2	1	.1	.1	10.9
Agar, Bates, Ledsam	3	2	.1	.1	11.0
Agar, Bates, Neal, K	4	2	.1	.1	11.1
Albert Goodman & Co	5	1	.1	.1	11.1
Alexander, Sagar & C	6	2	.1	.1	11.2
Alfred N. Emanuel &	7	1	.1	.1	11.3
Allan, Charlesworth	8	2	.1	.1	11.4
Allen A. & Scot	9	1	.1	.1	11.4
Allen Baldry Holman	10	1	.1	.1	11.5
Allen T. W.	11	1	.1	.1	11.5
Allfields	12	4	.2	.2	11.7
Alliott Peirson & Co	13	1	.1	.1	11.8
Amsdon, Cossart & We	14	1	.1	.1	11.8
Angus, Campbell & Co	15	1	.1	.1	11.9
Annan, Dexter & Co	16	3	.2	.2	12.0
Armitage & Norton	17	9	.5	.5	12.5
Arthur Andersen & Co	18	86	4.4	4.4	16.9
Arthur Goddard & Co	19	1	.1	.1	16.9
Arthur Young	20	11	.6	.6	17.5
Arthur Young, McClel	21	17	.9	.9	18.4
Ashmole, Edwards & G	22	1	.1	.1	18.4
Ashworth, Mosley & C	23	1	.1	.1	18.5
Aspinall Ivan G. & C	24	1	.1	.1	18.5
Atkin & Co	25	1	.1	.1	18.6
Auerbach, Hope & Co	26	4	.2	.2	18.8
Ault & Co	27	1	.1	.1	18.8
Ault Fred. J. & Co	28	1	.1	.1	18.9
Baber, Owen & Co	29	1	.1	.1	18.9
Baker & Co	30	1	.1	.1	19.0
Baker Rooke	31	1	.1	.1	19.0
Baker Sutton & Co	32	3	.2	.2	19.2
Baker, Rooke & Amsdo	33	1	.1	.1	19.2
Baker, Todman & Co	34	1	.1	.1	19.3
Ball, Baker, Deed &	35	3	.2	.2	19.4
Banner, Spencer, Wal	36	1	.1	.1	19.5
Barker Cohen	37	1	.1	.1	19.6
Barnes Roffe	38	1	.1	.1	19.6
Barr Andw. W. & Co	39	1	.1	.1	19.7
Barron & Barron	40	1	.1	.1	19.7
Barron, Rowles & Co	41	1	.1	.1	19.8
Barrow R.W. & Co	42	1	.1	.1	19.8
Barrowcliff C. Percy	43	4	.2	.2	20.0
Barton H.M. Sir	44	1	.1	.1	20.1
Barton, Mayhew & Co	45	11	.6	.6	20.6
BDO Binder Hamlyn	46	4	.2	.2	20.8
Beattie Frank & Co	47	1	.1	.1	20.9

ACCYF3 ACCYFIRM2 (consolidation of duplicate na

Beavis, Walker & Co	48	2	.1	.1	21.0
Bedell & Blair	49	2	.1	.1	21.1
Bee T & H.P.	50	1	.1	.1	21.1
Beevers & Adgie	51	2	.1	.1	21.2
Bennett Robert & Par	52	1	.1	.1	21.3
Beresford Lye & Co	53	1	.1	.1	21.3
Bertram, Kidson & Co	54	1	.1	.1	21.4
Best, Lawson & Co	55	1	.1	.1	21.4
Bexley & Co	56	1	.1	.1	21.5
Bilsons, Cullen & Co	57	1	.1	.1	21.5
Binder Hamlyn	58	30	1.5	1.5	23.1
Bird Luckin & Sheldr	59	1	.1	.1	23.1
Bird, Potter & Co	60	1	.1	.1	23.2
Black Geoghegan & Ti	61	3	.2	.2	23.3
Blackburns, Robson C	62	5	.3	.3	23.6
Blackburns, Robson,	63	5	.3	.3	23.8
Blaikie R.M. & Co	64	1	.1	.1	23.9
Blair, Sanders & Co	65	1	.1	.1	23.9
Blease, Lloyd & Co	66	1	.1	.1	24.0
Blick Rothenberg & N	67	1	.1	.1	24.0
Blythen Stanley & Co	68	2	.1	.1	24.1
Blythens	69	1	.1	.1	24.2
Bolton, Wawn & Co	70	1	.1	.1	24.2
Bourne Thomas & Co,	71	1	.1	.1	24.3
Bourner, Bullock & C	72	1	.1	.1	24.3
Bowen, Dawes, Wagsta	73	2	.1	.1	24.5
Boyce, Welch & Co	74	3	.2	.2	24.6
Bradshaw Johnson & C	75	1	.1	.1	24.7
Brebner, Allen & Tra	76	1	.1	.1	24.7
Brewer & Co	77	1	.1	.1	24.8
Brief S. & Co	78	1	.1	.1	24.8
Bright, Grahame, Mur	79	1	.1	.1	24.9
Broads, Paterson & C	80	3	.2	.2	25.0
Bromhead C.D. & Co	81	1	.1	.1	25.1
Brooking, Knowles &	82	1	.1	.1	25.1
Brown Alfred H.	83	1	.1	.1	25.2
Brown, Butler & Co	84	1	.1	.1	25.2
Brown, Fleming & Mur	85	3	.2	.2	25.4
Bryce, Hanmer & Co,	86	1	.1	.1	25.4
Buckland Sidney H. &	87	1	.1	.1	25.5
Burgess, Hodgson & C	88	1	.1	.1	25.5
Burgis & Bullock	89	1	.1	.1	25.6
Burne Phillips	90	2	.1	.1	25.7
Burnett, Swayne & Co	91	2	.1	.1	25.8
Buzzacott & Co	92	2	.1	.1	25.9
Calverley & Calverle	93	1	.1	.1	25.9
Cape & Dalgleish	94	2	.1	.1	26.0
Carlill, Burkinshaw	95	1	.1	.1	26.1
Carlisle, Ray & Co	96	1	.1	.1	26.1
Carlyle & Co	97	1	.1	.1	26.2
Carston, Poley, Morr	98	1	.1	.1	26.2

ACCYF3 ACCYFIRM2 (consolidation of duplicate na

Carter, Chaloner & K	99	1	.1	.1	26.3
Carter, Son & White	100	1	.1	.1	26.3
Cash, Stone & Co	101	1	.1	.1	26.4
Cassleton Elliott &	102	1	.1	.1	26.4
Casson Beckman	103	2	.1	.1	26.5
Chalmers, Impey & Co	104	5	.3	.3	26.8
Champness J.H., Cord	105	3	.2	.2	27.0
Charles Wakeling & C	106	1	.1	.1	27.0
Chas Richards & Co	107	1	.1	.1	27.1
Citroën, Wells & Co	108	2	.1	.1	27.2
Clark Pixley	109	1	.1	.1	27.2
Clark Whitehill	110	3	.2	.2	27.4
Clark, Battams & Co	111	2	.1	.1	27.5
Clarke Leslie D. & C	112	1	.1	.1	27.5
Clarke, Eckersley, P	113	1	.1	.1	27.6
Clements Hakim & Co	114	1	.1	.1	27.6
Clifford Towers, Tem	115	1	.1	.1	27.7
Clough & Co	116	1	.1	.1	27.7
Coates Richard & Co	117	1	.1	.1	27.8
Cole, Dickin and Hil	118	2	.1	.1	27.9
Collingwood, Burrows	119	1	.1	.1	27.9
Cook & Co	120	2	.1	.1	28.0
Cook, Sutton & Co	121	2	.1	.1	28.1
Cookson, Topham & Co	122	1	.1	.1	28.2
Cooper & Cooper	123	1	.1	.1	28.2
Cooper Basden & Adam	124	1	.1	.1	28.3
Cooper Brothers & Co	125	35	1.8	1.8	30.1
Cooper Cozens & Co	126	1	.1	.1	30.1
Coopers & Lybrand	127	57	2.9	2.9	33.0
Coward (Frank) & Co	128	1	.1	.1	33.1
Cowgill, Holloway &	129	1	.1	.1	33.1
Cox & Furse	130	1	.1	.1	33.2
Crabtree (Cresswell)	131	1	.1	.1	33.2
Crane Christmas & Co	132	1	.1	.1	33.3
Crombie, Lacon & Ste	133	2	.1	.1	33.4
Crossley & Davis	134	1	.1	.1	33.4
Crumpton, Homer & Co	135	1	.1	.1	33.5
Curtis, Jenkins, Cor	136	1	.1	.1	33.5
Daffern & Co	137	1	.1	.1	33.6
Dangerfield, Brewis	138	2	.1	.1	33.7
Davidson J.W., Cooks	139	2	.1	.1	33.8
Davie, Parsons & Co	140	2	.1	.1	33.9
Davies Richard & Co	141	1	.1	.1	33.9
Davies, Watson & Co	142	1	.1	.1	34.0
Dawson & Gordon	143	1	.1	.1	34.0
Dawson R.S. & Co	144	1	.1	.1	34.1
de Zoete & Bevan?	145	1	.1	.1	34.2
Dearden Farrow	146	8	.4	.4	34.6
dec 1985 Hallo L.J.	147	1	.1	.1	34.6
Deloitte Haskins & S	148	66	3.4	3.4	38.0
Denton Basil L. & Co	149	1	.1	.1	38.0

ACCYF3 ACCYFIRM2 (consolidation of duplicate na

Derbyshire & Co	150	2	.1	.1	38.1
Derek Lawrence & Co	151	1	.1	.1	38.2
Derek Webster & Co	152	1	.1	.1	38.2
Dixon Wilson & Co	153	5	.3	.3	38.5
Douglas T.H. & Co	154	1	.1	.1	38.5
Downham & Co	155	1	.1	.1	38.6
Dryden, Dorrington &	156	1	.1	.1	38.6
Duart-Smith, Baker &	157	1	.1	.1	38.7
Duthie & Son	158	1	.1	.1	38.7
Eastwood, Townend &	159	1	.1	.1	38.8
Edelman Gerald & Co	160	1	.1	.1	38.8
Edward Moore & Sons	161	1	.1	.1	38.9
Edward Myers, Clark,	162	1	.1	.1	38.9
Edwards, Trew & Co	163	1	.1	.1	39.0
eida 1980-87 exam li	164	4	.2	.2	39.2
Elles, Reeve & Co	165	1	.1	.1	39.3
Elliott (Cassleton)	166	1	.1	.1	39.3
Elliott, Mortlock, B	167	1	.1	.1	39.4
Elliott, Norman, Jac	168	3	.2	.2	39.5
Elliott, Templeton S	169	3	.2	.2	39.7
Ellis & Newall	170	1	.1	.1	39.7
Ellis H.G., Kennewel	171	1	.1	.1	39.8
Ernest Francis & Son	172	1	.1	.1	39.8
Ernst & Whinney	173	24	1.2	1.2	41.0
Ernst & Young	174	6	.3	.3	41.3
Essex, Abel, Hodgkin	175	1	.1	.1	41.4
Evans, Rankin & Co	176	1	.1	.1	41.4
Everett Pinto & Co	177	1	.1	.1	41.5
Fairbairn, Wingfield	178	1	.1	.1	41.6
Fairclough W.R. & Co	179	1	.1	.1	41.6
Fairhurst John & Tyr	180	1	.1	.1	41.7
Farrow, Middleton &	181	5	.3	.3	41.9
Fenton & Co	182	2	.1	.1	42.0
Finn Leonard & Co	183	1	.1	.1	42.1
Finnie & Co	184	6	.3	.3	42.4
Fisher, Conway, Fent	185	1	.1	.1	42.4
Fitzpatrick, Graham	186	2	.1	.1	42.5
Folkes & Campbell	187	1	.1	.1	42.6
Ford, Bull, Ellis &	188	3	.2	.2	42.7
Forrester, Boyd & Co	189	1	.1	.1	42.8
Foster & Stephens	190	1	.1	.1	42.8
Fox, Hoare, Harris &	191	1	.1	.1	42.9
Franklin, Wild & Co	192	1	.1	.1	42.9
Frankson, Wiles & Co	193	1	.1	.1	43.0
Fraser, Threlford, C	194	1	.1	.1	43.0
Frazer, Whitting & C	195	3	.2	.2	43.2
Freeman Rich	196	1	.1	.1	43.2
Freeman, Sutton & Co	197	1	.1	.1	43.3
French W.H. & Co	198	1	.1	.1	43.3
Fryer Whitehill & Co	199	1	.1	.1	43.4
Fuller, Jenks, Beecr	200	1	.1	.1	43.4

ACCYF3 ACCYFIRM2 (consolidation of duplicate na

Gale & Partners	201	1	.1	.1	43.5
Gane Jackson, Nelson	202	2	.1	.1	43.6
Garbutt & Elliott	203	1	.1	.1	43.6
Garnett, Crewdson &	204	2	.1	.1	43.7
George Hay & Co	205	1	.1	.1	43.8
George Henry L. & Ar	206	1	.1	.1	43.8
Gerald Brown & Co	207	1	.1	.1	43.9
Gerald Edelman	208	2	.1	.1	44.0
Gilbert W.J. & Co	209	1	.1	.1	44.1
Gilbert, Shepherd, O	210	1	.1	.1	44.1
Gilberts, Hallett &	211	1	.1	.1	44.2
Gilchrist, Tash, Wil	212	2	.1	.1	44.3
Gillings (W.H.) & Co	213	1	.1	.1	44.3
Glass Duncan & Co	214	1	.1	.1	44.4
Goldstein I.B. & Co	215	1	.1	.1	44.4
Goodier, Smith & Wat	216	1	.1	.1	44.5
Goodman Albert & Co	217	2	.1	.1	44.6
Gordon John, Harriso	218	3	.2	.2	44.7
Gould H.P. & Son	219	2	.1	.1	44.8
Grace, Darbyshire &	220	2	.1	.1	44.9
Grant Thornton	221	2	.1	.1	45.0
Graves, Causer & Co	222	1	.1	.1	45.1
Graves, Goddard & Ho	223	1	.1	.1	45.1
Gray, Stainforth & C	224	1	.1	.1	45.2
Green F. & Co	225	1	.1	.1	45.2
Greene Clements Blis	226	2	.1	.1	45.3
Greenslade & Co, and	227	1	.1	.1	45.4
Gresham, Whitehead &	228	1	.1	.1	45.4
Griffith & Jennings	229	1	.1	.1	45.5
Griffith R.O. & Co	230	1	.1	.1	45.5
Gruber, Levinson, Fr	231	1	.1	.1	45.6
Gubbay & Co	232	1	.1	.1	45.6
Haines Watts	233	1	.1	.1	45.7
Hall Ernest & Co	234	1	.1	.1	45.7
Halpern & Woolf	235	1	.1	.1	45.8
Halpern Cecil & Co	236	1	.1	.1	45.8
Ham, Jackson & Brown	237	2	.1	.1	45.9
Hands H.R. & Co	238	1	.1	.1	46.0
Harcourt, Picken & C	239	1	.1	.1	46.0
Hare A.C.R. & Co	240	1	.1	.1	46.1
Hare Wilson & Co	241	1	.1	.1	46.1
Harmood Banner & Co	242	14	.7	.7	46.9
Harper A.J. & Co	243	1	.1	.1	46.9
Harrison, Styler & C	244	1	.1	.1	47.0
Hart, Moss, Copley &	245	1	.1	.1	47.0
Hartleys, Wilkins &	246	2	.1	.1	47.1
Harvey Preen & Co	247	1	.1	.1	47.2
Haskew, Twist & Co	248	1	.1	.1	47.2
Hatfield, Dixon, Rob	249	1	.1	.1	47.3
Haworth & Wheatley J	250	1	.1	.1	47.3
Hawson W.G., Wing &	251	1	.1	.1	47.4

ACCYF3 ACCYFIRM2 (consolidation of duplicate na

Hayes Kenneth & Co	252	1	.1	.1	47.4
Hays Allan	253	3	.2	.2	47.6
Heap, Harrison & Co	254	1	.1	.1	47.6
Henry Smith, Hamer &	255	1	.1	.1	47.7
Hepburn & Son	256	1	.1	.1	47.7
Herbert Parnell & Co	257	1	.1	.1	47.8
Herbert Pepper & Rud	258	1	.1	.1	47.8
Hereward Scott Davie	259	1	.1	.1	47.9
Herring J.M. & Co	260	1	.1	.1	47.9
Hesketh, Hardy, Hirs	261	2	.1	.1	48.0
Hill & Vellacott	262	2	.1	.1	48.1
Hillier, Hopkins & C	263	2	.1	.1	48.2
Hilton, Sharp & Clar	264	1	.1	.1	48.3
Hines & Clowes	265	1	.1	.1	48.3
Hodgson Harris	266	1	.1	.1	48.4
Hodgson Impey	267	2	.1	.1	48.5
Hodgson, Morris & Co	268	6	.3	.3	48.8
Hogg, Bullimore, Gun	269	4	.2	.2	49.0
Holden, Howard & Co,	270	1	.1	.1	49.1
Hope, Agar & Co	271	3	.2	.2	49.2
Hope, Halstead & Co	272	1	.1	.1	49.3
Horne H.R. & Partner	273	1	.1	.1	49.3
Howard, Howes & Co	274	1	.1	.1	49.4
Howard, Smith, Thomp	275	1	.1	.1	49.4
Howle, Sewell & Neep	276	1	.1	.1	49.5
Hubbart, Durose & Pa	277	2	.1	.1	49.6
Hudson, Smith, Brigg	278	2	.1	.1	49.7
Hughes, Allen, Soole	279	2	.1	.1	49.8
Hunt, Hopkins & Lori	280	1	.1	.1	49.8
Jackson, Pixley & Co	281	2	.1	.1	49.9
Jackson, Taylor, Abe	282	2	.1	.1	50.0
James & Cowper	283	1	.1	.1	50.1
James Barlow & Son	284	1	.1	.1	50.1
James Christie & Co	285	1	.1	.1	50.2
James, Edwards, Dang	286	2	.1	.1	50.3
Jennings & Co	287	1	.1	.1	50.3
Jennings, Johnson &	288	2	.1	.1	50.4
Jennings, Living & C	289	1	.1	.1	50.5
Jewitt, Sparrow & Sw	290	1	.1	.1	50.5
John (A. Owen) & Co	291	1	.1	.1	50.6
John Wilkie & Co	292	1	.1	.1	50.6
Jones & Jasper	293	1	.1	.1	50.7
Jones David J. & Co	294	1	.1	.1	50.7
Jones, Hutchinson &	295	1	.1	.1	50.8
Jordan, Brookes & Co	296	2	.1	.1	50.9
Josolyne Layton-Benn	297	5	.3	.3	51.1
Josolyne, Miles & Co	298	3	.2	.2	51.3
Keelings	299	1	.1	.1	51.4
Keen W.B. & Co	300	2	.1	.1	51.5
Keens, Shay, Keens &	301	2	.1	.1	51.6
Kemp, Chatteris & Co	302	4	.2	.2	51.8

ACCYF3 ACCYFIRM2 (consolidation of duplicate na

Kennedy, Fox, Oldfie	303	2	.1	.1	51.9
Kevan Pilling & Co	304	1	.1	.1	51.9
Keys Clement & Son	305	1	.1	.1	52.0
Kidson Bertram & Co	306	1	.1	.1	52.0
Kidsons	307	7	.4	.4	52.4
King L. & Co	308	1	.1	.1	52.4
Kingdon, Marbeck, An	309	1	.1	.1	52.5
Kingsford, Garlant &	310	2	.1	.1	52.6
Kingston Smith & Co	311	1	.1	.1	52.6
Kirby Norman F. & Co	312	1	.1	.1	52.7
KMG Thomson McLintoc	313	4	.2	.2	52.9
Kneeshaw, Moffat & C	314	1	.1	.1	52.9
Knill, Padgham & Gra	315	1	.1	.1	53.0
Knox, Cropper, Gedge	316	1	.1	.1	53.0
Knox, Franklin & Co	317	2	.1	.1	53.1
KPMG	318	123	6.3	6.3	59.4
Lancaster, King, Rid	319	1	.1	.1	59.5
Landau, Morley & Par	320	2	.1	.1	59.6
Lane, Heywood & Co	321	1	.1	.1	59.6
Larking & Larking	322	1	.1	.1	59.7
Latham Wm. & Co	323	1	.1	.1	59.7
Lawson & Walker	324	1	.1	.1	59.8
Layton-Bennett, Bill	325	5	.3	.3	60.0
Leach, Johnson, Trav	326	2	.1	.1	60.1
Leech, Peirson, Evan	327	2	.1	.1	60.2
Leeds, Barlow & Co,	328	1	.1	.1	60.3
Leithead, Jennings &	329	1	.1	.1	60.3
Lewis Bloom & Co	330	1	.1	.1	60.4
Lewis Golden & Co	331	1	.1	.1	60.4
Limebeer & Co	332	1	.1	.1	60.5
Linde Gerard van de	333	1	.1	.1	60.5
Lingard, Wilson & Co	334	1	.1	.1	60.6
Lishman, Sidwell, Ca	335	1	.1	.1	60.6
Lithgow, Nelson & Co	336	1	.1	.1	60.7
Lithgow, Perkins & C	337	1	.1	.1	60.7
Little Geo., Sebire	338	1	.1	.1	60.8
Locking Johnson & Wa	339	1	.1	.1	60.8
Longcrofts	340	9	.5	.5	61.3
Lord, Foster & Co	341	1	.1	.1	61.4
Lubbock, Fine & Co	342	3	.2	.2	61.5
MacIntyre, Hudson &	343	1	.1	.1	61.6
Macnair, Mason, Evan	344	2	.1	.1	61.7
Mann Judd & Co	345	7	.4	.4	62.0
Manners, Elman, Dunc	346	1	.1	.1	62.1
many with different	347	2	.1	.1	62.2
March R.H., Son & Co	348	2	.1	.1	62.3
Marks, Bloom & Co	349	1	.1	.1	62.3
Martin & Acock	350	1	.1	.1	62.4
Mason & Son	351	1	.1	.1	62.4
Mason Percy & Co	352	1	.1	.1	62.5
Maw, Ellis, Warne &	353	1	.1	.1	62.5

ACCYF3 ACCYFIRM2 (consolidation of duplicate na

Mayhew-Sanders & Co	354	1	.1	.1	62.6
McBride & Co	355	1	.1	.1	62.6
McCabe & Ford	356	1	.1	.1	62.7
McClelland, Moores &	357	1	.1	.1	62.7
McEwan, Wallace, How	358	1	.1	.1	62.8
Meacock Walter & Co	359	1	.1	.1	62.8
Meeson, Makinson	360	1	.1	.1	62.9
Mellors, Basden & Co	361	4	.2	.2	63.1
Melman Pryke &Co	362	2	.1	.1	63.2
member in practice	363	3	.2	.2	63.3
Menzies (post qualif	364	1	.1	.1	63.4
Merchant H.A. & Co	365	1	.1	.1	63.5
Merrett, Son & Stree	366	1	.1	.1	63.5
Messik, Arthur & Co	367	1	.1	.1	63.6
Middleton & Middleto	368	1	.1	.1	63.6
Middleton C.F. & Co,	369	1	.1	.1	63.7
Midgley, Snelling &	370	1	.1	.1	63.7
Miles, Watson & Co,	371	1	.1	.1	63.8
Mills, Hawes, Harper	372	3	.2	.2	63.9
Mitchell & Plummer	373	1	.1	.1	64.0
Mitchell, Dowd, Walt	374	1	.1	.1	64.0
Monkhouse, Stoneham	375	1	.1	.1	64.1
Moore Edward & Sons	376	1	.1	.1	64.1
Moore, Fletcher, For	377	1	.1	.1	64.2
Moore, Stephens & Co	378	2	.1	.1	64.3
Moores, Carson & Wat	379	1	.1	.1	64.3
Morgan, Brown & Hayn	380	1	.1	.1	64.4
Morison Stoneham & C	381	1	.1	.1	64.4
Morison, Rutherford	382	1	.1	.1	64.5
Morley & Sharpe	383	1	.1	.1	64.5
Morris Crocker & Co	384	1	.1	.1	64.6
Morris I.M. & Co	385	1	.1	.1	64.6
Morris, Gregory & Co	386	3	.2	.2	64.8
Mosley & Co	387	1	.1	.1	64.8
Moss, Swallow & Isle	388	1	.1	.1	64.9
Muras, Baker, Jones	389	2	.1	.1	65.0
Murray H.N. & Co	390	1	.1	.1	65.0
Nash Broad & Co	391	1	.1	.1	65.1
Nasmith, Coutts & Co	392	2	.1	.1	65.2
Needham J. & Co	393	1	.1	.1	65.2
Nevill, Hovey, Gardn	394	6	.3	.3	65.5
Neville Russell	395	5	.3	.3	65.8
Newman & Partners	396	1	.1	.1	65.8
Newman D.W.	397	1	.1	.1	65.9
Newman Harris & Co	398	1	.1	.1	66.0
Newman, Biggs & Co	399	1	.1	.1	66.0
Nicholson Chas O. &	400	1	.1	.1	66.1
Norton Keen & Co	401	1	.1	.1	66.1
Norton, Slade & Co	402	2	.1	.1	66.2
Nuttall C., Shenton	403	1	.1	.1	66.3
Oddy & Fox	404	1	.1	.1	66.3

ACCYF3 ACCYFIRM2 (consolidation of duplicate na

Ogle Newman, Bevan &	405	1	.1	.1	66.4
Oury Walter H. & Co	406	2	.1	.1	66.5
Overton H, Salt & Co	407	1	.1	.1	66.5
Owen D.A. & Co	408	1	.1	.1	66.6
Owen West & McGregor	409	1	.1	.1	66.6
Page Robt. A. & Co	410	1	.1	.1	66.7
Pannell Fitzpatrick	411	6	.3	.3	67.0
Pannell Kerr Forster	412	5	.3	.3	67.2
Pannell, Crewdson &	413	1	.1	.1	67.3
Parkinson, Mather &	414	1	.1	.1	67.3
Partridge, Cox & Co	415	1	.1	.1	67.4
Paul, Dowd & Co	416	1	.1	.1	67.4
Pawley & Malyon	417	1	.1	.1	67.5
Peat Marwick McLinto	418	9	.5	.5	67.9
Peat, Marwick, Mitch	419	17	.9	.9	68.8
Peat, Marwick, Mitch	420	1	.1	.1	68.9
Pepper Herbert & Rud	421	1	.1	.1	68.9
Peters, Elworthy & M	422	1	.1	.1	69.0
Pettitt, Maddox & Co	423	1	.1	.1	69.0
Phillips & Drew	424	1	.1	.1	69.1
Pike, Russell & Co	425	2	.1	.1	69.2
Pinner, Darlington &	426	1	.1	.1	69.2
Pitt & Co, or Revell	427	1	.1	.1	69.3
Pittman, Wood & Co	428	1	.1	.1	69.3
Plummer, Parsons & C	429	1	.1	.1	69.4
Polak & Carpenter	430	1	.1	.1	69.4
Pontefract & Porritt	431	1	.1	.1	69.5
Porter, Matthews & M	432	1	.1	.1	69.5
Poulsom & Co	433	1	.1	.1	69.6
Price Waterhouse	434	149	7.6	7.6	77.2
Price William & Co	435	1	.1	.1	77.2
Prideaux, Frere, Bro	436	1	.1	.1	77.3
Pridie, Brewster & G	437	2	.1	.1	77.4
Prior & Palmer	438	1	.1	.1	77.4
Private Practice	439	1	.1	.1	77.5
Quilter Goodison & C	440	1	.1	.1	77.5
Radford, Sons & Co	441	2	.1	.1	77.6
Randle G.N. & Co	442	1	.1	.1	77.7
Rawlinson & Hunter	443	2	.1	.1	77.8
Rawlinson, Greaves &	444	3	.2	.2	77.9
Reads & Co	445	1	.1	.1	78.0
Reads, Drury Theobal	446	1	.1	.1	78.1
Rensburg & Co	447	1	.1	.1	78.1
Revell, Ward & Co	448	1	.1	.1	78.2
Reynolds & Lane	449	1	.1	.1	78.2
Rhodes & Rhodes	450	2	.1	.1	78.3
Richards, Russam & C	451	1	.1	.1	78.4
Rickitt Mitchell & P	452	1	.1	.1	78.4
Ridsdale, Cozens & P	453	4	.2	.2	78.6
Rivington, Lawrence	454	1	.1	.1	78.7
Roberts, White, & Co	455	1	.1	.1	78.7

ACCYF3 ACCYFIRM2 (consolidation of duplicate na

Robinson J.F.W. & Co	456	1	.1	.1	78.8
Robson Laidler	457	1	.1	.1	78.8
Robson Rhodes	458	11	.6	.6	79.4
Robson Taylor Barlow	459	1	.1	.1	79.4
Roffe, Swayne & Co	460	1	.1	.1	79.5
Ross Jack & Co	461	1	.1	.1	79.5
Rowland & Co	462	1	.1	.1	79.6
Rowland, Nevill & Co	463	1	.1	.1	79.6
Rowley, Pemberton &	464	1	.1	.1	79.7
Royce, Peeling, Gree	465	2	.1	.1	79.8
Rupert Lindley & Son	466	1	.1	.1	79.8
Russell Tillett & Co	467	1	.1	.1	79.9
Russell, Durie Kerr,	468	1	.1	.1	79.9
Ryden Harry & Co	469	1	.1	.1	80.0
Saffery, Sons & Co	470	4	.2	.2	80.2
Saint & Co	471	1	.1	.1	80.2
Salmon H.T. & Co	472	1	.1	.1	80.3
Salvage M.R. & Co	473	1	.1	.1	80.3
Sanders, Millichamp	474	1	.1	.1	80.4
Sayers A.G., Seaton	475	2	.1	.1	80.5
Sayers Butterworth	476	1	.1	.1	80.6
Scott E.L. & Co	477	1	.1	.1	80.6
Scott G.H. & Co	478	1	.1	.1	80.7
Scrutton, Goodchild	479	1	.1	.1	80.7
see List before 1970	480	1	.1	.1	80.8
Sharpe Fairbrother	481	2	.1	.1	80.9
Shaw W.H. & Sons	482	1	.1	.1	80.9
Sheard Fred & Sons	483	1	.1	.1	81.0
Sheen Stickland & Co	484	1	.1	.1	81.0
Shelley Ronald C. &	485	1	.1	.1	81.1
Shepherd Joseph W. &	486	1	.1	.1	81.1
Sherwood H.H. & Co	487	2	.1	.1	81.2
Shipley, Blackburn,	488	1	.1	.1	81.3
Sibbald James, Forsy	489	3	.2	.2	81.4
Silver, Altman & Co	490	2	.1	.1	81.5
Simpkins Edwards & C	491	1	.1	.1	81.6
Simpson, Wood & Co	492	1	.1	.1	81.6
Sinclair, de Mesquit	493	1	.1	.1	81.7
Singleton, Fabian, D	494	8	.4	.4	82.1
Smailes, Goldie & Co	495	3	.2	.2	82.2
Smallfield, Fitzhugh	496	2	.1	.1	82.3
Smallfield, Rawlins	497	1	.1	.1	82.4
Smith & Garton	498	3	.2	.2	82.5
Smith Evans, Boothro	499	1	.1	.1	82.6
Smith Frank J & Co	500	1	.1	.1	82.6
Smith Howard, Thomps	501	1	.1	.1	82.7
Smith, Wheeler & Hay	502	1	.1	.1	82.7
Smith, Willcox & Co,	503	1	.1	.1	82.8
Smith,Forshaw & Harp	504	1	.1	.1	82.8
Snow A.B., Wood & Co	505	1	.1	.1	82.9
Solomon Hare & Co	506	2	.1	.1	83.0

ACCYF3 ACCYFIRM2 (consolidation of duplicate na

Spain Brothers, McNa	507	5	.3	.3	83.3
Spencer T.W. & Co	508	1	.1	.1	83.3
Spicer & Oppenheim	509	2	.1	.1	83.4
Spicer & Pegler	510	36	1.8	1.8	85.2
Springer Alexander &	511	1	.1	.1	85.3
Sproull, Goddard & C	512	1	.1	.1	85.3
Stacey W.E. & H.R.	513	1	.1	.1	85.4
Stafford Rudkin & Co	514	1	.1	.1	85.5
Stanley A. Spofforth	515	1	.1	.1	85.5
Stansfield John, Wes	516	2	.1	.1	85.6
Stephens F.W. & Co	517	1	.1	.1	85.7
Stoy Hayward	518	22	1.1	1.1	86.8
Streets J.S. & Co	519	1	.1	.1	86.8
Stubbs, Parkin & Sou	520	1	.1	.1	86.9
Sturges, Fraser, Cav	521	1	.1	.1	86.9
Sugden B. & Co	522	1	.1	.1	87.0
Sully J. & A.W. & Co	523	1	.1	.1	87.0
Sunderland O. & Sons	524	1	.1	.1	87.1
Sutcliffe Arthur L.	525	1	.1	.1	87.1
Sydenham, Snowden, N	526	1	.1	.1	87.2
Tansley Witt & Co	527	4	.2	.2	87.4
Temple, Gothard & Co	528	3	.2	.2	87.5
Thei Maurice & Co	529	1	.1	.1	87.6
Thomas Bourne & Co,	530	1	.1	.1	87.6
Thomas May &Co	531	2	.1	.1	87.7
Thomson McLintock &	532	25	1.3	1.3	89.0
Thomson W.Y. & Co	533	1	.1	.1	89.1
Thornton & Thornton	534	2	.1	.1	89.2
Thornton Baker	535	43	2.2	2.2	91.4
Tildesley Cecil & To	536	1	.1	.1	91.4
Torgersen, Nicholson	537	1	.1	.1	91.5
Touche (George A.) &	538	2	.1	.1	91.6
Touche Ross & Co	539	52	2.7	2.7	94.2
Towers & Naismith	540	1	.1	.1	94.3
Train Scott	541	1	.1	.1	94.3
Trent Raymond & Co	542	1	.1	.1	94.4
Tribe, Clarke & Co,	543	2	.1	.1	94.5
Tribe, Clarke, Paint	544	2	.1	.1	94.6
Turk & Brandes, and	545	1	.1	.1	94.6
Turner, Easdale & Co	546	1	.1	.1	94.7
Turquand, Youngs & C	547	10	.5	.5	95.2
Tyson, Westall & Co	548	1	.1	.1	95.3
Vale W. Vincent & Co	549	1	.1	.1	95.3
Vallance, Lodge & Co	550	1	.1	.1	95.4
Vincent & Goodrich	551	1	.1	.1	95.4
Viney, Price & Goody	552	1	.1	.1	95.5
Voisey & Co	553	1	.1	.1	95.5
Wagstaff Lees & Co	554	1	.1	.1	95.6
Walker & Co	555	1	.1	.1	95.6
Walker, Fullerton, H	556	1	.1	.1	95.7
Walker, Weller & Roy	557	1	.1	.1	95.7

ACCYF3 ACCYFIRM2 (consolidation of duplicate na

Wallace Cash & Co	558	2	.1	.1	95.8
Walter Moore & Co	559	1	.1	.1	95.9
Walton W.T. & Son	560	2	.1	.1	96.0
Walton, Watts & Co	561	1	.1	.1	96.0
Ward Revell & Co	562	1	.1	.1	96.1
Ward Robert J. & Co	563	1	.1	.1	96.1
Warley & Warley	564	1	.1	.1	96.2
Warmsley, Henshall &	565	1	.1	.1	96.2
Watling & Partners	566	1	.1	.1	96.3
Wells W. & Co	567	1	.1	.1	96.3
Wells, Richardson &	568	1	.1	.1	96.4
Wenn Townsend & Co	569	2	.1	.1	96.5
West, Wake, Price &	570	3	.2	.2	96.6
Westcott Wilson	571	1	.1	.1	96.7
Weston R.J. & Co	572	1	.1	.1	96.7
Weyman John & Co	573	1	.1	.1	96.8
Wheawill & Sudworth	574	3	.2	.2	96.9
Wheeler, Whittingham	575	2	.1	.1	97.0
Whinney Murray & Co	576	19	1.0	1.0	98.0
White Edmund D. & So	577	2	.1	.1	98.1
Whitehead & Aldrich	578	2	.1	.1	98.2
Whitehill Marsh Jack	579	2	.1	.1	98.3
Whitley, Stimpstone	580	1	.1	.1	98.4
Whitting & Partners	581	1	.1	.1	98.4
Whittingham, Riddell	582	1	.1	.1	98.5
Whyatt, Pakeman, Par	583	1	.1	.1	98.5
Wigley Norman J. & P	584	1	.1	.1	98.6
Wilkins, Kennedy & C	585	1	.1	.1	98.6
Williams E.J. & Co	586	1	.1	.1	98.7
Williams G.B., Ross	587	1	.1	.1	98.7
Williams T.O. & Davi	588	1	.1	.1	98.8
Wilson Wright & Co	589	2	.1	.1	98.9
Wilson, Davis & Co	590	1	.1	.1	98.9
Wilson, De Zouche &	591	2	.1	.1	99.0
Wilson, Green, Gibbs	592	1	.1	.1	99.1
Wilson, Powell & Co	593	1	.1	.1	99.1
Windsor, Stead & Co	594	2	.1	.1	99.2
Winter John M. & Son	595	3	.2	.2	99.4
Winter, Robinson, Si	596	2	.1	.1	99.5
Wood A. & Co	597	1	.1	.1	99.5
Wood, Albery & Co	598	1	.1	.1	99.6
Woodthorpe, Bevan &	599	1	.1	.1	99.6
Worley James & Sons	600	1	.1	.1	99.7
Worshipful	601	1	.1	.1	99.7
Wortley Joshua & Son	602	1	.1	.1	99.8
Wright, Stevens & Ll	603	2	.1	.1	99.9
Wykes & Co	604	2	.1	.1	100.0
	Total	1959	100.0	100.0	

Valid cases 1959 Missing cases 0