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AUDIT MARKET STRUCTURE AND COMPETITION IN AUSTRALIA 2012 - 2018

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Audit Market Structure and Competition in Australia: 2012–2018

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Audit Market Structure and Competition in Australia: 2012–2018

Executive Summary

While concerns have been raised regarding the market dominance of the largest audit firms in the provision of audit services, there has been little consideration of the underlying data as it relates to the competitiveness of the Australian audit market, or the related academic studies regarding the structure and competitiveness of the Australian audit market.

This report provides an evidence-based perspective on the market for listed company audits which is an important input into any future proposal to further regulate the Australian audit market.

The purpose of this research paper is to identify the key metrics used to evaluate market structure in the academic literature and then document changes in these metrics in the Australian audit market for listed company audits over the period 2012–2018.

This analysis demonstrates that, unlike other jurisdictions where the Big 4 audit more than 70% (United States) or 84% (United Kingdom) of listed companies, in Australia the market share of Big 4 auditors is now less than 40%, declining from 40.71% in 2012 to 37.70% in 2018.

My analysis also shows that the Australian audit market for listed companies is both highly segmented and supplier concentrated, but not increasingly so, over the period 2012–2018.

The largest and most complex clients are audited by the Big 4, with just over 90% of the largest 200 companies by market capitalisation in each year audited by the Big 4. The Big 4 audit 64.67-70.67% of the next 300 largest clients and 30.81-33.68% of the medium client segment. I identify a significant decline in the percentage of audits undertaken by the Big 4 in the small client segment from 18.80% in 2012 to 9.90% in 2018.

There is evidence of a decline in the number of small audit firms undertaking listed company audits, from 55 individual audit firms in 2012 to 38 in 2018. There is also a decline in the number and percentage of audit clients audited by small audit firms in all client segments (except for small clients), with a decrease in the number of the largest 500 audit clients from 17 (3.4%) in 2012 to 5 (1.0%) in 2018.

The largest four audit firms combined receive 87% of the audit fee revenue for listed companies. I find that audit fees in Australia on average have increased at a modest rate of 16.97% over this period (an average annual increase of 2.82%). The average audit fee for a client of the Big 4 increased by 25.48% over this period (equating to an average annual increase of 3.64%, which is similar to wage growth and inflation) with a similar increase in median audit fees of 26.85%, noting that part of this fee increase will be attributable to a decline in the number of small clients audited by the Big 4.

Increases in mean and median audit fees are also observed for Large and Medium Non-Big 4 firms (19.64% and 17.55% increase in mean fees, 11.86% and 11.74% increase in median fees respectively). For Small Non-Big 4 audit firms, audit fees have declined over the period 2012–2018. Given the enhanced requirements in auditing standards and regulation, and the resulting increased audit effort needed to complete audit engagements, as well as general cost increases, this is an unexpected result. When comparing growth in audit fees with the growth in the size of clients (measured by median total assets) clients of the Big 4 have grown in size by 50% over the period 2012-2018 compared with the median audit fee growth of 26.85%. For the clients of all other categories of audit firms, median total assets are either stable or have decreased. Clients of the Big 4 audit firms are substantially larger (12 to 20 times larger) than the clients of any of the other categories of audit firms, and this analysis provides evidence that non-Big 4 audit firms do not currently have substantial experience auditing large complex clients.

In relation to concentration, the Big 4 dominate the market when measured using audit fees with a share of 87% of total fees charged to listed companies in 2012, with a decline in this measure over the period to 86%. Using measures based on number of clients, the Big 4's share of clients has declined but with a fairly minimal impact on their overall share of audit fee revenues. Using fee revenues, the Herfindahl-Hirschman Index (HHI) indicates that the Australian audit market is highly concentrated increasing from 2162 in 2012 to a maximum of 2218 in 2014 and declining to a current level of 1967 in 2018 pointing to a reduction in concentration in the audit market over this period. Given the ACCC's guideline of an HHI of 2000 as being an indicator of a point at which a merger would raise competitive concerns, it is evident that the audit market is just under this threshold from a revenue perspective within the 4 largest audit firms. When using number of clients, the HHI indicates a less highly concentrated market with the maximum at 779 in 2013 and a steady decline through to the current value of 722 in 2018.

Splitting the market into four categories based on client size, my analysis demonstrates that the very large company audit market is highly concentrated but this has not increased over 2012-2018 period. For large clients, the market is moderately concentrated and has become slightly less concentrated. For medium clients, the levels of concentration are low and there has been an increase in concentration in the small client market but this remains at a low overall level. These results indicate that, relative to other jurisdictions, the Australian market for listed companies is a more complex and segmented audit market and that any regulatory changes proposed need to take this into consideration.

On average, around 8% of clients change auditors in any particular year, with smaller clients more likely to change auditors. There is evidence of both audit fees increasing by more than 5% following an audit firm change (in a third of cases) and audit fees decreasing by more than 5% (in nearly half the cases observed).

A summary of the academic research literature regarding the underlying structure and competitiveness of the Australian audit market is also provided as an Appendix to this analysis.

This report provides an important input into any decision-making process to limit or regulate the behaviour of audit market participants which would benefit from a current and comprehensive understanding of the Australian listed company audit market.

Audit Market Structure and Competition in Australia: 2012–2018

Introduction

Regulators around the world have publicised their concerns regarding the market dominance of the largest audit firms in the provision of audit services, linking increases in audit market concentration to a corresponding reduction in competition between audit firms.[1] In the UK (Brydon Review 2019; CMA Market Study 2019) and Australia (Parliamentary Joint Committee on Corporations and Financial Services Inquiry 2019) concerns have been raised regarding the consequences of market concentration to whether a corresponding reduction in competition may have adverse impacts on audit quality. In the current environment, where the quality of audit services is being questioned, it is important for regulators, standard-setters and the profession in Australia to have a contemporary understanding of the Australian listed company audit market. Whilst research conducted in other environments is informative, it is critical that a systematic current understanding of these issues in the Australian context is available as an input to any proposal designed to limit or otherwise regulate the behaviour of market participants.

The contribution of this research paper is to provide a commentary informed by academic research on the current structure and competitiveness of the Australian audit market. To do this I identify the key metrics to examine market structure and competition and use a comprehensive dataset of Australian listed companies over the period 2012 to 2018 to analyse the Australian audit market. To my knowledge, whilst this data is publicly available, this is the most comprehensive systematically collected database of Australian audit market data and so I provide a unique perspective on the Australian audit market. In an Appendix, I provide a review of the body of research developing reliable models of audit fees and the findings of research set in Australia which examines market concentration, including the impact of audit firm mergers, auditor choice and auditor switching.

Before proceeding, I define some of the key terms used in this commentary. Using the Australian Competition and Consumer Commission (ACCC) Merger Guidelines (2008), a market is both a product (or service) space and a geographic space in which competition takes place. The market I focus on here is the Australian listed company market for audits of financial statements. Participants in a market compete in terms of price, service, technology and quality and their pricing and output is constrained by the behaviour or beliefs about the future behaviour of other market participants. The key participants in the audit market for listed company audits are a group of firms commonly referred to as the Big 4 accounting firms (Deloitte, EY, KPMG, PWC) primarily servicing the largest clients, with smaller clients serviced by a range of other providers. It is the concentration of the Big 4 firms that has aroused significant concerns by regulators, as it is alleged that increased concentration can give rise to monopolistic market power which eventually can be utilised to achieve abnormal returns and/or to restrict the ability of other providers to enter the market. On the other hand, high levels of market concentration might result in benefits including lower costs due to economies of scale and/or higher product quality because of specialisation due to industry or to expertise in auditing large complex clients.

[1] Whilst these arguments are intuitive to regulators and consistent with classical micro-economic theory, I note that the link between the number of major suppliers and competition in an industry is an open theoretical question in the industrial organisation literature (e.g. Tirole 1988). For further discussion, refer to Carson et al. (2012).

Analysis of the Current Australian Audit Market

Audit fees for Australian listed companies are required to be disclosed and are publicly available in the notes to the financial statements for Australian listed companies. In this research paper I do not examine the market for the provision of 'other' services by audit firms. The provision of non-audit services by auditors to their clients is examined in further detail in a separate research paper.

The ACCC Merger Guidelines (ACCC 2008) provide guidance on the three concentration metrics that would be utilised to consider any future merger or consolidation in the audit industry. These are market share, concentration ratios and the Herfindahl-Hirschman Index (HHI). The focus of academic research has generally been on concentration ratios and, to a lesser extent, the HHI. In academic research audit activities are usually measured on two bases: firstly, using audit fee revenues and secondly, using numbers of clients.

The concentration ratio (CR) is the percentage of total activity in a market that is accounted for by the n most active audit firms (Walker and Johnson 1996; Thavapalan et al. 2002). The formula for CR-N is expressed as follows:

$$CR-N = \frac{\text{Total Audit Activities of N largest Firms}}{\text{Total Audit Activities of All Firms}}$$

The most commonly defined number of suppliers for this measure is four (CR-4) which represents the combined market share (using audit fees or number of clients) of the four largest firms. In subsequent analyses, I also present calculations for the six and twenty largest suppliers as these are relevant categorisations for the Australian audit market.

The HHI is calculated by dividing the sum of the squares of the audit activities (e.g. audit fees) of each firm in the market by the square of the sum of the audit activities of each firm (Walker and Johnson 1996; Thavapalan et al. 2002). The formula is presented as follows:

$$HHI = \frac{\sum_{i=1}^{n}(S)^2}{(\sum_{i=1}^{n} S)^2}$$

Much of the prior academic research outlined in the Appendix is based on data which is not contemporary and the samples used do not enable a straightforward comparison over time. Accordingly, this research paper presents analysis of the most current data available for the Australian audit market utilising the UNSW Audit Fee and Audit Reporting database, which covers all Australian listed companies for the period 2000 onward. The focus here is on the period 2012–2018, given that the period to 2000–2011 is covered in Carson, Botica-Redmayne and Liao (2014). The results are placed in the context of the current Australian audit market. Whilst prior research usually splits audit firms into two categorisations (Big 4 and Non-Big 4) I split audit firms into four categories, the Big 4 (Deloitte, EY, KPMG, PWC), Large Non-Big 4 firms (Grant Thornton and BDO), Medium Non-Big 4 firms (the next 17 largest audit firms, required to prepare transparency reports with more than 10 public interest entity audits per year) and Small Non-Big 4 firms, to allow for a more nuanced view of the structure of the audit market. I consider market share based on both numbers of clients and audit fees, and calculate the key competitive metrics identified: concentration ratios and Herfindahl-Hirschman indices for audits of Australian listed companies over this period as well as changes in audit firms over this period. Accordingly this research paper provides the most complete, up-to-date and relevant analysis available for a contemporary insight into the current structure and issues arising in the Australian audit market.

Market Share

In the analysis conducted in the following Tables I identify all companies (removing trusts, Exchange Traded Funds and similar entities) listed on the Australian Stock Exchange headquartered in Australia, with audit opinions signed in Australia and disclosing audit fees in Australian dollars in their annual reports over the period 2012–2018, noting that 2018 is the latest full year of data available at the time of writing. In total, 12,357 listed companies meeting these criteria with all data available are analysed. There has been a general decline in the number of listed firms meeting these criteria over this period, starting with 1,803 firms in 2012 to 1,727 firms by the end of 2018.[2] Much of this decline is in the number of listed companies in the mining sector (as shown in Table 5).

Table 1: Market Share Based on Number of Listed Companies with Audit Opinions Signed in Australia

Year	Total	Big 4 No.	Big 4 %	Large Non-Big 4 No.	Large Non-Big 4 %	Medium Non-Big 4 No.	Medium Non-Big 4 %	Small Non-Big 4 No.	Small Non-Big 4 %
2012	1,803	734	**40.71**	402	**22.30**	526	**29.17**	141	**7.82**
2013	1,792	736	**41.07**	405	**22.60**	530	**29.58**	122	**6.81**
2014	1,778	717	**40.33**	399	**22.44**	542	**30.48**	120	**6.75**
2015	1,815	743	**40.94**	393	**21.65**	564	**31.07**	115	**6.34**
2016	1,718	677	**39.41**	372	**21.65**	562	**32.71**	107	**6.23**
2017	1,724	669	**38.81**	368	**21.35**	588	**34.11**	99	**5.74**
2018	1,727	651	**37.70**	356	**20.61**	616	**35.67**	104	**6.02**
Avg	**1,765**	**704**	**39.85**	**385**	**21.80**	**561**	**31.82**	**115**	**6.53**

Note:

Big 4: Deloitte, Ernst and Young, KPMG and PWC

Large Non-Big 4: Grant Thornton and BDO

Medium Non-Big 4: Issued transparency report in one or more years across the period 2012–2018: Bentleys, Crowe Horwath, Hall Chadwick, HLB Mann Judd, KS Black, Lawler Hacketts, Moore Stephens, Nexia, Pitcher Partners, PKF Hacketts, PKF Mack & Co, Rothsay, RSM Bird Cameron, ShineWing, Somes Cooke, Stantons International, William Buck and all firms are included as Medium Non-Big 4 Firms in each year of the analysis.

Small Non-Big 4: auditors not otherwise classified.

Whilst in many other countries, the market share for listed company audits based on number of clients of Big 4 audit firms is around 70% (for example, the United States) and in the UK it is currently 84% (CMA 2019), as shown in Table 1 it is clear that the market share of Big 4 audit firms in Australia is substantially lower and has declined from 40.71% to 37.70% over this period, with an average market share of just under 40%. Relative to the period 2000–2012, the market shares observed are fairly stable over this period with Small Non-Big 4 firms experiencing a small decline in their share of listed company audits (from 7.82% to 6.02%) and Large Non-Big 4 audit firms also seeing a slight decline from 22.30% to 20.61%. The only group of firms to increase their market share over this period are the Medium Non-Big 4 firms (from 29.17% to 35.67%). Relative to other listed company audit markets,

[2] There are over 2000 entities listed on the ASX in each of these years. I remove Exchange Traded Funds, Trusts, companies that are newly listed, delisted or suspended during the year from this analysis as well as companies headquartered outside Australia, not reporting in Australian Dollars, or where the office of the signing auditor is located outside Australia to ensure that the sample is comprised of companies (and auditors) subject to Australian reporting requirements for companies.

the Australian listed company audit market has a diverse group of suppliers with relatively low market share for the very largest audit firms.

In Table 2, the data for Table 1 is examined in detail for each of the six largest providers of audit services. This group of audit firms comprises the Big 4 audit firms (Deloitte, Ernst and Young, KPMG and PWC) as well as the two largest of the Non-Big 4 providers (BDO and Grant Thornton). It is interesting to note that the audit firm with the biggest market share by number of clients is a Large Non-Big 4 audit firm (BDO, with 12.45% of the number of listed company clients). The smallest provider in 2018 is also a Large Non-Big 4 firm (Grant Thornton with 8.16% of the clients of the audit market). The rank order of firms by market share in 2012 was BDO, EY, KPMG, PWC, Deloitte and Grant Thornton. By 2018, BDO and EY were still the largest two by market share with PWC and KPMG with similar shares, and Deloitte remaining as the smallest of the Big 4 audit firms ahead of Grant Thornton.

Table 2: Market Share for 6 Largest Audit Firms Based on Number of Listed Companies with Audit Opinions Signed in Australia

Year	Total	DT No.	DT %	EY No.	EY %	KPMG No.	KPMG %	PwC No.	PwC %	BDO No.	BDO %	GT No.	GT %
2012	1803	164	**9.10**	232	**12.87**	171	**9.48**	167	**9.26**	240	**13.31**	162	**8.99**
2013	1792	164	**9.15**	229	**12.78**	174	**9.71**	168	**9.38**	242	**13.50**	163	**9.10**
2014	1778	171	**9.62**	228	**12.82**	158	**8.89**	160	**9.00**	240	**13.50**	159	**8.94**
2015	1815	174	**9.59**	241	**13.28**	171	**9.42**	157	**8.65**	242	**13.33**	151	**8.32**
2016	1718	157	**9.14**	216	**12.57**	146	**8.50**	158	**9.20**	221	**12.86**	151	**8.79**
2017	1724	155	**8.99**	202	**11.72**	154	**8.93**	158	**9.16**	220	**12.76**	148	**8.58**
2018	1727	143	**8.28**	210	**12.16**	149	**8.63**	149	**8.63**	215	**12.45**	141	**8.16**
Avg	**1765**	**161**	**9.12**	**223**	**12.60**	**160**	**9.08**	**159**	**9.04**	**231**	**13.10**	**154**	**8.70**

Table 3 documents the number of suppliers comprising the Small Non-Big 4 group of audit suppliers. These audit firms audit less than 10 public interest entity audits per year and accordingly are not required to prepare transparency reports for the Australian Securities and Investments Commission (ASIC) so are subject to a relatively lower level of regulatory scrutiny and are also subject to a lower likelihood of being inspected by ASIC. At the same time there has been an increase in audit regulation and requirements under auditing standards. The impact on this group of suppliers is of interest. What can be observed from Table 3 is that there has been a decrease in the number of small audit firms servicing the listed company audit market with a decline from 55 individual audit firms in 2012 to 38 in 2018.

Table 3: Number of Small Non-Big 4 Firms Participating in Listed Company Audit Market

Year	No. of Audits by Small Non-Big 4 Firms	No. of Unique Small Non-Big 4 Firms
2012	141	55
2013	122	47
2014	120	59
2015	115	53
2016	107	49
2017	99	41
2018	104	38
Avg	**115**	**49**

In Table 4, I split listed companies into four market segments based on end of year market capitalisation[3]: the very largest 200 clients, the next largest 300 clients (201–500 by market capitalisation), the smallest 500 clients by market capitalisation, and the remaining clients are categorised as medium. It is evident that the largest auditors are the most important providers of audit services to very large clients with a market share of over 90% throughout the period. For the next group of clients, the Big 4 audit about two-thirds of these, with the Large and Medium Non-Big 4 audit firms also participating in this market. The Big 4 auditors have a declining share of the next largest, medium and small client markets over this period. The Medium Non-Big 4 firms have grown market share in both the large, medium and small client markets over this period with the Large Non-Big 4 maintaining fairly static share in these markets, whilst the smallest audit firms have had an overall decline in their market share, consistent with the smaller number of active providers shown in Table 3.

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[3] As a result there can be changes in the composition of clients included in each category based on year-end changes in market capitalisation.

Table 4: Market Share Based on Number of Listed Companies with Audit Opinions Signed in Australia Categorised by Client Size

Year	Big 4 No.	Big 4 %	Large Non-Big 4 No.	Large Non-Big 4 %	Medium Non-Big 4 No.	Medium Non-Big 4 %	Small Non-Big 4 No.	Small Non-Big 4 %
Panel A: Very Large Clients (Top 200 by Market Capitalisation)								
2012	183	**91.50**	6	**3.00**	9	**4.50**	2	**1.00**
2013	180	**90.00**	8	**4.00**	10	**5.00**	2	**1.00**
2014	181	**90.50**	7	**3.50**	11	**5.50**	1	**0.50**
2015	184	**92.00**	5	**2.50**	10	**5.00**	1	**0.50**
2016	182	**91.00**	6	**3.00**	10	**5.00**	2	**1.00**
2017	181	**90.50**	6	**3.00**	11	**5.50**	2	**1.00**
2018	184	**92.00**	4	**2.00**	11	**5.50**	1	**0.50**
Panel B: Large Clients (201–500 by Market Capitalisation)								
2012	203	**67.67**	45	**15.00**	37	**12.33**	15	**5.00**
2013	212	**70.67**	40	**13.33**	34	**11.33**	14	**4.67**
2014	199	**66.33**	44	**14.67**	46	**15.33**	11	**3.67**
2015	205	**68.33**	38	**12.67**	45	**15.00**	12	**4.00**
2016	201	**67.00**	45	**15.00**	45	**15.00**	9	**3.00**
2017	197	**65.67**	45	**15.00**	51	**17.00**	7	**2.33**
2018	194	**64.67**	42	**14.00**	60	**20.00**	4	**1.33**
Panel C: Medium Clients (Others)								
2012	254	**31.63**	221	**27.52**	257	**32.00**	71	**8.84**
2013	261	**32.95**	229	**28.91**	243	**30.68**	59	**7.45**
2014	262	**33.68**	215	**27.63**	240	**30.85**	61	**7.84**
2015	264	**32.39**	228	**27.98**	263	**32.27**	60	**7.36**
2016	223	**31.06**	185	**25.77**	259	**36.07**	51	**7.10**
2017	225	**31.08**	177	**24.45**	277	**38.26**	45	**6.22**
2018	224	**30.81**	169	**23.25**	287	**39.48**	47	**6.33**
Panel D: Small Clients (Bottom 500 by Market Capitalisation)								
2012	94	**18.80**	130	**26.00**	223	**44.60**	53	**10.60**
2013	82	**16.40**	128	**25.60**	243	**48.60**	47	**9.40**
2014	75	**15.00**	133	**26.60**	245	**49.00**	47	**9.40**
2015	90	**18.00**	122	**24.40**	246	**49.20**	42	**8.40**
2016	71	**14.20**	136	**27.20**	248	**49.60**	45	**9.00**
2017	66	**13.20**	140	**28.00**	249	**49.80**	45	**9.00**
2018	49	**9.90**	141	**28.20**	258	**51.60**	52	**10.40**

Table 5 splits listed companies into firms in the mining industry (as identified by GICS code 1510) and other industries. The number of firms in the mining industry has decreased from 733 in 2012 (40.65% of listed companies) to 581 in 2018 (33.64% of listed companies). It is apparent that the Big 4 have a lower market share for mining clients relative their market share in other industries, whilst all other audit firms have a relatively greater share of their clients in the mining industry.

Table 5: Market Share Based on Number of Listed Companies with Audit Opinions Signed in Australia Categorised by Industry

Year	Total	Big 4 No.	Big 4 %	Large Non-Big 4 No.	Large Non-Big 4 %	Medium Non-Big 4 No.	Medium Non-Big 4 %	Small Non-Big 4 No.	Small Non-Big 4 %
Panel A: Mining Industry (GICS Code 1510)									
2012	733	202	**27.56**	201	**27.42**	286	**39.02**	44	**6.00**
2013	731	202	**27.63**	203	**27.77**	285	**38.99**	41	**5.61**
2014	673	183	**27.19**	181	**26.89**	266	**39.52**	43	**6.39**
2015	629	170	**27.03**	169	**26.87**	256	**40.70**	34	**5.41**
2016	594	156	**26.26**	150	**25.25**	247	**41.58**	41	**6.90**
2017	579	158	**27.29**	145	**25.04**	233	**40.24**	43	**7.43**
2018	581	149	**25.65**	145	**24.96**	243	**41.82**	44	**7.57**
Avg	**645**	**174**	**26.94**	**171**	**26.31**	**259**	**40.27**	**41**	**6.47**
Panel B: Other Industries									
2012	1,070	532	**49.72**	201	**18.79**	240	**22.43**	97	**9.07**
2013	1,061	533	**50.24**	202	**19.04**	245	**23.09**	81	**7.63**
2014	1,105	534	**48.33**	218	**19.73**	276	**24.98**	77	**6.97**
2015	1,186	573	**48.31**	224	**18.89**	308	**25.97**	81	**6.83**
2016	1,124	521	**46.35**	222	**19.75**	315	**28.02**	66	**5.87**
2017	1,145	511	**44.63**	223	**19.48**	355	**31.00**	56	**4.89**
2018	1,146	502	**43.80**	211	**18.41**	373	**32.55**	60	**5.24**
Avg	**1,120**	**529**	**47.34**	**214**	**19.15**	**302**	**26.86**	**74**	**6.64**

Trends in Audit Fees

In Tables 6-10, audit fees are used as the base for my analysis of the Australian listed company audit market. The total audit fee analysed includes fees paid to the principal (signing) auditor, together with audit fees paid to members of the principal auditor's network and includes audit and audit-related services.

As shown in Table 6, the total audit fees paid by Australian listed companies ranges from $488 million in 2012 to $579 million in 2017, declining to $546 million in 2018. The total audit fees paid to Big 4 audit firms collectively are in the range of $425 million (2012) to $504 million (2017) and decline to $ million in 2018. Over the period 2012-2018, audit fees paid to the Big 4 represent over 87% of total audit fees, noting that this has declined from a high of 88.30% in 2014 to 86.51% in 2018. The Large Non-Big 4 audit firms (BDO and Grant Thornton) together receive audit fees from their listed company clients of $26 million in 2012 to a high of $31 million in 2017, overall representing 5% of the total audit market by audit fees. The Medium Non-Big 4 firms (17 firms) in total receive audit fees of $29 million in 2012 growing to $40 million by 2018 and growing their share of the market from 5.97% to 7.37% by 2018. Small Non-Big 4 firms are shown to be receiving a declining total audit fee revenue from over $7 million in 2012 to under $5 million in 2017, with an average share of around 1% of total audit fee revenues.

Table 6: Market Share Based on Total Audit Fees of Listed Companies with Audit Opinions Signed in Australia

Year	Total $ million	Big 4 $ million	Big 4 %	Large Non-Big 4 $ million	Large Non-Big 4 %	Medium Non-Big 4 $ million	Medium Non-Big 4 %	Small Non-Big 4 $ million	Small Non-Big 4 %
2012	488.198	425.027	**87.06**	26.623	**5.45**	29.159	**5.97**	7.387	**1.51**
2013	492.616	429.772	**87.24**	27.492	**5.58**	28.889	**5.86**	6.463	**1.31**
2014	538.316	475.328	**88.30**	27.519	**5.11**	29.982	**5.57**	5.486	**1.02**
2015	534.584	470.420	**88.00**	27.557	**5.15**	30.594	**5.72**	6.012	**1.12**
2016	542.568	473.472	**87.27**	29.497	**5.44**	33.781	**6.23**	5.816	**1.07**
2017	579.575	504.523	**87.05**	31.233	**5.39**	38.856	**6.70**	4.962	**0.86**
2018	546.975	473.171	**86.51**	28.207	**5.16**	40.324	**7.37**	5.271	**0.96**
Avg	**531.833**	**464.530**	**87.35**	**28.304**	**5.33**	**33.084**	**6.20**	**5.914**	**1.12**

In Table 7, I use the same four market segments as previously and analyse the total audit fees for each client segment by audit firm type for each year. The total audit fees paid to Big 4 audit firms collectively are in the range of $326 million (2012) to $398 million (2017) and represent over 98% of the audit fees paid by the largest 200 clients by market capitalisation. The Big 4 receive around a further $100 million per year from the audits of their other listed company clients, with a clear decline in their participation in the small client segment. The Large Non-Big 4 audit firms (BDO and Grant Thornton) together receive over 70% of their audit fee revenues from clients outside the top 500 by market capitalisation.

Table 7: Market Share Based on Audit Fees of Listed Companies with Audit Opinions Signed in Australia Categorised by Client Size

Year	Total Audit Fees ($ mill.)	Big 4 Audit Fees ($ mill.)	Big 4 Audit Fees %	Large Non-Big 4 Audit Fees ($ mill.)	Large Non-Big 4 Audit Fees %	Medium Non-Big 4 Audit Fees ($ mill.)	Medium Non-Big 4 Audit Fees %	Small Non-Big 4 Audit Fees ($ mill.)	Small Non-Big 4 Audit Fees %
Panel A: Very Large Clients (Top 200 by Market Capitalisation)									
2012	330.700	326.292	**98.67**	1.800	**0.54**	2.317	**0.70**	0.290	**0.09**
2013	332.269	327.044	**98.43**	2.074	**0.62**	2.834	**0.85**	0.316	**0.10**
2014	381.167	375.947	**98.63**	1.889	**0.50**	3.306	**0.87**	0.024	**0.01**
2015	375.260	370.201	**98.65**	1.682	**0.45**	3.353	**0.89**	0.023	**0.01**
2016	374.016	368.704	**98.58**	2.378	**0.64**	2.811	**0.75**	0.122	**0.03**
2017	405.719	398.004	**98.10**	2.649	**0.65**	4.924	**1.21**	0.140	**0.03**
2018	369.230	363.622	**98.48**	0.843	**0.23**	4.732	**1.28**	0.032	**0.01**
Panel B: Large Clients (201–500 by Market Capitalisation)									
2012	63.909	52.603	**82.31**	4.761	**7.45**	4.709	**7.37**	1.834	**2.87**
2013	67.271	56.833	**84.48**	4.623	**6.87**	4.156	**6.18**	1.658	**2.46**
2014	67.884	55.347	**81.53**	5.281	**7.78**	5.934	**8.74**	1.321	**1.95**
2015	68.360	55.558	**81.27**	5.071	**7.42**	5.974	**8.74**	1.757	**2.57**
2016	76.632	63.082	**82.32**	5.848	**7.63**	6.457	**8.43**	1.243	**1.62**
2017	76.472	63.721	**83.33**	6.335	**8.28**	5.488	**7.18**	0.927	**1.21**
2018	72.982	58.245	**79.81**	6.836	**9.37**	6.998	**9.59**	0.902	**1.24**
Panel C: Medium Clients (Others)									
2012	69.034	37.645	**54.53**	14.155	**20.50**	13.784	**19.97**	3.449	**5.00**
2013	69.218	38.427	**55.52**	15.092	**21.80**	12.648	**18.27**	3.049	**4.41**
2014	66.506	37.103	**55.79**	14.967	**22.51**	11.822	**17.78**	2.612	**3.93**
2015	65.965	33.597	**50.93**	15.981	**24.23**	13.351	**20.24**	3.034	**4.60**
2016	67.337	34.860	**51.77**	14.515	**21.56**	14.856	**22.06**	3.104	**4.61**
2017	68.850	34.800	**50.55**	14.230	**20.67**	17.438	**25.33**	2.380	**3.46**
2018	82.673	48.301	**58.42**	13.637	**16.50**	18.163	**21.97**	2.570	**3.11**
Panel D: Small Clients (Bottom 500 by Market Capitalisation)									
2012	24.554	8.485	**34.56**	5.907	**24.06**	8.348	**34.00**	1.813	**7.39**
2013	23.857	7.466	**31.30**	5.702	**23.90**	9.249	**38.77**	1.439	**6.03**
2014	22.758	6.930	**30.45**	5.380	**23.64**	8.919	**39.19**	1.528	**6.72**
2015	24.998	11.063	**44.26**	4.822	**19.29**	7.914	**31.66**	1.197	**4.79**
2016	24.581	6.825	**27.77**	6.754	**27.48**	9.656	**39.28**	1.345	**5.47**
2017	28.531	7.997	**28.03**	8.017	**28.10**	11.004	**38.57**	1.513	**5.30**
2018	22.088	3.001	**13.59**	6.889	**31.19**	10.430	**47.22**	1.766	**8.00**

In Table 8, I calculate the mean (average) and median (middle) audit fee for each category of audit firm by year. The total audit fee includes fees paid to the principal (signing) auditor, together with audit fees paid to members of the principal auditor's network. This has been a period of significant regulatory change with an increase in regulatory requirements and listing rules and a general increase in the complexity of accounting and audit requirements. The average audit fee for a Big 4 client increased from $579,212 in 2012 to over $726,838 by 2018, an increase of 25.48% over this period (equating to an average annual increase of 3.64%, which is similar to wage growth and inflation) with a similar increase apparent in median audit fees of 26.85%[4]. These rises are consistent with the increases in audit effort resulting from enhancements in auditing standards and increased work effort as a result of inspections undertaken by regulators which are particularly focused on this group of firms. Note that the difference between the means and median audit fees for Big 4 firms is particularly pronounced due to the existence of some extremely large audit fees for complex international group audits.

By 2018, the average audit fee for clients of BDO and Grant Thornton is just under $80,000, for clients of Medium Non-Big 4 firms around $65,000, and for clients of Small Non-Big 4 firms just over $50,000. This trend is reflective of the differing size of the clients for each category of audit firm. Increases in mean and median audit fees are also observed for Large and Medium Non-Big 4 firms (19.64% and 17.55% increase in mean fees, 11.86% and 11.74% increase in median fees for Large and Medium Non-Big 4 firms respectively). For Small Non-Big 4 audit firms, audit fees have declined over the period 2012–2018, although there is greater yearly variation in mean and median for this group of clients. Given the increase in audit regulation and expectations regarding auditing as well as general cost increases, this is an unexpected result. Given all audit fees noted here are for listed companies, it is interesting to note than even in 2018 that half of the audits (approximately 50) undertaken by Small Non-Big 4 firms attract a fee of less than $30,325.

Table 8: Mean and Median Audit Fees for Australian Listed Company Clients

Year	Big 4		Large Non-Big 4		Medium Non-Big 4		Small Non-Big 4	
	Mean $	Median $	Mean $	Median $	Mean $	Median $	Mean $	Median $
2012	579,212	163,125	66,228	47,249	55,689	37,000	52,395	37,500
2013	585,521	174,375	67,882	49,000	54,818	35,000	52,976	40,000
2014	662,941	182,125	68,971	47,405	55,318	34,637	45,718	33,174
2015	633,137	171,700	70,121	45,660	54,245	34,031	52,283	31,517
2016	699,368	209,739	79,293	50,000	60,110	36,795	54,364	31,115
2017	686,855	210,507	84,873	53,641	61,105	37,034	63,991	38,544
2018	726,838	206,925	79,235	52,855	65,462	41,342	50,688	30,325
Avg	**653,410**	**188,357**	**73,800**	**49,401**	**58,107**	**36,548**	**53,202**	**34,596**

[4] This average (median) fee decrease would also be partly attributable to the decrease in the number of small clients audited by the Big 4, as identified in Table 4, Panel D.

To provide some insight into the differences in client size between the portfolios of the different groups of audit firms, I analyse the mean and median total assets in Table 9 below. It is clear that that Big 4 audit firms are matched with the largest clients with median total assets of $161 million. The difference between the mean and median total assets demonstrates the variation in size of clients of the Big 4. The Large Non-Big 4 firm service on average a much smaller client segment (median assets of $14 million) with the Medium and Small Non-Big 4 firms servicing similar sized clients (median assets of $8 and $9 million respectively). By way of comparison, the growth in median total assets for clients of the Big 4 is 50% over the period 2012-2018 whilst median audit fee growth evident in Table 8 has been approximately half this (27%).

Table 9: Mean and Median Total Assets (in Millions) for Australian Listed Companies

Year	Big 4		Large Non-Big 4		Medium Non-Big 4		Small Non-Big 4	
	Mean $ million	Median $ million	Mean $ million	Median $ million	Mean $ million	Median $ million	Mean $ million	Median $ million
2012	5,632	130	57	16	68	10	71	10
2013	5,926	141	56	16	69	8	89	11
2014	6,391	144	56	14	79	7	61	8
2015	6,794	154	48	13	77	7	74	8
2016	6,174	178	56	13	76	8	77	8
2017	6,634	186	55	12	90	9	83	9
2018	7,715	195	54	12	94	10	91	9
Avg	**6,467**	**161**	**55**	**14**	**79**	**8**	**78**	**9**

Table 10 outlines the mean and median audit fees for each of the six largest audit firms. Looking at the average audit fees for the period, it can be seen that PWC has the highest average audit fee of $969,527 amongst the Big 4, with Deloitte having the lowest average over the period of $308,654. Median audit fees reveal a similar trend, but also demonstrate that there are a number of very large audit fees paid by large audit clients which skew the distribution. BDO and Grant Thornton have similar mean audit fees on average over the period of around $74,000. This reflects the diversity of the size and nature of the client base of the Big 4 compared to the Large Non-Big 4 audit firms discussed in Table 9.

Table 10: Mean and Median Audit Fees for Australian Listed Company Clients

Year	**DT**		**EY**		**KPMG**	
	Mean $	**Median $**	**Mean $**	**Median $**	**Mean $**	**Median $**
2012	240,969	112,796	567,269	149,153	736,254	183,075
2013	257,322	123,975	599,757	158,000	704,942	195,925
2014	277,661	123,900	615,173	145,551	809,167	229,047
2015	279,787	112,539	616,020	150,000	749,337	207,100
2016	341,917	146,602	628,587	153,623	814,172	218,775
2017	380,514	190,000	570,207	158,209	676,505	205,800
2018	382,410	210,000	642,729	155,578	768,508	200,376
Avg	**308,654**	**145,687**	**605,677**	**152,873**	**751,269**	**205,728**
	PwC		**BDO**		**Grant Thornton**	
	Mean $	**Median $**	**Mean $**	**Median $**	**Mean $**	**Median $**
2012	768,037	236,750	69,078	47,249	62,006	47,920
2013	763,874	240,000	68,084	48,582	67,582	50,000
2014	998,379	280,833	69,386	47,203	68,345	48,721
2015	924,462	280,000	71,045	44,655	68,640	46,200
2016	1,045,236	302,290	76,940	48,360	82,737	60,000
2017	1,152,428	298,000	84,189	51,667	85,888	60,217
2018	1,134,271	288,200	74,695	47,500	86,157	60,631
Avg	**969,527**	**275,153**	**73,345**	**47,888**	**74,479**	**53,384**

Concentration Ratios (CR-N) and Herfindahl-Hirschman Indices (HHI)

As discussed earlier, rather than observing market share directly, regulators often focus upon metrics such as concentration ratios or HHI which can be benchmarked to gain insights into the competitiveness (or lack of competitiveness) within a particular market.[5] For example, when considering whether to approve a merger between two large companies in an industry, regulators may examine how these metrics might change in a particular market before compared with after such a merger to see the impact of changes on market competition. The ACCC Merger Guidelines (2008) state that the HHI will be the primary indicator of the likelihood that the merger will raise competition concerns. The threshold at which concerns are likely to be raised is at a level of 2000 or a change of more than 100. In Table 11, I analyse these key metrics over the period 2012–2018 using audit fees and number of clients as the bases for comparing the market share held by the largest 4 firms (CR-4), the largest 6 firms (CR-6) and the largest twenty firms (CR-20) and for the whole market (HHI). These correspond to the Big 4, the Big 4 plus Large Non-Big 4, the Big 4 plus Large and Medium Non-Big 4 firms respectively. From this analysis, it is clear that the Big 4 dominate the market when measured using audit fees with a share of 87% of total fees charged to listed companies in 2012, with a decline in this measure over the period to 86%. This is still a very high share of the overall audit market in Australia. Using measures based on number of clients, it can be seen that the Big 4's share of clients has declined but with a fairly minimal impact on their overall share of audit fee revenues. A reasonable conclusion to draw here is that the Big 4 have not pursued the relatively small, recently listed companies, leaving these audits to the Non-Big 4 firms. When considering the share of the market occupied by the six largest firms, there is also a slight decline in share of overall revenues (from 93% to 91%). However, the overall fees attributable to the six largest audit providers are extremely high.

Table 11: Concentration Ratios and Herfindahl-Hirschman Indices Based on Audit Fees and Number of Clients

Year	CR-4		CR-6		CR-20		Calculated HHI	
	Fees %	Clients %	Fees %	Clients %	Fees %	Clients %	Fees	Clients
2012	87	41	93	63	98	92	2,162	767
2013	87	41	93	64	99	93	2,161	779
2014	88	40	93	63	99	93	2,218	768
2015	88	41	93	63	99	94	2,183	772
2016	87	39	93	61	99	94	2,150	751
2017	87	39	92	60	98	92	2,142	733
2018	86	38	91	58	99	94	1,967	722

5 The ACCC defines a market as "the product and geographic space in which rivalry and competition takes place" (ACCC, 2008, page 15). Goddard (1998) provides an analysis of how the Price Waterhouse/Coopers & Lybrand merger was assessed by competition regulators in Australia. From a product perspective, the market was considered to comprise six areas: auditing, tax, management consulting, actuarial, insolvency and corporate financial services with most focus placed on audit, tax and management consulting services. The prime analysis was conducted on listed companies with additional analysis on a small group of large private companies. Geographically, the market was considered to be Australia-wide. My analysis is confined to audit services to listed companies and is also Australia wide.

In the final two columns of Table 11, the HHI index is calculated for the market as a whole using two bases, audit fee revenues and number of clients. This measure assesses the competitiveness of a market taking in account the relative size of the providers in the market. By way of example, a market with 4 large providers of 20% market share each and then 20 providers with a market share of 1% each will result in an HHI of 1620. By comparison a market with 25 providers with 4% each will result in an HHI of 400. The theoretical maximum of the HHI is 10000 where the market is fully controlled by a single firm and the HHI approaches zero when the market is made up of a large number of similarly sized firms. A higher HHI is indicative of a less competitive market which is attributable to the relative unevenness of the market shares of large versus small players in the market. The HHI index calculated for the Australian market shows two different perspectives depending on whether fee revenues or number of clients are the base used in the calculation.

Using fee revenues, the HHI indicates that the Australian audit market is highly concentrated increasing from 2162 in 2012 to a maximum of 2218 in 2014 and declining to a current level of 1967 in 2018 pointing to a reduction in concentration in the audit market over this period. Given the ACCC's guideline of an HHI of 2000 as being an indicator of a point at which a merger would raise competitive concerns, it is clear that the audit market is just under this threshold from a revenue perspective within the 4 largest audit firms[6]. Should there be any future attempts to merge within the Big 4 it would seem unlikely that such an attempt would be endorsed by the Australian Competition and Consumer Commission. It is noteworthy that the HHI using number of clients is suggestive of a considerably less highly concentrated market with the maximum at 779 in 2013 and a steady decline through to the current value of 722 in 2018. This reflects the growth of medium sized audit firms over this period. Therefore the level of the HHI using the base of the number of clients would not be at levels that would be considered to raise competitive concerns of the ACCC.

I further analyse CR-4 and HHI (based on audit fees and number of clients) splitting the market into four categories based on client size (Table 12). This confirms my previous findings in that the very large client market is highly concentrated but not increasingly so (with fee- based CR-4 over 99% in all periods and HHI decreasing from 2896 to 2848 from 2012–2018). For large clients CR-4 has remaining in the low 80% range and the HHI has declined from a peak of 1868 in 2013 to 1713 by 2018. For medium-sized clients CR-4 has decreased from 55% to 50% by 2017 and an increase to 58% in 2018 and the HHI in 2012 was 1072 decreasing to 899 by 2018, suggesting a decrease in concentration for the medium client market. For small clients a decrease in CR-4 from 35% to 14% was observed, together with an increase in the HHI from 716 in 2012 to 842 in 2018, suggesting an increase in concentration for smaller clients at a modest level. Similar trends are observed for CR-4 and HHI calculated using numbers of clients. Overall this suggests that the concerns regarding audit industry concentration and competitiveness differ across markets based on client size, with the large client market being highly concentrated but not increasingly so over the time period examined, and that concentration has decreased over this period for all client segments except for small clients which are already at low levels.

[6] The United States Department of Justice considers HHI values of 1500 to 2500 to indicate a moderately concentrated market and values above 2500 to be indicative of a highly concentrated market. Using these thresholds and audit fees as a measure, the Australian audit market overall would be considered to be moderately concentrated and only for the very largest clients would it be considered to be highly concentrated.

Table 12: Concentration Ratios and Herfindahl-Hirschman Indices Based on Audit Fees and Number of Clients Categorized by Client Size

Year	CR-4 (fees) %	HHI (fees)	CR-4 (clients) %	HHI (clients)
Very Large Clients (Top 200 by Market Capitalisation)				
2012	99	2,896	92	2,277
2013	98	2,880	90	2,228
2014	99	2,893	91	2,188
2015	99	2,892	92	2,233
2016	99	2,893	91	2,230
2017	98	2,927	91	2,177
2018	98	2,848	92	2,231
Large Clients (201–500 by Market Capitalisation)				
2012	82	1,821	68	1,301
2013	84	1,868	71	1,364
2014	82	1,727	66	1,246
2015	81	1,699	68	1,282
2016	82	1,789	67	1,305
2017	83	1,844	65	1,229
2018	80	1,713	65	1,231
Medium Clients (Others)				
2012	55	1,072	32	790
2013	56	1,094	33	826
2014	56	1,107	34	834
2015	51	1,024	32	823
2016	52	991	31	745
2017	50	947	31	717
2018	58	899	31	693
Small Clients (Bottom 500 by Market Capitalisation)				
2012	35	716	19	653
2013	31	698	16	665
2014	30	695	15	675
2015	38	736	18	682
2016	28	793	14	728
2017	28	866	13	740
2018	14	842	10	767

Audit Firm Switching

Table 13 examines the incidence of clients changing audit firm for each year over the period 2012–2018. The number of clients changing audit firms varies from year to year, averaging just over 8% of audits clients changing audit firms, with a range of 5% to 12%. This provides an indication of the number of audit clients seeking to change auditors, as some audit clients may review their audit provider and not change their audit firm as a result. The average rate of change is highest for small clients (over 10% per year) and lowest for large clients (less than 3% change auditor in a given year). In untabulated analysis, changes in audit firm types are evenly spread between upgrading to an auditor in a higher tier, to another auditor in the same tier and to an audit in a lower tier.

Table 13: Number and Percentage of Clients Changing Auditors

Year	Total	No. of Observations with Clients also Listed in Prior Year	No. of Changes	% of Changes
2013	1,792	1,704	160	8.93
2014	1,778	1,676	168	9.45
2015	1,815	1,679	115	6.34
2016	1,718	1,578	206	11.99
2017	1,724	1,540	127	7.37
2018	1,727	1,523	103	5.96
Avg			**146**	**8.34**

In Table 14, I compare the audit fees charged by the previous audit firm with those charged by the new audit firm. In a minority of cases (approximately 15%), the audit fee is materially unchanged. There is evidence of both audit fees increasing by more than 5% following an audit firm change (in a third of cases) and audit fees decreasing by more than 5% (in nearly half the cases observed). Given that small clients have the highest rates of auditor change, seeking lower audit fees appears to be a key incentive driving this behaviour.

Table 14: Changes in Audit Fees for Clients Changing Auditors

Year	No. of Changes	% of Changes with Audit Fees Increasing by more than 5%	% of Changes with Audit Fees between -5% and +5%	% of Changes with Audit Fees Decreasing by more than 5%
2013	160	40.63	14.38	45.00
2014	168	35.12	17.26	47.62
2015	115	32.17	12.17	55.65
2016	206	36.89	16.51	46.60
2017	127	38.58	16.54	44.88
2018	103	33.01	14.56	52.43
Avg		**36.07**	**15.24**	**48.70**

Conclusions

Whilst regulators have publicised their concerns regarding the market dominance of the largest audit firms in the provision of audit services, there has been little consideration of the underlying data as it relates to the competitiveness of the Australian audit market, or the related academic studies regarding the underlying structure and competitiveness of the Australian audit market. In this research paper I provide a detailed analysis of the Australian audit market over the period 2012-2018 for listed companies. Unlike other jurisdictions, where the Big 4 audit more than 70% (United States) or 84% (United Kingdom) of listed companies, in Australia the market share of Big 4 auditors is now less than 40%. My analysis demonstrates that the market is highly segmented with differing levels of concentration across the client size segments examined. The largest and most complex clients are serviced by the Big 4, whilst smaller clients are serviced by a range of other providers. Audit fees in Australia over this period have increased but at a rate consistent with inflation and wage increases over this period for clients of Big 4, Large and Medium Non-Big 4 firms. This is observed at a time of enhancements to auditing and accounting standards and resulting increased audit effort needed to complete audit engagements in times of regulatory change and public scrutiny. Given this, it is surprising to observe that audit fees have not increased over this period for clients of Small Non-Big 4 audit firms. At the same time it is observed that there has been a decrease in the number of Small Non-Big 4 audit firms operating in the listed company audit market. In relation to concentration, my analysis demonstrates that the very large and large company audit market segments is highly concentrated but that this has not increased over this period, for medium clients the market is slightly less concentrated and that there has been an increase in concentration in the small client market but to a modest overall level. All of these results indicate a competitive but complex audit market. This report provides an important input into any decision-making process to limit or regulate the behaviour of audit market participants and a current understanding of the Australian listed company audit market.

To this end I have also reviewed the academic research on the structure and competitiveness of the Australian audit market in an Appendix following. One limitation of my analysis is that due to the availability of data I am necessarily confined to defining the audit market as audits of listed companies for which audit fee data is publicly available. Accordingly, my conclusions can only be generalised to the listed company market as a whole. Whilst it would be useful to examine the private company market for audits, as it represents a significant amount of the fee revenues for audit firms of all sizes, the data to do so is lodged in annual filings with the Australian Securities and Investments Commission, but the cost of accessing this data is prohibitive to researchers. My analysis is also confined to the audit services market, however accounting firms provide a range of other services (for example, taxation, advisory, information technology and other consulting services) to their audit clients and to their non-audit clients (see Carey et al. 2014 for a review of the academic research). This issue will be covered in a separate research paper.

Appendix: Summary of Academic Research conducted in Australia of the Audit Market

I have restricted this review to published research and have not included working papers as they have not been peer-reviewed.

Audit Fees

Investigating competitiveness of audit markets using audit fees has been extensively examined by accounting researchers for many years. Research on this topic started from the original seminal work by Simunic (1980), who argued that audit fees charged by auditors are driven by the auditor's production function and expected losses arising from the conduct of the audit. Following this approach, a large number of subsequent studies have modelled the relationship between audit fees and various attributes of the client, characteristics of the auditor as well as factors specific to that particular audit engagement (for a summary of these studies refer to Hay et al. 2006). This literature has had a significant input from the Australian academic community due to the public disclosure of audit fees which has occurred in Australia since 1962 (compared to the U.S. where disclosure was only required as a result of the Sarbanes Oxley Act in 2002, so U.S. studies conducted prior to this time period use small samples of either voluntary disclosures or survey data) enabling a detailed analysis of the Australian audit market over an extended period of time. Below I tabulate the key Australian published research in quality journals in relation to the key areas of interest.

Table to Appendix: Studies Undertaken in the Australian Market

Authors	Date	Period	Sample Size
Market Concentration, Competition and Audit Firm Mergers			
Carson, Botica-Redmayne and Liao	2014	2000–2011	18,584
Carson, Simnett, Soo and Wright	2012	1996–2007	11,593
Hamilton, Li and Stokes	2008	2000, 2003	1,207, 1,229
Thavapalan, Moroney and Simnett	2002	1997, 1999	1,085, 1,083
Goddard	1998	1995	1,000
Craswell and Taylor	1991	1982–1987	
Gilling and Stanton	1978	1971, 1976	150
Auditor Choice and Auditor Change			
Craswell and Francis	1999	1987	1,468
Butterworth and Houghton	1995	1987–1988	268
Anderson, Stokes and Zimmer	1993	1979–1985	60
Francis	1984	1974–1978	150
Audit Fees and Determinants			
Stewart, Kent and Routledge	2015	2007-2010	4,342
Yao, Percy and Hu	2015	2003-2007	984
Goodwin-Stewart and Kent	2006	2000	401
Carson, Fargher, Simon and Taylor	2004	1995–1999	795, 884
Gul, Chen and Tsui	2003	1993	648
Jubb, Houghton and Butterworth	1996	1988	229
Gerrard, Houghton and Woodliff	1994	1980	232
Haskins and Williams	1988	1979–1981	67
Francis and Stokes	1986	1983	96
Regulation, Events and Audit Fees			
Xu, Carson, Fargher and Jiang	2012	2005–2009	5,491
Salman and Carson	2009	2001, 2003, 2005	351, 350, 346
Boon, Crowe, McKinnon and Ross	2005	1993–2002	126

Industry Specialisation			
Goodwin and Wu	2014	2003-2010	6,368
Carson and Fargher	2007	1998, 1999, 2004	558, 543, 611
Ferguson, Francis and Stokes	2006	1998	1,046
Ferguson, Francis and Stokes	2003	1998	681
Ferguson and Stokes	2002	1990, 1992, 1994, 1998	586, 466, 564, 566
Craswell, Francis and Taylor	1995	1987	513

More specifically, the commonly-used audit fee model presented in prior research is expressed as follows:

$$InFees = \beta_0 + \beta_1 \textit{ control variables} + \beta_2 \textit{ experimental variables}$$

where *InFees* is the natural logarithm of the audit fees.

The academic literature investigates research questions by regressing audit fees on a series of control variables that have been identified in prior literature, as well as new interesting experimental variables. The control variables commonly used are size of the client (in total assets) which on its own explains most of the variation in audit fees between clients, riskiness of the client (liquidity, debt measures, existence of losses) and complexity (number of subsidiaries, foreign operations). The choice of experimental variables will be dependent on the research question being examined. If the coefficients on these experimental variables are found to be significant, the hypothesized relationship with audit fees is assumed to exist. I discuss some of the more pertinent findings in the literature below.

Literature on audit fees has extensively investigated the association between audit fees and a range of determinants, such as size, inherent risk, internal control and governance. An early study by Francis (1984) shows that, all else being equal, Big 8 audit firms charge higher audit fees than Non-Big 8 firms and this difference exists in both the large and small client samples during the period 1974–1978. Francis and Stokes (1986), confirmed by Carson et al. (2004), report that there are no significant differences in audit fees between Big 4 and Non-Big 4 for very large publicly listed Australian companies, but price premiums are observed for small companies audited by the Big 4. In a longitudinal analysis Carson et al. (2012) report that relative to 1996–1999, premiums paid to Big 4 have increased over the period 2000–2007 but that the growth has not impacted all segments of the market equally. In particular, large global clients have experienced lower growth in fees, attributable to their market power *vis a vis* their auditors whilst small clients choosing a Big 4 auditor are paying increasingly for the choice, despite the availability of alternate suppliers. This suggests that small clients perceive that there is a benefit in having a Big 4 auditor and that clients do not perceive audits provided by other audit firms as being equivalent to that of the Big 4.

In relation to corporate governance and audit fees, Goodwin-Stewart and Kent (2006) demonstrate that the existence of an audit committee, more frequent committee meetings, and increased use of internal audit are associated with higher audit fees, because higher quality audit is demanded. This is contrary to Gerrard et al.'s (1994) study, who find internal audit appears to be an insignificant determinant of audit fees. I attribute the conflicting findings here to an increased focus on internal audit and corporate governance issues in later time periods which were studied by Goodwin-Stewart and Kent (2006). Examining the relationship between inherent risk and audit fees, Jubb et al. (1996) use a factor analysis of 229 Australian firms to argue that both audit risk (which includes consideration of internal controls) and business risk are determinants of audit fees. However, generally there is a lack of evidence of strong relationships between internal control and governance on audit fees.

Impact of Regulation and Significant Events on Audit Fees

Changes in regulation have a significant impact on market competition and audit fees. Using a sample of 1,250 annual reports of 126 local councils in New South Wales during the period 1993 to 2002, Boon et al. (2005) find that introduction of compulsory audit tendering has significantly reduced audit fees and increased competition. In the context of current proposals in the UK regarding mandatory tendering, this is an example of where research using other types of organisations which are subject to differing regulations may be useful to understanding how such regulations would be applicable to the listed company market. Given the paucity of research using private companies, not for profits and the governmental sector in Australia, there are opportunities for researchers to further consider these types of organisations and their regulatory environments and the effects of changes in regulation on audit fees.

In an example of how extraterritorial regulation can impact the local audit market, Salman and Carson (2009) examine how the introduction of the Sarbanes-Oxley Act (SOX) in 2002 affects audit fees of Australian firms cross-listed on U.S. stock exchanges, compared to Australian domestic firms not subject to SOX. They show that compliance with SOX for Australian firms seeking to access US capital markets is associated with significantly increased audit fees providing evidence that pricing in Australian audit markets can be impacted by factors outside the control of local regulators and for reasons unrelated to competition. In research considering the most recent financial crisis, Xu et al. (2012) examine the impact of the global financial crisis on audit fees (amongst other factors) for Australian listed companies and find an increase in audit fees in the period 2008 to 2009 to reflect the additional auditor effort required to complete audit engagements during the financial crisis. Stewart et al (2016) examine the impact of audit partner rotation on audit fees for Australian listed companies over the period 2007 to 2010 and find that rotation is associated with higher audit fees for some market segments, reflecting the costs associated with such a policy. I conclude that there is evidence of changes in regulation and economic events impacting audit fees, and these changes are not attributable to changes in the level of competition or other regulatory changes in market structure.

Industry Specialisation

There is a large body of academic literature focusing on the economics of auditor industry specialisation. One of the reasons that audit firms develop industry specialisation is to differentiate themselves from their competitors by providing a higher quality audit service, which enhances an audit firm's reputation with the intent to achieve greater returns through higher audit fees (Hay and Jeter 2011). On the other hand, industry specialisation could achieve economies of scale and greater audit efficiency which, if passed onto the client, would lead to lower audit fees (Eichenseher and Danos 1981; Hay and Jeter 2011).

In the first Australian study to consider the issue of industry in the context of audit markets, Craswell and Taylor (1991) measure industry specialisation based on either the number of audit clients in an industry or the percentage of total audit fees in the industry. In addition, a minimum of 30 firms per industry is a requirement for industry specialisation. In this study, audit firms are defined as a specialist if they attain a 10% market share from either or both of these measures. Following this definition, a number of studies examined the effect of industry specialisation on audit fee premiums. For instance, by using a sample of 1484 public listed firms in 23 industries over the period 1982 to 1987, Craswell et al. (1995) showed that industry specialist auditors charge clients on average a 34% premium over non-specialist auditors. However, I note that this result is highly sensitive to the definition of industry specialisation and to the size of the client (Carson and Fargher 2007). Similarly, Ferguson and Stokes (2002) use various definitions of industry specialisation to investigate industry specialist premiums in the years 1990, 1992, 1994 and 1998 following the mergers that created the Big 6 and the Big 5 audit firms. They do not find existence of specialist premiums in the post-merger years, particularly from

1992 onwards. However, they do find the limited support for the presence of premiums for industry leader, which is defined as the audit firm with the largest share of audit fees in the client industry. Carson et al. (2012) confirm this result and document that the extent of the premium paid to industry specialists has declined over the period 1997 to 2007.

Unlike Craswell et al. (1995) and Ferguson and Stokes (2002) who examine specialisation at a national level, Ferguson et al. (2003) analyse industry specialisation at a city level in addition to a national level. Given the geographic distance between key cities in Australia, this is a useful approach to understanding how local city level audit markets behave. Using Big 5 industry rankings based on market share of total audit fees within each industry to measure industry experts, they find that auditors earn an average 24% audit fee premium when the auditor is both the city leader and one of the top two national firms, but that the top two national firms do not earn a premium if they are not a city leader. This result reveals that the pricing of industry specialist is primarily driven by city-level industry leadership, rather than the firm-wide view of industry expertise (Ferguson et al. 2003). In addition to the joint determination of the city specific and national industry expertise, Ferguson et al. (2006) further document that city specific market leadership also results in audit fee premiums. Goodwin and Wu (2014) analyse pricing of expertise at the audit partner level and find evidence of premium pricing by industry specialist partners (rather than specialist offices or firms). Overall this stream of research suggests that Big 4 audit firms (and partners) which successfully differentiate themselves as industry specialists have achieved economic returns from doing so, but that these returns have declined as the extent of differentiation between competitors appears to have reduced over time.

Market Concentration, Competition and Audit Firm Mergers

The earliest study examining the structure and competition of the Australian audit market is conducted by Gilling and Stanton (1978). By using three sample groups: (1) the 150 largest listed Australian companies (2) randomly selected public companies from Sydney Stock Exchange in 1976 and (3) unlisted firms with an authorized capital of over two million dollars, they find the evidence of high level of concentration and dominance of a small group of audit firms in the Australian audit market, reflected in the four-firm and eight-firm concentration ratios. However, Craswell and Taylor (1991) argue that while the Big 8 audit firms have large market shares, the measurements used to calculate the concentration ratios are sensitive to activity bases in calculation, and can vary across different client groups because of industry specialisation.

The structure of the audit market in Australia and world-wide has changed quite significantly over the last 25 years from 8 large suppliers through consolidation and collapse to 4 major suppliers. There are several studies investigating the impacts of these mergers on market competition in Australia. For example, after carefully examining the proposed merger between Coopers & Lybrand and Price Waterhouse to form PricewaterhouseCoopers (PwC) in July 1998, the Australian Competition and Consumer Commission (ACCC) concluded that the merger is unlikely to substantially lessen competition. This is because five vigorous competitors still remained and clients had substantial bargaining power in the marketplace despite the 4-firm concentration ratio in the post-merger market that exceeded the threshold at the time identified by the ACCC of 75 percent (Goddard 1998; Thavapalan et al. 2002). Thavapalan et al (2002) document that the merger decreased the gap between the then largest firm (KPMG) and the newly merged PwC which became the second largest firm, resulting in a more even distribution of market share amongst the largest firms. Using the Herfindahl index, Thavapalan et al (2002) find that in about a third of industries, the market shares of the largest four audit firms became more even, suggesting a more competitive post-merger market. Carson et al (2014) undertake a comprehensive analysis of the listed company audit market across the period 2000-2011 and conclude that the Australian audit market over this period is both highly segmented and supplier concentrated, and that audit fees have increased significantly over this period which the authors attribute to increased regulation and resulting increased audit effort needed to complete audit engagements in times of regulatory change and during the global financial crisis.

Hamilton et al. (2008) analysed the effect of the Arthur Andersen collapse and subsequent merger with Ernst & Young and reached a similar conclusion that competition among audit firms did not disappear following the merger. Overall, using data from 2000 and from 2003, they find that Big 4 audit firms earn premiums in large and small client segments and that there are diseconomies of scale which result in high barriers to entry to Non-Big 4 auditors seeking to enter the large client segment. Hamilton et al. (2008), in that way, provided further evidence of Australian audit market segmentation. Carson et al. (2012) assess the changes in audit market competition over the Big 6, Big 5 and Big 4 periods (1996–2007) in Australia. They report, similar to previous literature, that Big 4 firms receive audit fee premiums. Carson et al (2012) document that the premiums paid to Big 4 auditors have increased significantly for the Big 4 and Big 5 periods compared to the Big 6 period, suggesting that the decrease in the number of the largest audit firms from the Big 6 to Big 4 has likely reduced the level of competition in the audit market for public companies as reflected by increases in audit fee premiums, but that this impact is not consistent across all client segments. This does indicate that the impact of mergers on market structure and on competition may not be immediate and that any analysis of future mergers should consider a range of client segments across varying time periods as well as considering the use of carefully targeted research designs and methods.

Auditor Choice and Auditor Change

The structure of the audit market has, in part, been examined in academic literature by considering the situation where clients change auditor. However, empirical evidence of the impact of changing auditor on audit fees is mixed. For instance, De Angelo (1981) document the existence of “low balling” in the United States, which is a technique allegedly used by audit firms to offer initial engagement discounts to new clients. Early research found fairly limited evidence of initial engagement discounts in the Australian audit market. Francis (1984) uses a small sample of 26 auditor switches to investigate the impact of auditor changes on audit fees over the period 1974 to 1978. He finds no audit fee discounts existing for auditor switching, but initial audit fees are actually higher than continuing engagement fees. This is attributed to higher audit start-up costs. Butterworth and Houghton (1995) report a similar result that the audit fees charged by new auditor are significantly lower than those charged by incumbent auditors and auditor switching actually results in higher level of non-audit fees and in total non-audit and audit fees during 1987–1988. In addition, using a sample of 224 initial engagements in the mid-1980s, Craswell and Francis (1999) reveal that initial engagement discounts only occur for changing auditors from Non-Big 8 to Big 8, and no evidence of discounting for other auditor changes. This result is confirmed in more recent evidence where Carson et al. (2012) show that fee discounts for upgrading from a Non-Big 4 auditor to a Big 4 auditor have increased significantly in 2000–2007 relative to 1996–1999. They, however, find no evidence of discounts for other types of switches between auditors. This is because sellers of higher-priced, higher-quality services try to attract new clients by offering an inducement to purchase when uncertainty about quality can be resolved through experiencing the services (Craswell and Francis 1999; Carson et al. 2012).

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Parliamentary Joint Committee on Corporations and Financial Services Inquiry 2019

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