The impact of the Arthur Andersen and Ernst & Young merger on the Australian audit services market

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Certificate

I certify that this thesis has not already been submitted for any degree and is not being submitted as part of candidature for any other degree.

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Abstract

The merger between Arthur Andersen (AA) and Ernst & Young (EY) in Australia was announced on the 16th May 2002. The merger was the culmination of seven months of speculation and drama surrounding the future of AA, following its involvement in the collapse of Enron in the United States of America (US). With the number of Big N firms having been reduced to four, concerns were raised over the impact of the merger on the competitiveness of the Australian audit services market (Boreham, 2002; Robertson, 2002; Hamilton et al., 2008).

The objective of the thesis is to evaluate the impact of the merger of AA and EY on the market for audit services in Australia. In this regard, consideration is given to two specific questions. First, whether the Australian audit services market became less competitive subsequent to the merger of AA and EY. Second, whether any benefits, either in relation to audit pricing or efficiency, accrued to the firms involved as a consequence of the merger. In order to address these objectives, the impact of the merger on Australian listed firms is examined. This was done for both the market as a whole, as well as for the clients of EY. The sample was drawn from the 1271 available firms on the Australian Stock Exchange (ASX) in 2002.

The results show that the audit services market in Australia is still competitive subsequent to the merger of AA and EY. This is so, even though the changes in concentration would suggest that anti-competitive effects could be occurring. One possible explanation for these findings is that the measures of market concentration as identified in the industrial organization literature are difficult to apply to audit firms. Additionally, the lack of benefit to EY from the merger, either through increased pricing or efficiency, may simply be due to 2002 being too early

for benefits to be realised, possibly due to the stickiness of audit service fees (Ferguson et al., 2005) or merger implementation issues (Lawrence and Glover, 1998).

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Table of Contents

Tables

Chapter 1 – Introduction

The objective of this thesis is to evaluate the impact of the merger of Arthur Andersen (AA) and Ernst and Young (EY) on the market for audit services in Australia. In this regard, consideration is given to two specific questions. First, whether the Australian audit services market became less competitive subsequent to the merger of AA and EY. Second, whether any benefits, either in relation to audit pricing or efficiency, accrued to the firms involved as a consequence of the merger.

The merger of AA and EY was the most recent of a succession of mergers between large providers of audit services in Australia, and represented a further contraction in the number of large providers of audit services. It was labelled a 'merger' by the Australian Competition and Consumer Commission (ACCC) and was the culmination of seven months of speculation and drama about the future of AA. This was in the first instance fuelled by AA's involvement in the audit of Enron, which disclosed on 21 October, 2001 that it was reducing its after-tax net profit by USD544m (Benston and Hartgraves, 2002). Additionally, in Australia, AA was subjected to criticism over its involvement in the audit of the collapsed insurance company, HIH.[1] This was resolved on 16 May, 2002 when the merger of AA and EY was announced.

The new entity arising from the merger became known as Ernst & Young Australia, with no reference to AA as a merging partner. It would be Australia's second largest professional services firm (White, 2002), and have the largest share of the Australian audit services market. A distinguishing feature of this merger, compared to previous mergers in the audit services industry, was that it was determined entirely at a

[1] The HIH collapse was one of the largest collapses in Australian history, and in his conclusions of his report to ASIC the indepdent investigaot, David Lombe noted that AA did "not appear to have followed generally accepted auditing standards" (Gaylord, 2002).

national level. Critically, this provides a context where the motivations for the merger and its impacts on the audit services market can be evaluated without regard to impacts of the merger on the international operations of the audit firms.

The first motivation for this study is to evaluate whether the merger reduced the competitiveness of the audit services market in Australia. With the merger reducing the number of large providers of audit services to four, concerns were expressed that the increasing level of concentration was a threat to the level of competition in the audit services market. This was initially raised in the debate surrounding the collapse of AA as a stand alone firm, then in the context of a merger between AA and another of the Big 5 (Boreham, 2002; Robertson, 2002), and finally in relation to the merger of AA and EY.[2] Hamilton et al. (2008) provide a review of this debate, albeit focusing on the merger in Australia of AA and EY. Importantly, they document concerns about increasing supplier concentration and fewer large audit firms servicing the largest clients, and the general lessening of competition in the Australian audit services market. The question of whether these concerns were justified requires address.

The second motivation for this thesis is to evaluate a range of strategies potentially being pursued by the merger participants, and the extent to which any benefits were realised. Gramling and Stone (2001), in their review of the audit industry specialization literature, called for research in this area, claiming that "market share measure research generally casts audit firms as passive reactors to, rather than shapers of, their economic environments." (p.12). An example of this is Francis et al. (1999) who, in the context of the 1989 audit firm mergers that led to the creation of EY and Deloitte Touche, argued that audit firms simply pursued increased market share.

[2] It is also pertinent to note that similar issues were raised by regulators in the US, (GAO Report, 2003) United Kingdom (Oxera, 2006) and New Zealand (Baskerville and Hay, 2006)

Consideration was not given to outcomes other than market share changes, and the possibility that these could identify potential motivations for audit firm mergers.

The merger between AA and EY in Australia provides a unique setting in which to examine the strategies being employed by merger participants to shape their 'economic environment'. Unlike prior mergers between the Big N[3] audit firms, this was determined purely at a national level. The decision to merge was made and taken by the Australian partners of AA and EY, and the merger was only between the Australian partnerships of the two firms.[4] Accordingly, the evaluation of the strategies underpinning the merger, and determination of the potential benefits realised, is less problematic in this context. Two such strategies potentially underpinning mergers between audit service providers have been identified in the literature (Stevens, 1991; and Francis et al., 1999). These are the development of industry specializations and the generation of operating efficiencies. Both of these strategies have outcomes that are measurable within a localised setting, and the extent to which they are being pursued is an issue that requires address.

The third motivation for this study is to evaluate whether the nature of this merger impacted its outcomes in the audit services market. The merger of AA and EY was the first involving Big N firms where one of the merger participants was 'distressed'. All prior Big N mergers were undertaken voluntarily by partners of both merging firms. For AA and EY in Australia this is not the case, with it being likely that AA would not have been able to continue as a viable national practice (ACCC, 2002). As such, AA needed to either merge or be split up. Accordingly, a question requiring address is how this impacted the realisation of benefits arising from the merger.

[3] Big N refers to the Big 8/6/5/4

[4] This is distinct from prior mergers, where global factors had a strong influence on reasons to merge and outcomes may not have been country specific.

This thesis contributes to the extant literature on competition in the audit services market by moving beyond documenting the effect an audit firm merger has on the level of concentration in the audit services market. The majority of studies (i.e. Tonge and Wootton, 1991; Minyard and Tabor, 1991; Thavapalan et al., 2002; McMeeking et al., 2007) that have examined the impact of audit firm mergers on the audit services market have generally been limited to evaluating changes in concentration, although Hamilton et al. (2008) is a notable exception. This focus on a change in concentration is in line with regulatory approaches to assessing mergers (Goddard, 1998; ACCC, 1999) in that a change in concentration is an important indicator used in determining competitive impacts.

However, it has been argued that a change in concentration, in itself, does not indicate that there has been a change in the level of competition in the market (Simunic, 1980; Hamilton et al., 2008). Rather, a change in a given measure of competition (such as pricing) would provide evidence that a merger had an impact on the competitiveness of the market. To date this has not been explicitly studied in an audit services market context, and this study will contribute to the existing literature by testing the relation between concentration and competition.

A second contribution this study makes is in further understanding the dynamics of the audit services market, especially how firm size and industry specialization provide benefits to merging firms. This contribution will be made not only from the demand side by examining audit service fee premiums, but also the supply side through the consideration of efficiency benefits.

A feature of the extant literature on industry specialization is that this has typically been assessed through market leadership in a particular period. The association of market leadership with audit service fees has then been evaluated to determine audit

service fee premiums for industry specialists (e.g. Craswell et al., 1995; Francis et al., 2005). This static measure of industry leadership is limiting, as the manner in which the firm has become a market leader, and how recently it occurred, is ignored. However, in the context of the AA–EY merger, how and when market leadership was attained is determinable, and this allows for testing of whether premiums are earned by new and continuing market leaders. It also allows for testing of whether audit firms that are no longer market leaders are still able to charge an audit service fee premium.

Furthermore, it has been recognised in the literature that the ability to detect audit service fee premiums is potentially compromised if there are cost savings available to industry specialists, and the cost savings are passed on to the clients. Highlighting this problem, Stein and Cadman (2007) provide evidence of industry specialists both charging premiums and offering discounts. Similarly, DeFond et al. (2000) find that property specialist audit firms in Hong Kong actually provide discounted services. This study extends the current literature by concurrently testing for audit efficiencies (as measured by the audit report lag) and audit pricing.

The third contribution of this study is to provide evidence on the importance of reputation in a service industry merger. The ability of service firms to differentiate themselves from others is strongly driven by their reputation. It has been found that an audit firm that suffers a negative reputation event, such as a regulatory sanction or litigation (Wilson and Grimlund, 1990; Franz et al., 1998), does suffer a range of adverse effects. In all of these studies, the firm that suffered these adverse effects was still in existence and trading under the same name. In the merger of AA and EY, no explicit reference to AA was made once the merger was complete. The existence of significant effects on former AA clients would suggest that reputation concerns still hold, even if the problem firm is no more.

1.1 Results

Based on a sample of 1271 firms listed on the Australian Stock Exchange (ASX) in 2002, evidence is provided that there is no change in the audit service fees paid due to changes in market concentration. This supports the conclusion that whilst there was an increase in concentration, competition in the Australian audit services market did not decline following the merger between AA and EY. This result holds notwithstanding various geographic and industry definitions of the market, as well as alternate measures of concentration and fee models. This result is consistent with that of Hamilton et al. (2008).

Additionally, changes in the audit services market are considered. The merger led to EY becoming a leader in a number of markets, at both a national industry and city industry level. In the markets where EY became a leader, there is no evidence that the firm was able to increase fees paid by clients. Similarly there is no evidence that EY was able to audit its clients more efficiently in the markets in which it became a leader, with the audit report lag not changing. Taken together, the findings from the EY pricing and efficiency tests suggest that EY did not gain any economic benefits from merging with AA.

The results for the EY pricing and efficiency tests may have been impacted by reputation spillovers from AA. The results of the pricing changes model, controlling for AA clients, are consistent with the main results, in that EY did not gain any pricing advantage from becoming a market leader in 2002. Nor is there a significant change in fees paid by former AA clients. However, there is some evidence that it took longer to audit former AA clients at EY in 2002 than when they were at AA in 2001.

In conclusion, these results show that the audit services market in Australia is still competitive subsequent to the merger of AA and EY. This is so, even though the changes in concentration would suggest that anti-competitive effects could be occurring. One possible explanation for these findings is that the measures of market concentration, as identified in the industrial organization literature, are difficult to apply to audit firms. Additionally, the lack of benefit to EY from the merger, either through increased pricing or efficiency, may simply be due to 2002 being too early for benefits to be realised, possibly due to the stickiness of audit service fees (Ferguson et al., 2005) or merger implementation issues (Lawrence and Glover, 1998).

1.2 Structure

The remainder of the thesis is organised as follows. The literature review and hypothesis development is undertaken in Chapter 2. Chapter 3 describes methodology used to test the hypotheses and Chapter 4 documents the sample used and descriptive statistics. Chapter 5 documents the results and Chapter 6 completes the thesis with a discussion of the results as well as the conclusions from the study.

Chapter 2 – Theory and Hypotheses

2.1 Introduction

There is a well established literature that considers the nature of the firm and identifies the advantages this organizational form presents for undertaking economic activities.[5] This has been developed in the context of firm merger activity, where a number of motivations for firms undertaking mergers have been explored. These include revenue, cost, risk, managerial and reactionary explanations.[6]

In this chapter the relevance of this framework for evaluating merger activity in the audit services market, and in particular the merger between AA and EY, will be considered, and hypotheses developed. In the first instance, consideration is given to the impact of the merger on the market for audit services generally, and whether audit service fees increased as a consequence of an increase in concentration. Attention then shifts to the merger of AA and EY, and the evaluation of the motivations for the merger. Of particular concern is whether there was the opportunity for EY to increase audit service fees, or charge a premium, either in general, or in particular sections of the Australian audit services market. Benefits may also have arisen as a consequence of production efficiencies, and this outcome is also considered.

Finally, a distinguishing feature of the AA and EY merger was that one of the participants was 'distressed'. Accordingly, any change in the market for audit services may simply have reflected the uncertainty surrounding AA prior to the merger. This necessitates the separate evaluation of the changes in the provision of audit services to former AA and EY clients separately.

[5] See for example Coase (1937), Alchian and Demsetz (1972) and Williamson (1981)
[6] See for example Tichy (2001)

The remainder of this chapter is organised as follows. Section 2.2 considers the literature examining the nature of the firm and explores the implications this has for mergers. The recent history of mergers between the large providers of audit services will be considered against this framework in Section 2.3. The implications of the AA and EY merger for the market for audit services generally will be considered in Section 2.4, while the focus in Sections 2.5 and 2.6 will be on the clients of EY. Finally, a summary will be presented in Section 2.7.

2.2 The nature of the firm and its implications for merger activity

Following the seminal work of Coase (1937), the nature of the firm and the economic rationale for the establishment of the firm has been extensively considered. Coase identified firms as providing an economically efficient vehicle for undertaking business activities where there are potentially significant costs arising from reliance upon the market mechanism to allocate resources. This may occur for a range of reasons, including the costs of determining price, and short term contracts being inefficient.

Importantly, this provides an economic framework to evaluate the activities and strategies employed to maximise firm value. This framework identifies potential benefits from these activities and strategies and categorises them in a manner which facilitates analysis.

While the framework was developed within the context of a manufacturing firm, it is equally applicable to service firms, and in particular audit firms. For example, during the 1950's and 1960's many audit firms around the world merged to create the multi-national firms that became the forerunners of today's Big 4 (Carey, 1970).

Doubtless this was a reaction to the increasing globalization of audit clients and the need to deliver audit services globally for these clients. While these services could have been obtained by contracting with different audit firms, instead the firms expanded or merged to enable the services to be provided within the firms. The dominance of the audit services market by large firms today is indicative of these arrangements being economically efficient.

Following on from the work of Coase, a number of authors have sought to expand the conditions contributing to the firm being the optimal structure for organising business activities. For example, Alchian and Demsetz (1972) sought to explain the conditions that determined whether the gains from specialization and cooperative production are better obtained from the market or within a firm. Coase had argued that organizing resources within the firm will yield a greater advantage the higher the cost of transactions across the market. Alchian and Demsetz (1972), on the other hand, suggest there are benefits over and above the reduction of transactions costs. One such benefit in bringing transactions within the firm is better productive outputs when resources are used together as opposed to separately.

To illustrate how organizing resources within the firm generates benefits other than simply a reduction in transaction costs, Alchian and Demsetz (1972) use the example of two men lifting heavy cargo into trucks. These two men (production inputs) will lead to a production output of *Z*. Team production will be used if this joint production output (*Z*), less organizing costs, is greater than the sum of separable production. One of the identified problems with team production is that it is extremely difficult, if not impossible, to measure the marginal output of any one productive input. As such, this leads to incentives to shirk. One method to reduce shirking is the use of a specialist monitor of performance who oversees the input behaviour of the team

members. For the monitor to be incentivised, they must have a claim on the net profitability of the business (i.e. residual claimant) as well as have the ability to alter the contracts of the team members (i.e. including termination). This residual claimant is a common party with all other members of the firm, rather than having multiple, bilateral contracts.

Similarly, Williamson (1981) has expanded upon the earlier work of Coase and identified particular factors, which suggest that transactions should occur within the firm as opposed to the market, as well as taking the view that the internal organization of the firm is important for performance. These factors were formalised by Williamson as 'the asset specificity principle', 'the externality principle' and 'the hierarchical decomposition principle'. The first two, which are relevant to this study, refer to the factors which lead to transactions being more or less likely to be brought within the firm, whilst the third outlines the way in which firms should be organised internally for the best performance outcomes.

The asset specificity principle suggests that as asset specificity increases, transactions will be brought within the firm. Williamson (1983) identifies four dimensions of asset specificity, which include site, physical, human and dedicated assets. For example, a machine designed to build a particular car part is an asset with high physical specificity as it is only designed for a specific purpose. The machine cannot be used for production of other items.

Similarly, under the externality principle, transactions will increasingly be brought within the firm as demand externalities increase. This principle primarily deals with how manufacturers get a product to market. At one end of the spectrum they can engage retailers individually, whilst at the other end of the spectrum the manufacturer can forward integrate and bring the distribution function within the firm. What will

prompt a move away from autonomous contracting with retailers towards forward integration is the degree to which the quality differences amongst the retailers are perceived to affect each other. The greater the network externality, the more likely the firm is to bring distribution within the organization.

In many ways the rationales for operating as a firm are no different from the rationales for how large the firm should be. Not surprisingly, insights into the nature of the firm and the motivations for undertaking business activities within firms have been developed in the literature evaluating mergers between firms. A merger is simply one method by which firms can increase in size, and the motivations for firms flow from these firm size rationales. An overview of the motivations for firms to merge is provided by Tichy (2001), who identifies five explanations for merger behaviour:

i. revenue explanations
ii. cost explanations
iii. reactionary explanations
iv. managerial explanations
v. risk explanations

2.2.1 Revenue explanations

One potential motivation for a merger strategy is a revenue based explanation. A revenue based explanation reflects the ability of the merged firm to increase its revenues through either an increase in market power, caused by an increase in market concentration (Kim and Singal, 1993) or through revenue synergies (Berkovitch and Narayan, 1993; Harrison et al., 1991). These effects are both likely to be relevant in the AA–EY merger, as first, the reduction in large accounting firms from five to four may

have increased market concentration and thus lowering market competition, and second, the merger is likely going to affect leadership positions in the market, thus affecting the ability of the merged firm to charge higher audit service fees.

A merger which leads to the combined firm having a market share that allows it to dominate the market, and to increase its prices, is an example of a market power revenue explanation. Whilst Jensen (1988) argues that "…takeover gains do not come from creation of monopoly power" (p.23), the empirical results of Kim and Singal (1993) provide evidence that mergers can lead to increases in market power. They examine US airline mergers and find that there is a significant relation between changes in concentration and changes in prices charged, consistent with an increase in market power in those particular markets.

In the context of the audit services market, which is becoming increasingly concentrated (Thavapalan et al., 2002; McMeeking et al., 2007), this is a potential motive for any merger.

An alternate driver of increased revenues for the merged firm is the creation of revenue synergies (Capron, 1999). Theoretically, revenue synergies stem from a resource based view of the firm (Penrose, 1959), and Capron (1999) identifies two ways in which firms can enhance revenues: through increased market coverage or enhanced innovative ability.

Increased market coverage provides the merged firm access to a greater number of clients and allows it to cross-sell products and services of one firm to a customer base it did not formerly have such direct access to. Historically, this is likely to have influenced behaviour in the audit services market where audit clients may be provided non-audit services (Perera et al., 2003). However, with the concern over auditor

independence raised in the Ramsay Report (2001), and the restriction of the provision of non-audit services in Australia following CLERP 9, this is less likely to be relevant.

In terms of enhanced innovative ability, mergers can "enhance innovation capability by using the superior innovation capability … of one of the merged firms to enhance product features … or to improve organization and marketing effectiveness … Innovation capability can be converted into price premium and/or increased volume, leading to higher revenues." (Capron, 1999 p.990). Whilst not discounting the importance of innovation for audit firms, it is not expected that innovation will greatly impact audit service product features or the marketing of such services in the case of the AA and EY merger. There is no indication that any innovation in relation to audit procedures took place in the years shortly after the merger. It is also pertinent to note that 70% of the former AA clients audited by EY in 2002 continued to be audited by a former AA partner. As noted in Knechel and Payne (2001), the major innovations to audit technology and audit approaches have been "paperless" audits and integration with client information systems, as well as risk-based audit approaches. As these innovations have come into effect prior to 2001, they would be constant across the time period examined in this study. As such, this explanation is unlikely to have influenced behaviour in the audit services market.

2.2.2 Cost explanations

A second potential motivation for a merger strategy is a cost based explanation. This reflects the ability of the merged firm to achieve cost savings through reductions in production or distribution costs (e.g. Jensen and Ruback, 1983; Bradley et al., 1988; Anand and Singh, 1997; Tremblay and Tremblay, 1988). These cost savings are

primarily generated by the realization of economies of scale (Jensen and Ruback, 1983; Bradley et al., 1988), by which fixed costs (such as sales or administration costs) are spread over larger total volumes of production. This results in lower costs per unit.

Research into efficiencies flowing from mergers have found that they can occur, but that the integration process leading to such efficiencies can take a long time (Capron, 1999) and that the level of relatedness of merging organizations is important in terms of positive efficiency outcomes (Harrison et al., 1991).

It has been suggested (Lawrence and Glover, 1998) that a motivation for audit firm mergers may have been to increase operating performance, of which operational efficiency is an under researched area. As the size of a firms' operations in specific industries or markets increases, the knowledge gained with one client and particular types of transactions may mean that the time required to audit a similar client is reduced, i.e. the time required to audit two similar clients is not double the time required to audit one. Accordingly, this may have been a motivation in the context of the AA–EY merger.

2.2.3 Reactionary explanations

The third group of explanations is that mergers and acquisitions are efficient reactions by organizations to either changing competitive or industry conditions (Mitchell and Mulherin, 1996; Mulherin and Boone, 2000; Andrade and Stafford, 2004; Weston et al., 2004; Harford, 2005). One such Australian example of changing industry conditions that led to mergers occurring was the deregulation of the banking industry following recommendations by the Australian Financial System Inquiry (1981). As noted by Sturm and Williams (2004), the major impact that deregulation had on the

banking sector was to allow access by foreign banks into the Australian market. In response to the potential for foreign entrants, mergers between the largest six Australian banks led to the creation of the four major domestic banks (Stearn and Tress, 1983; Hall, 1987).

There is also evidence that professional service firms use mergers and acquisitions as a reaction to their current or expected future operating conditions. Small and mid-tier firms, both accounting and legal, are finding that "mid-market clients are competing on a globalised front and, while they can't pay Big Five rates, they want advisers with real expertise, not general practitioners." (Thomas, 2002). To be able to provide this specialised expertise, scale is required by the firm, and one such method to achieve scale is to merge. However, in the absence of an industry or regulatory change, it is unlikely that this motivated the merger of AA and EY.

2.2.4 Managerial explanations

These explanations for mergers, which Mulherin and Boone (2000) have collectively labelled 'non-synergistic theory', suggest that mergers may be instigated for the benefit of managers rather than shareholders. This may be because corporate managers explicitly set out to increase the size of the company due to personal advantages that overseeing a larger company brings. These advantages may include additional prestige from running a larger organization (i.e. Rhoades, 1986), or increased compensation as "…changes in compensation are positively related to growth in sales" (Jensen, 1986). It has also been argued that acquiring assets increases the organization's dependence on management, and as such the organization is less likely to remove them thus providing greater job security (Shleifer and Vishny, 1989).

Managerial explanations also include managers making mistakes in their analysis of the outcomes of the merger. Commonly labelled hubris, this suggests that acquiring managers may overestimate the synergy benefits from a particular acquisition and therefore take on an acquisition which, at best, is value neutral, or at worst value destroying (Berkovtich and Narayan, 1993).

While managerial explanations for mergers have been identified in the merger literature for some time (see Roll, 1986, through to Akdogu, 2009), the merger of accounting firms differs significantly from the merger of corporations. This is due to the difference in legal form between an accounting partnership and a public corporation. In a corporation there is a separation between the ownership of the company and the agents who actually run the company, whereas in the case of accounting firms, many still adopt the professional partnership organizational form in which "ownership, management, and operations are combined into a 'representative democracy'" (Rohrer, 2004 p.5). The link between control and ownership is much closer for a professional partnership organization than for a typical corporation (Fama and Jensen, 1983). As such, the managerial motivations for mergers, which often destroy shareholder value, are less likely to be a problem in a professional partnership merger. Partners, in their capacity as owners and not simply agents of the owners, have no reason to undertake mergers which are value destroying as this would in turn reduce their personal wealth. Accordingly, this is less likely to be an issue within this context.

2.2.5 Risk explanations

The last merger explanation is that mergers are used as a means for the organization to diversify and spread risk. However, this explanation has fallen from

favour over the last two decades (Tichy, 2001). The idea underpinning this explanation is that, by undertaking conglomerate style mergers and acquisitions, organizations were able to reduce the level of risk the group was subject to.

Whilst conglomerate mergers have fallen from favour in corporate circles, the nature of the professional partnership organization means that a role for diversification in mergers of professional service firms may still exist. For example, Rohrer (2004) noted that "…law firms were seeking diversity in geography and product line. Through the act of buying a well-established firm in another market, a law firm could instantly gain access to an entire new set of clients in addition to providing a wider range of services to existing customers." (p.10). The reason for this is that the lack of separation between ownership and control means that a large proportion of an audit firm partner's wealth is linked to the wealth of the firm. However, while a shareholder in a corporation is able to diversify their ownership holdings to company specific risk, an owner in a professional partnership is unable to gain the same benefits by investing in other partnerships. As such, within firm diversification is one means of achieving this aim.

However, this benefit through diversification is unlikely to be significant in the merger of AA and EY in Australia. The merger itself was national in scope and, as such, the only geographic diversity that was able to occur was access to city markets in which one firm had a presence and one did not. In comparison to the US, which has an extremely large and dispersed audit services market (Francis et al., 1999), 97.72% of Australian publicly listed companies have their corporate headquarters in one of only five major metropolitan cities.[7] Each of these cities was serviced by both AA and EY. Similarly, there was significant overlap in the industries covered by each firm. Accordingly, diversification is unlikely to be an issue in this particular merger.

[7] Of the 1271 publicly listed clients in 2002, 1242 (97.72%) had audit reports signed off in one of the five major metropolitan cities (Adelaide, Brisbane, Melbourne, Perth or Sydney) in Australia.

2.3 Recent mergers between large audit service providers

Mergers between accounting firms are not a new phenomenon (Carey, 1970), nor are they restricted to the Big N firms (Thomas, 2002). The Big 8, as they were known up until 1989, comprised the firms Arthur Andersen, Arthur Young & Co, Coopers & Lybrand, Ernst & Whinney, Deloitte Haskins & Sells, Peat Marwick Mitchell, Price Waterhouse and Touche Ross. The origins of many of these firms were alliances and mergers between accounting firms, from Britain and the United States of America (US), in the late 19th and early 20th centuries, with growth often assisted by mergers between the national firms and smaller local firms (Carey, 1970). The main reason these national firm–local firm mergers took place was for the national firms to "… meet the need for new offices in areas where clients' operations were expanding, or to strengthen or enlarge existing offices by acquiring the personnel of local firms." (Carey, 1970 p.342). It is possible for the large national firms to contract with local firms to provide services for growing clients, however the cost of managing the marginal increase in firm size is generally less than the benefit of bringing a local firm under the auspices of the national firm. Notwithstanding, even since 2000 there have been instances where national firms have worked together with a local provider in an area where the national firm does not have an office.[8]

The first of the large mergers was the merger of Ernst & Whinney and Arthur Young & Co., which became Ernst & Young in June 1989. This was followed two months later by Deloitte Haskins & Sells merging with Touche Ross to become Deloitte & Touche. The Deloitte & Touche merger was complicated by certain offices of Touche

[8] See for example the audit of Bendigo Bank Ltd in 2001. It was a joint audit between Ernst & Young and Richmond Sinnott & Delahunty (a local Bendigo firm).

Ross and Deloitte Haskins & Sells merging with various others of the Big N. Specifically in the United Kingdom (UK), Deloitte Haskins & Sells merged with Coopers & Lybrand, whilst in Australia, Touche Ross merged with KPMG. Nine years later, in July of 1998, Price Waterhouse merged with Coopers & Lybrand to become PricewaterhouseCoopers. Around the same time, a proposed merger between Ernst & Young and KPMG did not proceed due to concerns about increasing regulation of the industry and costs (McManus, 1998).

Perera et al. (2003) examined the motivations for these mergers in their study of the effects of globalization on the major accounting firms. The impacts of deregulation in client industries (especially in the banking and telecommunications sectors), globalization and technology were all important factors. The first two factors, deregulation and globalization, have had an important demand side influence, whilst the third factor, technology, has had an important supply side effect.

Deregulation and globalization have both led to increasing audit firm client sizes, through client mergers and the increasing occurrence of multinational enterprises respectively. To be able to audit these organizations efficiently, audit firms need scale, both in terms of personnel but also geographic reach (Kirsch et al., 2000, Andon and Free, 1999/2000). Advances in technology now mean that larger audit firms are more able to efficiently provide these services, as the communication and control (i.e. administration) costs have reduced. Importantly, these are consistent with four of the five motivations (revenue, cost, reactionary and risk) for mergers generally, as discussed above in Section 2.2.[9]

2.4 The impact of the AA and EY merger on the market for audit services (H1)

[9] As noted in Section 2.2, managerial explanations for mergers are unlikely to be a key driver for professional service firms.

As noted in Section 2.2.1, one of the potential motivations for a merger strategy is a revenue based explanation. One way in which revenues are increased is when competition in the market is reduced, and this usually occurs when market concentration increases. Between 1989 and 2002, mergers amongst the largest global accounting firms reduced the number of the Big N from eight to four. Concerns existed regarding the level of concentration in the audit services market even before the 1989 mergers (US Congress, 1976), but these concerns have increasingly been raised as the number of large firms have reduced (Goddard, 1998; Oxera, 2006).

Historically, the primary concern of regulators, the media and academics has been whether the level of competition in the audit services market was reduced after each merger. Academic research into these concerns has typically focused on two key, inter-related areas: first, the impact of the mergers on the level of concentration in the market for audit services and, second, the impact of the mergers on the level of competition in the market.

A number of studies have documented the effects of mergers amongst the Big N accounting firms on the level of concentration in the audit services market, and these are summarised in Table 2.1. This literature began with the analysis, by Tonge and Wootton (1991) and Minyard and Tabor (1991), of the 1989 mergers that led to the formation of Ernst & Young and Deloitte and Touche. Since then, the impact of the 1989 mergers[10] has been examined in various geographic settings, including the US (Wootton et al., 1994), UK (Beattie and Fearnley, 1994; Iyer and Iyer, 1996), Hong Kong (Tai and Kwong, 1997; Lee, 2005), Europe generally (Choi and Zeghal, 1999), and Denmark (Christiansen and Loft, 1992). With the exception of Minyard and Tabor

[10] The 1989 mergers refer to the mergers which formed Ernst & Young and Deloitte & Touche

(1991), Tai and Kwong (1997) and Lee (2005), the findings of these studies are that concentration increased following the merger.

The slight decline in the concentration ratio (CR) found in the Hong Kong national market by Lee (2005) can be explained by the competitive positions of the audit firms pre merger. As noted in Section 2.3, the two mergers that occurred in 1989 were the mergers of Deloitte Haskins & Sells with Touche Ross, and Ernst & Whinney with Arthur Young & Company. A distinctive feature of the Hong Kong audit services market in 1989 was its dominance by Price Waterhouse (43.78%) and KPMG (23.73%). The next two largest firms were Ernst & Whinney (4.09%) and Deloitte Haskins & Sells (6.39%). The remaining Big N firms in Hong Kong had only a minimal presence at best (i.e., Touche Ross, 0.03%; Arthur Young & Company, 0.78%; Coopers & Lybrand, 1.28% and Arthur Andersen, 0.90%). Accordingly, the mergers involved Ernst & Whinney and Deloitte Haskins & Sells integrating with firms which, at the time, had a combined market share of less than 1%. It is not surprising then that the 1989 mergers led to no real changes in the CR in Hong Kong.

A somewhat different explanation is available for the decline in concentration found by Minyard and Tabor (1991) and Tai and Kwong (1997) in their analysis of the same mergers in the US and Hong Kong respectively. They are the only studies of the 1989 mergers (and indeed any of the mergers) to exclusively use the Herfindahl–Hirschmann Index (HHI) as a measure of concentration. All other studies either use the concentration ratio alone or both measures. Of the studies that use the HHI, only Iyer and Iyer (1996) found HHI increases post merger as compared to a static or declining HHI. A feature of the HHI is that it takes into account the relative weights of the firms included, and by doing so allows for a determination of how evenly sized the firms are. In the 1989 mergers, Arthur Young & Co, and Touche Ross were small in both the US

(ranked 6th and 7th) and Hong Kong (ranked 7th and 9th) markets and having these firms integrate with the middle-sized Big N firms led to more evenly sized competitors.

The concentration effects of the 1998 merger leading to the formation of PricewaterhouseCoopers (Thavapalan et al., 2002; McMeeking et al., 2007; Wolk et al., 2001), and the 2002 merger between AA and Deloitte in the UK (McMeeking et al., 2007), have also been examined.

The results from these studies (Minyard and Tabor, 1991, through to McMeeking et al., 2007) suggest that the concentration of the market is altered following the merger of major firms, but the more important question is whether this change in concentration leads to a change in competition. Simunic (1980) questions whether a high or increasing level of concentration is a concern. He contends that the audit services market, by its nature, can still operate competitively, even with a high level of concentration.

A number of studies (summarised in Table 2.2) have examined whether indicators of competition, such as pricing and switching, have been affected by mergers between the large accounting firms. The findings from these studies, which examine the impact of audit firm mergers on audit service fees (Iyer and Iyer, 1996; Lee, 2005; Tai and Kwong, 1997; Pong and Burnett, 2006; and Hamilton et al., 2008) are that audit service fees in post merger periods are higher than pre merger periods. This is not surprising, given price inflation, but these studies do not differentiate between markets in which the merger led to a substantial change in concentration as compared to those markets in which concentration did not change, or even declined.

If there were moves by audit firms to increase audit service fees above that for which clients were willing to bear, this would be reflected in a competitive market by an increase in auditor switching. The switching studies (Tai and Kwong, 1997; Choi and

Zehgal, 1999; Pong and Burnett, 2006; and Duxbury et al., 2007) show no indication that clients have a reduced ability to switch auditors post merger, which suggests that competition is not impaired by the mergers. Overall, both the audit service fee and audit switching studies do not provide any consistent indication that competition in the audit services market is reduced following mergers of Big N auditors.

However, none of these studies explicitly test for a relation between a change in concentration and a change in the level of competition in the market, using either audit pricing or switching. The closest is Tai and Kwong (1997), who do find that the industries that have the highest increases in audit service fees are the industries in which concentration has increased the most. However, the sample size is small, and they do not test the relation for statistical significance. It does however suggest that a link between concentration and audit service fees may be present.

The concerns expressed by regulators (see review in Hamilton et al., 2008), with respect to a merger between Big N auditors, is that these mergers led to a reduction in competition in the audit services market. The findings from the concentration studies (see Table 2.1) are that audit firm mergers led to an increase in concentration. However, the studies examining the competitive impacts of mergers (see Table 2.2) do not attempt to empirically link the change in concentration following the mergers with competitive effects such as audit pricing.

Accordingly, if audit pricing is a function of the level of concentration in the market, and reflects the competitiveness of the market, a change in concentration will affect the audit service fees paid to the auditor. Specifically, it is expected that the change in audit service fees will be positively related to the change in concentration in the Australian audit services market from 2001 to 2002. This will be considered using

three different definitions of the market — national industry, city and city industry — which will be further discussed in Chapter 3.

Hypothesis 1:

- 1a: Audit firm clients will pay a higher audit service fee premium in 2002 as compared to 2001, in national industries in which there is an increase in concentration
- 1b: Audit firm clients will pay a higher audit service fee premium in 2002 as compared to 2001, in cities in which there is an increase in concentration
- 1c: Audit firm clients will pay a higher audit service fee premium in 2002 as compared to 2001, in city industries in which there is an increase in concentration

2.5 The impact of the AA and EY merger on clients of the merged entity (H2 and H3)

The first hypothesis tests whether the 2002 merger of AA and EY led to a change in the competitiveness of the Australian audit services market generally. The following hypotheses move from examining the impact of the merger at a market level, to the impact of the merger at a firm level. A basis for understanding these firm level impacts is provided by the economic theories of the firm first developed by Coase (1937) and expanded by Alchian and Demsetz (1972) and Williamson (1981), amongst others. These have been discussed in Section 2.2 and provide the basis for the five

explanations of why firms merge (Tichy, 2001), of which revenue and cost explanations are relevant for this study.

Drawing from these two explanations, Section 2.5.1 will argue that the main revenue benefit for EY in merging with AA is to obtain market leaderships, which will lead to audit service fee premiums. Adopting a cost perspective, Section 2.5.2 will argue that increases in market share signify that economies of scale were generated, which leads to a reduction in the time required to conduct the audit.

2.5.1 The impact of the AA and EY merger on audit pricing (H2)

This section will examine the revenue benefits to be generated from the merger of AA and EY. As discussed in Section 2.2.1, revenue benefits, driven by either market power (Kim and Singal, 1993) or revenue synergies (Berkovitch and Narayan, 1993; Harrison et al., 1991) is a potential motivation for a merger strategy. Of these two drivers of revenue benefits, the market power explanation has been extensively researched (refer to Table 2.1) in relation to audit firm mergers, especially mergers between the Big N firms. Much of this, however, has been devoted to determining whether a merger impacts the level of concentration in the marketplace and has already been discussed in Section 2.4. A second, smaller, stream of research into audit firm mergers has attempted to resolve the questions of why audit firms merge, and what benefits (i.e. increased revenue, increased market share) audit firms gain from merging. This section will focus on the benefits to the merging firms in terms of increased revenues or, more specifically, the benefits market leadership has for the newly merged firm. It is expected that the generation of revenue synergies is relevant in the case of the merger of AA and EY, as the merger would likely have created new market leaderships

for the merged firm. Market leaderships are important in increasing the level of revenue earned through revenue synergies.

Market leadership is important in the audit industry. The audit services market is a hedonic market (Simunic, 1980), in that it is a market in which users are not able to ascertain the quality of the service prior to purchase. As such, the user relies on proxies for quality. Market leadership has been identified as an important proxy for quality in the audit services market (see Ferguson et al., 2003 for the discussion of the importance of market leadership).

The merger of EY and AA was expected to lead to an increase in the number of market leaderships that EY held in 2002.[11] As clients use leadership as a proxy for quality, the combined entity will be seen as provider of higher quality audit services in those markets in which it gained these leaderships. Accordingly, it is expected that EY will be able to charge higher audit service fees to reflect this investment in their reputation and the higher level of monitoring they are able to provide. This will be assessed with regard to markets defined at national industry, city, and city industry levels.

Hypothesis 2:

- 2a: EY clients will pay higher audit service fee premiums in 2002 as compared to 2001, in national industries where EY becomes market leader.
- 2b: EY clients will pay higher audit service fee premiums in 2002 as compared to 2001, in cities where EY becomes market leader.

[11] Increasing the number of market leaderships was identified by Francis et al. (1999) as a motivation for audit firms to merge.

- 2c: EY clients will pay higher audit service fee premiums in 2002 as compared to 2001, in city industries where EY becomes market leader.

This hypothesis is prefaced on the assumption that clients perceive market leaders as providing a higher quality service. However, in the case of the merger between AA and EY, AA's reputation was brought into question following concerns over audits both in the US and in Australia. This may affect the results from Hypothesis 2 and, as such, a sensitivity of these results to the impact of the AA clients will be addressed in Section 2.6.

2.5.2 The impact of the AA and EY merger on audit efficiency (H3)

The previous section examined the potential revenue benefits to EY from merging with AA. This section will examine the cost benefits to be generated from the merger. As already discussed in Section 2.2.1, cost benefits, driven by realization of synergies, are a second potential motivation for a merger strategy (see Jensen and Ruback, 1983; Bradley et al., 1988; Tichy, 2001; Malmendier and Tate, 2008).

Commonly identified ways for synergy benefits to be created through a merger are either through the realization of economies of scale or through the adoption of improved production techniques (Jensen and Ruback, 1983; Bradley et al., 1988). These will reduce the per unit cost of providing the goods or services post merger. Without access to cost data from the accounting firms, it is impossible to infer whether any change in costs have occurred. However, audit report delay has been identified in the literature as a proxy for audit efficiency, and is predicated on the idea that audit

efficiency is greater when sufficient competent evidential matter can be obtained in fewer rather than greater hours and when this occurs audit report lag will decrease (Knechel and Payne, 2001).

Audit report lag has been used to test for the impact of the provision of non-audit services on audit efficiency (Knechel and Payne, 2001), company specific determinants such as size, complexity and losses (i.e. Ashton et al. 1987; Ashton et al. 1989 and Ashton and Newton, 1991) and the impact of audit firm mergers on audit efficiency (Lawrence and Glover, 1998).

The use of audit report delay reflects the assumption that the synergy benefits created will be realised through increased operational efficiency (in this case the provision of audit services), and the audit report delay should decline post merger. Findings from Knechel and Payne (2001) suggest that the mix of audit personnel may influence the efficiency, but without proprietary data it is impossible to control for.

The first study to provide evidence on whether audit firm mergers led to an increase in efficiency was an analysis of the 1989 mergers in the US by Lawrence and Glover (1998). They expected to find that the mergers led to increased operating efficiencies and that in turn would lead to a decline in the audit report lag. However, contrary to expectations, they found that the non-merging Big N firms were able to increase efficiency, whilst the merging Big N firms were not. One explanation for this result, as noted by the authors, is that merger integration issues such as "adopting new cultures, practices and organizational and managerial philosophies" (Lawrence and Glover, 1998 p.161) may override the ability of the merged firms to generate synergies. This explanation is supported by Taiwanese evidence that operational efficiency benefits from audit firm mergers are realised, but this may take some time (Tsai and Yang, 2008). Based on a sample of 120 audit firm mergers in Taiwan, and utilizing data

envelopment analysis, they conclude that, "although mergers could not produce instant benefits for medium- and large-sized audit firms, the value of mergers lay in the reduction of costs after reorganization and integration". (p.102).

A second explanation for the lack of results in Lawrence and Glover (1998) is that the heterogenous industry and geographic strengths of the audit firms involved in the mergers means that synergy benefits would not be expected to be realised for every client. Rather, synergy benefits would be expected in those industries as well as offices in which both firms have appreciable market share and, in turn, expertise.

This means that the greatest operational efficiency benefits will occur in those markets in which there is a larger integration of resources. For markets where the merger leads to little change in the firm's market share, it is unlikely operational efficiency will be affected in any substantial way.

As such, if the merger of EY and AA generated operational efficiencies in those markets in which the firms had a substantial overlap of resources, it would be expected that audit report lags will decline in those markets. The creation of market leadership is used to identify those markets in which both firms had a substantial presence and in which the merger is expected to increase operational efficiency. Three definitions of the market are used: national industry, city and city industry, consistent with Hypotheses 1 and 2.

Hypothesis 3:

- 3a: EY clients will have shorter audit report lags in 2002 as compared to 2001, in national industries where EY becomes market leader.

- 3b: EY clients will have shorter audit report lags in 2002 as compared to 2001, in cities where EY becomes market leader.
- 3c: EY clients will have shorter audit report lags in 2002 as compared to 2001, in city industries where EY becomes market leader.

2.6 The impact of the AA and EY merger on former clients of AA (H4 and H5)

Any observation of revenue or cost benefit outcomes for the newly merged firm as described in Section 2.5 could simply be recognition of the audit risk[12] attached to the audits of the former AA clients. If this was the case, any benefits from the merger strategy would solely relate to former AA clients. There is evidence that audit firms will charge a risk premium for riskier clients (Johnstone and Bedard, 2001). If former clients of AA are perceived by EY as risky (for reasons discussed below), any finding of audit service fee premiums from Hypothesis 2, which does not distinguish between former AA and EY clients, may be attributable to this risk premium as opposed to leadership benefits from the merger. These clients are also likely to require greater amounts of audit work (Johnstone and Bedard, 2001), leading to a longer audit report lag, which may offset any potential merger efficiency benefits obtained from the merger and examined in Hypothesis 3.

Research on US data has shown that following AA's demise, there was increased concern over the quality of the financial reports of former AA clients, which

[12] *Auditing Standard ASA 200 Objective and General Principles Governing an Audit of a Financial Report* defines audit risk as "a function of the risk of material misstatement of the financial report and the risk that the auditor will not detect such misstatement" (paragraph 34). This differs from the auditor's business risk in that audit risk is the likelihood of letting a misstatement through, whilst auditor business risk is the potential loss the auditor may incur from being involved with a client.

led to an increase in audit service fees for former AA clients (Scott, 2003), as well as increased accounting conservatism (e.g., Cahan and Zhang, 2006). However, it was also found that concerns by subsequent auditors were more pronounced for former AA clients from the Houston[13] office. As evidence "suggests that audit partners at Andersen's Houston office tolerated aggressive accounting practices by their clients…" (Krishnan, 2005 p.189), these concerns do seem to be warranted. These findings suggest any problems within AA were not likely to be systemic, but, rather, geographically localised. These findings are also consistent with negative reputation literature studies, which have found similar geographical effects of government criticism and litigation of auditors (Wilson and Grimlund, 1990; Franz et al., 1998).

This leads to the question of whether the reputation problem of AA arose in Australia. The following suggests that this is likely to have occurred. First, of all the Big N audit firms, AA was seen as the most truly international. All staff, worldwide, underwent centralised training through their Chicago office. This was clearly identified by Fuerman (2004), who interviewed Mark Leicester, a former principal in the forensic accounting and financial consulting practice in the Boston office of AA, who suggested that AA "appeared to be the least decentralised of the Big Five CPA firms" (p.139). Therefore, to the extent there was an issue with AA's audit approach to its clients in the US, a similar issue could have been embedded in the practices of its Australian offices. Second, and more importantly, the collapse of HIH in Australia, and AA's ties with the failing firm, were remarkably similar to the collapse only nine months later of Enron in the US. The media had also linked AA with issues concerning its US operations[14] and

[13] Houston was the engagement office for Enron (Krishnan, 2005)

[14] "Andersen, the accounting firm that audited the accounts of the failed HIH Insurance group, has agreed to pay $US 7m to settle charges it issued false and misleading audit reports on a US company over a five-year period." — Andersen Settles US 'false' Audit Charge for $US7m., *Australian Financial Review* 21 June, 2001

prior alleged Australian audit failures[15] even before the Enron issue. With Enron filing for bankruptcy on 2 December, 2001 and the Royal Commission into the HIH collapse beginning on 3 December, 2001, media reports began to link the two, as well as document the problems with AA's Australian audit of HIH.[16] The close similarity of the issues concerning both the US and Australian operations of AA, and the timing of the HIH Royal Commission, would have heightened the concern over the quality of AA's audits in Australia. In summary, this suggests that any change in the audit services market may relate primarily to AA clients.

2.6.1 Audit service fee impacts of former AA clients (H4)

The expectation in Hypothesis 2 is that in those markets in which EY becomes a market leader, EY will be able to charge higher audit service fees, consistent with the perception of being a supplier of higher quality audit services. Post merger, however, a substantial proportion of EY's clients were formerly audited by AA. Any finding of an increase in audit service fees in Hypothesis 2 could be driven by risk factors associated with AA clients and not the creation of market leadership.

There is US evidence, as has been noted, that former AA clients have been treated more conservatively in the years immediately following the collapse of AA. Additionally, AA clients were found to be paying higher audit service fees (Scott, 2003). This increase in audit service fees can be explained by findings from a study examining the effect risk factors have on engagement planning by audit firms. Johnstone and Bedard (2001) examine risk factors attached to audits and the effect these

[15] Bond Accountants 'Abandoned Prudence', *Australian Financial Review* 22 November, 2001.
[16] See for example: Andersen Braces for a Bombshell, *Business Review Weekly* 29 November, 2001; Audits: A Need for Independence, *Australian Financial Review* 16 January, 2002; Andersen's Auditing Nightmare, *Australian Financial Review* 19 January, 2002

factors have on initial engagement risk planning. They find that audit firms do respond to fraud and error risk factors by placing more highly experienced personnel onto the engagement, applying more intensive testing and/or performing additional reviews, as well as charging a risk premium for the engagement.

To the extent that former Australian AA clients were perceived by their successor auditors as being of higher audit risk, this could be reflected through higher audit service fees. This means that any results from Hypothesis 2 could be confounded by not controlling for the 2001 auditor. If former AA clients are perceived as riskier by EY, they will likely pay higher audit service fees than in 2001. To ensure that Hypothesis 4 is consistent with Hypothesis 2, the effects are examined at a national industry, city, and city industry level.

Hypothesis 4:

- 4a Former AA clients will pay higher audit service fee premiums in 2002 as compared to 2001, in national industries where EY becomes market leader
- 4b Former AA clients will pay higher audit service fee premiums in 2002 as compared to 2001, in cities where EY becomes market leader
- 4c Former AA clients will pay higher audit service fee premiums in 2002 as compared to 2001, in city industries where EY becomes market leader

2.6.2 Audit efficiency impacts of former AA clients (H5)

The expectation in Hypothesis 3 is that the markets in which EY will realise the greatest efficiency benefits are those in which it becomes market leader in 2002. However, as with Section 2.6.1, many of the clients audited by EY in these markets will be former AA clients. As noted by Johnstone and Bedard (2001), one of the responses by audit firms, to increased audit risk posed by new clients, is to apply more intensive testing and/or performing additional reviews. Again, this is especially likely for former AA clients, for which concerns existed about their previous auditor.

This increase in testing and/or additional reviews is likely to increase the time required to conduct the audit, which means it would be expected that former AA clients will have longer audit report lags in 2002 than they did in 2001. It also means that, without differentiating between former AA clients and existing EY clients, the results of Hypothesis 3 may be confounded. Accordingly, the impacts of former AA clients are separately considered:

Hypothesis 5:

- 5a Former AA clients will have longer audit report lags in 2002 as compared to 2001, in national industries where EY becomes market leader
- 5b Former AA clients will have longer audit report lags in 2002 as compared to 2001, in cities where EY becomes market leader
- 5c Former AA clients will have longer audit report lags in 2002 as compared to 2001, in city industries where EY becomes market leader

2.7 Conclusion

The merger between AA and EY in 2001 led to the creation of the second largest professional services firm in Australia and the largest supplier of audit services to publicly listed companies. This chapter sets out to first provide a testable hypothesis on the impact the merger had on the level of competition in the Australian audit services market. This is based on the economic theory of the firm that has its origins with Coase (1937). Hypotheses 2 and 3 seek to test whether EY benefited from the merger, through the realization of either revenue or cost benefits. Hypotheses 4 and 5 test whether the reputation damage, due to one of the merger partners being in distress, impacts the benefits derived. Together the results from these hypotheses will provide evidence of the overall market level impact of the merger, as well as firm specific impacts.

Table 2.1
Audit Firm Concentration Studies

This table provides an overview of studies that have examined the impact of audit firm mergers on the level of concentration in the audit services market.

STUDY	MERGER	MEASURES	COUNTRY	MARKET	FINDINGS
Tonge & Wootton (1991)	1989 mergers	CR	US	Exchange	No change for CR_8 Increase for CR_4
Iyer and Iyer (1996)	1989 mergers	CR and HHI	UK	National	Increase in both CR and HHI
Beattie and Fearnley (1994)	1989 mergers	CR	UK	National	Increase
Wootton et al. (1994)	1989 mergers	CR and HHI	US	National	Increase in CR. HHI results suggest a more even level of competition amongst the large firms.
Lee (2005)	1989 mergers	CR	Hong Kong	National	Decline
Tai and Kwong (1997)	1989 mergers	HHI	Hong Kong	Industry	Decline
Choi and Zeghal (1999)	1989 mergers	CR and HHI	10 European	National	Increase in CR HHI results suggest a more even level of competition amongst the large firms.
Christiansen and Loft (1992)	1989 mergers	CR and HHI	Denmark	National	Increase
Thavapalan et al. (2002)	1997 merger	CR and HHI	Australia	Industry	CR increase HHI constant
McMeeking et al. (2007)	1989, 1998	CR	UK	National	Increase across all mergers

	and 2002 mergers				
Wolk et al. (2001)	1989 and 1997 mergers	CR and HHI	US	Exchange	CR increase HHI constant
Minyard and Tabor (1991)	1989 mergers	HHI	US	Industry	Decline

Where:

CR	:	Concentration Ratio
HHI	:	Herfindahl–Hirschmann Index
US	:	United States of America
UK	:	United Kingdom
Market	:	Market definition used in the study. National indicates that the country is taken as one market; Industry indicates that commonly used industry definitions (such as ASX or SIC codes) define audit markets; Exchange indicates that firms listed on the same stock market comprise the market
1989 mergers	:	1989 mergers between Deloitte Haskins & Sells and Touche Ross (Deloitte & Touch) and Ernst & Whinney and Arthur Young & Company (Ernst & Young)
1998 merger	:	1998 merger between Pricewaterhouse and Coopers & Lybrand to form PricewaterhouseCoopers
2002 merger	:	2002 merger between Arthur Andersen and the respective Big N firm in the relevant country

Table 2.2
Audit Firm Merger Competitive Effect Studies

This table provides an overview of studies that have examined the impact of audit firm mergers on the level of competitiveness in the audit services market.

STUDY	MERGER	IMPACT	COUNTRY	FINDINGS
Iyer and Iyer (1996)	1989 mergers	Audit Service Fees	UK	Increase in audit service fees post merger
Lee (2005)	1989 mergers	Audit Service Fees	Hong Kong	Increase in merged firm audit service fees No difference in post merger audit service fees (merged v non-merged firms)
Tai and Kwong (1997)	1989 mergers	Audit Service Fees	Hong Kong	Increase in audit service fees post merger Link: increase in concentration and increase in audit service fees
Pong and Burnett (2006)	1998 merger	Audit Service Fees	UK	Continuing clients pay higher audit service fees
Hamilton et al. (2008)	2002 merger	Audit Service Fees	Australia	Big N premium exists in both large and small client markets
Tai and Kwong (1997)	1989 mergers	Market Share	Hong Kong	Gain in market share by merging firms following the merger
Choi and Zeghal (1999)	1989 mergers	Market Share	Europe	Loss of market share by merging firms following the merger
Pong and Burnett (2006)	1998 merger	Market Share	UK	Differential effects on market retention by PwC dependent on continuing or new leadership
Duxbury et al. (2007)	1998 merger	Market Share	UK	PwC net loser of clients (simulation)

Chapter 3 – Research Method

3.1 Introduction

The objective of this chapter is to outline the research method that is followed in the thesis to test the hypotheses outlined in Chapter 2. Attention is initially directed at the impact of the AA–EY merger on competition and pricing in the audit services market generally. The impact of mergers on the audit services market has been considered in the context of the historic mergers (e.g., Wootton et al., 1994; Iyer and Iyer, 1996; Thavapalan et al., 2002) and this approach will be extended here. This is outlined in Section 3.2. The focus then shifts to the impacts of the merger on EY and its clients to determine possible motivations for the merger. The specific motivations that will be examined are whether EY was able to extract price and/or efficiency benefits from the merger. The approaches used to determine whether these benefits accrue to EY are outlined in Section 3.3 and include an extension of the industry specialist audit service fee literature (e.g. Ferguson et al., 2003; Francis et al., 2005) for the pricing benefits, and an extension of Lawrence and Glover (1998) for the efficiency benefits. Finally, consideration is directed at whether the impacts were experienced primarily by the former clients of AA. The design, addressed in Section 3.4, builds on the work of McMeeking et al. (2007).

An issue that arises for testing each of the five hypotheses is the definition of the audit services market in Australia. In the extant literature, audit services markets have been defined nationally (e.g., Simunic, 1980), by city (e.g., Francis et al., 1999; Ferguson et al., 2005) and by industries within a city (e.g. Ferguson et al., 2003; Francis et al., 2005). There is support in the literature to consider the audit services

market at either a national, city or city industry level.[17] This study does not take a position on which definition of the market is more appropriate, and all hypotheses will be tested across the three main audit services market definitions: national industry, city and city industry. Even though the expected sign of the coefficients are similar for the national industry, city and city industry markets in each of the five hypotheses each market definition must be tested due to the variation in audit firm market shares across the different definitions. Whilst the audit market data is slightly out of date, Table 1 of Ferguson et al. (2003, p.435) demonstrates that, for example, PwC is the national industry leader in the ASX industry Mining – Gold, it is only the city leader in Brisbane and only city industry leader in Mining Gold in Sydney. These heterogenous market shares mean that the merger will have different impacts on the market, depending on the definition of the market. In addition, this obviates the need for assumptions about how firms operate and how the market assesses leadership.

3.2 The impact of the AA and EY merger on the market for audit services (H1)

The focus initially is on the impact of the merger of AA and EY on the audit services markets, and whether the increase in concentration created by the merger led to an increase in audit service fees. This will be evaluated with the following model, which will be evaluated across all companies for which data is held (i.e., clients and non-clients of EY):

[17] See Ferguson et al. (2003) for a summary of the arguments for the national and city level views of the audit market. Carcello et al. (1992) and Behn et al. (1997) provide arguments on the view that competition occurs at an industry level.

$$AF2002_i = \alpha_0 + \alpha_1 \Delta Conc_i + \alpha_2 EstAF_i + \varepsilon_i \quad (1)$$

Considering the focus of the research question is the change in audit service fees, this is suggestive of a model specified in terms of changes, rather than level, of audit service fees. However, this was not undertaken in the primary tests for a number of reasons. First, prior studies have typically included an estimate of audit service fees as an independent variable (e.g. Ferguson et al., 2003; Francis et al. 2005). Doubtless, this approach was considered more appropriate when the audit service fee model was used to estimate audit service fees. To ensure consistency with prior studies this was also followed here. Second, a feature of the same literature is that audit service fees are typically logged. If such a scaling approach was also followed here, a log transformation would not be possible when audit service fees decreased (i.e. a negative number) as it would result in the exclusion of all negative observations. This would induce a bias in accepting the hypotheses. Table 3.1 provides evidence that of the 2002 sample with available audit service fee data, 66.05% of companies had an increase in audit service fees between 2001 and 2002, whereas 31.18% had a decrease in audit service fees. However, recognising the arguments for a changes model, this is addressed as a sensitivity in which a log of the ratio of current to prior year audit service fees is used.

3.2.1 Audit service fees (AF2002)

Of primary concern in the testing of H1 is the impact of the merger of AA and EY on the level of audit service fees paid in the year subsequent to the merger

(i.e., 2002). The focus is specifically on audit service fees, reflecting concerns of the regulators (GAO, 2003; Oxera, 2006), and in the media (Jopson, 2005), that reduced competition in the audit services market led to higher prices for those services. This is also consistent with the prior literature, which has focused only on audit service fees in determining the competitiveness of the audit services market (e.g. Simunic, 1980; Hamilton et al., 2008).[18]

While it is recognised that audit service firms may also provide non-audit services (NAS), these are not considered relevant for this analysis. First, the focus in this study is on the impact on the audit services market, where only accredited audit firms can provide audit services and, as such, barriers to entry are high (Goddard, 1998). In the market for NAS there are numerous other potential service providers, such as tax specialists and consulting firms that compete with the audit firms. Accordingly, there is less likely to be an impact in this market and economic and other factors impacting the demand for NAS may potentially confound any result. Second, the amount of NAS fees paid by clients to audit firms other than their incumbent auditor is not known. This is particularly problematic as, at the time of the merger, concerns were being expressed about the impact of NAS on auditor independence. Any subsequent decline in NAS because of this would mask any impact on the audit services market.

A significant body of literature evaluating audit services pricing has relied upon the audit service fee model (e.g. Simunic, 1980; Craswell et al., 1995; Ferguson et al., 2003; Francis et al., 2005). To address potential non-linearity in the relation

[18] Both Simunic (1980) and Hamilton et al. (2008) use audit fees as a dependent variable in assessing the competitiveness of the audit market in the US and Australian respectively. However, in comparison to this study, where an increase in pricing related to an increase in concentration is indicative of a decrease in competition, they both use a framework in which relative Big N premiums in the large and small client segments are used to infer the competitiveness of the market.

between audit service fees and the determinants of audit service fees, audit service fees have traditionally been logged. To maintain consistency with this literature, and across various tests here, audit service fees will also be logged. Additionally, the logging of audit service fees addresses the potential for the change in audit service fees to be relative and multiplicative, rather than absolute and simply additive.

3.2.2 Concentration (ΔConc)

The merger of AA and EY led to changes in concentration in the Australian audit services market. In order to test the relation between concentration and competition, and specifically whether a change in concentration leads to a change in competition, the independent variable Δ*Conc* is included as a test variable in the model. Δ*Conc* is in the first instance measured as the change in the normalised four firm Herfindahl–Hirschmann Index (HHI) from 2001 to 2002 in the market (i.e., $HHI_{2002} - HHI_{2001}$). The HHI, which has been used extensively in academic studies (Minyard and Tabor, 1991; Wootton et al., 1994; Iyer and Iyer, 1996; Thavapalan et al., 2002) and by regulators (DoJ, 1997; ACCC, 2008), is calculated as the sum of squares of the market share possessed by the *n* most active audit firms in the industry (Thavapalan et al., 2002). As such, it is calculated as follows:

$$HHI_n = \frac{\sum_1^n S_i^2}{\left(\sum_1^n S_i\right)^2}$$

where n is the number of audit firms considered and S_i is the size of the audit firm (measured by audit service fee revenue generated in the relevant market).

As noted in Section 2.4, other measures of concentration have been used in the literature. Of these, the most commonly used is the concentration ratio (CR). The CR_n is simply the percentage of total market size accounted for by the largest n audit firms, where market size is calculated using audit service fees. Studies that have used the CR_n have typically used a four-firm CR_n (i.e. Wootton et al., 1994; Iyer and Iyer, 1996; and Goddard, 1998). The CR_n is calculated as follows:

$$CR_n = \frac{\sum_{1}^{n} S_i}{\sum_{1}^{k} S_i}$$

where k is the total number of audit firms in the relevant market, and n and S are as previously defined.

While the ACCC uses the CR (Goddard, 1998; ACCC, 1999), the HHI has been argued as a better measure of concentration (for example, see Wootton et al., 1994; Choi and Zeghal, 1999; Pong, 1999; Thavapalan et al., 2002). This is because the HHI takes into account the relative market share of the leading suppliers in an industry, whereas the CR does not. For example, using the CR_4, a market that has suppliers with market shares of 65%, 5%, 5% and 5% would have the same CR (0.80) as one with the four top firms each having a market share of 20%. However, the respective HHI_4 for these two markets would be 0.43 and 0.16, indicating that the first market is highly concentrated, whereas the second market is not, even though the CR_4 is 0.80 for both. It is for this reason that the HHI is preferred as the primary

measure of concentration and CR is used as a sensitivity. The results of estimating the model with concentration measured using the CR are included in the appendices.

3.2.3 Estimated audit service fees (EstAF)

To determine the impact of the merger on audit service fees, an estimate of audit service fees for 2002, assuming no merger, is required so that the effect of a change in concentration can be measured. As such, the control variable, *EstAF*, is an estimate of the audit service fees the client would pay in 2002. The primary method to measure *EstAF* uses the audit service fees paid by the client to its auditor in 2001, which assumes audit service fees follow a simple, random walk. To the extent that audit service fees have been shown to be systematically linked to client characteristics (e.g. Simunic, 1980), and these characteristics are unlikely to change significantly between years, audit service fees in the prior year are expected to be significantly related to audit service fees in the current year. In this way the client will act as its own control.

To alleviate concerns that the company is not an adequate control for itself, as a sensitivity an alternate measure for *EstAF* is used based upon the audit service fee model developed initially by Simunic (1980). To obtain this variable for a client, the standard audit service fee model (i.e. Ferguson et al., 2003) is run on the 2001 dataset from which coefficients for each of the audit service fee model variables are calculated. These coefficients are then multiplied by relevant client characteristics in 2002 to provide an estimate of the audit service fees in 2002. Logged audit service fees are used in the model to address potential non-linearity in the estimates of audit service fees and to ensure consistency with prior research (i.e. Simunic, 1980;

Craswell et al., 1995; Ferguson et al., 2003, Francis et al., 2005). The results of using estimated audit service fees using the audit service fee model are included in the appendices.

3.3 The impact of the AA and EY merger on clients of the merged entity (H2 and H3)

Hypotheses 2 and 3 are concerned with whether the merger led to economic benefits to EY in the form of either audit service fee premium increases or increased efficiency in the provision of audit services. The audit service fee model (Hypothesis 2) will be discussed first, followed by the audit report lag model (Hypothesis 3).

3.3.1 The impact of the AA and EY merger on audit pricing (H2)

To ascertain whether the merger of AA and EY led to the merged firm being able to increase audit service fees for clients in markets in which it became a leader, the following model, which is a variation of that used in Section 3.2, is estimated on a sample of EY clients:

$$AF2002_i = \alpha_0 + \alpha_1 ContinueLead_i + \alpha_2 NewLead_i + \alpha_3 LostLead_i + \alpha_4 EstAF_i + \varepsilon_i \quad (2)$$

The variables $AF2002_i$ and $EstAF_i$ are as previously measured and additional variables are introduced to capture whether EY was the market leader (or changes therein) in the audit clients industry. These variables are defined as follows:

ContinueLead indicator variable, coded 1 if the client was audited by the market leader in both 2002 and 2001, 0 otherwise.

NewLead indicator variable, coded 1 if the client was audited by the market leader in 2002 but not in 2001, 0 otherwise.

LostLead indicator variable, coded 1 if the client was audited by the market leader in 2001, but not in 2002, 0 otherwise.

The fourth potential category of client firms are those for whom neither EY, or its predecessor firms, were the market leader, and it is from these firms the general level of audit service fee changes between 2001 and 2002 is determined. The use of leadership variables in this manner is an extension to prior work in the audit firm industry specialization literature (see Craswell et al., 1995; Ferguson et al., 2003; Francis et al., 2005).

Two methods for determining industry specialization have been used predominantly in the literature[19], with the first being whether an audit firm is a market leader. The second is whether the audit firms' market share is in excess of a specified threshold. This study follows the Ferguson et al. (2003) approach by using market leadership as the key indicator of specialization. Supporting this proposition, market leadership has also been identified by audit firm partners as important reasons for merging **(**Greenwood et al., 1993).

It should be noted that the constant and the coefficient on *EstAF* estimated in equation 2 identifies the general level of change in audit pricing for EY clients unaffected by issues of market leadership. Support for H2, and EY being able to

[19] See Hay et al. (2006) for an extensive summary of the literature regarding audit fee studies, including industry specialization.

increase audit service fees more in markets where it became a market leader, would be indicated by a positive coefficient on *NewLead* and a negative coefficient on *LostLead*. While making no prediction, *ContinueLead* is interesting to the extent that it highlights whether market leaders were able to increase audit service fees more in increasingly concentrated markets. Additionally, separate identification of these firms avoids any difference in audit service fees for these firms confounding the determination of the change in the level of audit service fees more generally. A feature of this design and context which contrasts with many prior market leadership studies (e.g., Craswell et al., 1995; Ferguson et al., 1995; Francis et al., 2005) is that it allows for the differentiation of new and continuing leaders.

3.3.2 The impact of the AA and EY merger on audit efficiency (H3)

To ascertain whether the merger of AA and EY led to the merged entity becoming more efficient in markets in which it became leader, the following model (based on Lawrence and Glover, 1998) will be used:

$$Lag2002_i = \beta_0 + \beta_1 ContinueLead_i + \beta_2 NewLead_i + \beta_3 LostLead_i + \beta_4 Lag2001_i + \varepsilon_i \quad (3)$$

Audit efficiency is captured by the audit report lag, and as such the dependent variable (*Lag*2002) is the audit report lag for the client in 2002. The audit report lag is calculated as the difference between the audit report signing date and the financial year end for the company. Audit report lag is used as the dependent variable as it is the one visible measure of the operational efficiency of the audit firm (Lawrence and

Glover, 1998). As discussed in Section 2.5.2, the combination of firms' resources through a merger is argued to lead to synergy benefits through the realization of increased economies of scale or through the adoption of improved production techniques. The prior year audit report lag (*Lag2001*) is used as a control variable.

An increase in efficiency in the provision of audit services is expected to lead to a decrease in the time required to conduct the audit. However, these efficiency benefits are not expected to be homogenous across all markets. The greatest effect is expected in the markets in which both EY and AA have a presence, as their dual presence indicates the greatest opportunity for economies of scale. As these markets will tend to be those in which the new firm now dominates, where individually the firms did not before, the variable *NewLead* from Section 3.3.1 is used. If the newly merged firm is able to obtain efficiency benefits, it would be expected that *NewLead* will have a negative coefficient. Those markets in which the merger had no substantial impact on market share are expected to have little efficiency impacts and, as such, no significance is expected for either *ContinueLead* or *LostLead*.

3.4 The impact of the AA and EY merger on clients of AA (H4 and H5)

As discussed in Chapter 2, the potential effects of the merger for both pricing and efficiency may be impacted by the concerns over one of the merging firms, specifically AA. The inclusion of interaction terms will allow the merger benefit to be distinguished from AA impacts, and will be detailed below.

3.4.1 Audit service fee impacts of former AA clients (H4)

The expectation for Hypothesis 2 is that market leadership for the merged firm is indicative of reputation as an expert in that market and will lead to audit service fee premiums. However, findings in the US have shown that former AA clients paid higher audit service fees as subsequent auditors were concerned over the quality of financial reports audited by AA (e.g. Scott, 2003). Accordingly, it is necessary to identify whether the changes between 2001 and 2002 are attributable to former AA clients only.

This is addressed by the inclusion of an interaction between an AA variable (coded 1 if the client was audited by AA in 2001, 0 otherwise) and the leadership variables as defined in Section 3.2.1. Specifically, a positive coefficient on the AA variables and no significance on the leadership variables will indicate that any increase in audit service fees is driven by concerns over AA's quality, rather than merger benefits through greater leadership.

$$AF2002_i = \alpha_0 + \alpha_1 ContinueLead_i + \alpha_2 NewLead_i + \alpha_3 LostLead_i + \alpha_4 AA_i + \alpha_5 AA * ContinueLead_i + \alpha_6 AA * NewLead_i + \alpha_7 AA * LostLead_i + \alpha_8 EstAF_i + \varepsilon_i \quad (4)$$

3.4.2 Audit efficiency impacts of former AA clients (H5)

The expectation for Hypothesis 3 is that synergy benefits will lead to a reduction in the audit report lag, especially for those clients in markets in which leadership is obtained. However, any result could be masked by reductions in efficiency caused by former AA clients. Specifically, concern over the quality of the

financial reports audited by AA may lead EY to spend more time on the engagement through more intensive testing and/or performing additional reviews (e.g. Johnstone and Bedard, 2001).

As such the inclusion of an interaction term, AA, with the leadership variables will allow these effects to be differentiated. Accordingly, model 3 will be modified with the inclusion of these interaction terms to give model 5. Specifically, a positive coefficient on the AA variables will indicate that the audit report lag for former AA clients increased between 2001 and 2002, suggestive of concerns over AA's quality. If the coefficients on the leadership variables are significant in the directions expected (see Section 3.3.2), then EY was able to generate efficiency benefits from the merger, but only in relation to continuing clients.

$$Lag2002_i = \beta_0 + \beta_1 ContinueLead_i + \beta_2 NewLead_i + \beta_3 LostLead_i + \beta_4 AA_i + \beta_5 AA * ContinueLead_i + \beta_6 AA * NewLead_i + \beta_7 AA * LostLead_i + \beta_8 Lag2001_i + \varepsilon_i \quad (5)$$

All variables are as defined previously.

3.5 Conclusion

This chapter sets out the research method that will be used to test the hypotheses as discussed in Chapter 2. To test whether the merger of AA and EY led to a decline in competition in the Australian audit services market, a lagged audit service fee model, including a change in concentration variable, will be used. To test

whether the merger of AA and EY led to pricing or efficiency benefits, lagged audit service fee and lagged audit report lag models respectively will be used. Both of these models will include leadership variables that will allow a differentiation of whether pricing or efficiency benefits accrue to EY due to new or continuing market leadership. The final group of tests are included to determine whether the damage to AA's reputation, caused by its involvement with HIH and Enron just prior to merger, had an influence on EY being able to obtain benefits, such as increased pricing and efficiency, from the merger. These tests are a replication of tests used in Hypotheses 2 and 3, but include AA interaction terms.

The next chapter will provide details of the samples used in the tests for each of the five hypotheses, as well as the descriptive statistics.

Table 3.1
Change in Audit Service Fees 2001 - 2002

This table details the changes in audit service fees for clients between 2001 and 2002

Change in Audit Service Fees (01-02)	All Firms		EY		PwC		KPMG		Deloitte	
Increase	786	66.1%	164	68.3%	157	72.0%	117	65.4%	81	69.8%
Decrease	371	31.2%	71	29.6%	61	28.0%	53	29.6%	32	27.6%
No Change	33	2.8%	5	2.1%	0	0.0%	9	5.0%	3	2.6%
TOTAL	1190		240		218		179		116	

Where

EY : Ernst & Young
PwC : PricewaterhouseCoopers
Deloitte : Deloitte Touche Tohmatsu

Chapter 4 – Sample and Descriptive Statistics

4.1 Introduction

The objective of this chapter is to describe the sample used in the thesis to test the hypotheses in Chapter 2. The merger of AA and EY occurred in the Australian market only, and the primary concern is with the audit services market. Accordingly, the focal point for this study is firms listed on the ASX in 2001 and 2002. Depending on the hypotheses tested, this is focused on ASX listed firms generally or restricted to EY clients only. Data is collected from a range of sources including the CMCRC-UTS Audit Markets database,[20] Aspect Huntleys Financial Database and, where necessary, hand collected from annual reports. The chapter is structured as follows. Section 4.2 will provide details of the sample selection procedures used in each of the five hypotheses. This will be followed by descriptive statistics in Section 4.3.

4.2 Sample selection

Sample firms were identified in the first instance from firms listed on the ASX in 2001 and 2002. For these firms audit related information was obtained from the CMCRC-UTS Audit Markets database, and financial statement information was obtained from the Aspect Huntleys Financial Database. Observations were necessarily excluded if insufficient data was available for any of the tests.

[20] The CMCRC-UTS Audit Markets database contains information on financial and audit related information of Australian publicly listed companies. It was a joint project of the Capital Markets CRC Ltd. and the University of Technology, Sydney.

4.2.1 The impact of the AA and EY merger on the market for audit services (H1)

The initial testing in this study was on the impact of the merger between AA and EY on the audit services market generally. Accordingly, the sample for these tests is all companies for which sufficient data is held, and this would include companies that were not clients of EY. As such, the test of Hypothesis 1 is based on the largest available sample of companies. Details of the sample are presented in Table 4.1[21] (Panel A), and this shows that there were 1271 companies in the CMCRC-UTS Audit markets database in 2002. This is reduced by three for missing 2002 audit service fee data, and 78 for missing 2001 audit service fee data. This leaves a potential sample of 1190.

Testing of market impacts requires consideration of the alternative potential market definitions, and the determination of the basis for classifying audit clients. First, for markets defined on a national industry basis, GICS (Global Industry Classification Standard) classifications are required. This reduces the sample by three to 1187 for tests based upon a national industry classification. Second, for markets defined on a city basis, only those observations audited in a major Australian metropolitan location (Adelaide, Brisbane, Melbourne, Perth and Sydney) are included.[22] This leads to 27 deletions and a test sample of 1163. Third, for markets based on a city industry basis, only those observations in a major metropolitan location and with a GICS industry classification are included. This leads to 27 and three deletions respectively, and a test sample of 1160.

[21] Table 4.2 provides the distribution of the sample across GICS industries

[22] As noted in Section 2.2, 97.72% of publicly listed clients had audit reports signed off in one of the five metropolitan cities in Australia. The deletion of clients from non-metropolitan cities is consistent with that of prior research (i.e. Ferguson et al., 2003).

4.2.2 Pricing impacts of the AA and EY merger on clients of the merged entity (H2 and H4)

Hypotheses 2 and 4 are concerned with the price impacts the merger had on clients of EY in 2002. The data requirements for these hypotheses are similar to that of Hypothesis 1. However, instead of using the full sample, only clients of EY in 2002 are required. As such, the test samples as described above (Section 4.2.1) are used as a starting point with deletions for non-EY clients, with this reported in Table 4.1 (Panel B). This leaves 241 observations for markets defined on a national industry basis, 239 for markets on a city basis and 238 for markets defined on a city industry basis.

4.2.3 Efficiency impacts of the AA and EY merger on clients of the merged entity (H3 and H5)

Hypotheses 3 and 5 are concerned with testing the efficiency impacts from the merger of AA and EY. The samples used in testing Hypothesis 3 and 5 comprise all EY audit clients in 2002 with the required data. However, as some of the excluded observations in Panel A of Table 4.1 have the necessary data for Hypotheses 3 and 5, the data selection procedure begins with the full sample of 2002 clients. This is reduced for observations missing audit report lag data in either 2001 or 2002, as well as relevant city or industry data. Finally non-EY observations are removed from the respective samples to leave a national industry sample of 239, a city sample of 237

and a city industry sample of 236. The sample selection for Hypotheses 3 and 5 is presented in Table 4.1 Panel C.

4.3 Descriptive statistics

This section provides details of the descriptive statistics of the variables for each of the samples used in hypothesis testing.

4.3.1 The impact of the AA and EY merger on the market for audit services (H1)

In the first instance attention is directed to the impact of the merger on the competitiveness of the Australian audit services market. Descriptive statistics for the level of audit service fees and industry concentration are presented in Table 4.3. With respect to national industry markets (Panel A), the mean (logged) audit service fee (*AF*2002) in 2002 was 10.980, compared with 10.826 in 2001 (i.e., *EstAF*). In unscaled terms this represented an increase in audit service fees of 16.8%. This is a material increase in audit service fees, and would suggest that competitiveness was reduced by the merger. However, to the extent that this was not associated with a change in industry concentration, this may simply have reflected changes in industry costs, rather than the diminution of competition. The impact of the change in industry concentration ($\Delta Conc$) is also reported, and it is notable the mean increase was 0.035, which is consistent with the merger generally increasing concentration.[23] Of

[23] In untabulated results, the mean national industry four firm HHI for 2001 is 0.214, whereas for 2002 is it 0.249. A paired samples t-test indicates the differences in means is significant (p = 0.000). The

the changes in industry concentration (Δ*Conc*) 84% were positive and this is also consistent with the merger generally increasing concentration. However, there was considerable variation in the changes, with the maximum increase in concentration being 0.198 and a minimum change of -0.227.

Corresponding descriptive statistics are presented for the city markets (Panel B) and the city industry market (Panel C) and these are not substantively different.

4.3.2 The impact of the AA and EY merger on audit pricing (H2)

The corresponding audit service fee statistics for EY are reported in Table 4.4. With respect to national industry markets (Panel A), the mean (logged) audit service fee (*AF*2002) for EY clients was 11.427. This compares to 10.980 for the full sample, and 11.259 in the prior year (*EstAF*). This suggests that EY generally audits larger companies, and this is not unexpected for any of the Big N auditors. Furthermore, the increase in audit service fees between 2001 and 2002 for EY clients (18.3%) is consistent with increases in the market generally.

The impact of the merger on the leadership variables is also reported. As would be expected with the merger of two Big N audit service firms, the merger resulted in EY gaining market leadership for 29.9% of the clients (*NewLead* = 0.299). Furthermore, EY maintained leadership for a further 6.2% of clients (*ContinueLead* = 0.062). Following the merger, EY did not lose any market leaderships.

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difference in four firm HHI's between 2001 and 2002 for both city and city industry markets are also significant at (p = 0.000).

Corresponding descriptive statistics are presented for the city markets (Panel B) and city industry markets (Panel C). For both markets, the audit service fee data for 2001 and 2002 are comparable. However, there was variation in the leadership variables. With respect to the city markets, the merger effectively maintained existing leaderships (58.6% of observations). With only five city markets in Australia, and EY being the leader of two of these in 2001, this is not an unexpected outcome. It did not, however, result in any new leaderships. In comparison, for city industry markets, EY became the industry leader for 31.9% of clients and continued its leadership for 21.0% of clients. Surprisingly, EY lost market leadership for 3.8% of clients.

4.3.3 The impact of the AA and EY merger on audit efficiency (H3)

This section presents details of the impact the merger had on the efficiency of audit services provided by EY. Descriptive statistics for the audit report lag and leadership variables are presented in Table 4.5. With respect to national industry markets (Panel A), the mean audit report lag (*Lag2002*) for EY clients in 2002 was 80.849 days, compared to 85.151 days in 2001 (*Lag2001*). This represented a decrease in audit report lag of 4.302 days (5.1%). This is a material decrease in audit report lag, and would suggest that EY did gain efficiency benefits from the merger with AA. However, to the extent that this was not associated with a change in market leadership, this may not reflect the gaining of efficiency benefits.[24]

[24] In untabulated results, the mean change in audit report lag for all firms between 2001 and 2002 (n=1174) is 0.444. Each of the three remaining Big N experienced a positive change in audit report lag between 2001 and 2002 (PwC = 0.463; KPMG = 1.640 and DTT = 1.351).

The impact of the merger on the leadership variables is also reported. As would be expected with the merger of two Big N audit service firms, the merger resulted in EY achieving market leadership for 29.7% of the firms' clients (*NewLead* = 0.297). Furthermore, EY maintained leadership for a further 6.3% of clients (*ContinueLead* = 0.063). Following the merger, EY did not lose any market leaderships.

Corresponding descriptive statistics are presented for the city markets (Panel B) and city industry markets (Panel C). For both markets, the audit lag data for 2001 and 2002 are comparable. However, as highlighted previously, there was variation in the leadership variables. With respect to the city markets, the merger effectively maintained existing leaderships (58.2% of observations). It did not, however, result in any new leaderships. In comparison, for city industry markets, EY became the industry leader for 31.8% of clients (*NewLead* = 0.318) and continued its leadership for 20.8% of clients (*ContinueLead* = 0.208). Again, EY lost market leadership for 3.8% of clients (*LossLead* = 0.038).

4.3.4 The impact of the AA and EY merger on clients of AA (H4 and H5)

As discussed in Chapter 2, the potential effects of the merger for both pricing and efficiency may be impacted by the concerns over one of the merging firms, specifically AA. Attention is first directed to the impact of the merger on the pricing of audit services for the clients of EY, controlling for whether the client was a former AA client. Attention is then directed to the impact of the merger on the efficiency of audit services for clients of EY, controlling for whether the client was a former AA

client. This is undertaken through the use of AA interaction variables to identify the separate impacts of the former clients of AA.

4.3.4.1 Audit service fee impacts of former AA clients (H4)

Descriptive statistics for AA interaction leadership variables used in primary tests are presented in Table 4.6. As the same sample is used in Hypothesis 4 as in Hypothesis 2, there is no need to include a discussion of either the audit service fee variables (i.e. *AF2002* or *EstAF*) or the market leadership variables (i.e. *ContinueLead*, *NewLead*, *LossLead* or *NeverLead*). Rather, the focus in Table 4.6 will be on the AA interaction variables.

Turning first to the national industry market (Panel A), 26.1% of EY clients in 2002 were audited by AA in 2001 (*AA* = 0.261). Thus, it is clear from Table 4.6 that relative to the other Big N firms, AA had a small audit business.[25] Furthermore, this is reflected in the market leaderships. While for 6.2% of companies EY was a continuing leader, only 1.2% were former AA clients (*AA*ContinueLead* = 0.012). Similarly, of 29.7% of companies for which EY was a New Leader, only 9.1% were former AA clients (*AA*NewLead* = 0.091).

Corresponding descriptive statistics are presented for the city markets (Panel B) and the city industry market (Panel C). For city markets, the 26.4% of EY clients that are former AA clients (*AA* = 0.264) are evenly split between the continuing and never lead cities, with 12.6% in continuing leadership cities (*AA*ContinueLead* =

[25] This is consistent with Table 1 in Hamilton et al. (2008). In 2001 AA had 84 audit clients, which represents 6.68% of all clients in 2001. This is the smallest number of clients audited by a Big N firm, with the next smallest, DTT, auditing 124. The audit service fees generated by AA in 2001 was only $35.3m, which represents a market share of 13.9%. Only DTT had a smaller market share (11.2%), whilst the remaining three Big N audit firms all had market shares in excess of 21%.

0.126) and 13.8% in the never lead cities (*AA*NeverLead* = 0.138). Descriptive statistics for the city industry markets reinforce those for the national industry market, in that 11.8% of clients are former AA clients in new market leadership industries (*AA*NewLead* = 0.118). This represents approximately one third of all clients in city industry markets in which EY is a new leader.

4.3.4.2 Audit efficiency impacts of former AA clients (H5)

Descriptive statistics for the AA interaction leadership variables used in the efficiency (audit report lag) tests are presented in Table 4.7. As the same sample is used in Hypothesis 5 as in Hypothesis 3, again there is no discussion of the audit lag variables (i.e. *Lag2002* or *Lag2001*). Rather, the focus in Table 4.7 will be on the AA interaction variables.

Turning first to the national industry market (Panel A), 25.9% of EY clients in 2002 were audited by AA in 2001 (*AA* = 0.259). Again it is clear that relative to the other Big N firms, AA had a small audit business. Furthermore, this is reflected in the market leaderships. While for 6.3% of companies EY was a continuing leader, only 1.3% were former AA clients (*AA*ContinueLead* = 0.013). Similarly, of 29.7% of companies for which EY was a new market leader, only 9.2% were former AA clients (*AA*NewLead* = 0.092).

Corresponding descriptive statistics are presented for the city markets (Panel B) and the city industry market (Panel C). For city markets the 26.2% of EY clients that are former AA clients (*AA* = 0.262) are evenly split between the continuing and never lead cities, with 12.2% in continuing leadership cities (*AA*ContinueLead* = 0.122) and 13.9% in the never lead cities (*AA*NeverLead* = 0.139). Descriptive

statistics for the city industry markets reinforce those for the national industry market, in that 11.4% of clients are former AA clients in new market leadership industries (*AA*NewLead* = 0.114). This represents approximately one third of all clients in city industry markets in which EY is a new leader. This suggests that whilst former AA clients do not make up a large proportion of EY clients in 2002, it is important to control for them in any test of the potential merger benefits.

4.3.5 Conclusion

The merger between AA and EY in 2002 did lead to an overall increase in audit market concentration. The average change in concentration across national industry markets was 4%, with 84% of national industry markets experiencing an increase in concentration between 2001 and 2002. Qualitatively similar changes in concentration were also found when using a city or city industry market definitions.

However, the merger did not lead to homogenous changes to the concentration of the markets. Sixteen per cent of national industry markets experienced either no change or a negative change to concentration after the merger. When taking a city industry definition of the market, this proportion increases to 39%. There was also substantial variation in the market concentration impacts of the merger. This is an important point to note in the context of this study. The regulators, as well as the majority of prior research, have taken a one market view of the audit services market in Australia when assessing the potential competitive impacts of audit firm mergers. However, the fact that a large number of Australian companies are in audit services markets that did not have adverse changes in concentration following the merger would suggest that a one market view is too broad when

assessing the competitive impact of the merger. As such, there is support for examining the competitive effects of the AA–EY merger with the relevant markets being defined at a national industry, city and city industry level.

From the descriptive statistics provided in Tables 4.2 and 4.3, there is evidence of audit service fees increasing between 2001 and 2002, generally and for EY clients. Furthermore the average audit report lag also declined for EY clients over that period, which is consistent with an overall increase in the audit efficiency. However, this is absent any control for changes in leadership.

The merger did lead to EY gaining a number of market leaderships at both the national and city industry levels. When using either of these market definitions, the majority of EY's leaderships in 2002 were generated from the merger. This supports the notion that the merger was about generating leadership, and as such it is pertinent to examine the potential impacts this has for the firm, both in terms of pricing and efficiency. What is also clear is that no changes in leadership occurred at the city market level (as opposed to the city industry level). As such the hypotheses cannot be directly tested at the city market level.

The descriptive statistics for Hypotheses 4 and 5 do suggest that while AA had a small audit business in Australia, the effect of the former AA clients in EY's portfolio in 2002 may influence the results in Hypothesis 2 and 3. In both the national and city industry defined market samples, former AA clients made up approximately one third of all EY clients in industries in which it had gained market leadership. As such, it is important that these former AA clients are controlled for to ensure that any merger benefits from increased leaderships are able to be identified.

Table 4.1
Sample Selection

This table details the selection of observations to be included in the test of the competitiveness of the Australian audit services market (Panel A), the tests of EY audit service fee changes following the merger (Panel B), and the tests of EY efficiency changes following the merger (Panel C).

Panel A – Sample Selection for Audit Service Market Tests (Hypothesis 1)			
	Market Definition		
	National Industry	**City**	**City Industry**
Full 2002 Sample	1271	1271	1271
Less Missing 2002 Audit Service Fee Data	3	3	3
Less Missing 2001 Audit Service Fee Data	78	78	78
	1190	1190	1190
Less Missing Industry Classifications	3	0	3
Less Non Metro Areas	0	27	27
TOTAL	1187	1163	1160

Panel B – Sample Selection for Audit Service Fee Tests (Hypotheses 2 and 4)			
	Market Definition		
	National Industry	**City**	**City Industry**
Full 2002 Sample	1271	1271	1271
Less Missing 2002 Audit Service Fee Data	3	3	3
Less Missing 2001 Audit Service Fee Data	78	78	78
	1190	1190	1190
Less Missing Industry Classifications	3	0	3
Less Non Metro Areas	0	27	27
Hypothesis 1 Sample	1187	1163	1160
Less Non EY Clients	946	924	922
TOTAL	241	239	238

Panel C – Sample Selection for Audit Efficiency Tests (Hypotheses 3 and 5)			
	Market Definition		
	National Industry	City	City Industry
Full 2002 Sample	1271	1271	1271
Less Missing 2002 Audit Report Lag Data	2	2	2
Less Missing 2001 Audit Report Lag Data	16	16	16
	1253	1253	1253
Less Missing Industry Classifications	1	0	1
Less Non Metro Areas	0	3	3
	1252	1250	1249
Less non EY observations	1013	1013	1013
TOTAL	239	237	236

Table 4.2
Distribution of Sample Across GICS Industry Codes

This table details the distribution of observations across the Global Industry Classification Standard (GICS) Industry Codes

Panel A – Distribution of National Industry Sample By GICS Industry		
GICS Industry Code	GICS Industry Group	n
1010	Energy	59
1510	Materials	299
2010	Capital Goods	65
2020	Commercial & Professional Services	57
2030	Transportation	16
2510	Automobiles and Components	12
2520	Consumer Durables and Apparel	14
2530	Consumer Services	37
2540	Media	47
2550	Retailing	31
3010	Food & Staples Retailing	8
3020	Food, Beverage & Tobacco	47
3030	Household & Personal Products	2
3510	Health Care Equipment & Services	41
3520	Pharmaceuticals, Biotechnology & Life Sciences	47
4010	Banks	12
4020	Diversified Financials	117
4030	Insurance	7
4040	Real Estate	83
4510	Software & Services	107
4520	Technology Hardware & Equipment	30
5010	Telecommunication Services	34
5510	Utilities	15
TOTAL		1187

Panel B – Distribution of City Sample By GICS Industry							
GICS Industry Code	GICS Industry Group	City					Total
		Adelaide	Brisbane	Melbourne	Perth	Sydney	
1010	Energy	3	8	6	24	18	59
1510	Materials	9	19	46	154	67	295
2010	Capital Goods	4	5	17	15	21	62
2020	Commercial & Professional Services		3	15	8	28	54
2030	Transportation	1	1	5	2	7	16
2510	Automobiles and Components	1		4	5	2	12
2520	Consumer Durables and Apparel		2	3	5	3	13
2530	Consumer Services	2	10	4	4	15	35
2540	Media	1	1	8	4	33	47
2550	Retailing	2	3	5	4	16	30
3010	Food & Staples Retailing			3	3	2	8
3020	Food, Beverage & Tobacco	5	5	13	8	15	46
3030	Household & Personal Products			1		1	2
3510	Health Care Equipment & Services	2	2	15	6	16	41
3520	Pharmaceuticals, Biotechnology & Life Sciences	3	6	18	9	11	47
4010	Banks	1	2	2	2	3	10
4020	Diversified Financials	6	11	27	13	56	113
4030	Insurance			2	1	4	7
4040	Real Estate		8	10	9	54	81
4510	Software & Services	3	9	28	28	39	107
4520	Technology Hardware & Equipment	1	4	8	6	9	28

5010	Telecommunication Services		2	7	12	11	32
5510	Utilities	1	1	4	3	6	15
NO CODE				2		1	3
TOTAL		45	102	253	325	438	1163

Panel C – Distribution of City Industry Sample By GICS Industry							
GICS Industry Code	GICS Industry Group	City					Total
		Adelaide	Brisbane	Melbourne	Perth	Sydney	
1010	Energy	3	8	6	24	18	59
1510	Materials	9	19	46	154	67	295
2010	Capital Goods	4	5	17	15	21	62
2020	Commercial & Professional Services		3	15	8	28	54
2030	Transportation	1	1	5	2	7	16
2510	Automobiles and Components	1		4	5	2	12
2520	Consumer Durables and Apparel		2	3	5	3	13
2530	Consumer Services	2	10	4	4	15	35
2540	Media	1	1	8	4	33	47
2550	Retailing	2	3	5	4	16	30
3010	Food & Staples Retailing			3	3	2	8
3020	Food, Beverage & Tobacco	5	5	13	8	15	46
3030	Household & Personal Products			1		1	2
3510	Health Care Equipment & Services	2	2	15	6	16	41
3520	Pharmaceuticals, Biotechnology & Life Sciences	3	6	18	9	11	47
4010	Banks	1	2	2	2	3	10
4020	Diversified Financials	6	11	27	13	56	113
4030	Insurance			2	1	4	7
4040	Real Estate		8	10	9	54	81
4510	Software & Services	3	9	28	28	39	107
4520	Technology Hardware & Equipment	1	4	8	6	9	28

5010	Telecommunication Services		2	7	12	11	32
5510	Utilities	1	1	4	3	6	15
TOTAL		45	102	251	325	437	1160

Table 4.3
Descriptive Statistics for the Sample Used in Hypothesis 1

This table details the descriptive statistics for the sample identified in Table 4.1 (Panel A), and used to test the impact of the AA–EY merger on the competitiveness of the Australian audit service market (H1).

Panel A – Descriptive Statistics for National Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	1187	7.601	16.493	10.980	1.396
$EstAF_i$	1187	7.313	16.664	10.826	1.391
$\Delta Conc_i$	1187	-0.227	0.198	0.035	0.057
ΔConc (% positive)	1187			84.0%	

Panel B – Descriptive Statistics for City Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	1163	7.601	16.493	10.983	1.392
$EstAF_i$	1163	7.313	16.664	10.829	1.383
$\Delta Conc_i$	1163	-0.040	0.090	0.073	0.027
ΔConc (% positive)	1163			96.1%	

Panel C – Descriptive Statistics for City Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	1160	7.601	16.493	10.983	1.392
$EstAF_i$	1160	7.313	16.664	10.828	1.383
$\Delta Conc_i$	1160	-0.506	0.983	0.037	0.134
ΔConc (% positive)	1160			60.9%	

Where

$AF2002_i$	:	Natural log of audit service fees paid by client *i* in 2002
$EstAF_i$	:	Natural log of audit service fees paid by client *i* in 2001
$\Delta Conc_i$	:	2002 market four firm HHI less the 2001 market four firm HHI
ΔConc (% positive)	:	Indicator variable, coded 1 if $\Delta Conc_i$ is positive, 0 otherwise

Table 4.4
Descriptive Statistics for the Sample Used in Hypothesis 2

This table details the descriptive statistics for the sample identified in Table 4.1 (Panel B), and used to test the impact of the AA–EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership (H2).

Panel A – Descriptive Statistics for National Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	241	8.700	16.493	11.427	1.397
$EstAF_i$	241	8.407	16.664	11.259	1.413
$ContinueLead_i$	241			0.062	
$NewLead_i$	241			0.299	
$LossLead_i$	241			0.000	
$NeverLead_i$	241			0.639	

Panel B – Descriptive Statistics for City Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	239	8.700	16.493	11.423	1.395
$EstAF_i$	239	8.407	16.664	11.252	1.404
$ContinueLead_i$	239			0.586	
$NewLead_i$	239			0.000	
$LossLead_i$	239			0.000	
$NeverLead_i$	239			0.414	

Panel C – Descriptive Statistics for City Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	238	8.700	16.493	11.419	1.396
$EstAF_i$	238	8.407	16.664	11.247	1.405
$ContinueLead_i$	238			0.210	
$NewLead_i$	238			0.319	
$LossLead_i$	238			0.038	
$NeverLead_i$	238			0.433	

Where

$ContinueLead_i$	:	Indicator variable, coded 1 if client *i* was audited by the market leader in both 2002 and 2001, 0 otherwise
$NewLead_i$	:	Indicator variable, coded 1 if client *i* was audited by the market leader in 2002 but not in 2001, 0 otherwise
$LossLead_i$	:	Indicator variable, coded 1 if client *i* was audited by the market leader in 2001 but not in 2002, 0 otherwise
$NeverLead_i$	:	Indicator variable, coded 1 if client *i* was not audited by the market leader in either 2002 or 2001, 0 otherwise

All other variables previously defined

Table 4.5
Descriptive Statistics for Sample Used in Hypothesis 3

This table details the descriptive statistics for the sample identified in Table 4.1 (Panel C), and used to test the impact of the AA–EY merger on EY's ability to increase audit efficiency for clients in markets in which it gained leadership (H3)

Panel A – Descriptive Statistics for National Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$Lag2002_i$	239	23.000	536.000	80.849	38.341
$Lag2001_i$	239	16.000	901.000	85.151	68.767
$ContinueLead_i$	239			0.063	
$NewLead_i$	239			0.297	
$LossLead_i$	239			0.000	
$NeverLead_i$	239			0.640	

Panel B – Descriptive Statistics for City Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$Lag2002_i$	237	23.000	536.000	80.958	38.483
$Lag2001_i$	237	16.000	901.000	85.241	69.047
$ContinueLead_i$	237			0.582	
$NewLead_i$	237			0.000	
$LossLead_i$	237			0.000	
$NeverLead_i$	237			0.418	

Panel C – Descriptive Statistics for City Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$Lag2002_i$	236	23.000	536.000	80.924	38.562
$Lag2001_i$	236	16.000	901.000	85.220	69.193
$ContinueLead_i$	236			0.208	
$NewLead_i$	236			0.318	
$LossLead_i$	236			0.038	
$NeverLead_i$	236			0.436	

Where

$Lag2002_i$: The number of days between the signing of the client *i*'s 2002 audit report and client *i*'s financial year end

$Lag2001_i$: The number of days between the signing of the client *i*'s 2001 audit report and client *i*'s financial year end

All other variables previously defined

Table 4.6
Descriptive Statistics for the Sample Used in Hypothesis 4

This table details the descriptive statistics for the sample identified in Table 4.1 (Panel B), and used to test the impact of the AA–EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership, controlling for former AA clients (H4).

Panel A – Descriptive Statistics for National Industry Sample		
	n	Mean
AA_i	241	0.261
$AA*ContinueLead_i$	241	0.012
$AA*NewLead_i$	241	0.091
$AA*LossLead_i$	241	0.000
$AA*NeverLead_i$	241	0.158

Panel B – Descriptive Statistics for City Sample		
	n	Mean
AA_i	239	0.264
$AA*ContinueLead_i$	239	0.126
$AA*NewLead_i$	239	0.000
$AA*LossLead_i$	239	0.000
$AA*NeverLead_i$	239	0.138

Panel C – Descriptive Statistics for City Industry Sample		
	n	Mean
AA_i	238	0.265
$AA*ContinueLead_i$	238	0.038
$AA*NewLead_i$	238	0.118
$AA*LossLead_i$	238	0.004
$AA*NeverLead_i$	238	0.105

Where

AA_i : Indicator variable, coded 1 if client $_i$ was audited by AA in 2001, 0 otherwise

All other variables previously defined

Table 4.7
Descriptive Statistics for the Sample Used in Hypothesis 5

This table details the descriptive statistics for the sample identified in Table 4.1 (Panel C), and used to test the impact of the AA–EY merger on EY's ability to increase audit efficiency to clients in markets in which it gained leadership, controlling for former AA clients (H5).

Panel A – Descriptive Statistics for National Industry Sample		
	n	Mean
AA_i	239	0.259
$AA*ContinueLead_i$	239	0.013
$AA*NewLead_i$	239	0.092
$AA*LossLead_i$	239	0.000
$AA*NeverLead_i$	239	0.155

Panel B – Descriptive Statistics for City Sample		
	n	Mean
AA_i	237	0.262
$AA*ContinueLead_i$	237	0.122
$AA*NewLead_i$	237	0.000
$AA*LossLead_i$	237	0.000
$AA*NeverLead_i$	237	0.139

Panel C – Descriptive Statistics for City Industry Sample		
	n	Mean
AA	236	0.263
AA*ContinueLead	236	0.038
AA*NewLead	236	0.114
AA*LossLead	236	0.004
AA*NeverLead	236	0.106

Where

All variables previously defined

Chapter 5 – Results

5.1 Introduction

The objective of this chapter is to present the results for the tests of hypotheses evaluating the impacts of the AA–EY merger on the audit services market in Australia. This focuses initially on the market impacts, and whether the increase in concentration resulting from the merger reduced competition and increased audit service fees. Attention then shifts to the impacts of the merger on EY and its clients. Consideration is given to whether there was an increase in audit service pricing, which would be consistent with revenue based incentives for the merger being realised, and/or whether audit report lags declined, which would suggest that cost benefits for the merger were realised.

The chapter is structured as follows. Section 5.2 will report the results of the first hypothesis, examining the impact of the merger of AA and EY on the market for audit services. This will be followed by Sections 5.3 and 5.4, reporting results of the tests of the impact of the merger on pricing (H2) and efficiency (H3), respectively. The results of Hypotheses H4 and H5, relating to the impact of AA clients, will be presented in Section 5.5. Section 5.6 documents the sensitivity tests of the main results and Section 5.7 concludes the chapter.

5.2 The impact of the AA and EY merger on the market for audit services (H1)

Concern is directed initially towards the impact of the merger of AA and EY on the audit services market generally to evaluate whether this resulted in a reduction

in competition (H1). Normally, this would commence with a simple univariate comparison of audit service fees in pre (i.e., *EstAF*) and post (*AF*2002) periods. This is not undertaken here, as such a comparison would be impacted by the level of cost changes in the audit services industry and would introduce a bias supporting the rejection of the null hypothesis. Accordingly, attention is directed to the multivariate tests, with the results presented in Table 5.1.

The results in Panel A show the relation between audit service fees (*AF*2002), estimated audit service fees (*EstAF*) and change in concentration (Δ*Conc*) at the national industry, city and city industry level. It is notable that all the models appear well specified, with the adjusted R^2 for each model being over 85%. In relation to national industry markets, the constant is large and highly significant (α_0 = 0.943, t-stat = 7.770, p = 0.000) and, together with the coefficient on estimated audit service fees (α_2 = 0.928, t-stat = 84.172, p = 0.000), this is consistent with a significant increase in audit service fees across the test period. However, an issue is whether this is attributable to the AA–EY merger, or other factors. Inconsistent with expectations, the coefficient on Δ*Conc* is negative and significant (α_1 = -0.411, t-stat = -1.533, p = 0.063). Accordingly, while there was a significant increase in audit service fees subsequent to the AA–EY merger, there is no evidence that this resulted from an increase in concentration and may simply have reflected cost pressures in the industry.

The results are also presented for the alternative industry definitions and these are qualitatively similar to those from the national industry. The constants in both cases are significant and positive for (City: α_0 = 0.901, t-stat = 6.833, p = 0.000; City Industry: α_0 = 0.872, t-stat = 7.099, p = 0.000). Similarly, the coefficients on estimated audit service fees (City: α_2 = 0.933, t-stat = 83.601, p = 0.000; City

Industry: α_2 = 0.934, t-stat = 83.344, p = 0.000) are significant and close to one. However, the coefficient on $\Delta Conc$ (α_1) is -0.226 (t-stat = -0.398, p = 0.345) and 0.071 (t-stat = 0.616, p = 0.269) respectively for the city and city industry market definitions. Importantly, for these alternative market definitions, there is still no evidence of an increase in concentration being associated with an increase in audit service fees.

To evaluate the sensitivity of the results to alternative definitions of audit service market concentration, consideration was given to those industries where the change in concentration was positive (i.e. by redefining $\Delta Conc$ to a dummy variable, coded 1 if the change in HHI was positive, 0 otherwise). Importantly, this relaxes any assumption of a linear relation between audit service fees and concentration. The results are presented in Panel B and are substantively the same as those presented in Panel A. For each of the three market definitions, the models are still well specified, with adjusted R^2s over 85%. The coefficient on $\Delta Conc$, the variable of interest, is negative and insignificant for all three market definitions.

In summary, the above results taken together provide no evidence to support H1, and a relation between an increase in concentration and an increase in audit service fees.

5.3 The impact of the AA and EY merger on audit pricing (H2)

Focusing specifically on clients of EY, and determining whether any benefits accrued as a consequence of the merger, the changes in audit service fees between 2001 and 2002 are evaluated. As previously discussed, univariate tests were not undertaken, and the results of the multivariate tests are presented in Table 5.2. It is

notable that all the models appear well specified, with the adjusted R^2 for each model being over 87%. In relation to the national industry, the constant is large and highly significant (α_0 = 0.998, t-stat = 3.827, p = 0.000) and this, in combination with the coefficient on estimated audit service fees (α_4 = 0.928, t-stat = 39.995, p = 0.000), is consistent with market wide changes. However, an issue is whether this is attributable to the AA–EY merger, or other factors. Contrary to expectations, the coefficient on *NewLead* is negative, although insignificant (α_2 = -0.034, t-stat = -0.473, p = 0.318). This is inconsistent with H2, for which the predicted value was positive. Additionally, the coefficient on *ContinueLead* is negative and significant (α_1 = -0.223, t-stat = -1.629, p = 0.052). This suggests that audit service fee increases were less in markets where EY became market leader or maintained market leadership. Accordingly, while there was a material increase in audit service fees for EY clients subsequent to the AA–EY merger, there is no evidence that this was consequent to new market leaderships generated from the merger and may simply have reflected cost pressures in the industry. In this regard it must be noted that the inputs into the audit services market are relatively generic and cost increases would have been experienced across the industry. Furthermore, the negative coefficient on *NewLead* is suggestive of the merger leading to cost savings which were ultimately passed onto the clients.

The results are also presented for the alternative industry definitions. At a city level, the only leadership variable included in the model is *ContinueLead* as EY neither gained nor lost city overall leaderships between 2001 and 2002. The coefficient on this variable is positive and insignificant (α_1 = 0.046, t-stat = 0.693, p = 0.245). The insignificance of this variable and the fact that no changes in

leadership occurred at the city level means that there is again no evidence to support or reject H2.

Turning to the city industry definition of the market, the constant is again large and highly significant (α_0 = 0.931, t-stat = 3.498, p = 0.001) and, in combination with the coefficient on estimated audit service fees (α_4 = 0.931, t-stat = 3.498, p = 0.001), reaffirms an economically significant increase in audit service fees across the test period. The coefficient on *NewLead* is positive and significant (α_2 = 0.131, t-stat = 1.717, p = 0.044), and is consistent with H2. The coefficient on *ContinueLead* (α_1 = 0.045, t-stat = 0.518, p = 0.303), while positive — which is consistent with increases in audit service fees due to market leadership — is not significant. *LossLead* is, however, also positive, which is inconsistent with expectation, but again insignificant (α_3 = 0.050, t-stat = 0.287, p = 0.387).

Accordingly, the results provide limited support for the argument that the merger led to audit service pricing benefits for EY in 2002 where markets are defined at a city industry level. Specifically, the only clients for which EY was able to increase prices for in 2002 were those clients in city industry markets in which it had gained leadership. One possible explanation for this may be that local reputation is an important factor in audit services pricing, and gaining leadership at a city industry level may hold more importance for a client than gaining leadership at an national industry level, Accordingly, there is limited support for H2, where markets are defined at the city industry level.

5.4 The impact of the AA and EY merger on audit efficiency (H3)

Attention in the previous section focused on the impact of the merger on the pricing of audit services for clients of EY. This section now turns to the impact the merger had on the efficiency of audit services provided by EY and to evaluate whether this resulted in benefits for EY (H3), with the results presented in Table 5.3.

The results in Table 5.3 show the relation between audit report lag (*Lag2002*), prior year audit report lag (*Lag2001*) and the market leadership variables (*ContinueLead, NewLead* and *LossLead*) at the national industry, city and city industry levels. It is notable that all the models appear well specified, with the adjusted R^2 for each model being between 53% and 54%.

In relation to the national industry, the constant is large and highly significant (β_0 = 44.885, t-stat = 14.684, p = 0.000) and, in combination with the coefficient on prior period audit lag (β_4 = 0.411, t-stat = 16.562, p = 0.000), suggests a general decrease in audit report lags across the test period.[26] The coefficient on *NewLead*, while positive, is not significant (β_2 = 3.518, t-stat = 0.931, p = 0.176). This is inconsistent with H3 for which the predicted value was negative. The coefficient on *ContinueLead* is negative, but insignificant (β_1 = -1.660, t-stat = -0.234, p = 0.408). Accordingly, while there is evidence of a decrease in the audit report lag for EY clients subsequent to the AA–EY merger, there is no evidence that new market leaderships generated from the merger generated efficiency benefits as measured by audit report lag.

The results are also presented for the alternative industry definitions. At a city level, the only leadership variable included in the model was *ContinueLead,* as EY neither gained nor lost city market leaderships between 2001 and 2002. The

[26] For example, taking the mean audit report lag for $Lag2001_i$ from Table 4.5, Panel A, and using the coefficients on β_0 and β_4 would generate an average audit report lag of 79.88 days. This is a reduction of 5.27 days or 6.19%.

coefficient on this variable is negative and significant (β_1 = -7.015, t-stat = -2.043, p = 0.021). Whilst not specifically a test of H2, as no change of leadership occurred at a city level, it is of interest to note that EY did seem to increase its efficiency in its Sydney and Perth offices as compared to audits based in Adelaide, Brisbane or Melbourne.

Turning to the city industry definition of the market, the constant is large and highly significant (β_0 = 45.451, t-stat = 13.413, p = 0.000) and the coefficient on prior year audit report lag is positive and significant (β_4 = 0.410, t-stat = 16.580, p = 0.000) which, taken together, is consistent with the results for the national industry and city market definitions and a general decline in audit lag. However, the negative coefficient on *NewLead*, whilst in the expected direction, is insignificant (β_2 = -3.143, t-stat = -0.790, p = 0.215). Accordingly, there is no support for H3. The coefficient on *ContinueLead* is positive and significant (β_1 = 6.931, t-stat = 1.522, p = 0.065) which suggests that EY's efficiency declined in those markets in which it was already leader. The coefficient on *LossLead* (β_3 = 1.721, t-stat = 0.189, p = 0.425) is positive and insignificant.

Taken together, the results from Table 5.3 indicate that gaining market leadership, regardless of the definition of the market, does not generate efficiency benefits in the first year after the merger, and thus provides no support for Hypothesis 3.

5.5 The impact of the AA and EY merger on former clients of AA (H4 and H5)

The last section of results will focus on the impact of former AA clients on the results obtained for H2 and H3. As documented in Tables 4.5 and 4.6, in the national industry and city industry markets, former AA clients made up approximately one third of all EY clients in markets in which EY had gained leadership. This is a material proportion and, as such, needs to be controlled for.

5.5.1 Audit service fee impacts of former AA clients (H4)

Attention is first directed towards the impact of former AA clients on the merger of AA and EY, and EY's ability to generate revenue benefits for (H4). The results in Table 5.4 show the relation between audit service fees (*AF2002*), estimated audit service fees (*EstAF*), market leadership variables (*ContinueLead, NewLead* and *LossLead*), and whether or not the company was a client of AA in 2001 (*AA*).

It is notable that all the models appear well specified, with the adjusted R^2 for each model being 87%. In relation to the national industry, the constant is large and highly significant ($\alpha_0 = 0.938$, t-stat = 3.537, p = 0.000) which, in combination with the coefficient on estimated audit service fees ($\alpha_8 = 0.934$, t-stat = 39.276, p = 0.000), suggests an economically significant increase in audit service fees across the test period. The coefficient on *NewLead* is positive but insignificant ($\alpha_2 = 0.014$, t-stat = 0.160, p = 0.437), even when controlling for AA clients ($\alpha_4 = -0.006$, t-stat = -0.069, p = 0.473). This reaffirms no support for H2, even after AA interactions are included in the model, suggesting that whilst the merger did lead to substantial leadership gains for EY, it did not have any audit service fee impacts.

Additionally, the coefficient on *ContinueLead* is negative and significant ($\alpha_1 = -0.263$, t-stat = -1.706, p = 0.045), which suggests that audit service fees for clients

of EY, in markets in which it maintained leadership, had a lower growth in fees than in other markets. Accordingly, while there was a significant increase in audit service fees for EY clients subsequent to the AA–EY merger, there is no evidence that this resulted from the new market leaderships generated from the merger and may simply have reflected cost pressures in the industry. It is also important to note that neither *AA* nor any of the AA interaction terms were significant, which provides no support for H4 that AA clients paid a premium as compared to continuing EY clients.

The results are also presented for the alternative industry definitions. At a city level, the only leadership variable included in the model is *ContinueLead*, as EY neither gained nor lost city leaderships between 2001 and 2002. The coefficient on this variable is positive but insignificant ($\alpha_1 = 0.014$, t-stat = 0.183, p = 0.428), as is the *AA* variable and all AA interaction terms. The insignificance of all variables and the fact that no changes in leadership occurred at the city overall level means that there is no evidence to support or reject H4.

Turning to the city industry definition of the market, the constant is large and highly significant ($\alpha_0 = 0.946$, t-stat = 3.425, p = 0.001), which, in combination with the coefficient on estimated audit service fees ($\alpha_4 = 0.930$, t-stat = 7.892, p = 0.000), suggests an economically significant increase in audit service fees across the test period. The only variable to be of significance, apart from prior year audit service fees (*EstAF*) is the indicator variable for former AA clients *AA*, with a negative coefficient of -0.168 (t-stat = -1.428, p = 0.077). Unfortunately, whilst significant, it is in the wrong direction and, as such, there is no support for H4. Overall, the evidence from Table 5.4 is that H4 is not supported.

5.5.2 Audit efficiency impacts of former AA clients (H5)

Finally, attention is directed towards the impact of former AA clients on the merger of AA and EY, and EY's ability to generate efficiency benefits for (H_5). The results in Table 5.5 show the relation between audit report lag (*Lag2002*), prior year audit report lag (*Lag2001*), market leadership variables (*ContinueLead, NewLead* and *LossLead*), and whether or not the client was a client of AA in 2001 (*AA*).

It is notable that all the models appear well specified, with the adjusted R^2 for each model being between 53% and 55%. In relation to the national industry, the constant is large and highly significant (β_0 = 46.504, t-stat = 13.934, p = 0.000), which, in combination with the coefficient on prior year audit report lag (β_8 = 0.407, t-stat = 16.411, p = 0.000), suggests a decrease in audit report lag across the test period. Contrary to expectations, the coefficient on *NewLead* is positive and significant (β_2 = 6.771, t-stat = 1.521, p = 0.065) when controlling for AA clients. However, neither the *AA* variable or AA interaction terms are significant, which is contrary to expectation. As such, H5 is rejected and there is no evidence that former AA clients were audited less efficiently, or that these clients reduced EY's efficiency for its continuing clients.

The results are also presented for the alternative industry definitions. At a city level, the only leadership variable included in the model is *ContinueLead* as EY neither gained nor lost city leaderships between 2001 and 2002. The coefficient on this variable is negative and significant (β_1 = -11.134, t-stat = -2.763, p = 0.003), as is the *AA* variable (β_4 = -14.515, t-stat = -2.619, p = 0.005). However, the coefficient on the *AA*ContinueLead* interaction term is positive and significant (β_5 = 10.966, t-stat = 1.421, p = 0.078). Taken together, the results from the city definition of the market provide limited support for both H3 and H5. Support is provided for H3 in the sense

that, when the former AA clients are controlled for, efficiency benefits did emerge for continuing EY clients, and for H5 in that it seems that a group of former AA clients took longer to be audited than previously. However, this support of the hypotheses is limited to the extent that at the city definition of the market, EY generated no new leaderships and, as such, it is difficult to attribute these outcomes to leadership generation.

Turning to the city industry definition of the market, the constant is large and highly significant (β_0 = 47.580, t-stat = 12.155, p = 0.000), which, in combination with the prior year audit report lag (β_8 = 0.405, t-stat = 16.224, p = 0.000), reaffirms a decrease in audit report lag across the test period. However, none of the leadership interaction variables are significant. This does not provide support for H5, in that there is no evidence that former AA clients have an overall increase in audit report lag, as compared to non-former AA clients. Overall, Table 5.5 provides limited support for Hypothesis 5, that there is an increase in audit report lags for former AA clients.

5.6 Sensitivities

A number of sensitivity tests are conducted to ensure the robustness of the results, and are presented in Appendices 1–7. These sensitivity tests consider alternate models, as well as variable definitions, for the hypotheses relating to the effect of the merger on the Australian audit services market generally (i.e., H1), firm specific audit service fee effects (i.e., H2 and H4), and firm specific audit efficiency effects (i.e., H3 and H5).

Attention is first directed to Appendix 1, in which a sensitivity of the results to the use of the audit service fee model, as used in Ferguson et al. (2003), is evaluated. For determining the impacts of the merger on the market generally (i.e., H1) and on EY clients specifically (i.e., H2 and H4) *EstAF* is estimated with the audit service fee model rather than lagged audit service fee. The explanatory power of the models are high (all with adjusted R^2's exceeding 76%), which is in line with prior research. However these are all lower than the equivalent results in the main tables. For the impact of the merger on the market generally, the results from Table A1.2 suggest that there is some evidence that an increase in concentration is associated with an increase in audit service fees, which is inconsistent with the result in Table 5.1. Similarly the results for the impact of the merger on EY clients specifically, as presented in Tables A1.4 and Tables A1.6, show there being an association between gaining leadership and an increase in audit service fees and an association between former AA clients and a decrease in audit service fees. These are generally inconsistent with the findings from the main tables. However, it should be noted that the lagged audit service fee model used in the main tables exhibits a higher adjusted R^2, indicating it has a higher explanatory power. This brings into question the use of the audit service fee model in this circumstance where time series rather than cross sectional analysis is used and lagged estimated of audit service fees are available. However, further evaluating this issue is beyond the scope of this study, and will be left for future research.

Appendix 2 presents the results of a sensitivity for both the market generally (i.e., H1) and EY clients specifically (i.e., H2 and H4) using an alternate definition of *EstAF*. Whereas in the main tables *EstAF* was defined as the 2001 audit service fee paid by the client, in Appendix 2 *EstAF* is the estimated 2002 audit service fee. This

is calculated by taking the 2001 audit service model coefficients and multiplying them by the client variables in 2002. As with Appendix 1, the explanatory power of the models is high (all with adjusted R^2s exceeding 76%), but again lower than the equivalent results in the main tables. The results for the impact of the merger on the market generally, as well as for EY clients specifically, are not unexpectedly similar to that of Appendix 1. As with Appendix 1, the results from Appendix 2 do not seem to be consistent with the main tables. Explanations for this apparent lack of consistency are that similar to those provided for Appendix 1 as the output of the audit service fee model is generating the independent variable.

Attention is then directed towards Appendix 3, which considers a sensitivity of the results to an alternate measure of concentration . In this sensitivity, the CR, as opposed to the HHI is used to determine *ΔConc*. The results, provided in Table A3.2, are qualitatively similar to that in Table 5.1. Accordingly the results for Hypothesis 1 are robust to whether *ΔConc* is defined using the HHI or the CR.

Appendix 4 presents the results of another sensitivity of the impact of the merger on the market generally (i.e., H1). In this case both concentration changes (*ΔConc*) and concentration levels (*Conc*) are included in the model. The overall results, as presented in Table A4.2 are qualitatively similar to those in Table 5.1 Additionally, *Conc* is positive and significant for all market definitions, except National Industry (when using an indicator variable for change in concentration). These results again suggest that findings in Table 5.1 are robust, but additionally that there is evidence of a link between the level of concentration and the level of audit service fees paid.

Appendix 5 presents the results of the sensitivities of the impact of the merger on audit efficiency (i.e., H3 and H5). A small number of clients in the EY sample

had large audit report lags. As such, this sensitivity limits audit report lag to a maximum of 100 days. In doing so the samples for the national industry, city and city industry definitions of the market are reduced by 24 each. The results for the impact on EY clients, without controlling for former AA clients (i.e., H3) is presented in A5.2, and are qualitatively similar to that of Table 5.3 with the exception that *ContinueLead* at the city market definition losses significance. This suggests that the significant decrease in audit report lag for *ContinueLead* found for the city market is due to outliers. The results for the impact of the merger on EY clients, controlling for former AA clients (i.e., H5) are provided in Table A5.4. The coefficients on the variables for the national industry and city definitions of the market, whilst similar in direction, lose significance as compared to Table 5.5. City industry results, however, indicate that for clients in markets in which EY gained (*NewLead*) or maintained (*ContinueLead*) market leadership, audit report lag increased significantly. There is also evidence that there was a significant decrease in audit report lag for former AA clients in city industries in which EY became a leader (*AA*NewLead*). Overall the results from Appendix 5 are generally consistent with the main tables.

An additional sensitivity in relation to the impact of the merger on audit pricing for the market generally (i.e., H1) and EY clients specifically (i.e., H2 and H4) is included in Appendix 6. This examines whether using the change in audit service fee (*LnΔAF*), calculated as the natural logarithm of the ratio of the 2002 audit service fee to the 2001 audit service fee as the dependent variable provides the same results as using *AF2002* as the dependent and *EstAF* as an independent. The results, presented in Table A6.1 (H1), Table A6.2 (H2) and Table A6.3 (H4) show almost no explanatory power, with adjusted R^2s of 0.000. Explanatory power notwithstanding, the results are qualitatively similar to that in the main tables. Accordingly the results

in the main tables for the impact of the merger on audit pricing for the market generally and for EY clients specifically are robust to using a changes model as opposed to controlling for prior year fees on the right hand side.

Attention then turns to partitioning by client size. Clients are partitioned into large and small samples based on median total assets. Tables A7.1, 7.2 and 7.3 provide results for the size partitioned analysis of the impact of the merger on the market generally (i.e., H1) and for EY clients specifically (i.e., H2 and H4). The results for both impacts are qualitatively similar to the main tests, with two notable exceptions. First, the explanatory power of the large sample tests is much greater (approximate R^2s of 84%) as compared to the small sample tests (approximate R^2s of 54%). Second, whereas there is no indication of a link between increases in concentration and audit service fees in either the main tests or the large client sample, there is evidence of such a link at a national industry level for the small client sample. This suggests that there is weak evidence of a decline in competition for small audit clients at a national industry level in Australia.

In addition, all Hypotheses were replicated using both 2003 and 2004 data in place of 2002. The results, tabulated in Appendices 8 and 9, were generally consistent with the primary results for Hypothesis 2. With the exception of change α_1 becoming significant (positive) in Table A9.6 at a city level (α_1 = 1.408, t-stat = 2.298, p = 0.011), all other variables were qualitatively similar to those in the main tables. It is interesting to note that the explanatory power using t-2 audit service fees as a control variable is still high, with adjusted R^2s for Table A8.6 all above 0.80.

However, the results for Hypotheses 2 through to 5 do show sensitivity to using 2003 and 2004 data. For many of the tables nearly every variable of interest is qualitatively different to that from the main tables. There is difficulty though in

interpreting these results, as one hand increasing the time frame allows more time for the effects to be witness, but it also allows for extraneous events to create noise in the tests.

Finally, all Hypotheses were replicated limiting the sample to only those clients with a 30 June year end. The results, tabled in Appendix 10, indicate some minor changes in significance for a small number of variables in the five Hypotheses tests, but the overall tenor of Appendix 10 is consistent with the results presented in the main tables.

Hypotheses 1 was replicated at a national industry, city and city industry level, dropping clients from each individual GICS industry to determine whether any particular industry drove the results in Table 5.1. The results, not tabulated, were consistent with Table 5.1. Additionally all five Hypotheses were replicated with individual GICS industry dummies included in the models. The results, not tabulated were generally consistent with the main table results. As such the results for the impact of the merger on the market generally or for EY are not driven by industry specific factors.

5.7 Conclusion

Initially, attention is directed towards the market generally and how audit service fees changed between 2001 and 2002. There is evidence of a significant increase in audit service fees generally, but that there is no evidence to support the hypothesis that there is a link between increasing concentration and increasing audit service fees.

Attention is then directed towards the impact the merger had on audit service fee price changes for clients of EY. As with the market generally, there is evidence of a general increase in audit service fees for clients of EY pre to post merger. However, there is no evidence to support the hypothesis that these audit service fee increases are linked to the generation of market leaderships by EY in 2002.

The third part of this thesis examines the impact of the merger between AA and EY on the efficiency of EY post merger. There is evidence of a general decline in audit report lag post merger for all EY clients, but there is only weak evidence that the generation of these operational efficiencies are related to the generation of market leaderships by EY. The general decline in the audit report lag of EY clients following the merger does suggest that the merger did lead to increased efficiency in the audit process. However, in the markets where efficiencies were most likely to be generated, i.e. markets where EY became a leader, there is only limited evidence of efficiencies being created.

The final section of analysis examines the impact of former AA clients on the ability of EY to generate pricing and efficiency benefits from the merger. There is no evidence to suggest that the impact of former AA clients masked the generation of pricing or efficiency benefits to continuing EY clients. There is also no evidence to suggest that the audit service fees for former AA clients increased because of the concern of their former audit firm. However, there is weak evidence of an increase in audit report lag for former AA clients.

Table 5.1
Results of Tests of the Competitiveness of the Australian Audit Service Market (H1)

This table details results of the test of the impact of the AA–EY merger on the competitiveness of the Australian audit service market (H1). The sample used is drawn from the full sample of 2002 Australian listed companies, and the sample selection is provided in Table 4.1 (Panel A). The test used is an OLS regression model with $2002AF_i$ as the dependent variable and $EstAF_i$ and $\Delta Conc_i$ as independent variables. The market is defined at the national industry, city and city industry levels.

Panel A – Continuous Concentration Variable									
	National Industry			**City**			**City Industry**		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	0.943	7.770	0.000	0.901	6.833	0.000	0.872	7.099	0.000
$\Delta Conc_i$	-0.411	-1.533	0.063	-0.226	-0.398	0.345	0.071	0.616	0.269
$EstAF_i$	0.928	84.172	0.000	0.933	83.601	0.000	0.934	83.344	0.000
n		1187			1163			1160	
F-Statistic		3564.945			3521.467			3504.294	
P-Value		0.000			0.000			0.000	
Adjusted R sq.		0.857			0.858			0.858	
Test variables are all one-tailed									

Panel B – Indicator as Positive / Not Positive Change in Concentration									
	National Industry			City			City Industry		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	1.035	7.897	0.000	0.974	6.769	0.000	0.898	7.109	0.000
$\Delta Conc_i$	-0.094	-2.240	0.013	-0.096	-1.207	0.114	-0.015	-0.476	0.317
$EstAF_i$	0.926	83.340	0.000	0.933	83.955	0.000	0.932	83.037	0.000
n		1187			1163			1160	
F-Statistic		3574.300			3526.055			3503.757	
P-Value		0.000			0.000			0.000	
Adjusted R sq.		0.858			0.859			0.858	
Test variables are all one-tailed									

$$AF2002_i = \alpha_0 + \alpha_1 \Delta Conc_i + \alpha_2 EstAF_i + \varepsilon_i$$

Where

ΔConc : Indicator variable, coded 1 if 2002 market four firm HHI less the 2001 market four firm HHI is positive, 0 otherwise

All variables previously defined

Table 5.2

Results of Tests of the Audit Service Fee Benefits to EY Following the AA–EY Merger (H2)

This table details results of the test of the impact of the AA–EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership (H2). The sample used is drawn from the sample of 2002 Australian listed companies audited by EY, and the sample selection is provided in Table 4.1 (Panel B). The test used is an OLS regression model with $2002AF_i$ as the dependent variable and $EstAF_i$, $ContinueLead_i$, $NewLead_i$ and $LossLead_i$ as independent variables. The market is defined at the national industry, city and city industry levels.

	National Industry			**City**			**City Industry**		
	est.	t-stat	prob.	est.	t-stat	prob.	est.	t-stat	prob.
(Constant)	0.998	3.827	0.000	0.953	3.541	0.000	0.931	3.498	0.001
$ContinueLead_i$	-0.223	-1.629	0.052	0.046	0.693	0.245	0.045	0.518	0.303
$NewLead_i$	-0.034	-0.473	0.318	-	-	-	0.131	1.717	0.044
$LossLead_i$	-	-	-	-	-	-	0.050	0.287	0.387
$EstAF_i$	0.928	39.995	0.000	0.928	39.890	0.000	0.928	39.731	0.000
n		241			239			238	
F-Statistic		542.511			797.128			397.357	
P-Value		0.000			0.000			0.000	
Adjusted R Sq.		0.871			0.870			0.870	
Test variables are one-tailed									

$$AF2002_i = \alpha_0 + \alpha_1 ContinueLead_i + \alpha_2 NewLead_i + \alpha_3 LostLead_i + \alpha_4 EstAF_i + \varepsilon_i$$

Where
All variables previously defined

Table 5.3

Results of Tests of the Audit Efficiency Benefits to EY Following the AA–EY Merger (H3)

This table details results of the test of the impact of the AA–EY merger on EY's ability to increase audit efficiency to clients in markets in which it gained leadership (H3). The sample used is drawn from the sample of 2002 Australian listed companies audited by EY, and the sample selection is provided in Table 4.1 (Panel C). The test used is an OLS regression model with $Lag2002_i$ as the dependent variable and $Lag2001_i$, $ContinueLead_i$, $NewLead_i$, and $LossLead_i$ as independent variables. The market is defined at the national industry, city and city industry levels.

	National Industry			**City**			**City Industry**		
	est.	t-stat	prob.	est.	t-stat	prob.	est.	t-stat	prob.
(Constant)	44.885	14.684	0.000	50.318	14.880	0.000	45.451	13.413	0.000
$ContinueLead_i$	-1.660	-0.234	0.408	-7.015	-2.043	0.021	6.931	1.522	0.065
$NewLead_i$	3.518	0.931	0.176	-	-	-	-3.143	-0.790	0.215
$LossLead_i$	-	-	-	-	-	-	1.721	0.189	0.425
$Lag2001_i$	0.411	16.562	0.000	0.407	16.575	0.000	0.410	16.580	0.000
n		239			237			236	
F-Statistic		91.640			140.261			69.415	
P-Value		0.000			0.000			0.000	
Adjusted R Sq.		0.533			0.541			0.538	
Test variables are one-tailed									

$$Lag2002_i = \beta_0 + \beta_1 ContinueLead_i + \beta_2 NewLead_i + \beta_3 LostLead_i + \beta_4 Lag2001_i + \varepsilon_i$$

Where

All variables previously defined

Table 5.4

Results of Tests of the Audit Service Fee Benefits to EY Following the AA–EY Merger, Controlling for Former AA Clients (H4)

This table details results of the test of the impact of the AA–EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership, controlling for former AA clients (H4). The sample used is drawn from the sample of 2002 Australian listed companies audited by EY, and the sample selection is provided in Table 4.1 (Panel B). The test used is an OLS regression model with $2002AF_i$ as the dependent variable and $EstAF_i$, $ContinueLead_i$, $NewLead_i$, $LossLead_i$, AA_i, and AA_i interaction terms as independent variables. The market is defined at the national industry, city and city industry levels.

	National Industry			City			City Industry		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	0.938	3.537	0.000	0.953	3.506	0.001	0.946	3.425	0.001
$ContinueLead_i$	-0.263	-1.706	0.045	0.014	0.183	0.428	0.005	0.049	0.480
$NewLead_i$	0.014	0.160	0.437	-	-	-	0.078	0.837	0.202
$LossLead_i$	-	-	-	-	-	-	0.072	0.380	0.352
AA_i	-0.006	-0.069	0.473	-0.095	-0.872	0.192	-0.168	-1.428	0.077
AA_i*$ContinueLead_i$	0.179	0.528	0.299	0.097	0.646	0.260	0.163	0.733	0.232
AA_i*$NewLead_i$	-0.162	-1.016	0.155	-	-	-	0.201	1.206	0.115
AA_i*$LossLead_i$	-	-	-	-	-	-	-0.400	-0.728	0.234
$EstAF_i$	0.934	39.276	0.000	0.931	39.220	0.000	0.930	37.892	0.000
n		241			239			238	
F-Statistic		270.376			396.660			198.491	
P-Value		0.000			0.000			0.000	
Adjusted R Sq.		0.871			0.870			0.870	
Test variables are one-tailed									

$$AF2002_i = \alpha_0 + \alpha_1 ContinueLead_i + \alpha_2 NewLead_i + \alpha_3 LostLead_i + \alpha_4 AA_i$$

$$+\alpha_5 AA_i * ContinueLead_i + \alpha_6 AA_i * NewLead_i + \alpha_7 AA_i * LostLead_i + \alpha_8 EstAF_i + \varepsilon_i$$

Where
All variables previously defined

Table 5.5

Results of Tests of the Audit Efficiency Benefits to EY Following the AA–EY Merger, Controlling for Former AA Clients (H5)

This table details results of the test of the impact of the AA–EY merger on EY's ability to increase audit efficiency to clients in markets in which it gained leadership, controlling for former AA clients (H5). The sample used is drawn from the sample of 2002 Australian listed companies audited by EY, and the sample selection is provided in Table 4.1 (Panel C). The test used is an OLS regression model with $Lag2002_i$ as the dependent variable and $Lag2001_i$, $ContinueLead_i$, $NewLead_i$, $LossLead_i$, AA_i, and AA_i interaction terms as independent variables. The market is defined at the national industry, city and city industry levels.

	National Industry			City			City Industry		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	46.504	13.934	0.000	55.915	14.113	0.000	47.580	12.555	0.000
$ContinueLead_i$	-3.827	-0.485	0.314	-11.134	-2.763	0.003	5.104	0.998	0.160
$NewLead_i$	6.771	1.521	0.065	-	-	-	-1.356	-0.282	0.389
$LossLead_i$	-	-	-	-	-	-	0.460	0.047	0.481
AA_i	-5.091	-1.032	0.152	-14.515	-2.619	0.005	-6.782	-1.119	0.132
$AA*ContinueLead_i$	9.999	0.571	0.284	10.966	1.421	0.078	7.489	0.656	0.256
$AA*NewLead_i$	-9.580	-1.155	0.125	-	-	-	-2.806	-0.321	0.374
$AA*LossLead_i$	-	-	-	-	-	-	2.806	0.099	0.461
$Lag2001_i$	0.407	16.411	0.000	0.399	16.259	0.000	0.405	16.224	0.000
n		239			237			236	
F-Statistic		47.387			73.535			35.083	
P-Value		0.000			0.000			0.000	
Adjusted R Sq.		0.539			0.551			0.537	
Test variables are one-tailed									

$$Lag2002_i = \beta_0 + \beta_1 ContinueLead_i + \beta_2 NewLead_i + \beta_3 LostLead_i + \beta_4 AA_i$$

$$+\beta_5 AA_i * ContinueLead_i + \beta_6 AA_i * NewLead_i + \beta_7 AA_i * LostLead_i + \beta_8 Lag2001_i + \varepsilon_i$$

Where
All variables previously defined

Chapter 6 – Conclusion

The merger between AA and EY in Australia was announced on 16 May, 2002. The merger was the culmination of seven months of speculation and drama surrounding the future of AA, following its involvement in the collapse of Enron in the US. With the number of Big N firms having been reduced to four, concerns were raised over the impact of the merger on the competitiveness of the Australian audit services market (Boreham, 2002; Robertson, 2002; Hamilton et al., 2008).

The objective of the thesis is to evaluate the impact of the merger of AA and EY on the market for audit services in Australia. In this regard, consideration is given to two specific questions. First, whether the Australian audit services market became less competitive subsequent to the merger of AA and EY. Second, whether any benefits, either in relation to audit pricing or efficiency, accrued to the firms involved as a consequence of the merger.

In order to address these objectives, the impact of the merger on Australian listed firms is examined. This was done for both the market as a whole, as well as for the clients of EY. The sample was drawn from the 1271 available firms on the ASX in 2002.

Initially, attention is directed towards the market generally and how audit service fees changed between 2001 and 2002. There is evidence of a significant increase in audit service fees generally, but that there is no evidence to support the hypothesis that there is a link between increasing concentration and increasing audit service fees. The evidence of a general increase is consistent with prior work, which finds an increase in audit service fees post merger (i.e. Iyer and Iyer, 1996; Lee, 2005). The lack of a link between increasing concentration and increasing audit service fees is

inconsistent with the only study to note such a relationship (Tai and Kwong, 1997). However, that study did not explicitly test for such a link.

Attention is then directed towards the impact the merger had on audit service fee price changes for clients of EY. As with the market generally, there is evidence of a general increase in audit service fees for clients of EY pre to post merger. However, there is no evidence to support the hypothesis that these audit service fee increases are linked to the generation of market leaderships by EY in 2002. This is inconsistent with the research evidence on the ability of market leaders to earn audit service fee premiums. A large number of studies (Craswell et al., 1995; Ferguson et al., 2005; Francis et al., 2005) have documented that industry leading audit firms are able to generate audit service fee premiums. However, a distinguishing feature of this study is the use of changes in market leaderships. By taking into account how market leadership changes, the study arguably provides a finer measure of the impact of market leadership on audit pricing. Furthermore, the use of changes allows the prior year audit service fees to be used as a control, and hence the results are less sensitive to misspecification of the audit service fee model, due to differences between the characteristics of clients of different audit firms.

The third part of this thesis examines the impact of the merger between AA and EY on the efficiency of EY post merger. There is evidence of a general decline in audit report lag post merger for all EY clients, but there is only weak evidence that the generation of these operational efficiencies are related to the generation of market leaderships by EY. The general decline in the audit report lag of EY clients following the merger does suggest that the merger did lead to increased efficiency in the audit process. However, in the markets where efficiencies were most likely to be generated, i.e. markets where EY became a leader, there is only limited evidence of efficiencies

being created. This is consistent with prior research (Lawrence and Glover, 1998; Tsai and Yang, 2008), and suggests that, at least in the short term, EY had difficulties in generating efficiencies through the combination of the two firms.

The final section of analysis examines the impact of former AA clients on the ability of EY to generate pricing and efficiency benefits from the merger. There is no evidence to suggest that the impact of former AA clients masked the generation of pricing or efficiency benefits to continuing EY clients. There is also no evidence to suggest that the audit service fees for former AA clients increased due to EY concerns over the quality of AA's auditing of these clients.. However, there is weak evidence of an increase in audit report lag for former AA clients. This is consistent with the findings of Johnstone and Bedard (2001), in that this increase in audit report lag for former AA clients suggests that EY was concerned about the quality of the accounting of these companies and spent longer auditing them in 2002.

There are, however, a number of limitations to this study. The first is that the pricing for audit services has been identified as 'sticky' (Ferguson et al., 2005). This means that due to the existence of multi-year audit contracts, there is the potential that the pricing for audit services does not change substantially year on year. As such, taking the change only over one year may not allow for the full pricing effects to be realised. Whilst acknowledging the existence of this limitation, a one year analysis was chosen because an extension beyond one year meant introducing additional complexity into the analysis, and factors which may be difficult to control for (such as the reactions of competitor Big N firms).

The second limitation is that it may take some time for leadership effects to be fully understood by the audit market and, as such, there may be a delay between an audit firm obtaining market leadership and being able to increase audit service fees

commensurate with its position as market leader. Whilst the appendices extended the main table tests to include longer time horizons, these models did not properly allow for the additional complexity of factors such as competitor reactions. As such, there is potential for future research to examine the impact of the merger on longer horizons with a model which can control for this additional complexity.

A third limitation is that, at the time of the merger between AA and EY, there were a number of regulatory changes occurring in both the Australian and US audit markets which may have influenced some of the outcomes. In Australia, whilst the *Corporate Law Economic Reform Program (Audit Reform and Corporate Disclosure) Act 2004* (also known as CLERP 9) became law on 1 July, 2004, initial releases by the Australian Government in June of 2002 suggested that reductions in non-audit service fees were expected (Australian Government, 2002). This potentially put pressure on audit firms to increase audit service fees to make up for this decline in revenue from non-audit services. Additionally, the implementation of the *Sarbanes-Oxley Act (2002)* in the US has been shown to lead to an increase in audit service fees for cross-listed Australian companies (Salman and Carson, 2008). If there are companies in the sample that are cross-listed in the US, this may have also impacted on the general finding of an increase in audit service fees.

The last limitation of this thesis is the use of the audit report lag as a proxy for operational efficiency of the audit. Whilst it has been used in the literature (Lawrence and Glover, 1998), it may be considered an imprecise measure. However, without proprietary cost data from the relevant audit firms, it is the best proxy available for efficiency. This does provide an avenue for future research: if access to audit firm proprietary cost data is made available, a more accurate analysis of the efficiency impacts of the merger will be possible.

Appendix 1

Results using the audit service fee model

The audit service fee model, as developed by Simunic (1980), is commonly used in the prior literature (i.e. Craswell et al., 1995; Ferguson et al., 2003; Francis et al., 2005). As such, the hypotheses which use the lagged audit services fee model (H1, H3 and H5) are replicated replacing *EstAF* with the control variables from the audit service fee model.

Table A1.1
(Corresponds to Table 4.3)
Descriptive statistics for the sample used in Hypothesis 1 (audit service fee model)

This table details the descriptive statistics for the sample identified in Table 4.1 (Panel A), and used to test the impact of the AA–EY merger on the competitiveness of the Australian audit service market (H1) using the audit service fee model.

Panel A – Descriptives for National Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	1187	7.601	16.493	10.980	1.396
$LnTA_i$	1187	10.131	26.657	17.310	2.370
$LnSUB_i$	1187	0.000	7.049	1.543	1.330
$CATA_i$	1187	0.000	1.000	0.429	0.291
$QUICK_i$	1187	0.003	84.656	5.453	13.137
DE_i	1187	0.000	2.016	0.139	0.238
ROI_i	1187	-10.592	9.554	-0.273	1.149
$Foreign_i$	1187			0.143	
$Opinion_i$	1187			0.156	
YE_i	1187			0.166	
$Loss_i$	1187			0.656	
Big_i	1187			0.634	
$\Delta Conc_i$	1187	-0.227	0.198	0.035	0.057
ΔConc (% positive)	1187			0.840	

Panel B - Descriptives for City Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	1163	7.601	16.493	10.983	1.392
$LnTA_i$	1163	10.131	26.657	17.307	2.369
$LnSUB_i$	1163	0.000	7.049	1.553	1.333
$CATA_i$	1163	0.000	1.000	0.430	0.292
$QUICK_i$	1163	0.003	84.656	5.499	13.213
DE_i	1163	0.000	2.016	0.139	0.239
ROI_i	1163	-10.592	9.554	-0.269	1.134
$Foreign_i$	1163			0.143	
$Opinion_i$	1163			0.156	
YE_i	1163			0.167	
$Loss_i$	1163			0.654	
Big_i	1163			0.637	
$\Delta Conc_i$	1163	-0.040	0.090	0.073	0.027
ΔConc (% positive)	1163			0.961	

Panel C - Descriptives for City Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	1160	7.601	16.493	10.983	1.392
$LnTA_i$	1160	10.131	26.657	17.305	2.367
$LnSUB_i$	1160	0.000	7.049	1.552	1.334
$CATA_i$	1160	0.000	1.000	0.431	0.292
$QUICK_i$	1160	0.003	84.656	5.502	13.228
DE_i	1160	0.000	2.016	0.139	0.239
ROI_i	1160	-10.592	9.554	-0.270	1.136
$Foreign_i$	1160			0.143	
$Opinion_i$	1160			0.156	
YE_i	1160			0.166	
$Loss_i$	1160			0.655	
Big_i	1160			0.637	
$\Delta Conc_i$	1160	-0.506	0.983	0.037	0.134
ΔConc (% positive)	1160			0.609	

Where

$LnTA_i$	:	Natural log of clients' total assets
$LnSUB_i$	:	Natural log of the number of the clients' audited subsidiaries
$CATA_i$	:	Ratio of clients' current assets to total assets
$QUICK_i$	:	Ratio of clients' current assets (less inventories) to current liabilities
DE_i	:	Ratio of clients' long-term debt to total assets
ROI_i	:	Ratio of clients' earnings before tax to total assets
$Foreign_i$	:	Proportion of clients' subsidiaries that are foreign
$Opinion_i$	:	Indicator variable, coded 1 if a qualified opinion, 0 otherwise
YE_i	:	Indicator variable, coded if non-June 30 year end, 0 otherwise
$Loss_i$	:	Indicator variable, 1 if there is a loss in any of the past 3 years, 0 otherwise
Big_i	:	Indicator variable, 1 if audit firm is a Big N accounting firm, 0 otherwise

And all other variables previously defined

Table A1.2
(Corresponds to Table 5.1)
Results of tests of the competitiveness of the Australian audit service market (H1) using the audit service fee model

This table details the results of the test of the impact of the AA–EY merger on the competitiveness of the Australian audit service market (H1). The sample used is drawn from the full sample of 2002 Australian listed companies, and the sample selection is provided in Table 4.1 (Panel A). The test used is an OLS regression model with $2002AF_i$ as the dependent variable and control variables for the audit service fee regression model (Hamilton et al. 2008) and $\Delta Conc_i$ as independent variables. The market is defined at the national industry, city and city industry level.

Panel A – Continuous Concentration Variable									
	National Industry			**City**			**City Industry**		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	3.719	15.283	0.000	3.950	15.669	0.000	3.929	16.051	0.000
$\Delta Conc_i$	1.071	3.063	0.001	-0.247	-0.338	0.368	-0.079	-0.529	0.299
$LnTA_i$	0.363	26.579	0.000	0.351	25.478	0.000	0.351	25.422	0.000
$LnSUB_i$	0.268	13.659	0.000	0.278	14.069	0.000	0.278	14.049	0.000
$CATA_i$	0.741	9.993	0.000	0.751	10.084	0.000	0.748	10.051	0.000
$QUICK_i$	-0.010	-6.443	0.000	-0.011	-6.486	0.000	-0.011	-6.491	0.000
DE_i	0.310	3.535	0.000	0.326	3.690	0.000	0.327	3.702	0.000
ROI_i	-0.098	-5.046	0.000	-0.087	-4.412	0.000	-0.088	-4.429	0.000
$Foreign_i$	0.413	5.002	0.000	0.425	5.062	0.000	0.425	5.058	0.000
$Opinion_i$	0.115	1.939	0.053	0.110	1.845	0.065	0.109	1.825	0.068
YE_i	0.018	0.325	0.745	0.011	0.199	0.842	0.06	0.114	0.909
$Loss_i$	-0.156	-3.050	0.002	-0.140	-2.718	0.007	-0.139	-2.677	0.008
Big_i	0.348	7.961	0.000	0.355	8.042	0.000	0.355	8.022	0.000
n		1187			1163			1160	

F-Statistic	327.008	320.596	319.280
P-Value	0.000	0.000	0.000
Adjusted R sq.	0.767	0.767	0.858
Test variables are all one-tailed			

Panel B - Indicator as Postive / Not Positive Change in Concentration									
	National Industry			City			City Industry		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	3.577	13.899	0.000	3.727	14.106	0.000	3.972	16.060	0.000
ΔConc (% Positive)$_i$	0.157	2.838	0.002	0.198	1.938	0.026	-0.053	-1.298	0.097
LnTA$_i$	0.365	26.427	0.000	0.352	25.602	0.000	0.351	25.396	0.000
LnSUB$_i$	0.268	13.678	0.000	0.277	14.025	0.000	0.278	14.046	0.000
CATA$_i$	0.757	10.203	0.000	0.753	10.145	0.000	0.743	9.961	0.000
QUICK$_i$	-0.011	-6.611	0.000	-0.011	-6.627	0.000	-0.010	-6.346	0.000
DE$_i$	0.298	3.398	0.001	0.330	3.747	0.000	0.326	3.694	0.000
ROI$_i$	-0.100	-5.152	0.000	-0.087	-4.400	0.000	-0.087	-4.384	0.000
Foreign$_i$	0.411	4.970	0.000	0.429	5.121	0.000	0.429	5.107	0.000
Opinion$_i$	0.118	1.995	0.046	0.108	1.807	0.071	0.108	1.808	0.071
YE$_i$	0.014	0.266	0.790	0.008	0.152	0.879	0.004	0.074	0.941
Loss$_i$	-0.156	-3.038	0.002	-0.141	-2.733	0.06	-0.139	-2.696	0.007
Big$_i$	0.350	7.992	0.000	0.359	8.140	0.000	0.354	8.005	0.000
n		1187			1163			1160	
F-Statistic		326.530			321.915			319.788	
P-Value		0.000			0.000			0.000	
Adjusted R sq.		0.767			0.768			0.767	
Test variables are all one-tailed									

$$AF2002_i = \alpha_0 + \alpha_1 \Delta Conc_i + \alpha_2 LnTA_i + \alpha_3 LnSUB_i + \alpha_4 CATA_i + \alpha_5 QUICK_i$$
$$+ \alpha_6 DE_i + \alpha_7 ROI_i + \alpha_8 Foreign + \alpha_9 Opinion_i + \alpha_{10} YE_i + \alpha_{11} Loss_i + \alpha_{12} Big + \varepsilon_i$$

Where

All variables previously defined

Table A1.3
(Corresponds to Table 4.4)
Descriptive statistics for the sample used in Hypothesis 2 (audit service fee model)

This table details the descriptive statistics for the sample identified in Table 4.1 (Panel B), and used to test the impact of the AA–EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership (H2) using the audit service fee model.

Panel A – Descriptives for National Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	241	8.700	16.493	11.427	1.397
$LnTA_i$	241	13.044	26.243	18.067	2.449
$LnSUB_i$	241	0.000	7.049	1.897	1.512
$CATA_i$	241	0.001	1.000	0.445	0.294
$QUICK_i$	241	0.006	84.656	5.701	14.053
DE_i	241	0.000	0.817	0.122	0.150
ROI_i	241	-9.930	1.000	-0.127	0.747
$Foreign_i$	241			0.169	
$Opinion_i$	241			0.162	
YE_i	241			0.170	
$Loss_i$	241			0.573	
Big_i	241			1.000	
$ContinueLead_i$	241			0.062	
$NewLead_i$	241			0.299	
$LossLead_i$	241			0.000	
$NeverLead_i$	241			0.639	

Panel B - Descriptives for City Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	239	8.700	16.493	11.423	1.395
$LnTA_i$	239	13.044	26.243	18.063	2.444
$LnSUB_i$	239	0.000	7.049	1.891	1.511
$CATA_i$	239	0.001	1.000	0.445	0.296
$QUICK_i$	239	0.006	84.656	5.741	14.105
DE_i	239	0.000	0.817	0.123	0.151
ROI_i	239	-9.930	1.000	-0.127	0.750
$Foreign_i$	239			0.168	
$Opinion_i$	239			0.159	
YE_i	239			0.172	
$Loss_i$	239			0.569	
Big_i	239			1.000	
$ContinueLead_i$	239			0.586	
$NewLead_i$	239			0.000	
$LossLead_i$	239			0.000	
$NeverLead_i$	239			0.414	

Panel C - Descriptives for City Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	238	8.700	16.493	11.419	1.396
$LnTA_i$	238	13.044	26.243	18.047	2.436
$LnSUB_i$	238	0.000	7.049	1.887	1.513
$CATA_i$	238	0.001	1.000	0.446	0.296
$QUICK_i$	238	0.006	84.656	5.763	14.131
DE_i	238	0.000	0.817	0.121	0.149
ROI_i	238	-9.930	1.000	-0.128	0.751
$Foreign_i$	238			0.168	
$Opinion_i$	238			0.160	
YE_i	238			0.172	
$Loss_i$	238			0.571	
Big_i	238			1.000	
$ContinueLead_i$	238			0.210	
$NewLead_i$	238			0.319	
$LossLead_i$	238			0.038	
$NeverLead_i$	238			0.433	

All variables previously defined

Table A1.4
(Corresponds to Table 5.2)
Results of tests of the audit service fee benefits to EY following the AA–EY merger (H2) using the audit service fee model

This table details the results of the test of the impact of the AA-EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership (H2). The sample used is drawn from the sample of 2002 Australian listed companies audited by EY, and the sample selection is provided in Table 4.1 (Panel B). The test used is an OLS regression model with $2002AF_i$ as the dependent variable and control variables for the audit service fee regression model (Hamilton et al. 2008) and $ContinueLead_i$, $NewLead_i$, and $LossLead_i$ as independent variables. The market is defined at the national industry, city and city industry level.

	National Industry			City			City Industry		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	3.852	7.645	0.000	4.188	8.103	0.000	4.016	7.714	0.000
$ContinueLead_i$	0.254	1.454	0.074	-0.219	-2.620	0.005	0.150	1.317	0.095
$NewLead_i$	0.256	2.703	0.004	-	-	-	-0.053	-0.541	0.295
$LossLead_i$	-	-	-	-	-	-	0.267	1.211	0.114
$LnTA_i$	0.374	13.331	0.000	0.363	12.626	0.000	0.366	12.587	0.000
$LnSUB_i$	0.222	6.208	0.000	0.244	6.807	0.000	0.237	6.443	0.000
$CATA_i$	0.660	4.123	0.000	0.734	4.641	0.000	0.749	4.662	0.000
$QUICK_i$	-0.007	-2.241	0.026	-0.007	-2.211	0.028	-0.008	-2.478	0.014
DE_i	0.713	1.862	0.064	0.734	1.910	0.057	0.793	2.011	0.045
ROI_i	-0.153	-2.576	0.011	-0.161	-2.723	0.007	-0.165	-2.755	0.006
$Foreign_i$	0.336	2.115	0.036	0.403	2.520	0.012	0.357	2.210	0.028
$Opinion_i$	0.013	0.103	0.918	-0.036	-0.294	0.769	-0.013	-0.107	0.915
YE_i	-0.093	-0.835	0.405	-0.094	-0.844	0.399	-0.151	-1.316	0.189
$Loss_i$	-0.174	-1.654	0.100	-0.170	-1.614	0.108	-0.185	-1.720	0.087

n	1187	1163	1160
F-Statistic	83.335	88.201	73.014
P-Value	0.000	0.000	0.000
Adjusted R sq.	0.805	0.801	0.798
Test variables are all one-tailed			

$$AF2002_i = \alpha_0 + \alpha_1 ContinueLead_i + \alpha_2 NewLead_i + \alpha_3 LossLead_i + \alpha_4 LnTA_i + \alpha_5 LnSUB_i + \alpha_6 CATA_i + \alpha_7 QUICK_i + \alpha_8 DE_i + \alpha_9 ROI_i + \alpha_{10} Foreign + \alpha_{11} Opinion_i + \alpha_{12} YE_i + \alpha_{13} Loss_i + \alpha_{14} Big + \varepsilon_i$$

Where
All variables previously defined

Table A1.5
(Corresponds to Table 4.6)
Descriptive statistics for the sample used in Hypothesis 4 (audit service fee model)

This table details the descriptive statistics for the sample identified in Table 4.1 (Panel B), and used to test the impact of the AA–EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership, controlling for former AA clients (H4), using the audit service fee model.

Panel A – Descriptives for National Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
AA_i	241			0.261	
AA_i*$ContinueLead_i$	241			0.012	
AA_i*$NewLead_i$	241			0.091	
AA_i*$LossLead_i$	241			0.000	
AA_i*$NeverLead_i$	241			0.158	

Panel B - Descriptives for City Sample					
	n	Minimum	Maximum	Mean	St. Dev.
AA_i	239			0.264	
AA_i*$ContinueLead_i$	239			0.126	
AA_i*$NewLead_i$	239			0.000	
AA_i*$LossLead_i$	239			0.000	
AA_i*$NeverLead_i$	239			0.138	

Panel C - Descriptives for City Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
AA_i	238			0.265	
AA_i*$ContinueLead_i$	238			0.038	
AA_i*$NewLead_i$	238			0.118	
AA_i*$LossLead_i$	238			0.004	
AA_i*$NeverLead_i$	238			0.105	

All variables previously defined

Table A1.6
(Corresponds to Table 5.4)
Results of tests of the audit service fee benefits to EY following the AA–EY merger, controlling for former AA clients (H4), using the audit service fee model

This table details the results of the test of the impact of the AA–EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership, controlling for former AA clients (H4). The sample used is drawn from the sample of 2002 Australian listed companies audited by EY, and the sample selection is provided in Table 4.1 (Panel B). The test used is an OLS regression model with $2002AF_i$ as the dependent variable and control variables for the audit service fee regression model (Hamilton et al. 2008), $ContinueLead_i$, $NewLead_i$, $LossLead_i$, AA_i, and AA_i interaction terms as independent variables. The market is defined at the national industry, city and city industry level.

	National Industry			City			City Industry		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	3.827	7.546	0.000	4.220	8.161	0.000	4.096	7.768	0.000
$ContinueLead_i$	0.329	1.668	0.049	-0.297	-2.967	0.002	0.266	2.105	0.018
$NewLead_i$	0.360	3.220	0.001	-	-	-	0.017	0.148	0.442
$LossLead_i$	-	-	-	-	-	-	0.422	1.796	0.037
AA_i	0.161	1.376	0.085	-0.139	-1.021	0.155	0.301	2.063	0.020
AA_i*$ContinueLead_i$	-0.309	-0.720	0.236	0.187	1.477	0.071	-0.543	-1.971	0.025
AA_i*$NewLead_i$	-0.355	-1.774	0.039	-	-	-	-0.290	-1.385	0.084
AA_i*$LossLead_i$	-	-	-	-	-	-	-1.006	-1.445	0.075
$LnTA_i$	0.373	13.232	0.000	0.365	12.654	0.000	0.359	12.257	0.000
$LnSUB_i$	0.223	6.185	0.000	0.242	6.717	0.000	0.235	6.391	0.000
$CATA_i$	0.636	3.902	0.000	0.715	4.508	0.000	0.751	4.637	0.000
$QUICK_i$	-0.007	-2.092	0.038	-0.007	-2.129	0.034	-0.009	-2.752	0.006
DE_i	0.724	1.888	0.060	0.749	1.943	0.053	0.879	2.227	0.027
ROI_i	-0.142	-2.390	0.018	-0.158	-2.672	0.008	-0.167	-2.774	0.006
$Foreign_i$	0.361	2.256	0.025	0.394	2.464	0.014	0.328	2.031	0.043

$Opinion_i$	0.020	0.158	0.875	-0.038	-0.311	0.756	-0.024	-0.193	0.847
YE_i	-0.089	-0.791	0.430	-0.103	-0.918	0.360	-0.175	-1.522	0.129
$Loss_i$	-0.180	-1.704	0.090	-0.172	-1.618	0.107	-0.173	-1.601	0.111
n		241			239			238	
F-Statistic		67.041			74.860			56.793	
P-Value		0.000			0.000			0.000	
Adjusted R sq.		0.805			0.801			0.800	
Test variables are all one-tailed									

$$AF2002_i = \alpha_0 + \alpha_1 ContinueLead_i + \alpha_2 NewLead_i + \alpha_3 LostLead_i + \alpha_4 AA_i + \alpha_5 AA_i * ContinueLead_i + \alpha_6 AA_i * NewLead_i + \alpha_7 AA_i * LostLead_i$$
$$+ \alpha_8 LnTA_i + \alpha_9 LnSUB_i + \alpha_{10} CATA_i + \alpha_{11} QUICK_i + \alpha_{12} DE_i + \alpha_{13} ROI_i + \alpha_{14} Foreign + \alpha_{15} Opinion_i + \alpha_{16} YE_i + \alpha_{17} Loss_i + \varepsilon_i$$

Where
All variables previously defined

Appendix 2

Results using alternate EstAF

The control variable *EstAF* is defined as the audit service paid by the client to their auditor in 2001. As discussed in Section 3.2.3 this assumes audit service fees follow a random walk. An alternate method for defining *EstAF* is to extract the coefficients of the audit service fee model based on the 2001 sample. These coefficients are then multiplied by the clients' 2002 characteristics to provide an estimate of the lagged audit service fees in 2002. As such, the hypotheses which use the lagged audit services fee model (H1, H3 and H5) are replicated using this alternate definition of *EstAF*.

Table A2.1
(Corresponds to Table 4.3)
Descriptive statistics for the sample used in Hypothesis 1 (alternate EstAF)

This table details the descriptive statistics for the sample identified in Table 4.1 (Panel A), and used to test the impact of the AA–EY merger on the competitiveness of the Australian audit service market (H1) using an alternate definition of *EstAF*.

Panel A – Descriptives for National Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	1187	7.601	16.493	10.980	1.396
$EstAF_i$	1187	7.560	15.797	10.756	1.285
$\Delta Conc_i$	1187	-0.227	0.198	0.035	0.057
ΔConc (% positive)	1187			0.840	

Panel B - Descriptives for City Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	1163	7.601	16.493	10.983	1.392
$EstAF_i$	1163	7.560	15.797	10.759	1.288
$\Delta Conc_i$	1163	-0.040	0.090	0.073	0.027
ΔConc (% positive)	1163			0.961	

Panel C - Descriptives for City Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	1160	7.601	16.493	10.983	1.392
$EstAF_i$	1160	7.560	15.797	10.758	1.288
$\Delta Conc_i$	1160	-0.506	0.983	0.037	0.134
ΔConc (% positive)	1160			0.609	

Where

$EstAF_i$: Estimated natural log of audit service fees. Calculated by taking 2001 audit service fee model coefficients and multiplying by client *i* 2002 characteristics.

All other variables as previously defined

Table A2.2
(Corresponds to Table 5.1)
Results of tests of the competitiveness of the Australian audit service market (H1) using an alternate definition of EstAF

This table details the results of the test of the impact of the AA–EY merger on the competitiveness of the Australian audit service market (H1). The sample used is drawn from the full sample of 2002 Australian listed companies, and the sample selection is provided in Table 4.1 (Panel A). The test used is an OLS regression model with $2002AF_i$ as the dependent variable and $EstAF_i$ and $\Delta Conc_i$ as independent variables. The market is defined at the national industry, city and city industry level.

Panel A – Continuous Concentration Variable									
	National Industry			**City**			**City Industry**		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	0.693	4.081	0.000	0.835	4.631	0.000	0.827	4.912	0.000
$\Delta Conc_i$	0.931	2.673	0.004	-0.202	-0.275	0.392	-0.074	-0.495	0.311
$EstAF_i$	0.953	61.567	0.000	0.945	61.151	0.000	0.944	60.979	0.000
n		1187			1163			1160	
F-Statistic		1908.788			1885.909			1877.940	
P-Value		0.000			0.000			0.000	
Adjusted R sq.		0.763			0.764			0.764	
Test variables are all one-tailed									

Panel B - Indicator as Postive / Not Positive Change in Concentration									
	National Industry			City			City Industry		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	0.574	3.086	0.002	0.613	3.088	0.002	0.866	5.010	0.000
ΔConc (% Positive)$_i$	0.138	2.494	0.006	0.194	1.887	0.030	-0.045	-1.105	0.135
EstAF$_i$	0.957	60.761	0.000	0.947	61.518	0.000	0.943	60.765	0.000
n		1187			1163			1160	
F-Statistic		1906.847			1893.313			1880.011	
P-Value		0.000			0.000			0.000	
Adjusted R sq.		0.763			0.765			0.764	
Test variables are all one-tailed									

$$AF2002_i = \alpha_0 + \alpha_1 \Delta Conc_i + \alpha_2 EstAF_i + \varepsilon_i$$

Where

EstAF$_i$: Estimated natural log of audit service fees. Calculated by taking 2001 audit service fee model coefficients and multiplying by client *i* 2002 characteristics.

All other variables previously defined

Table A2.3
(Corresponds to Table 4.4)
Descriptive statistics for the sample used in Hypothesis 2 (alternate EstAF)

This table details the descriptive statistics for the sample identified in Table 4.1 (Panel B), and used to test the impact of the AA–EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership (H2) using an alternate definition of *EstAF*.

Panel A – Descriptives for National Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	241	8.700	16.493	11.427	1.397
$EstAF_i$	241	8.005	15.797	11.271	1.334
$ContinueLead_i$	241			0.062	
$NewLead_i$	241			0.299	
$LossLead_i$	241			0.000	
$NeverLead_i$	241			0.639	

Panel B - Descriptives for City Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	239	8.700	16.493	11.423	1.395
$EstAF_i$	239	8.005	15.797	11.266	1.331
$ContinueLead_i$	239			0.586	
$NewLead_i$	239			0.000	
$LossLead_i$	239			0.000	
$NeverLead_i$	239			0.414	

Panel C - Descriptives for City Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	238	8.700	16.493	11.419	1.396
$EstAF_i$	238	8.005	15.797	11.260	1.330
$ContinueLead_i$	238			0.210	
$NewLead_i$	238			0.319	
$LossLead_i$	238			0.038	
$NeverLead_i$	238			0.433	

Where

$EstAF_i$: Estimated natural log of audit service fees. Calculated by taking 2001 audit service fee model coefficients and multiplying by client *i* 2002 characteristics.

All other variables as previously defined

Table A2.4
(Corresponds to Table 5.2)
Results of tests of the audit service fee benefits to EY following the AA–EY merger (H2) using an alternate definition of EstAF

This table details the results of the test of the impact of the AA-EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership (H2). The sample used is drawn from the sample of 2002 Australian listed companies audited by EY, and the sample selection is provided in Table 4.1 (Panel B). The test used is an OLS regression model with $2002AF_i$ as the dependent variable and $EstAF_i$, $ContinueLead_i$, $NewLead_i$, and $LossLead_i$ as independent variables. The market is defined at the national industry, city and city industry level.

	National Industry			**City**			**City Industry**		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	0.934	2.642	0.000	1.055	2.944	0.004	0.957	2.648	0.000
$ContinueLead_i$	0.134	0.772	0.221	-0.182	-2.155	0.016	0.048	0.431	0.334
$NewLead_i$	0.187	2.034	0.022	-	-	-	-0.083	-0.844	0.200
$LossLead_i$	-	-	-	-	-	-	0.185	0.815	0.208
$EstAF_i$	0.925	29.642	0.000	0.930	29.633	0.000	0.930	29.167	0.000
n		241			239			238	
F-Statistic		298.533			440.045			214.307	
P-Value		0.000			0.000			0.000	
Adjusted R sq.		0.788			0.787			0.783	
Test variables are all one-tailed									

$$AF2002_i = \alpha_0 + \alpha_1 ContinueLead_i + \alpha_2 NewLead_i + \alpha_3 LostLead_i + \alpha_4 EstAF_i + \varepsilon_i$$

Where
All variables previously defined

Table A2.5
(Corresponds to Table 4.6)
Descriptive statistics for Hypothesis 4 (alternate EstAF)

This table details the descriptive statistics for the sample identified in Table 4.1 (Panel B), and used to test the impact of the AA–EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership, controlling for former AA clients (H4), and using an alternate definition of *EstAF*.

Panel A – Descriptives for National Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
AA_i	241			0.261	
AA_i*$ContinueLead_i$	241			0.012	
AA_i*$NewLead_i$	241			0.091	
AA_i*$LossLead_i$	241			0.000	
AA_i*$NeverLead_i$	241			0.158	

Panel B - Descriptives for City Sample					
	n	Minimum	Maximum	Mean	St. Dev.
AA_i	239			0.264	
AA_i*$ContinueLead_i$	239			0.126	
AA_i*$NewLead_i$	239			0.000	
AA_i*$LossLead_i$	239			0.000	
AA_i*$NeverLead_i$	239			0.138	

Panel C - Descriptives for City Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
AA_i	238			0.265	
AA_i*$ContinueLead_i$	238			0.038	
AA_i*$NewLead_i$	238			0.118	
AA_i*$LossLead_i$	238			0.004	
AA_i*$NeverLead_i$	238			0.105	

Where

All variables as previously defined

Table A2.6
(Corresponds to Table 5.4)
Results of tests of the audit service fee benefits to EY following the AA–EY merger, controlling for former AA clients (H4) using an alternate definition of EstAF

This table details the results of the test of the impact of the AA–EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership, controlling for former AA clients (H4). The sample used is drawn from the sample of 2002 Australian listed companies audited by EY, and the sample selection is provided in Table 4.1 (Panel B). The test used is an OLS regression model with $2002AF_i$ as the dependent variable and $EstAF_i$, $ContinueLead_i$, $NewLead_i$, $LossLead_i$, AA_i, and AA_i interaction terms as independent variables. The market is defined at the national industry, city and city industry level.

	National Industry			City			City Industry		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	0.882	2.459	0.015	1.083	3.001	0.003	1.002	2.694	0.008
$ContinueLead_i$	0.203	1.037	0.151	-0.228	-2.262	0.013	0.179	1.429	0.077
$NewLead_i$	0.271	2.493	0.007	-	-	-	-0.028	-0.234	0.408
$LossLead_i$	-	-	-	-	-	-	0.321	1.332	0.092
AA_i	0.161	1.336	0.092	-0.066	-0.472	0.319	0.295	1.980	0.025
AA_i*$ContinueLead_i$	-0.306	-0.707	0.240	0.175	0.916	0.181	-0.614	-2.179	0.015
AA_i*$NewLead_i$	-0.308	-1.503	0.067	-	-	-	-0.245	-1.135	0.129
AA_i*$LossLead_i$	-	-	-	-	-	-	-0.849	-1.204	0.115
$EstAF_i$	0.926	29.132	0.000	0.929	29.110	0.000	0.920	27.930	0.000
n		241			239			238	
F-Statistic		149.534			219.232			109.041	
P-Value		0.000			0.000			0.000	
Adjusted R sq.		0.788			0.786			0.785	

Test variables are all one-tailed			

$$AF2002_i = \alpha_0 + \alpha_1 ContinueLead_i + \alpha_2 NewLead_i + \alpha_3 LostLead_i + \alpha_4 AA_i$$

$$+\alpha_5 AA_i * ContinueLead_i + \alpha_6 AA_i * NewLead_i + \alpha_7 AA_i * LostLead_i + \alpha_8 EstAF_i + \varepsilon_i$$

Where
All variables previously defined

Appendix 3

Results using alternate ΔConc

For the test of H1 in the main tables, Δ*Conc* was defined as the change in the four firm HHI. An alternate measure of concentration, as noted in Section 3.2.2 is the CR. As such, Appendix 3 replicates the tests of the effect of the merger on the market using the change in the four firm CR as Δ*Conc*.

Table A3.1
(Corresponds to Table 4.3)
Descriptive statistics for the sample used in Hypothesis 1 (Alternate ΔConc)

This table details the descriptive statistics for the sample identified in Table 4.1 (Panel A), and used to test the impact of the AA–EY merger on the competitiveness of the Australian audit service market (H1) using an alternate definition of *ΔConc*.

Panel A – Descriptives for National Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	1187	7.601	16.493	10.980	1.396
$EstAF_i$	1187	7.313	16.664	10.826	1.391
$\Delta Conc_i$	1187	0.000	0.123	0.053	0.034
ΔConc (% positive)				99.2%	

Panel B - Descriptives for City Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	1163	7.601	16.493	10.983	1.392
$EstAF_i$	1163	7.313	16.664	10.829	1.383
$\Delta Conc_i$	1163	0.043	0.119	0.103	0.021
ΔConc (% positive)	1163			100.0%	

Panel C - Descriptives for City Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	1160	7.601	16.493	10.983	1.392
$EstAF_i$	1160	7.313	16.664	10.828	1.383
$\Delta Conc_i$	1160	-0.093	0.119	0.035	0.040
ΔConc (% positive)	1160			75.9%	

Where

$AF2002_i$	:	Natural log of audit service fees paid by client *i* in 2002
$EstAF_i$	:	Natural log of audit service fees paid by client *i* in 2001
$\Delta Conc_i$	:	2002 market four firm CR less the 2001 market four firm CR
ΔConc (% positive)	:	Indicator variable, coded 1 if $\Delta Conc_i$ is positive, 0 otherwise

Table A3.2
(Corresponds to Table 5.1)
Results of tests of the competitiveness of the Australian audit service market (H1) using an alternate definition of ΔConc

This table details the results of the test of the impact of the AA–EY merger on the competitiveness of the Australian audit service market (H1). The sample used is drawn from the full sample of 2002 Australian listed companies, and the sample selection is provided in Table 4.1 (Panel A). The test used is an OLS regression model with $2002AF_i$ as the dependent variable and $EstAF_i$ and $\Delta Conc_i$ as independent variables. The market is defined at the national industry, city and city industry level.

Panel A – Continuous Concentration Variable									
	National Industry			**City**			**City Industry**		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	1.016	8.048	0.000	0.859	6.467	0.000	0.956	7.493	0.000
$\Delta Conc_i$	-1.135	-2.517	0.006	0.297	0.410	0.341	-0.752	-1.897	0.029
$EstAF_i$	0.926	83.529	0.000	0.932	82.664	0.000	0.928	81.707	0.000
n		1187			1163			1160	
F-Statistic		3578.913			3521.502			3515.650	
P-Value		0.000			0.000			0.000	
Adjusted R sq.		0.858			0.858			0.858	
Test variables are all one-tailed									

Panel B - Indicator as Postive / Not Positive Change in Concentration									
	National Industry			City			City Industry		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	1.039	4.575	0.000	-	-	-	0.959	7.238	0.000
ΔConc (% Positive)$_i$	-0.113	-0.632	0.264	-	-	-	-0.054	-1.462	0.072
EstAF$_i$	0.929	83.545	0.000	-	-	-	0.929	81.756	0.000
n		1187			-			1160	
F-Statistic		3558.114			-			3510.498	
P-Value		0.000			-			0.000	
Adjusted R sq.		0.857			-			0.858	
Test variables are all one-tailed									

$$AF2002_i = \alpha_0 + \alpha_1 \Delta Conc_i + \alpha_2 EstAF_i + \varepsilon_i$$

Where

$\Delta Conc_i$: 2002 market four firm CR less the 2001 market four firm CR

All other variables previously defined

Appendix 4

Results including level of concentration

For the test of H1 in the main tables, only the change in the level of concentration was included as an independent variable (notwithstanding the control variable *EstAF*). To further examine the impact of concentration on audit service fees, the level of concentration is included in the model for Appendix 4. The level of concentration is defined as the four firm HHI in the market for 2002.

Table A4.1
(Corresponds to Table 4.3)
Descriptive statistics for the sample used in Hypothesis 1 (including Conc)

This table details the descriptive statistics for the sample identified in Table 4.1 (Panel A), and used to test the impact of the AA–EY merger on the competitiveness of the Australian audit service market (H1). Includes the level of concentration in the market.

Panel A – Descriptives for National Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	1187	7.601	16.493	10.980	1.396
$EstAF_i$	1187	7.313	16.664	10.826	1.391
$Conc_i$	1187	0.105	0.592	0.249	0.101
$\Delta Conc_i$	1187	-0.227	0.198	0.035	0.057
ΔConc (% positive)				84.0%	

Panel B - Descriptives for City Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	1163	7.601	16.493	10.983	1.392
$EstAF_i$	1163	7.313	16.664	10.829	1.383
$Conc_i$	1163	0.109	0.246	0.226	0.027
$\Delta Conc_i$	1163	-0.040	-0.090	0.073	0.027
ΔConc (% positive)	1163			96.1%	

Panel C - Descriptives for City Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	1160	7.601	16.493	10.983	1.392
$EstAF_i$	1160	7.313	16.664	10.828	1.383
$Conc_i$	1160	0.000	1.000	0.282	0.040
$\Delta Conc_i$	1160	-0.506	0.983	0.037	0.197
ΔConc (% positive)	1160			60.9%	

Where

$AF2002_i$	:	Natural log of audit service fees paid by client *i* in 2002
$EstAF_i$	:	Natural log of audit service fees paid by client *i* in 2001
$Conc_i$	:	2002 market four firm HHI
$\Delta Conc_i$	:	2002 market four firm HHI less the 2001 market four firm HHI
ΔConc (% positive)	:	Indicator variable, coded 1 if $\Delta Conc_i$ is positive, 0 otherwise

Table A4.2
(Table Corresponds to 5.1)
Results of tests of the competitiveness of the Australian audit service market (H1) including Conc

This table details the results of the test of the impact of the AA-EY merger on the competitiveness of the Australian audit service market (H1). The sample used is drawn from the full sample of 2002 Australian listed companies, and the sample selection is provided in Table 4.1 (Panel A). The test used is an OLS regression model with $2002AF_i$ as the dependent variable and $EstAF_i$, $Conc_i$ and $\Delta Conc_i$ as independent variables. The market is defined at the national industry, city and city industry level.

Panel A – Continuous Concentration Variable									
	National Industry			**City**			**City Industry**		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	0.896	7.213	0.000	0.806	4.633	0.000	0.869	7.085	0.000
$\Delta Conc_i$	-0.660	-2.171	0.015	-0.802	-0.902	0.184	-0.026	-0.197	0.422
$Conc_i$	0.300	1.738	0.041	0.757	0.843	0.200	0.146	1.653	0.050
$EstAF_i$	0.927	83.734	0.000	0.929	79.246	0.000	0.930	81.863	0.000
n		1187			1163			1160	
F-Statistic		2381.693			2347.296			2340.607	
P-Value		0.000			0.000			0.000	
Adjusted R sq.		0.858			0.858			0.858	
Test variables are all one-tailed									

Panel B - Indicator as Postive / Not Positive Change in Concentration									
	National Industry			City			City Industry		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	1.008	7.500	0.000	0.724	4.246	0.000	0.896	7.097	0.000
ΔConc (% Positive)$_i$	-0.096	-2.269	0.012	-0.493	-2.965	0.002	-0.029	-0.885	0.188
Conc$_i$	0.135	0.889	0.187	3.257	2.717	0.003	0.154	1.906	0.028
EstAF$_i$	0.925	83.150	0.000	0.923	79.402	0.000	0.929	82.055	0.000
n		1187			1163			1160	
F-Statistic		2382.707			2366.100			2342.362	
P-Value		0.000			0.000			0.000	
Adjusted R sq.		0.858			0.859			0.858	
Test variables are all one-tailed									

$$AF2002_i = \alpha_0 + \alpha_1 \Delta Conc_i + \alpha_2 Conc_i + \alpha_3 EstAF_i + \varepsilon_i$$

Where

ΔConc$_i$: 2002 market four firm HHI less the 2001 market four firm HHI

Conc$_i$: 2002 market four firm HHI

All other variables previously defined

Appendix 5

Results excluding outliers

In the process of preparing the sample for the efficiency tests (H3 and H5), it was noted that a small number of observations exhibited extreme values for both *Lag2001* and *Lag2002*. In Appendix 5, a reduced sample is used in which *Lag2001* and *Lag2002* are limited to a maximum of 100 days. This reduces each of the samples (national industry, city, and city industry) by 24 observations each.

Table A5.1
(Corresponds to Table 4.5)
Descriptive statistics for the sample used in Hypothesis 3 (outliers removed)

This table details the descriptive statistics for the sample used to test the impact of the AA–EY merger on EY's ability to increase audit efficiency to clients in markets in which it gained leadership (H3). The sample is based on that documented in Table 4.1 (Panel C), but only including observations for which $Lag2002_i$ and $Lag2001_i$ are less than 100 days.

Panel A - Descriptives for National Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$Lag2002_i$	215	23.000	96.000	74.674	16.268
$Lag2001_i$	215	16.000	95.000	73.698	16.291
$ContinueLead_i$	215			0.056	
$NewLead_i$	215			0.298	
$LossLead_i$	215			0.000	
$NeverLead_i$	215			0.647	

Panel B - Descriptives for City Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$Lag2002_i$	213	23.000	96.000	74.737	16.329
$Lag2001_i$	213	16.000	95.000	73.690	16.347
$ContinueLead_i$	213			0.592	
$NewLead_i$	213			0.000	
$LossLead_i$	213			0.000	
$NeverLead_i$	213			0.408	

Panel C - Descriptives for City Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$Lag2002_i$	212	23.000	96.000	74.670	16.338
$Lag2001_i$	212	16.000	95.000	73.613	16.347
$ContinueLead_i$	212			0.208	
$NewLead_i$	212			0.325	
$LossLead_i$	212			0.038	
$NeverLead_i$	212			0.429	

Where

$Lag2002_i$: The number of days between the signing of the client *i*'s 2002 audit report and client *i*'s financial year end

$Lag2001_i$: The number of days between the signing of the client *i*'s 2001 audit report and client *i*'s financial year end

All other variables previously defined

Table A5.2
(Corresponds to Table 5.3)
Results of tests of the audit efficiency benefits to EY following the AA–EY merger (H3) with outliers removed

This table details the results of the test of the impact of the AA–EY merger on EY's ability to increase audit efficiency to clients in markets in which it gained leadership (H3). The sample used is drawn from the sample of 2002 Australian listed companies audited by EY, with a maximum of 100 days for either $Lag2001_i$ or $Lag2002_i$. The test used is an OLS regression model with $Lag2002_i$ as the dependent variable and $Lag2001_i$, $ContinueLead_i$, $NewLead_i$, and $LossLead_i$ as independent variables. The market is defined at the national industry, city and city industry level.

	National Industry			City			City Industry		
	est.	t-stat	prob.	est.	t-stat	prob.	est.	t-stat	prob.
(Constant)	26.558	6.717	0.000	26.051	6.536	0.000	24.355	6.203	0.000
$ContinueLead_i$	0.890	-0.240	0.406	0.139	0.081	0.468	7.091	3.187	0.001
$NewLead_i$	-1.078	-0.580	0.282	-	-	-	2.445	1.265	0.104
$LossLead_i$	-	-	-	-	-	-	0.437	0.098	0.461
$Lag2001_i$	0.657	12.661	0.000	0.660	12.723	0.000	0.652	12.779	0.000
n		215			213			212	
F-Statistic		54.479			81.278			44.339	
P-Value		0.000			0.000			0.000	
Adjusted R Sq.		0.428			0.431			0.451	
Test variables are one-tailed									

$$Lag2002_i = \beta_0 + \beta_1 ContinueLead_i + \beta_2 NewLead_i + \beta_3 LostLead_i + \beta_4 Lag2001_i + \varepsilon_i$$

Where all variables previously defined

Table A5.3
(Corresponds to Table 4.7)
Descriptive statistics for sample used in Hypothesis 5 (outliers removed)

This table details the descriptive statistics for the sample used to test the impact of the AA–EY merger on EY's ability to increase audit efficiency to clients in markets in which it gained leadership (H5). The sample is based on that documented in Table 4.1 (Panel C), but only including observations for which $Lag2002_i$ and $Lag2001_i$ are less than 100 days.

Panel A - Descriptives for National Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
AA_i	215			0.284	
AA_i*$ContinueLead_i$	215			0.014	
AA_i*$NewLead_i$	215			0.102	
AA_i*$LossLead_i$	215			0.000	
AA_i*$NeverLead_i$	215			0.167	

Panel B - Descriptives for City Sample					
	n	Minimum	Maximum	Mean	St. Dev.
AA_i	213			0.286	
AA_i*$ContinueLead_i$	213			0.131	
AA_i*$NewLead_i$	213			0.000	
AA_i*$LossLead_i$	213			0.000	
AA_i*$NeverLead_i$	213			0.155	

Panel C - Descriptives for City Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
AA_i	212			0.288	
AA_i*$ContinueLead_i$	212			0.042	
AA_i*$NewLead_i$	212			0.123	
AA_i*$LossLead_i$	212			0.005	
AA_i*$NeverLead_i$	212			0.118	

Where

$Lag2002_i$: The number of days between the signing of the client *i*'s 2002 audit report and client *i*'s financial year end

$Lag2001_i$: The number of days between the signing of the client *i*'s 2001 audit report and client *i*'s financial year end

All other variables previously defined

Appendix 5.4

(Corresponds to Table 5.5)

Results of tests of the audit efficiency benefits to EY following the AA–EY merger (H5) with outliers removed

This table details the results of the test of the impact of the AA–EY merger on EY's ability to increase audit efficiency to clients in markets in which it gained leadership (H5). The sample used is drawn from the sample of 2002 Australian listed companies audited by EY, with a maximum of 100 days for either $Lag2001_i$ or $Lag2002_i$. The test used is an OLS regression model with $Lag2002_i$ as the dependent variable and $Lag2001_i$, $ContinueLead_i$, $NewLead_i$, and $LossLead_i$ as independent variables. The market is defined at the national industry, city and city industry level.

	National Industry			City			City Industry		
	est.	t-stat	prob.	est.	t-stat	prob.	est.	t-stat	prob.
(Constant)	28.389	6.875	0.000	28.529	6.635	0.000	27.508	6.699	0.000
$ContinueLead_i$	1.059	0.248	0.402	-0.539	-0.259	0.398	6.072	2.424	0.008
$NewLead_i$	0.204	0.091	0.464	-	-	-	5.202	2.199	0.015
$LossLead_i$	-	-	-	-	-	-	-0.161	-0.034	0.487
AA_i	-2.712	-0.909	0.182	-3.758	-1.368	0.087	-1.670	-0.593	0.277
AA_i*$ContinueLead_i$	-0.295	-0.034	0.487	0.522	0.138	0.446	4.751	0.895	0.186
AA_i*$NewLead_i$	-3.228	-0.802	0.212	-	-	-	-0.677	-1.636	0.052
AA_i*$LossLead_i$	-	-	-	-	-	-	3.857	0.294	0.385
$Lag2001_i$	0.639	12.097	0.000	0.645	12.313	0.000	0.615	11.791	0.000
n		215			213			212	
F-Statistic		27.919			41.739			23.681	
P-Value		0.000			0.000			0.000	
Adjusted R Sq.		0.430			0.435			0.462	

Test variables are one-tailed			

$$Lag2002_i = \beta_0 + \beta_1 ContinueLead_i + \beta_2 NewLead_i + \beta_3 LostLead_i + \beta_4 AA_i$$

$$+\beta_5 AA_i * ContinueLead_i + \beta_6 AA_i * NewLead_i + \beta_7 AA_i * LostLead_i + \beta_8 Lag2001_i + \varepsilon_i$$

Where
All variables previously defined

Appendix 6

Results using Ln(2002/2001)

The audit service fee tests for the effect of the merger on the market generally (H1) and for EY specifically (H2 and H4) use a model which has logged current year audit service fees (*AF2002*) as the dependent variable and logged prior year audit service fees as an independent variable (*EstAF*). An alternate method is to include the change in audit service fees as the dependent variable, negating the requirement for the prior year audit service fees as a control. As such, Appendix 6 replicates the tests of H1, H2 and H4 using $Ln\Delta AF$ as the dependent variable. $Ln\Delta AF$ is defined as the natural logarithm of the ratio of current year audit services fees to prior year audit service fees.

Table A6.1
(Corresponds to Table 5.1)
Results of tests of the competitiveness of the Australian audit service market (H1) using a change fee model

This table details the results of the test of the impact of the AA-EY merger on the competitiveness of the Australian audit market (H1). The sample used is drawn from the full sample of 2002 Australian listed companies, and the sample selection is provided in Table 4.1 (Panel A). The test used is an OLS regression model with $Ln\Delta AF_i$ as the dependent variable and $\Delta Conc_i$ as the independent variable. The market is defined at the national industry, city and city industry level.

	Continuous Concentration Variable								
	National Industry			**City**			**City Industry**		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	0.164	8.964	0.000	0.150	3.322	0.001	0.149	9.198	0.000
$\Delta Conc_i$	-0.305	-1.118	0.132	0.058	0.102	0.459	0.141	1.207	0.114
n		1187			1163			1160	
F-Statistic		1.249			0.010			1.458	
P-Value		0.264			0.919			0.228	
Adjusted R sq.		0.000			-0.001			0.000	
Test variables are all one-tailed									

$$Ln\Delta AF_i = \alpha_0 + \alpha_1 \Delta Conc_i + \varepsilon_i$$

Where
$Ln\Delta AF_i$: Natural log of (2002 Audit Service Fee / 2001 Audit Service Fee)

All other variables previously defined

Table A6.2
(Corresponds to Table 5.2)
Results of tests of the audit service fee benefits to EY following the AA–EY merger (H2) using a change fee model

This table details the results of the test of the impact of the AA–EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership (H2). The sample used is drawn from the sample of 2002 Australian listed companies audited by EY, and the sample selection is provided in Table 4.1 (Panel B). The test used is an OLS regression model with $Ln\Delta AF_i$ as the dependent variable and $ContinueLead_i$, $NewLead_i$, and $LossLead_i$ as independent variables. The market is defined at the national industry, city and city industry level.

	National Industry			City			City Industry		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	0.204	4.960	0.000	0.137	2.672	0.008	0.122	2.424	0.016
$ContinueLead_i$	-0.275	-1.993	0.024	0.059	0.871	0.192	0.034	0.388	0.349
$NewLead_i$	-0.062	-0.851	0.198	-	-	-	0.132	1.705	0.045
$LossLead_i$	-	-	-	-	-	-	0.016	0.089	0.464
n		241			239			238	
F-Statistic		2.123			0.759			1.006	
P-Value		0.122			0.385			0.391	
Adjusted R sq.		0.009			-0.001			0.000	
Test variables are all one-tailed									

$$Ln\Delta AF_i = \alpha_0 + \alpha_1 ContinueLead_i + \alpha_2 NewLead_i + \alpha_3 LostLead_i + \varepsilon_i$$

Where
All variables previously defined

Table A6.3
(Corresponds to Table 5.4)
Results of tests of the audit service fee benefits to EY following the AA–EY merger, controlling for former AA clients (H4) using a change fee model

This table details the results of the test of the impact of the AA–EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership, controlling for former AA clients (H4). The sample used is drawn from the sample of 2002 Australian listed companies audited by EY, and the sample selection is provided in Table 4.1 (Panel B). The test used is an OLS regression model with $Ln\Delta AF_i$ as the dependent variable and $ContinueLead_i$, $NewLead_i$, $LossLead_i$, AA_i, and AA_i interaction terms as independent variables. The market is defined at the national industry, city and city industry level.

	National Industry			**City**			**City Industry**		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	0.214	4.516	0.000	0.184	2.913	0.004	0.177	3.049	0.003
$ContinueLead_i$	-0.325	-2.103	0.018	0.020	0.251	0.401	-0.028	-0.284	0.388
$NewLead_i$	-0.002	-0.024	0.491	-	-	-	0.096	1.024	0.153
$LossLead_i$	-	-	-	-	-	-	0.014	0.072	0.471
AA_i	-0.039	-0.413	0.340	-0.139	-1.268	0.103	-0.224	-1.902	0.029
AA_i*$ContinueLead_i$	0.241	0.702	0.242	0.103	0.677	0.249	0.268	1.207	0.114
AA_i*$NewLead_i$	-0.189	-1.169	0.122	-	-	-	0.174	1.027	0.153
AA_i*$LossLead_i$	-	-	-	-	-	-	-0.244	-0.439	0.330
n		241			239			238	
F-Statistic		1.572			0.827			1.087	
P-Value		0.169			0.480			0.372	
Adjusted R sq.		0.012			-0.002			0.003	
Test variables are all one-tailed									

$$Ln\Delta AF_i = \alpha_0 + \alpha_1 ContinueLead_i + \alpha_2 NewLead_i + \alpha_3 LostLead_i + \alpha_4 AA_i$$

$$+\alpha_5 AA_i * ContinueLead_i + \alpha_6 AA_i * NewLead_i + \alpha_7 AA_i * LostLead_i + \varepsilon_i$$

Where
All variables previously defined

Appendix 7

Results partitioning by client size

To ensure consistency of results across clients of various sizes, the samples are partitioned based on client total assets. Clients are separated into large client and small client subsamples based on median total assets for the full 2002 sample (H1) and for the EY sample (H2 and H4).

Table A7.1
(Corresponds to Table 5.1)
Results of tests of the competitiveness of the Australian audit service market (H1) partitioning by client size

This table details the results of the test of the impact of the AA–EY merger on the competitiveness of the Australian audit service market (H1). The sample used is drawn from the full sample of 2002 Australian listed companies, and the sample selection is provided in Table 4.1 (Panel A). The test used is an OLS regression model with $2002AF_i$ as the dependent variable and $EstAF_i$ and $\Delta Conc_i$ as independent variables. The market is defined at the national industry, city and city industry level. The partition is based on the median client total assets for the full sample.

Panel A – Large Clients – Continuous Concentration Variable									
	National Industry			**City**			**City Industry**		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	1.196	6.427	0.000	1.150	5.957	0.000	1.152	6.132	0.000
$\Delta Conc_i$	-0.528	-1.531	0.063	0.110	0.152	0.440	0.026	0.154	0.439
$EstAF_i$	0.916	57.820	0.000	0.918	57.495	0.000	0.919	57.326	0.000
n		605			592			590	
F-Statistic		1680.996			1653.637			1650.210	
P-Value		0.000			0.000			0.000	
Adjusted R sq.		0.848			0.848			0.848	
Test variables are all one-tailed									

Panel B – Small Clients - Continuous Concentration Variable									
	National Industry			City			City Industry		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	2.966	12.710	0.000	3.012	11.744	0.000	2.874	12.075	0.000
$\Delta Conc_i$	0.752	1.935	0.027	-1.044	-1.265	0.103	0.125	0.863	0.194
$EstAF_i$	0.710	30.318	0.000	0.717	30.071	0.000	0.722	30.527	0.000
n		582			571			570	
F-Statistic		476.613			470.563			466.968	
P-Value		0.000			0.000			0.000	
Adjusted R sq.		0.621			0.622			0.621	
Test variables are all one-tailed									

$$AF2002_i = \alpha_0 + \alpha_1 \Delta Conc_i + \alpha_2 EstAF_i + \varepsilon_i$$

Where
All other variables previously defined

Table A7.2
(Corresponds to Table 5.2)
Results of tests of the audit service fee benefits to EY following the AA-EY merger (H2) partitioning by client size

This table details the results of the test of the impact of the AA-EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership (H2). The sample used is drawn from the sample of 2002 Australian listed companies audited by EY, and the sample selection is provided in Table 4.1 (Panel B). The test used is an OLS regression model with $2002AF_i$ as the dependent variable and $EstAF_i$, $ContinueLead_i$, $NewLead_i$, and $LossLead_i$ as independent variables. The market is defined at the national industry, city and city industry level. The partition is based on the median client total assets for the full EY sample.

Panel A – Large Clients									
	National Industry			**City**			**City Industry**		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	1.647	4.167	0.000	1.647	4.238	0.000	1.596	3.996	0.000
$ContinueLead_i$	-0.107	-0.616	0.269	-0.013	-0.148	0.441	0.061	0.463	0.322
$NewLead_i$	-0.045	-0.457	0.324	-	-	-	0.131	1.396	0.083
$LossLead_i$	-	-	-	-	-	-	0.001	0.003	0.499
$EstAF_i$	0.885	26.909	0.000	0.884	27.971	0.000	0.883	26.689	0.000
n		120			119			118	
F-Statistic		257.292			391.229			194.773	
P-Value		0.000			0.000			0.000	
Adjusted R sq.		0.866			0.869			0.869	
Test variables are all one-tailed									

Panel B – Small Clients									
	National Industry			City			City Industry		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	3.585	6.103	0.000	3.485	5.446	0.000	3.352	5.583	0.000
$ContinueLead_i$	-0.224	-1.193	0.118	-0.047	-0.502	0.617	0.165	1.510	0.067
$NewLead_i$	0.170	1.762	0.040	-	-	-	0.052	0.473	0.319
$LossLead_i$	-	-	-	-	-	-	0.123	0.489	0.313
$EstAF_i$	0.661	11.500	0.000	0.677	11.348	0.000	0.681	11.901	0.000
n		121			120			120	
F-Statistic		53.853			74.637			37.880	
P-Value		0.000			0.000			0.000	
Adjusted R sq.		0.569			0.553			0.554	
Test variables are all one-tailed									

$$AF2002_i = \alpha_0 + \alpha_1 ContinueLead_i + \alpha_2 NewLead_i + \alpha_3 LostLead_i + \alpha_4 EstAF_i + \varepsilon_i$$

Where
All variables previously defined

Table A7.3
(Corresponds to Table 5.4)
Results of tests of the audit service fee benefits to EY following the AA–EY merger, controlling for former AA clients (H4) partitioning by client size

This table details the results of the test of the impact of the AA–EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership, controlling for former AA clients (H4). The sample used is drawn from the sample of 2002 Australian listed companies audited by EY, and the sample selection is provided in Table 4.1 (Panel B). The test used is an OLS regression model with $2002AF_i$ as the dependent variable and $EstAF_i$, $ContinueLead_i$, $NewLead_i$, $LossLead_i$, AA_i, and AA_i interaction terms as independent variables. The market is defined at the national industry, city and city industry level. The partition is based on the median client total assets for the full EY sample.

Panel A – Large Clients									
	National Industry			**City**			**City Industry**		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	1.602	3.973	0.000	1.604	4.104	0.000	1.420	3.533	0.001
$ContinueLead_i$	-0.153	-0.748	0.228	-0.006	-0.057	0.477	-0.057	-0.402	0.344
$NewLead_i$	-0.029	-0.229	0.410	-	-	-	0.147	1.166	0.123
$LossLead_i$	-	-	-	-	-	-	-0.094	-0.433	0.333
AA_i	-0.117	-1.039	0.150	-0.084	-0.631	0.165	-0.277	-1.973	0.026
AA_i*$ContinueLead_i$	0.134	0.337	0.368	-0.093	-0.512	0.305	0.588	1.206	0.115
AA_i*$NewLead_i$	-0.015	-0.076	0.470	-	-	-	0.103	0.527	0.299
AA_i*$LossLead_i$	-	-	-	-	-	-	-	-	-
$EstAF_i$	0.891	26.401	0.000	0.891	27.953	0.000	0.905	26.672	0.000
n		120			119			118	
F-Statistic		127.463			196.925			114.756	
P-Value		0.000			0.000			0.000	
Adjusted R sq.		0.864			0.869			0.872	

Test variables are all one-tailed			

Panel B – Small Clients									
	National Industry			City			City Industry		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	3.514	5.871	0.000	3.560	5.621	0.000	3.386	5.560	0.000
$ContinueLead_i$	-0.237	-1.157	0.125	-0.148	-1.432	0.077	0.164	1.304	0.097
$NewLead_i$	0.221	2.064	0.021	-	-	-	0.027	0.221	0.413
$LossLead_i$	-	-	-	-	-	-	0.270	0.921	0.179
AA_i	0.112	0.790	0.216	-0.227	-1.438	0.077	0.009	0.051	0.480
AA_i*$ContinueLead_i$	0.116	0.216	0.415	0.495	2.266	0.013	0.004	0.017	0.493
AA_i*$NewLead_i$	-0.258	-1.120	0.132	-	-	-	0.167	0.568	0.286
AA_i*$LossLead_i$	-	-	-	-	-	-	-0.590	-0.998	0.160
$EstAF_i$	0.665	11.366	0.000	0.675	11.402	0.000	0.678	11.633	0.000
n		121			120			120	
F-Statistic		26.820			39.642			18.748	
P-Value		0.000			0.000			0.000	
Adjusted R sq.		0.564			0.565			0.544	
Test variables are all one-tailed									

$$AF2002_i = \alpha_0 + \alpha_1 ContinueLead_i + \alpha_2 NewLead_i + \alpha_3 LostLead_i + \alpha_4 AA_i$$

$$+\alpha_5 AA_i * ContinueLead_i + \alpha_6 AA_i * NewLead_i + \alpha_7 AA_i * LostLead_i + \alpha_8 EstAF_i + \varepsilon_i$$

Where all variables are previously defined

Appendix 8

Results Using 2003 Data

As noted in Tsai and Yang (2008), there is a concern that the effects of the merger may not become apparent immediately. As such, the main tables were replicated replacing 2002 data with 2003 data. Whilst this has the benefit of allowing more time for the effects of the merger to become apparent, it also allows more confounding factors into the analysis. As such, results must be interpreted with caution.

Table A8.1
(corresponds to Table 4.3)
Descriptive Statistics for the Sample Used in Hypothesis 1 using 2003 Data

This table details the descriptive statistics for a sample generated using the same selection process as that identified in Table 4.1 (Panel A), but using 2003 data instead of 2002 data. It is used to test the impact of the AA–EY merger on the competitiveness of the Australian audit service market (H1).

Panel A – Descriptive Statistics for National Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2003_i$	1139	7.601	16.702	11.005	1.390
$EstAF_i$	1139	7.313	16.664	10.788	1.381
$\Delta Conc_i$	1139	-0.188	0.626	0.043	0.068
ΔConc (% positive)	1139			88.1%	

Panel B – Descriptive Statistics for City Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2003_i$	1117	7.601	16.702	11.013	1.391
$EstAF_i$	1117	7.313	16.664	10.793	1.384
$\Delta Conc_i$	1117	-0.074	0.258	0.093	0.043
ΔConc (% positive)	1117			96.5%	

Panel C – Descriptive Statistics for City Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2003_i$	1115	7.601	16.702	11.013	1.392
$EstAF_i$	1115	7.313	16.664	10.793	1.384
$\Delta Conc_i$	1115	-0.824	0.891	0.040	0.158
ΔConc (% positive)	1115			68.8%	

Where

$AF2003_i$	:	Natural log of audit service fees paid by client *i* in 2003
$EstAF_i$	:	Natural log of audit service fees paid by client *i* in 2001
$\Delta Conc_i$	:	2003 market four firm HHI less the 2001 market four firm HHI
ΔConc (% positive)	:	Indicator variable, coded 1 if $\Delta Conc_i$ is positive, 0 otherwise

Table A8.2
(corresponds to Table 4.4)
Descriptive Statistics for the Sample Used in Hypothesis 2 using 2003 Data

This table details the descriptive statistics for the sample generated using the same selection process as in Table 4.1 (Panel B), but using 2003 data instead of 2002 data. It is used to test the impact of the AA–EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership (H2).

Panel A – Descriptive Statistics for National Industry Sample

	n	Minimum	Maximum	Mean	St. Dev.
$AF2003_i$	239	8.659	16.702	11.494	1.363
$EstAF_i$	239	8.517	16.664	11.219	1.356
$ContinueLead_i$	239			0.063	
$NewLead_i$	239			0.234	
$LossLead_i$	239			0.021	
$NeverLead_i$	239			0.682	

Panel B – Descriptive Statistics for City Sample

	n	Minimum	Maximum	Mean	St. Dev.
$AF2003_i$	239	8.659	16.702	11.490	1.360
$EstAF_i$	239	8.517	16.664	11.215	1.351
$ContinueLead_i$	239			0.536	
$NewLead_i$	239			0.105	
$LossLead_i$	239			0.008	
$NeverLead_i$	239			0.351	

Panel C – Descriptive Statistics for City Industry Sample

	n	Minimum	Maximum	Mean	St. Dev.
$AF2003_i$	238	8.659	16.702	11.487	1.362
$EstAF_i$	238	8.517	16.664	11.210	1.351
$ContinueLead_i$	238			0.185	
$NewLead_i$	238			0.328	
$LossLead_i$	238			0.063	
$NeverLead_i$	238			0.424	

Where

$ContinueLead_i$	:	Indicator variable, coded 1 if client *i* was audited by the market leader in both 2003 and 2001, 0 otherwise
$NewLead_i$	:	Indicator variable, coded 1 if client *i* was audited by the market leader in 2003 but not in 2001, 0 otherwise
$LossLead_i$	:	Indicator variable, coded 1 if client *i* was audited by the market leader in 2001 but not in 2003, 0 otherwise
$NeverLead_i$	:	Indicator variable, coded 1 if client *i* was not audited by the market leader in either 2003 or 2001, 0 otherwise

All other variables previously defined

Table A8.3
(corresponds to Table 4.5)
Descriptive Statistics for Sample Used in Hypothesis 3 using 2003 Data

This table details the descriptive statistics for the sample generated using the same selection process as Table 4.1 (Panel C), but using 2003 data instead of 2002 data, and limiting the sample to so that $Lag2004_i$ and $Lag2001_i$ are both equal or less than 100 days. It is used to test the impact of the AA–EY merger on EY's ability to increase audit efficiency for clients in markets in which it gained leadership (H3)

Panel A – Descriptive Statistics for National Industry Sample

	n	Minimum	Maximum	Mean	St. Dev.
$Lag2003_i$	217	14.000	99.000	72.931	17.201
$Lag2001_i$	217	16.000	94.000	74.152	16.416
$ContinueLead_i$	217			0.060	
$NewLead_i$	217			0.240	
$LossLead_i$	217			0.023	
$NeverLead_i$	217			0.677	

Panel B – Descriptive Statistics for City Sample

	n	Minimum	Maximum	Mean	St. Dev.
$Lag2003_i$	217	14.000	99.000	73.055	17.234
$Lag2001_i$	217	16.000	94.000	74.263	16.442
$ContinueLead_i$	217			0.535	
$NewLead_i$	217			0.106	
$LossLead_i$	217			0.009	
$NeverLead_i$	217			0.350	

Panel C – Descriptive Statistics for City Industry Sample

	n	Minimum	Maximum	Mean	St. Dev.
$Lag2003_i$	216	14.000	99.000	72.972	17.231
$Lag2001_i$	216	16.000	94.000	74.190	16.445
$ContinueLead_i$	216			0.185	
$NewLead_i$	216			0.319	
$LossLead_i$	216			0.069	
$NeverLead_i$	216			0.426	

Where

$Lag2003_i$: The number of days between the signing of the client *i*'s 2003 audit report and client *i*'s financial year end

$Lag2001_i$: The number of days between the signing of the client *i*'s 2001 audit report and client *i*'s financial year end

All other variables previously defined

Table A8.4
(corresponds to Table 4.6)
Descriptive Statistics for the Sample Used in Hypothesis 4 using 2003 Data

This table details the descriptive statistics for the sample identified in Table A8.2 and used to test the impact of the AA–EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership, controlling for former AA clients (H4).

Panel A – Descriptive Statistics for National Industry Sample		
	n	Mean
AA_i	239	0.234
$AA*ContinueLead_i$	239	0.013
$AA*NewLead_i$	239	0.063
$AA*LossLead_i$	239	0.000
$AA*NeverLead_i$	239	0.159

Panel B – Descriptive Statistics for City Sample		
	n	Mean
AA_i	239	0.234
$AA*ContinueLead_i$	239	0.113
$AA*NewLead_i$	239	0.021
$AA*LossLead_i$	239	0.000
$AA*NeverLead_i$	239	0.100

Panel C – Descriptive Statistics for City Industry Sample		
	n	Mean
AA_i	238	0.235
$AA*ContinueLead_i$	238	0.021
$AA*NewLead_i$	238	0.113
$AA*LossLead_i$	238	0.013
$AA*NeverLead_i$	238	0.088

Where

AA_i : Indicator variable, coded 1 if client $_i$ was audited by AA in 2001, 0 otherwise

All other variables previously defined

Table A8.5
(corresponds to Table 4.7)
Descriptive Statistics for the Sample Used in Hypothesis 5 using 2003 Data

This table details the descriptive statistics for the sample identified in Table A8.3 and used to test the impact of the AA–EY merger on EY's ability to increase audit efficiency to clients in markets in which it gained leadership, controlling for former AA clients (H5).

Panel A – Descriptive Statistics for National Industry Sample		
	n	Mean
AA_i	217	0.249
$AA*ContinueLead_i$	217	0.014
$AA*NewLead_i$	217	0.069
$AA*LossLead_i$	217	0.000
$AA*NeverLead_i$	217	0.166

Panel B – Descriptive Statistics for City Sample		
	n	Mean
AA_i	237	0.249
$AA*ContinueLead_i$	237	0.120
$AA*NewLead_i$	237	0.023
$AA*LossLead_i$	237	0.000
$AA*NeverLead_i$	237	0.106

Panel C – Descriptive Statistics for City Industry Sample		
	n	Mean
AA	236	0.250
AA*ContinueLead	236	0.023
AA*NewLead	236	0.120
AA*LossLead	236	0.014
AA*NeverLead	236	0.093

Where

All variables previously defined

Table A8.6
(corresponds to Table 5.1)
Results of Tests of the Competitiveness of the Australian Audit Service Market (H1) using 2003 Data

This table details results of the test of the impact of the AA–EY merger on the competitiveness of the Australian audit service market (H1). The sample used is drawn from the full sample of 2003 Australian listed companies with all available data. The test used is an OLS regression model with $2003AF_i$ as the dependent variable and $EstAF_i$ and $\Delta Conc_i$ as independent variables. The market is defined at the national industry, city and city industry levels.

Panel A – Continuous Concentration Variable									
	National Industry			**City**			**City Industry**		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	1.277	8.919	0.000	1.250	8.054	0.000	1.241	8.679	0.000
$\Delta Conc_i$	-0.575	-2.150	0.016	-0.045	-0.108	0.457	-0.030	-0.262	0.397
$EstAF_i$	0.904	69.046	0.000	0.905	68.296	0.000	0.905	68.994	0.000
n		1139			1117			1115	
F-Statistic		2391.708			2390.066			2382.286	
P-Value		0.000			0.000			0.000	
Adjusted R sq.		0.808			0.811			0.810	
Test variables are all one-tailed									

Panel B – Indicator as Positive / Not Positive Change in Concentration									
	National Industry			City			City Industry		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	1.346	8.593	0.000	1.270	7.380	0.000	1.252	8.598	0.000
$\Delta Conc_i$	-0.088	-1.567	0.059	-0.027	-0.275	0.392	-0.018	-0.452	0.326
$EstAF_i$	0.902	68.470	0.000	0.905	69.135	0.000	0.905	69.019	0.000
n		1139			1117			1115	
F-Statistic		2386.093			2390.236			2382.644	
P-Value		0.000			0.000			0.000	
Adjusted R sq.		0.807			0.811			0.810	
Test variables are all one-tailed									

$$AF2003_i = \alpha_0 + \alpha_1 \Delta Conc_i + \alpha_2 EstAF_i + \varepsilon_i$$

Where

ΔConc : Indicator variable, coded 1 if 2003 market four firm HHI less the 2001 market four firm HHI is positive, 0 otherwise

All variables previously defined

Table A8.7
(corresponds to Table 5.2)
Results of Tests of the Audit Service Fee Benefits to EY Following the AA–EY Merger (H2) using 2003 Data

This table details results of the test of the impact of the AA–EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership (H2). The sample used is drawn from the sample of 2003 Australian listed companies audited by EY with all available data. The test used is an OLS regression model with $2003AF_i$ as the dependent variable and $EstAF_i$, $ContinueLead_i$, $NewLead_i$ and $LossLead_i$ as independent variables. The market is defined at the national industry, city and city industry levels.

	National Industry			City			City Industry		
	est.	t-stat	prob.	est.	t-stat	prob.	est.	t-stat	prob.
(Constant)	1.062	3.733	0.000	1.079	3.723	0.000	1.061	3.687	0.000
$ContinueLead_i$	0.025	0.175	0.431	-0.017	-0.234	0.408	0.114	1.203	0.115
$NewLead_i$	0.120	1.485	0.070	-0.100	-0.831	0.203	0.003	0.034	0.487
$LossLead_i$	-0.179	-0.752	0.226	0.186	0.495	0.311	-0.213	-1.471	0.071
$EstAF_i$	0.928	36.800	0.000	0.930	36.839	0.000	0.929	36.875	0.000
n		239			239			238	
F-Statistic		344.866			339.867			344.034	
P-Value		0.000			0.000			0.000	
Adjusted R Sq.		0.852			0.851			0.853	
Test variables are one-tailed									

$$AF2003_i = \alpha_0 + \alpha_1 ContinueLead_i + \alpha_2 NewLead_i + \alpha_3 LostLead_i + \alpha_4 EstAF_i + \varepsilon_i$$

Where
All variables previously defined

Table A8.8
(corresponds to Table 5.3)
Results of Tests of the Audit Efficiency Benefits to EY Following the AA–EY Merger (H3) using 2003 Data

This table details results of the test of the impact of the AA–EY merger on EY's ability to increase audit efficiency to clients in markets in which it gained leadership (H3). The sample used is drawn from the sample of 2003 Australian listed companies audited by EY, with all available data, excluding those companies with $Lag2003_i$ or $Lag2001_i$ in excess of 100 days. The test used is an OLS regression model with $Lag2003_i$ as the dependent variable and $Lag2001_i$, $ContinueLead_i$, $NewLead_i$, and $LossLead_i$ as independent variables. The market is defined at the national industry, city and city industry levels.

	National Industry			City			City Industry		
	est.	t-stat	prob.	est.	t-stat	prob.	est.	t-stat	prob.
(Constant)	25.689	5.994	0.000	26.570	6.021	0.000	23.585	5.437	0.000
$ContinueLead_i$	3.741	0.947	0.172	-1.438	-0.722	0.236	3.939	1.525	0.064
$NewLead_i$	2.077	0.946	0.173	-8.590	-2.672	0.004	4.507	2.081	0.019
$LossLead_i$	-10.494	-1.701	0.045	-3.631	-0.374	0.355	6.043	1.601	0.055
$Lag2001_i$	0.631	11.112	0.000	0.407	16.575	0.000	0.631	5.437	0.000
n		217			217			216	
F-Statistic		33.817			35.00			34.061	
P-Value		0.000			0.000			0.000	
Adjusted R Sq.		0.378			0.386			0.381	
Test variables are one-tailed									

$$Lag2003_i = \beta_0 + \beta_1 ContinueLead_i + \beta_2 NewLead_i + \beta_3 LostLead_i + \beta_4 Lag2001_i + \varepsilon_i$$

Where
All variables previously defined

Table A8.9
(corresponds to Table 5.4)
Results of Tests of the Audit Service Fee Benefits to EY Following the AA–EY Merger, Controlling for Former AA Clients (H4) using 2003 Data

This table details results of the test of the impact of the AA–EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership, controlling for former AA clients (H4). The sample used is the same as that in Table A8.7. The test used is an OLS regression model with $2003AF_i$ as the dependent variable and $EstAF_i$, $ContinueLead_i$, $NewLead_i$, $LossLead_i$, AA_i, and AA_i interaction terms as independent variables. The market is defined at the national industry, city and city industry levels.

	National Industry			City			City Industry		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	1.056	3.660	0.000	1.110	3.767	0.000	1.074	3.582	0.000
$ContinueLead_i$	0.061	0.378	0.353	-0.029	-0.337	0.368	0.114	1.111	0.134
$NewLead_i$	0.145	1.530	0.064	-0.169	-1.237	0.109	-0.033	-0.349	0.364
$LossLead_i$	-0.173	-0.722	0.236	0.170	0.449	0.327	-0.317	-1.949	0.026
AA_i	0.023	0.237	0.406	-0.052	-0.408	0.342	-0.073	-0.565	0.286
AA_i*$ContinueLead_i$	-0.175	-0.495	0.311	0.037	0.214	0.415	-0.064	-0.227	0.410
AA_i*$NewLead_i$	-0.095	-0.508	0.306	0.323	1.099	0.136	0.132	0.733	0.232
AA_i*$LossLead_i$	-	-	-	-	-	-	0.518	1.422	0.078
$EstAF_i$	0.928	36.028	0.000	0.929	36.135	0.000	0.930	35.269	0.000
n		239			239			238	
F-Statistic		194.992			192.920			171.292	
P-Value		0.000			0.000			0.000	
Adjusted R Sq.		0.851			0.850			0.852	
Test variables are one-tailed									

$$AF2003_i = \alpha_0 + \alpha_1 ContinueLead_i + \alpha_2 NewLead_i + \alpha_3 LostLead_i + \alpha_4 AA_i$$

$$+\alpha_5 AA_i * ContinueLead_i + \alpha_6 AA_i * NewLead_i + \alpha_7 AA_i * LostLead_i + \alpha_8 EstAF_i + \varepsilon_i$$

Where
All variables previously defined

Table A8.10
(corresponds to Table 5.5)
Results of Tests of the Audit Efficiency Benefits to EY Following the AA–EY Merger, Controlling for Former AA Clients (H5) using 2003 Data

This table details results of the test of the impact of the AA–EY merger on EY's ability to increase audit efficiency to clients in markets in which it gained leadership, controlling for former AA clients (H5). The sample used is the same as that used in Table A8.8. The test used is an OLS regression model with $Lag2003_i$ as the dependent variable and $Lag2001_i$, $ContinueLead_i$, $NewLead_i$, $LossLead_i$, AA_i, and AA_i interaction terms as independent variables. The market is defined at the national industry, city and city industry levels.

	National Industry			City			City Industry		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	25.639	5.673	0.000	26.542	5.603	0.000	25.763	5.701	0.000
$ContinueLead_i$	5.553	1.233	0.110	-0.815	-0.347	0.365	2.487	0.892	0.187
$NewLead_i$	1.464	0.561	0.288	-7.898	-2.131	0.017	6.495	2.461	0.007
$LossLead_i$	-10.756	-1.727	0.043	-3.375	-0.344	0.366	3.870	0.921	0.179
AA_i	-1.087	-0.414	0.340	0.702	0.205	0.419	-1.273	-0.374	0.354
$AA*ContinueLead_i$	-8.072	-0.861	0.195	-2.526	-0.555	0.290	11.717	1.608	0.055
$AA*NewLead_i$	2.241	0.453	0.326	-2.887	-0.377	0.353	-4.523	-0.936	0.175
$AA*LossLead_i$	-	-	-	-	-	-	10.627	1.136	0.129
$Lag2001_i$	0.635	10.856	0.000	0.647	11.267	0.000	0.605	10.397	0.000
n		217			217			216	
F-Statistic		19.352			19.837			18.088	
P-Value		0.000			0.000			0.000	
Adjusted R Sq.		0.373			0.379			0.389	
Test variables are one-tailed									

$$Lag2003_i = \beta_0 + \beta_1 ContinueLead_i + \beta_2 NewLead_i + \beta_3 LostLead_i + \beta_4 AA_i$$

$$+\beta_5 AA_i * ContinueLead_i + \beta_6 AA_i * NewLead_i + \beta_7 AA_i * LostLead_i + \beta_8 Lag2001_i + \varepsilon_i$$

Where
All variables previously defined

Appendix 9

Results Using 2004 Data

As noted in Tsai and Yang (2008), there is a concern that the effects of the merger may not become apparent immediately. As such, the main tables were replicated replacing 2002 data with 2004 data. Whilst this has the benefit of allowing more time for the effects of the merger to become apparent, it also allows more confounding factors into the analysis. As such, results must be interpreted with caution.

Table A9.1
(corresponds to Table 4.3)
Descriptive Statistics for the Sample Used in Hypothesis 1 using 2004 Data

This table details the descriptive statistics for a sample generated using the same selection process as that identified in Table 4.1 (Panel A), but using 2004 data instead of 2002 data. It is used to test the impact of the AA–EY merger on the competitiveness of the Australian audit service market (H1).

Panel A – Descriptive Statistics for National Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2004_i$	1080	7.601	16.680	11.100	1.411
$EstAF_i$	1080	7.313	16.664	10.762	1.400
$\Delta Conc_i$	1080	-0.197	0.626	0.057	0.080
ΔConc (% positive)	1080			92.1%	

Panel B – Descriptive Statistics for City Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2004_i$	1057	7.601	16.680	11.099	1.404
$EstAF_i$	1057	7.313	16.664	10.761	1.396
$\Delta Conc_i$	1057	-0.046	0.266	0.071	0.034
ΔConc (% positive)	1057			96.4%	

Panel C – Descriptive Statistics for City Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2004_i$	1055	7.601	16.680	11.100	1.404
$EstAF_i$	1055	7.313	16.664	10.761	1.396
$\Delta Conc_i$	1055	-0.887	0.983	0.054	0.179
ΔConc (% positive)	1055			68.7%	

Where

$AF2004_i$	:	Natural log of audit service fees paid by client *i* in 2004
$EstAF_i$	:	Natural log of audit service fees paid by client *i* in 2001
$\Delta Conc_i$	:	2004 market four firm HHI less the 2001 market four firm HHI
ΔConc (% positive)	:	Indicator variable, coded 1 if $\Delta Conc_i$ is positive, 0 otherwise

Table A9.2
(corresponds to Table 4.4)
Descriptive Statistics for the Sample Used in Hypothesis 2 using 2004 Data

This table details the descriptive statistics for the sample generated using the same selection process as in Table 4.1 (Panel B), but using 2004 data instead of 2002 data. It is used to test the impact of the AA–EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership (H2).

Panel A – Descriptive Statistics for National Industry Sample

	n	Minimum	Maximum	Mean	St. Dev.
$AF2004_i$	219	8.716	16.680	11.468	1.310
$EstAF_i$	219	8.517	16.664	11.065	1.342
$ContinueLead_i$	219			0.000	
$NewLead_i$	219			0.210	
$LossLead_i$	219			0.078	
$NeverLead_i$	219			0.712	

Panel B – Descriptive Statistics for City Sample

	n	Minimum	Maximum	Mean	St. Dev.
$AF2004_i$	219	8.716	16.680	11.468	1.310
$EstAF_i$	219	8.517	16.664	11.066	1.342
$ContinueLead_i$	219			0.247	
$NewLead_i$	219			0.100	
$LossLead_i$	219			0.251	
$NeverLead_i$	219			0.402	

Panel C – Descriptive Statistics for City Industry Sample

	n	Minimum	Maximum	Mean	St. Dev.
$AF2004_i$	218	8.716	16.680	11.464	1.312
$EstAF_i$	218	8.517	16.664	11.059	1.342
$ContinueLead_i$	218			0.151	
$NewLead_i$	218			0.326	
$LossLead_i$	218			0.106	
$NeverLead_i$	218			0.417	

Where

$ContinueLead_i$	:	Indicator variable, coded 1 if client *i* was audited by the market leader in both 2004 and 2001, 0 otherwise
$NewLead_i$	:	Indicator variable, coded 1 if client *i* was audited by the market leader in 2004 but not in 2001, 0 otherwise
$LossLead_i$	:	Indicator variable, coded 1 if client *i* was audited by the market leader in 2001 but not in 2004, 0 otherwise
$NeverLead_i$	:	Indicator variable, coded 1 if client *i* was not audited by the market leader in either 2004 or 2001, 0 otherwise

All other variables previously defined

Table A9.3
(corresponds to Table 4.5)
Descriptive Statistics for Sample Used in Hypothesis 3 using 2004 Data

This table details the descriptive statistics for the sample generated using the same selection process as Table 4.1 (Panel C), but using 2004 data instead of 2002 data, and limiting the sample to so that $Lag2004_i$ and $Lag2001_i$ are both equal or less than 100 days. It is used to test the impact of the AA–EY merger on EY's ability to increase audit efficiency for clients in markets in which it gained leadership (H3)

Panel A – Descriptive Statistics for National Industry Sample

	n	Minimum	Maximum	Mean	St. Dev.
$Lag2004_i$	205	29.000	92.000	72.478	16.790
$Lag2001_i$	205	16.000	97.000	75.498	15.964
$ContinueLead_i$	205			0.000	
$NewLead_i$	205			0.215	
$LossLead_i$	205			0.073	
$NeverLead_i$	205			0.712	

Panel B – Descriptive Statistics for City Sample

	n	Minimum	Maximum	Mean	St. Dev.
$Lag2004_i$	205	29.000	92.000	72.517	16.822
$Lag2001_i$	205	16.000	97.000	75.498	15.964
$ContinueLead_i$	205			0.234	
$NewLead_i$	205			0.098	
$LossLead_i$	205			0.259	
$NeverLead_i$	205			0.410	

Panel C – Descriptive Statistics for City Industry Sample

	n	Minimum	Maximum	Mean	St. Dev.
$Lag2004_i$	204	29.000	92.000	72.431	16.818
$Lag2001_i$	204	16.000	97.000	75.426	15.970
$ContinueLead_i$	204			0.152	
$NewLead_i$	204			0.314	
$LossLead_i$	204			0.108	
$NeverLead_i$	204			0.426	

Where

$Lag2004_i$: The number of days between the signing of the client *i*'s 2004 audit report and client *i*'s financial year end

$Lag2001_i$: The number of days between the signing of the client *i*'s 2001 audit report and client *i*'s financial year end

All other variables previously defined

Table A9.4
(corresponds to Table 4.6)
Descriptive Statistics for the Sample Used in Hypothesis 4 using 2004 Data

This table details the descriptive statistics for the sample identified in Table A9.2 and used to test the impact of the AA–EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership, controlling for former AA clients (H4).

Panel A – Descriptive Statistics for National Industry Sample		
	n	Mean
AA_i	219	0.242
$AA*ContinueLead_i$	219	0.000
$AA*NewLead_i$	219	0.059
$AA*LossLead_i$	219	0.014
$AA*NeverLead_i$	219	0.169

Panel B – Descriptive Statistics for City Sample		
	N	Mean
AA_i	219	0.242
$AA*ContinueLead_i$	219	0.050
$AA*NewLead_i$	219	0.014
$AA*LossLead_i$	219	0.064
$AA*NeverLead_i$	219	0.114

Panel C – Descriptive Statistics for City Industry Sample		
	N	Mean
AA_i	218	0.243
$AA*ContinueLead_i$	218	0.018
$AA*NewLead_i$	218	0.115
$AA*LossLead_i$	218	0.018
$AA*NeverLead_i$	218	0.092

Where

AA_i : Indicator variable, coded 1 if client $_i$ was audited by AA in 2001, 0 otherwise

All other variables previously defined

Table A9.5
(corresponds to Table 4.7)
Descriptive Statistics for the Sample Used in Hypothesis 5 using 2004 Data

This table details the descriptive statistics for the sample identified in Table A9.3 and used to test the impact of the AA–EY merger on EY's ability to increase audit efficiency to clients in markets in which it gained leadership, controlling for former AA clients (H5).

Panel A – Descriptive Statistics for National Industry Sample		
	n	Mean
AA_i	205	0.249
$AA*ContinueLead_i$	205	0.000
$AA*NewLead_i$	205	0.063
$AA*LossLead_i$	205	0.015
$AA*NeverLead_i$	205	0.171

Panel B – Descriptive Statistics for City Sample		
	N	Mean
AA_i	205	0.249
$AA*ContinueLead_i$	205	0.044
$AA*NewLead_i$	205	0.015
$AA*LossLead_i$	205	0.068
$AA*NeverLead_i$	205	0.122

Panel C – Descriptive Statistics for City Industry Sample		
	N	Mean
AA	236	0.250
AA*ContinueLead	236	0.020
AA*NewLead	236	0.113
AA*LossLead	236	0.020
AA*NeverLead	236	0.098

Where

All variables previously defined

Table A9.6
(corresponds to Table 5.1)
Results of Tests of the Competitiveness of the Australian Audit Service Market (H1) using 2004 Data

This table details results of the test of the impact of the AA–EY merger on the competitiveness of the Australian audit service market (H1). The sample used is drawn from the full sample of 2004 Australian listed companies with all available data. The test used is an OLS regression model with $2004AF_i$ as the dependent variable and $EstAF_i$ and $\Delta Conc_i$ as independent variables. The market is defined at the national industry, city and city industry levels.

Panel A – Continuous Concentration Variable									
	National Industry			**City**			**City Industry**		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	1.675	10.139	0.000	1.568	9.468	0.000	1.637	9.997	0.000
$\Delta Conc_i$	-0.385	-1.467	0.071	1.408	2.298	0.011	-0.012	-0.099	0.461
$EstAF_i$	0.878	58.440	0.000	0.876	58.276	0.000	0.879	58.367	0.000
n		1080			1057			1055	
F-Statistic		1736.650			1722.383			1740.237	
P-Value		0.000			0.000			0.000	
Adjusted R sq.		0.763			0.765			0.764	
Test variables are all one-tailed									

Panel B – Indicator as Positive / Not Positive Change in Concentration									
	National Industry			City			City Industry		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	1.744	9.494	0.000	1.692	8.572	0.000	1.644	9.854	0.000
$\Delta Conc_i$	-0.105	-1.343	0.090	-0.055	-0.484	0.314	-0.011	-0.235	0.407
$EstAF_i$	0.878	58.544	0.000	0.879	58.491	0.000	0.879	58.375	0.000
n		1080			1057			1055	
F-Statistic		1735.916			1711.663			1704.333	
P-Value		0.000			0.000			0.000	
Adjusted R sq.		0.763			0.764			0.764	
Test variables are all one-tailed									

$$AF2004_i = \alpha_0 + \alpha_1 \Delta Conc_i + \alpha_2 EstAF_i + \varepsilon_i$$

Where

$\Delta Conc$: Indicator variable, coded 1 if 2004 market four firm HHI less the 2001 market four firm HHI is positive, 0 otherwise

All variables previously defined

Table A9.7
(corresponds to Table 5.2)
Results of Tests of the Audit Service Fee Benefits to EY Following the AA–EY Merger (H2) using 2004 Data

This table details results of the test of the impact of the AA–EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership (H2). The sample used is drawn from the sample of 2004 Australian listed companies audited by EY with all available data. The test used is an OLS regression model with $200\backslash 4AF_i$ as the dependent variable and $EstAF_i$, $ContinueLead_i$, $NewLead_i$ and $LossLead_i$ as independent variables. The market is defined at the national industry, city and city industry levels.

	National Industry			**City**			**City Industry**		
	est.	t-stat	prob.	est.	t-stat	prob.	est.	t-stat	prob.
(Constant)	1.945	3.733	0.000	2.289	6.014	0.000	1.906	5.234	0.000
$ContinueLead_i$	-	-	-	-0.202	-1.812	0.036	0.198	1.528	0.064
$NewLead_i$	0.211	2.003	0.023	-0.161	-1.056	0.146	0.134	1.324	0.093
$LossLead_i$	-0.291	-1.802	0.036	0.001	-0.013	0.495	-0.083	-0.558	0.289
$EstAF_i$	0.859	26.849	0.000	0.836	24.942	0.000	0.858	26.434	0.000
n		219			219			218	
F-Statistic		244.640			177.972			176.990	
P-Value		0.000			0.000			0.000	
Adjusted R Sq.		0.770			0.765			0.764	
Test variables are one-tailed									

$$AF2004_i = \alpha_0 + \alpha_1 ContinueLead_i + \alpha_2 NewLead_i + \alpha_3 LostLead_i + \alpha_4 EstAF_i + \varepsilon_i$$

Where
All variables previously defined

Table A9.8
(corresponds to Table 5.3)
Results of Tests of the Audit Efficiency Benefits to EY Following the AA–EY Merger (H3) using 2003 Data

This table details results of the test of the impact of the AA–EY merger on EY's ability to increase audit efficiency to clients in markets in which it gained leadership (H3). The sample used is drawn from the sample of 2004 Australian listed companies audited by EY, with all available data, excluding those companies with $Lag2004_i$ or $Lag2001_i$ in excess of 100 days. The test used is an OLS regression model with $Lag2004_i$ as the dependent variable and $Lag2001_i$, $ContinueLead_i$, $NewLead_i$, and $LossLead_i$ as independent variables. The market is defined at the national industry, city and city industry levels.

	National Industry			City			City Industry		
	est.	t-stat	prob.	est.	t-stat	prob.	est.	t-stat	prob.
(Constant)	28.846	6.067	0.000	29.245	6.071	0.000	25.833	5.267	0.000
$ContinueLead_i$	-	-	-	7.205	2.860	0.002	3.889	1.328	0.093
$NewLead_i$	-0.830	-0.345	0.365	1.802	0.518	0.303	5.746	2.495	0.007
$LossLead_i$	-7.825	-2.057	0.020	-0.876	-0.361	0.359	3.386	1.014	0.156
$Lag2001_i$	0.588	9.553	0.000	0.551	8.903	0.000	0.581	5.267	0.000
n		205			205			204	
F-Statistic		30.996			25.511			23.749	
P-Value		0.000			0.000			0.000	
Adjusted R Sq.		0.306			0.325			0.310	
Test variables are one-tailed									

$$Lag2004_i = \beta_0 + \beta_1 ContinueLead_i + \beta_2 NewLead_i + \beta_3 LostLead_i + \beta_4 Lag2001_i + \varepsilon_i$$

Where
All variables previously defined

Table A9.9
(corresponds to Table 5.4)
Results of Tests of the Audit Service Fee Benefits to EY Following the AA–EY Merger, Controlling for Former AA Clients (H4) using 2004 Data

This table details results of the test of the impact of the AA–EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership, controlling for former AA clients (H4). The sample used is the same as that used in Table A9.7. The test used is an OLS regression model with $2004AF_i$ as the dependent variable and $EstAF_i$, $ContinueLead_i$, $NewLead_i$, $LossLead_i$, AA_i, and AA_i interaction terms as independent variables. The market is defined at the national industry, city and city industry levels.

	National Industry			City			City Industry		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	1.958	5.382	0.000	2.227	5.745	0.000	1.968	5.079	0.000
$ContinueLead_i$	-	-	-	-0.147	-1.150	0.126	0.189	1.332	0.092
$NewLead_i$	0.173	1.391	0.083	-0.090	-0.534	0.297	0.099	0.805	0.211
$LossLead_i$	-0.320	-1.773	0.039	-0.020	-0.159	0.437	-0.066	-0.393	0.347
AA_i	-0.062	-0.515	0.304	0.054	0.357	0.361	-0.052	-0.317	0.376
AA_i*$ContinueLead_i$	0.146	0.609	0.272	-0.238	-0.904	0.183	0.038	0.099	0.461
AA_i*$NewLead_i$	0.140	0.333	0.370	-0.447	-1.051	0.147	0.117	0.509	0.306
AA_i*$LossLead_i$	0.859	25.941	0.000	0.075	0.300	0.382	-0.100	-0.254	0.400
$EstAF_i$	1.958	5.382	0.000	0.840	24.435	0.000	0.854	24.514	0.000
n		219			219			218	
F-Statistic		120.961			88.539			87.069	
P-Value		0.000			0.000			0.000	
Adjusted R Sq.		0.768			0.763			0.760	
Test variables are one-tailed									

$$AF2004_i = \alpha_0 + \alpha_1 ContinueLead_i + \alpha_2 NewLead_i + \alpha_3 LostLead_i + \alpha_4 AA_i$$

$$+\alpha_5 AA_i * ContinueLead_i + \alpha_6 AA_i * NewLead_i + \alpha_7 AA_i * LostLead_i + \alpha_8 EstAF_i + \varepsilon_i$$

Where
All variables previously defined

Table A9.10
(corresponds to Table 5.5)
Results of Tests of the Audit Efficiency Benefits to EY Following the AA–EY Merger, Controlling for Former AA Clients (H5) using 2004 Data

This table details results of the test of the impact of the AA–EY merger on EY's ability to increase audit efficiency to clients in markets in which it gained leadership, controlling for former AA clients (H5). The sample used is the same as that used in Table A9.8. The test used is an OLS regression model with $Lag2004_i$ as the dependent variable and $Lag2001_i$, $ContinueLead_i$, $NewLead_i$, $LossLead_i$, AA_i, and AA_i interaction terms as independent variables. The market is defined at the national industry, city and city industry levels.

	National Industry			City			City Industry		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	29.807	5.867	0.000	30.000	5.802	0.000	30.280	5.924	0.000
$ContinueLead_i$	-	-	-	7.210	2.500	0.007	2.241	0.715	0.238
$NewLead_i$	-1.021	-0.356	0.361	0.678	0.175	0.431	7.918	2.890	0.002
$LossLead_i$	-6.629	-1.554	0.061	-0.281	-0.098	0.461	-0.219	-0.060	0.476
AA_i	-2.179	-0.792	0.215	-1.478	-0.441	0.330	-3.884	-1.109	0.134
$AA*ContinueLead_i$	-	-	-	-0.788	-0.129	0.449	10.672	1.309	0.096
$AA*NewLead_i$	1.074	0.198	0.422	6.287	0.672	0.251	-4.812	-0.943	0.174
$AA*LossLead_i$	-6.272	-0.658	0.256	-2.463	-0.451	0.326	18.136	2.168	0.016
$Lag2001_i$	0.582	9.074	0.000	0.547	8.577	0.000	0.534	8.419	0.000
n		205			205			204	
F-Statistic		15.647			12.787			13.650	
P-Value		0.000			0.000			0.000	
Adjusted R Sq.		0.301			0.316			0.333	
Test variables are one-tailed									

$$Lag2004_i = \beta_0 + \beta_1 ContinueLead_i + \beta_2 NewLead_i + \beta_3 LostLead_i + \beta_4 AA_i$$

$$+\beta_5 AA_i * ContinueLead_i + \beta_6 AA_i * NewLead_i + \beta_7 AA_i * LostLead_i + \beta_8 Lag2001_i + \varepsilon_i$$

Where
All variables previously defined

Appendix 10

Results Excluding Non 30 June Year End Observations

Approximately 17% of observations have non 30 June financial year ends (Table A1.3). Such a proportion of observations, especially given the timing of the merger, may confound the analysis. As such, the main tests are replicated restricting the analysis to only those observations with only 30 June year ends.

Table A10.1
(corresponds to Table 4.3)
Descriptive Statistics for the Sample Used in Hypothesis 1 (excluding non 30 June)

This table details the descriptive statistics for the sample initially identified in Table 4.1 (Panel A), but excluding non 30 June year end observations. It is used to test the impact of the AA–EY merger on the competitiveness of the Australian audit service market (H1).

Panel A – Descriptive Statistics for National Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	990	7.601	16.493	10.846	1.296
$EstAF_i$	990	7.313	16.610	10.687	1.286
$\Delta Conc_i$	990	-0.227	0.198	0.036	0.056
ΔConc (% positive)	990			84.4%	

Panel B – Descriptive Statistics for City Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	969	7.601	16.493	10.851	1.298
$EstAF_i$	969	7.313	16.410	10690	1.283
$\Delta Conc_i$	969	-0.040	0.090	0.073	0.027
ΔConc (% positive)	969			96.1%	

Panel C – Descriptive Statistics for City Industry Sample					
	n	Minimum	Maximum	Mean	St. Dev.
$AF2002_i$	967	7.601	16.493	10.851	1.297
$EstAF_i$	967	7.313	16.410	10.690	1.282
$\Delta Conc_i$	967	-0.506	0.983	0.039	0.132
ΔConc (% positive)	967			62.0%	

Where

$AF2002_i$	:	Natural log of audit service fees paid by client *i* in 2002
$EstAF_i$	:	Natural log of audit service fees paid by client *i* in 2001
$\Delta Conc_i$	:	2002 market four firm HHI less the 2001 market four firm HHI
ΔConc (% positive)	:	Indicator variable, coded 1 if $\Delta Conc_i$ is positive, 0 otherwise

Table A10.2
(corresponds to Table 5.1)
Results of Tests of the Competitiveness of the Australian Audit Service Market (H1) excluding non 30 June

This table details results of the test of the impact of the AA–EY merger on the competitiveness of the Australian audit service market (H1). This table uses the sample initially identified in Table 4.1 (Panel A), but excluding non 30 June year end observations. The test used is an OLS regression model with $2002AF_i$ as the dependent variable and $EstAF_i$ and $\Delta Conc_i$ as independent variables. The market is defined at the national industry, city and city industry levels.

Panel A – Continuous Concentration Variable									
	National Industry			**City**			**City Industry**		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	1.019	7.228	0.000	0.948	6.234	0.000	0.934	6.578	0.000
$\Delta Conc_i$	-0.324	-1.072	0.142	0.027	0.044	0.483	0.168	1.315	0.094
$EstAF_i$	0.921	70.615	0.000	0.926	70.509	0.000	0.927	70.521	0.000
n		990			969			967	
F-Statistic		2495.720			2503.234			2493.782	
P-Value		0.000			0.000			0.000	
Adjusted R sq.		0.835			0.838			0.838	
Test variables are all one-tailed									

Panel B – Indicator as Positive / Not Positive Change in Concentration									
	National Industry			City			City Industry		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	1.082	7.169	0.000	1.004	6.142	0.000	0.953	6.559	0.000
$\Delta Conc_i$	-0.065	-1.391	0.082	-0.056	-0.647	0.259	0.001	0.031	0.488
$EstAF_i$	0.919	70.012	0.000	0.926	70.772	0.000	0.926	70.285	0.000
n		990			969			967	
F-Statistic		2498.095			2504.524			2488.459	
P-Value		0.000			0.000			0.000	
Adjusted R sq.		0.835			0.838			0.837	
Test variables are all one-tailed									

$$AF2002_i = \alpha_0 + \alpha_1 \Delta Conc_i + \alpha_2 EstAF_i + \varepsilon_i$$

Where

ΔConc : Indicator variable, coded 1 if 2002 market four firm HHI less the 2001 market four firm HHI is positive, 0 otherwise

All variables previously defined

Table A10.3
(corresponds to Table 5.2)
Results of Tests of the Audit Service Fee Benefits to EY Following the AA–EY Merger (H2) excluding non 30 June

This table details results of the test of the impact of the AA–EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership (H2). This table uses the sample initially identified in Table 4.1 (Panel B), but excluding non 30 June year end observations. The test used is an OLS regression model with $2002AF_i$ as the dependent variable and $EstAF_i$, $ContinueLead_i$, $NewLead_i$ and $LossLead_i$ as independent variables. The market is defined at the national industry, city and city industry levels.

	National Industry			City			City Industry		
	est.	t-stat	prob.	est.	t-stat	prob.	est.	t-stat	prob.
(Constant)	1.002	3.485	0.001	0.897	2.989	0.003	0.909	3.117	0.002
$ContinueLead_i$	-0.243	-1.608	0.055	0.062	0.856	0.197	0.049	0.494	0.311
$NewLead_i$	0.004	0.046	0.482	-	-	-	0.165	2.052	0.021
$LossLead_i$	-	-	-	-	-	-	0.007	0.034	0.487
$EstAF_i$	0.930	35.736	0.000	0.935	35.815	0.000	0.931	35.851	0.000
n		200			198			197	
F-Statistic		441.525			647.050			324.387	
P-Value		0.000			0.000			0.000	
Adjusted R Sq.		0.869			0.868			0.868	
Test variables are one-tailed									

$$AF2002_i = \alpha_0 + \alpha_1 ContinueLead_i + \alpha_2 NewLead_i + \alpha_3 LostLead_i + \alpha_4 EstAF_i + \varepsilon_i$$

Where
All variables previously defined

Table A10.4
(corresponds to Table 5.3)
Results of Tests of the Audit Efficiency Benefits to EY Following the AA–EY Merger (H3)

This table details results of the test of the impact of the AA–EY merger on EY's ability to increase audit efficiency to clients in markets in which it gained leadership (H3). This table uses the sample initially identified in Table 4.1 (Panel C), but excluding non 30 June year end observations. The test used is an OLS regression model with $Lag2002_i$ as the dependent variable and $Lag2001_i$, $ContinueLead_i$, $NewLead_i$, and $LossLead_i$ as independent variables. The market is defined at the national industry, city and city industry levels.

	National Industry			**City**			**City Industry**		
	est.	t-stat	prob.	est.	t-stat	prob.	est.	t-stat	prob.
(Constant)	43.958	14.402	0.000	47.745	14.125	0.000	43.070	12.466	0.000
$ContinueLead_i$	-3.415	-0.468	0.320	-7.312	-2.114	0.018	4.769	0.966	0.168
$NewLead_i$	-1.556	-0.409	0.342	-	-	-	-2.133	-0.543	0.294
$LossLead_i$	-	-	-	-	-	-	5.002	0.524	0.301
$Lag2001_i$	0.444	18.279	0.000	0.442	18.485	0.000	0.444	18.276	0.000
n		199			197			196	
F-Statistic		113.306			174.765			84.490	
P-Value		0.000			0.000			0.000	
Adjusted R Sq.		0.630			0.639			0.631	
Test variables are one-tailed									

$$Lag2002_i = \beta_0 + \beta_1 ContinueLead_i + \beta_2 NewLead_i + \beta_3 LostLead_i + \beta_4 Lag2001_i + \varepsilon_i$$

Where
All variables previously defined

Table A10.5
(corresponds to Table 5.4)
Results of Tests of the Audit Service Fee Benefits to EY Following the AA–EY Merger, Controlling for Former AA Clients (H4) using 2004 Data

This table details results of the test of the impact of the AA–EY merger on EY's ability to increase audit service fees to clients in markets in which it gained leadership, controlling for former AA clients (H4). The sample used is the same as that used in Table A10.3. The test used is an OLS regression model with $2002AF_i$ as the dependent variable and $EstAF_i$, $ContinueLead_i$, $NewLead_i$, $LossLead_i$, AA_i, and AA_i interaction terms as independent variables. The market is defined at the national industry, city and city industry levels.

	National Industry			City			City Industry		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	0.949	3.218	0.002	0.899	2.935	0.004	0.905	2.969	0.003
$ContinueLead_i$	-0.278	-1.735	0.042	0.018	0.209	0.418	0.051	0.450	0.327
$NewLead_i$	0.025	0.267	0.395	-	-	-	0.126	1.316	0.095
$LossLead_i$	-	-		-	-	-	0.055	0.257	0.399
AA_i	-0.047	-0.451	0.326	-0.119	-1.015	0.156	-0.178	-1.216	0.113
AA_i*$ContinueLead_i$	0.292	0.549	0.292	0.144	0.874	0.192	0.106	0.737	0.231
AA_i*$NewLead_i$	-0.069	-0.398	0.346	-	-	-	-0.011	-0.044	0.483
AA_i*$LossLead_i$	-	-	-	-	-	-	0.145	0.797	0.213
$EstAF_i$	0.936	34.578	0.000	0.938	34.722	0.000	-0.374	-0.666	0.253
n		200			198			197	
F-Statistic		218.789			322.283			143.205	
P-Value		0.000			0.000			0.000	
Adjusted R Sq.		0.868			0.867			0.867	
Test variables are one-tailed									

$$AF2002_i = \alpha_0 + \alpha_1 ContinueLead_i + \alpha_2 NewLead_i + \alpha_3 LostLead_i + \alpha_4 AA_i$$

$$+\alpha_5 AA_i * ContinueLead_i + \alpha_6 AA_i * NewLead_i + \alpha_7 AA_i * LostLead_i + \alpha_8 EstAF_i + \varepsilon_i$$

Where
All variables previously defined

Table A10.6
(corresponds to Table 5.5)
Results of Tests of the Audit Efficiency Benefits to EY Following the AA–EY Merger, Controlling for Former AA Clients (H5) excluding non 30 June

This table details results of the test of the impact of the AA–EY merger on EY's ability to increase audit efficiency to clients in markets in which it gained leadership, controlling for former AA clients (H5). The sample used is the same as that used in Table A10.4. The test used is an OLS regression model with $Lag2002_i$ as the dependent variable and $Lag2001_i$, $ContinueLead_i$, $NewLead_i$, $LossLead_i$, AA_i, and AA_i interaction terms as independent variables. The market is defined at the national industry, city and city industry levels.

	National Industry			City			City Industry		
	est.	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**	**est.**	**t-stat**	**prob.**
(Constant)	45.775	13.619	0.000	52.300	13.023	0.000	44.368	11.543	0.000
$ContinueLead_i$	-5.527	-0.720	0.236	-9.904	-2.431	0.008	3.222	0.580	0.281
$NewLead_i$	0.486	0.108	0.457	-	-	-	1.224	0.262	0.397
$LossLead_i$	-	-	-	-	-	-	5.202	0.503	0.308
AA_i	-5.774	-1.155	0.125	-11.336	-2.031	0.022	-3.999	-0.629	0.265
$AA*ContinueLead_i$	15.004	0.585	0.280	5.009	0.638	0.262	6.927	0.574	0.283
$AA*NewLead_i$	-5.351	-0.642	0.261	-	-	-	-8.547	-0.972	0.166
$AA*LossLead_i$	-	-	-	-	-	-	-3.902	-0.145	0.442
$Lag2001_i$	0.439	18.043	0.000	0.434	18.073	0.000	0.440	17.971	0.000
n		199			197			196	
F-Statistic		57.709			90.271			43.011	
P-Value		0.000			0.000			0.000	
Adjusted R Sq.		0.632			0.646			0.633	
Test variables are one-tailed									

$$Lag2002_i = \beta_0 + \beta_1 ContinueLead_i + \beta_2 NewLead_i + \beta_3 LostLead_i + \beta_4 AA_i$$

$$+\beta_5 AA_i * ContinueLead_i + \beta_6 AA_i * NewLead_i + \beta_7 AA_i * LostLead_i + \beta_8 Lag2001_i + \varepsilon_i$$

Where
All variables previously defined

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