Audit Market Structure, Concentration, and Competition in Australia 2019-2022

Sarowar Hossain

School of Accounting, Auditing, and Taxation

UNSW Business School

USNW Sydney Australia

Email: s.hossain@unsw.edu.au

and

Professor Gary S Monroe

School of Accounting, Auditing, and Taxation

UNSW Business School

USNW Sydney Australia

Email: s.monroe@unsw.edu.au

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Executive Summary

Regulatory bodies worldwide have expressed concerns about the potential negative consequences that might arise from market concentration in the market for audit services. They are particularly concerned that a decline in competition might result in adverse effects on both the pricing and quality of audit services. These concerns have been expressed in various countries, such as the United Kingdom, where the Brydon Review in 2019 and the CMA Market Study in the same year addressed these issues. Australia's Parliamentary Joint Committee on Corporations and Financial Services Inquiry in 2019 also raised similar concerns. The specific area of focus centres on the dominance and concentration of the Big 4 audit firms observed in the audit market, along with apprehensions related to potential mergers among the Big 4 audit firms. The objective of this study is to provide a commentary informed by academic research on the current structure and competitiveness of the Australian audit market and changes in that market using recent data from companies listed on the Australian Securities Exchange (ASX) during 2019-2022.[1]

To examine audit market competition and concentration, we categorised audit firms into four types, (i) Big 4 audit firms (Deloitte, EY, KPMG, and PwC), (ii) large Non-Big 4 audit firms (Grant Thornton and BDO), (iii) medium non-Big 4 audit firms (the next 14 largest audit firms required to prepare transparency reports with more than 10 public interest entity audits per year), and (iv) small non-Big 4 audit firms, to allow for a more nuanced view of the structure of the audit market in Australia. The ACCC's Merger Guidelines (ACCC 2008) provide guidance on three concentration metrics that would be utilised to consider any future mergers or consolidations in the audit industry. These are market share, concentration ratios and the Herfindahl-Hirschman Index (HHI). We measure market share based on both the number of clients and audit fees, and calculate the key competitive metrics identified by (i) concentration ratios, and (ii) Herfindahl-Hirschman indices for audits of Australian listed companies during 2019-2022. Accordingly, this research report provides an up-to-date and relevant analysis for insights into the current structure and competition in the Australian audit market.

[1] Our sample includes all companies listed on the ASX after excluding companies that present their financial statements in currencies other than the Australian dollar and those with their client or auditor offices located outside of Australian jurisdictions.

Regulators are concerned about the market dominance of the largest audit firms, particularly the large market shares held by the Big 4 audit firms. For example, in the US, the Big 4 firms audited 46% of public companies (51% if Special Purpose Acquisition Companies are excluded) in 2022. In the UK, the Big 4 market share is 61% of companies listed on the London Stock Exchange and 96% of audit fees in 2022. In Europe, the Big 4 firms dominate the audit market with a market share of 93% of the 2022 audit fees for all listed companies on regulated European Exchanges (Audit Analytics, June 2023 and December 2023). In contrast, our findings indicate that the audit market structure in Australia is much less concentrated than in these other jurisdictions. In Australia, the market share of Big 4 audit firms is now less than 38% of listed companies, but these firms received 83% of the audit fees paid by listed companies in 2022. Our analyses show that the Australian audit market is competitively structured based on the number of clients but is moderately competitive when competition is based on audit fees. However, the market is highly segmented with differing levels of concentration and competition across the client segments investigated. The largest and most complex clients are mainly audited by the Big 4 audit firms, while smaller clients are audited by a range of other auditors. This is consistent with what occurs globally where Big 4 audit firms dominate the market for audit services provided to large and complex companies. We also find that the Australian audit market experienced a shift in market share dynamics from 2019 to 2022. Both the Big 4 and smaller audit firms saw their market share decline during this period. Meanwhile, large and medium-sized non-Big 4 audit firms gained market shares.

The Big 4 audit firms have the largest market share of listed companies; however, their market share based on both number of clients and audit fees decreased during our sample period. The next two largest audit firms, BDO and Grant Thornton, hold significant market shares, but their clients are, on average, much smaller than the clients of the Big 4 firms. Their market shares increased slightly over our sample period. The medium non-Big 4 audit firms have significant market shares in the medium and small client market segments.

The Big 4 audit firms clearly dominate the largest and most complex clients, auditing approximately 96% of the top 200 companies in 2022 and capturing a substantial portion (99%) of audit fees. For the next 300 largest clients, the Big 4 firms maintain a strong presence, with a market share of 76% of the clients in this segment in 2022 and securing a significant share (84%) of audit fees; however, their market share decreased during our sample period, while the market share of the large non-Big 4 audit firms increased slightly. In the medium and small size client markets, the market share of the Big 4 firms decreased based on both number of clients and audit fees, the large non-Big 4 audit firms experienced a small increase in market share and the medium non-Big 4 audit firms experienced a significant and increasing market share. In the small client market segment, the Big 4 audit firms have a very low market share, the large non-Big 4 audit firms have a significant and relatively stable market share, the medium non-Big 4 audit firms have the largest market share and their share in this market increased during our sample period, and the small non-Big 4 auditors have a small and decreasing market share.

The market share of the Big 4 audit firms in Australia has been declining, both in terms of listed companies and audit fees. These trends reflect changing dynamics in the Australian audit services sector. In contrast, large non-Big 4 audit firms in Australia have experienced a slight increase in their market share, while medium-sized non-Big 4 firms have witnessed growth. These shifts indicate changing dynamics within the Australian audit market, with some non-Big 4 firms gaining ground in terms of market share and audit fees.

With respect to shifts in the different client market segments based on client size, the Big 4 audit firms market share for the largest 200 companies based on total assets increased slightly during our sample period. With respect to the next 300 largest clients, the Big 4 audit firms experienced a slight decline in their market share of clients and audit fees. At the same time, the large non-Big 4 increased their market share of both clients and audit fees. In the medium size client market segment, the Big 4 audit firms experienced a decline in their share of clients and audit fees. The market share of clients in this segment for the large non-Big 4 audit firms remained relatively stable although they experienced a slight increase in their share of audit fees. In the medium size client market, the medium non-Big 4 audit firms increased their market share of clients and audit fees. In the small client market segment, the Big 4 audit firms have a very low market share and their share of companies decreased although their share of audit fees increased slightly. In the small client market segment, the large non-Big 4 audit firms market share of clients and audit fees experienced a slight decrease. The medium non-Big 4 audit firms market share of companies and audit fees substantially. The small non-Big 4 audit firms experienced small declines in both their share of clients and audit fees in the small client audit market segment. These findings emphasize the Big 4 audit firms' strong foothold in the largest and most complex client categories, while also indicating shifts in the market shares of the different audit firm categories across the different client market segments in Australia.

Regarding the individual market shares of each of the Big 4 audit firms based on the number of listed client companies in our sample, EY held the largest market share among the Big 4 firms, followed by KPMG with both firms having relatively stable market shares. In contrast, both DTT and PwC experienced a reduction in market share. For the large non-Big 4 audit firms, the market shares for both BDO and Grant Thornton increased slightly during our sample period. Interestingly, BDO holds the largest market share of clients, but these clients, on average, are much smaller than the EY's clients. These variations in market shares highlight the shifting dynamics among the Big 4 audit firms, with some firms maintaining consistent shares while others experienced changes over the study period.

Regulators often focus on metrics, rather than observing market share directly, such as concentration ratios or Herfindahl-Hirschman Indices (HHI) which can be benchmarked to gain insights into the competitiveness (or lack of competitiveness) within a particular market. In our case, if regulators are considering whether to approve a merger between two large audit firms, they should examine how such a merger will change the audit 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. A market with an HHI of less than 1,500 is considered a competitive marketplace, an HHI of 1,500 to 2,500 is moderately concentrated, and an HHI of 2,500 or greater is highly concentrated.

In evaluating the concentration of the audit market, measured by concentration ratios, we find that the Big 4 audit firms were responsible for auditing a significant portion of the companies in our sample, with an average market share of 40% of the listed companies. In terms of audit fees, their combined market share exhibited some fluctuations, but it remained substantial. When we broaden our analysis to include the six largest audit firms, known as the Big 6, which includes BDO and Grant Thornton along with the Big 4, these firms collectively audited approximately 57% of the companies in our study in 2022. Their share of audit fees also remained significant. Extending our examination to the largest 20 audit firms, we see that they audited approximately 93% of the listed companies in 2022, with a consistent share of audit fees. These concentration ratios shed light on how audit services are distributed across different tiers of audit firms and their collective prominence in the market.

The analysis of market concentration using the Herfindahl-Hirschman Index (HHI) reveals interesting patterns in the ASX audit market with different conclusions depending on whether the metrics are based on the number of clients or audit fees. Overall, the analysis of HHI based on audit fees indicates a moderate level of market concentration, potentially sparking competition-related concerns, particularly within the domain of the Big 4 auditors. In contrast, the HHI calculated based on the number of clients indicates a competitively structured market, thus diminishing the likelihood of substantial competition concerns according to ACCC benchmarks. When we analyse the different client market segments based on client size, our analysis reveals a fragmented market with different levels of competition within the different market segments. The market for very large clients maintained a high level of concentration over the study period and is dominated by the Big 4 audit firms while the market for large clients is classified as moderately concentrated. The medium and small client market segments remained competitive over our sample period. These HHI assessments offer insights into how market concentration varies across different client segments in the audit industry.

The results indicate shifts in concentration levels and their corresponding HHIs over time, underlining the nuanced dynamics of market competitiveness across distinct client categories. Notably, the market for very large clients maintained a high level of concentration over the study period, while the market for large clients is classified as moderately concentrated. The medium and small client market segments remained competitive over our sample period.

We also examined audit fees as part of our study. Average audit fees experienced a consistent upward trajectory during our study period. Notably, PwC stands out with the highest average audit fee per client, which increased consistently throughout our sample period. EY also saw an increase in their average audit fee, as did KPMG and Deloitte (DTT), albeit with varying degrees of growth. Among the large non-Big 4 auditors, Grant Thornton (GT) and BDO also exhibited significant increases in their average audit fees. These findings highlight the overall increase in average audit fees among both Big 4 and large non-Big 4 audit firms in Australia during our sample period.

Our research examined auditor switches during the study period. The findings reveal that auditor changes vary by year and are more frequent among smaller clients compared to larger ones. We note that the pattern of auditor switches is consistent with the different levels of competition in the four client market segments. The lowest incidence of auditor changes is observed among the top 200 clients. This is the client market segment that is the least competitive as it is the most concentrated market. Auditor switches are most prevalent among medium and small clients, which is consistent with these market segments being competitively structured as reflected in the CR and HHI scores.

We also conducted an analysis of changes in audit fees when clients switched auditors. In a substantial portion of our sample that switched auditors, clients experienced an increase in audit fees of more than 5 percent. At the same time, a smaller but still substantial portion of companies that switched auditors experienced a decrease in audit fees of more than 5 percent. Around 13% of companies that switched auditors experienced a small change in audit fees. The findings demonstrate that changing auditors presents an opportunity for some clients to negotiate lower audit costs; however, the majority of clients that change auditors either wind up paying a much larger audit fee or an audit fee that is not substantially different than the audit fee that was paid to their predecessor auditor. These findings highlight the variety of audit fee outcomes when clients switch auditors.

In our analysis of audit firm tenure, we find that average audit firm tenure is a little over 7 years, with some variation observed, including one exceptional case stretching to 58 years. When we examined these relationships based on client size, the patterns are consistent with the different levels of competition in the different client market segments with longer average audit firm tenure in the less competitive client market segment and shorter average audit firm tenure in the more competitive client market segments. The data are also consistent with the auditor switching findings. The top 200 companies stood out with the lengthiest average tenures, reflecting their preference for Big 4 auditors. The next largest 300 companies also leaned towards Big 4 firms, showing moderately long tenures. In contrast, medium-sized clients had somewhat shorter average tenures, while the shortest average tenures were observed for the smallest 500 clients. These findings highlight how client size influences the duration of these audit firm relationships within the study period.

This report offers insights on the market for audit services for any decision-making process aimed at restraining or regulating the conduct of participants in the audit market by presenting a recent overview of the Australian listed company market for audit services. The findings indicate that the consequences of mergers on market structure and competition may not be uniform across all segments of the audit market. When analysing future regulations or potential mergers it is important to take into account the effects on different client market segments.

Audit Market Structure, Concentration, and Competition in Australia 2019-2022

Introduction

Regulators worldwide, such as those in the UK and Australia, have expressed concerns about the potential negative consequences of market concentration, particularly with respect to the largest Big 4 audit firms. These concerns revolve around the impact of reduced competition on audit pricing and quality. The purpose of this study is to build upon the research efforts of Carson, Botica-Redmayne, and Liao (2014) and Carson (2019) by providing an updated analysis using more recent data spanning the years 2019 to 2022, focusing on companies listed on the ASX.

Previous studies by Carson et al. (2014) and Carson (2019) utilized data from 2000 to 2011 and 2012 to 2018, respectively. These studies explored various aspects of the Australian audit market, including audit fees, non-audit fees, market concentration, auditor selection, auditor switches, and audit firm mergers. The present study seeks to build on this foundation by utilizing more recent data (2019-2022) to address concerns raised by organizations like CA ANZ, CPA Australia, and Australian Auditing and Accounting Public Policy Committee (APPC) regarding the structure and competitive dynamics of the Australian audit market.

The specific objectives of the current study are as follows:

1. **Assessing Changes in Market Dominance:** The study aims to determine whether there have been any shifts in the market dominance of the largest audit firms between 2019 and 2022.
2. **Examining Changes in Audit Fees:** The study will analyse how audit fees have evolved over the period from 2019 to 2022.
3. **Investigating Changes in Market Concentration:** The study will explore any changes in market concentration that have occurred during the years 2019 to 2022.
4. **Assessing audit firm switches and audit fee changes:** The research will examine instances of audit firm switches and the resulting changes in audit fees.
5. **Explore audit firm tenure:** The report will also explore the duration of audit firm relationships during the years 2019 to 2022.

By addressing these objectives, the study aims to contribute to a deeper understanding of the evolving landscape of the Australian audit market and its potential implications for competition, and concentration on pricing, and quality in the provision of audit services.

Analysis of the Current Australian Audit Market

We analyse the audit market for Australian listed companies by utilizing publicly available data from annual reports of companies spanning 2019 to 2022. Our methodology involves calculating market share based on both the number of clients and audit fees, while also employing concentration ratios and Herfindahl-Hirschman indices to assess the degree of competition and market concentration. To allow for a more nuanced view of the structure of the audit market in Australia, we categorise audit firms into four types, (i) Big 4 audit firms (Deloitte, EY, KPMG, and PwC), (ii) large non-Big 4 audit firms (Grant Thornton and BDO), (iii) medium non-Big 4 audit firms (the next 14 largest audit firms required to prepare transparency reports with more than 10 public interest entity audits per year), and (iv) small non-Big 4 audit firms. We also analyse these metrics for different audit client market segments based on client size. Furthermore, the study investigates audit firm switches, audit fee changes for the switching firm and audit firm tenure during this time frame. This comprehensive approach yields valuable insights into the competitive dynamics of the Australian audit market and its evolution throughout the specified period.

Our sample includes all companies listed on the ASX after excluding companies that present their financial statements in currencies other than the Australian dollar and those with their client or auditor offices located outside of Australian jurisdictions[2] for the period spanning from 2019 to 2022, resulting in a collective count of 8,301 firm-year observations.

Concentration Ratio

To assess audit market concentration, we employ a methodology similar to that employed in Carson (2019), which follows previous research conducted by Walker and Johnson (1996) as well as Thavapalan et al. (2002). In line with these studies, we utilize a concentration ratio (CR) approach, wherein the CR reflects the proportion of the total activity within a market attributed to the *n* most prominent audit firms.

[2] We exclude companies if their financial statements are not in Australian dollars due to the difficulties in translating total assets into Australian dollars. Carson (2019) omits trusts, Exchange Traded Funds (ETFs), and similar entities from their analysis. In contrast, our approach differs from Carson (2019) as we incorporate companies that were delisted at a later time, but annual report, audit fee, and auditor names are available for previous years, provided they have submitted annual reports and disclosed information regarding audit fees and auditors. This comprehensive approach allows us to offer a more complete representation of the audit market for a specific year.

The formula for the Concentration Ratio (CR-N) is as follows:

$$CR - N = \frac{Total\ active\ activities\ of\ N\ larget\ frims}{Total\ audit\ activities\ of\ all\ firms}$$

This formula quantifies the market share represented by the *n* most active audit firms, expressed as a percentage of the aggregate market activity across all audit firms. By calculating the CR-N, we can evaluate the extent to which market activity is concentrated among a selected group of dominant audit firms. This approach offers insights into the level of competition within the audit market and the potential implications for market dynamics.

Similar to Carson (2019), we analyse the Australian audit market using data from the years 2019 to 2022 to assess whether there have been any shifts or alterations in market concentration during this time frame, and to determine if these changes correspond with patterns previously observed in academic research. As in Carson (2019), we examine the market share held by the Big 4 audit firms (CR-4) in relation to either audit fees or the number of clients. This measurement reflects the combined market share of the Big 4 audit firms, offering insights into their collective dominance within the audit market. Moreover, we also apply this concentration ratio measure to the six largest and twenty largest audit firms, as these categories are pertinent to the structure of the Australian audit market, as identified in Carson's 2019 work.

By leveraging this methodology, our study contributes to a comprehensive understanding of the changing landscape of the Australian audit market, as well as to extend and validate the trends previously identified in Carson (2019). Through the examination of more recent data, we aim to ascertain whether the observed patterns of market concentration have persisted, evolved, or deviated in the years 2019 to 2022.

Herfindahl-Hirschman Index (HHI)

Following Carson (2019), we use the Herfindahl-Hirschman Index (HHI) as another measure of market concentration. The HHI offers an alternative perspective on market concentration, assessing it through the lens of the distribution of audit fees among the various firms in the market. Consistent with Carson (2019), we calculate the HHI by summing the squares of the audit activities (e.g., audit fees and number of clients) for each individual audit firm within the market. This sum is divided by the squares of the total sum of audit activities across all firms in the market. This approach allows us to capture the concentration of audit activities within the market in a way that considers both the individual contributions of each firm and the overall distribution of audit activities. In our study, the following formula is used to calculate HHI:

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

Where *n* represents the total number of firms in the market, and *S* represents the market share of each individual firm, expressed as a fraction or percentage. The formula sums the squared market shares of all firms in the market and divides it by the squared sum of all market shares. The result is then increased by 1. The HHI ranges from 1 (perfect competition) to a maximum value of 10,000 (monopoly). The HHI indicate the level of market concentration and competitiveness within the audit market based on the distribution of audit activities among different firms. A higher HHI value signifies a greater concentration of market share among a few firms, which could suggest reduced competition. Conversely, a lower HHI value indicates a more dispersed market share among various firms, implying a higher degree of competition.

By utilizing both the concentration ratio (CR) and the Herfindahl-Hirschman Index (HHI), we aim to provide a robust analysis of market concentration in the Australian audit market. These complementary measures contribute to a more comprehensive understanding of how the market has evolved over the years 2019 to 2022, offering insights into potential shifts in the competitive dynamics and market structure.

Market Share based on Number of Clients

Table 1 reports the number of companies, categorised by type of audit firm. The number of our sample of publicly listed companies showed a gradual increase over our study period, increasing from 2,010 entities in 2019 to 2,132 entities by the year 2022.[3]

The findings in Table 1 indicate a notable trend in the audit market landscape over the analysed period. The market share of the Big 4 auditing firms declined over our sample period. Specifically, their share in the market decreased from 42.49% in 2019 to 37.85% in 2022. In contrast, the market share of large non-Big 4 auditors has demonstrated an upward trajectory, increasing from 18.96% in 2019 to 19.47% in 2022. This suggests that large non-Big 4 auditors have been able to capture a slightly larger portion of the market for audit services.

[3] Utilizing data from the years 2012 to 2018, the number of companies as reported by Carson (2019) exhibited a decline from an initial count of 1,803 firms in 2012 to a total of 1,727 firms in 2018.

Table 1: Market Share Based on Number of Listed Companies for Each Type of Audit Firm

Year	Total	Big4 No.	Big4 (%)	Large Non-Big4 No.	Large Non-Big4 (%)	Medium Non-Big4 No.	Medium Non-Big4 (%)	Small Non-Big4 No.	Small Non-Big4 (%)
2019	2,010	854	42.49	381	18.96	629	31.29	146	7.26
2020	2,032	839	41.29	368	18.11	705	34.69	120	5.91
2021	2,127	827	38.88	411	19.32	749	35.21	140	6.58
2022	2,132	807	37.85	415	19.47	772	36.21	138	6.47
Avg	**2,075**	**832**	**40.08**	**394**	**18.97**	**714**	**34.39**	**136**	**6.55**

Note:
Big 4: Deloitte, Ernst and Young, KPMG and PWC
Large Non-Big 4: Grant Thornton and BDO
Medium Non-Big 4: Bentleys, Crowe Horwath, Hall Chadwick, HLB Mann Judd, KS Black, Moore Stephens, Nexia, Pitcher Partners, PKF, Rothsay, RSM Bird Cameron, ShineWing, Stanton 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.

The most significant growth in market share occurs among medium-sized non-Big 4 auditors, whose market share has increased from 31.29% in 2019 to 36.21% in 2022. This suggests that medium-sized non-Big 4 auditors have been able to expand their market presence and attract more clients. Interestingly, the market share of small non-Big 4 auditors has remained relatively stable throughout the entire sample period. Despite some fluctuations, their market share ranges between 5.91% and 7.26%, indicating a consistent level of presence in the market.

Overall, these findings underscore the evolving dynamics within the Australian audit market, where the dominance of the Big 4 firms has softened, providing opportunities for both large and medium-sized non-Big 4 auditors to increase their market share.

Carson (2019) reported that the market share held by Big 4 auditors experienced a decrease from 40.71% in 2012 to 37.70% in 2018. Similarly, the market share for large non-Big 4 auditors saw a decline from 22.30% in 2012 to 20.61% in 2018. Carson (2019) also identified an upward trend in the market share of medium-sized non-Big 4 auditors, which rose from 29.17% in 2012 to 35.67% in 2018. Throughout the examined timeframe in Carson (2019), the market share of small non-Big 4 auditors remained stable, ranging from 5.74% at the beginning of the study to 7.82% at its conclusion.

The findings presented in Table 2 offer insights into the distribution of market share among the six major providers of audit services based on the number of clients. Within the group Big 4 audit firms, EY commands the largest market share, ranging from 11.42% to 12.01% during our sample period. Following EY, KPMG maintains a consistent market share of 10.79% to 11.27% over the same period. This stability in market share for both EY and

KPMG suggests that they have effectively maintained their positions in the market without experiencing significant fluctuations.

Table 2: Market Share for Six Largest Audit Firms Based on Number of Listed Companies

Year	Total	DTT No.	DTT (%)	EY No.	EY (%)	KPMG No.	KPMG (%)	PwC No.	PwC (%)	BDO No.	BDO (%)	GT No.	GT (%)
2019	2,010	191	9.50	238	11.84	220	10.95	205	10.20	243	12.09	138	6.87
2020	2,032	193	9.50	235	11.56	229	11.27	182	8.96	236	11.61	132	6.50
2021	2,127	169	7.95	243	11.42	237	11.14	178	8.37	272	12.79	139	6.54
2022	2,132	159	7.46	256	12.01	230	10.79	162	7.60	275	12.90	140	6.57
Avg	**2,075**	**178**	**8.58**	**243**	**11.71**	**229**	**11.03**	**182**	**8.76**	**257**	**12.36**	**137**	**6.61**

On the other hand, the dynamics for DTT and PwC are different. The market share of DTT has seen a decline, reducing from 9.50% to 7.46%, while PwC's market share has similarly contracted from 10.20% to 7.60% over the study period. This decline in market share for DTT and PwC could potentially indicate challenges they might have encountered in retaining or acquiring clients during this timeframe.

The market share for BDO and GT has remained relatively stable, with BDO holding a consistent market share of 12.09% to 12.90%, and GT maintaining a share ranging from 6.50% to 6.87%. This steadiness in market share might signify a certain level of client loyalty or a balanced competitive position for these firms in the audit market.

Table 2 offers a snapshot of how the market shares for audit services for the six major audit firms have evolved over time. It reflects the varying degrees of success and challenges these firms have encountered in maintaining or expanding their positions within the audit market.

Carson (2019) reported that BDO and EY occupied the most substantial market share, while PwC and KPMG showcased similar shares. Furthermore, Carson (2019) identified DTT as the smallest Big 4 audit firm, with Grant Thornton surpassing DTT in terms of market share. This assessment of market share distribution offers insights into the relative positions of these audit firms within the context of Carson's 2019 research.

Table 3 presents a tally of small non-Big 4 audit firms engaged in auditing less than 10 listed companies. Throughout our study period, the number of these small non-Big 4 auditors remained somewhat stable at 46 audit firms (the exception being 52 audit firms in 2021). This diverges from Carson (2019), which reported a reduction in the number of small audit firms servicing the listed company audit market, decreasing from 55 individual audit firms in 2012 to 38 in 2018.

Table 3: Number of Small non-Big 4 Firms Conducting Audits of Listed Companies

Year	No. of Audits by Small Non-Big 4 Firms	No. of Unique Small Non-Big 4 Firms
2019	146	46
2020	120	46
2021	140	52
2022	138	46
Avg	**136**	**48**

Table 4 presents the mean and median values of total assets of the clients audited by the different types of audit firms for our sample of companies. As expected, Big 4 auditors are closely associated with the largest clients, evident from their average (median) total assets of $8,285 million ($257 million). In contrast, large non-Big 4 auditors tend to cater to much smaller clients, as indicated by their average (median) total assets of $71 million ($17 million). Similarly, medium and small non-Big 4 auditors focus on market segments comprising much smaller clients, with average (median) total assets of $92 million and $174 million ($14 million and $12 million) respectively. These findings underscore the noticeable differences in client size between Big 4 auditors and other audit firms operating in the Australian market for audit services. For all categories of audit firms, the average size of the clients is much higher than the median value. The discrepancy between the mean and median value of total assets indicates that each group of audit firm has a few large clients and a much larger number of smaller clients. The difference between mean and median values is particularly notable for the Big 4 audit clients, which highlights the diversity in client sizes within the Big 4 category of audit firms.

Table 4: Mean and Median Total Assets of Clients (in Millions) for Australian Listed Companies for Each Type of Audit Firm

Year	Big4 Assets ($ mill.)		Large Non-Big4 Assets ($ mill.)		Medium Non-Big4 Assets ($ mill.)		Small Non-Big4 Assets ($ mill.)	
	Mean	**Median**	**Mean**	**Median**	**Mean**	**Median**	**Mean**	**Median**
2019	8,060	184	50	13	86	9	80	10
2020	7,430	239	65	15	97	12	152	8
2021	8,020	281	72	19	90	16	266	13
2022	9,630	323	96	21	94	17	196	16
Avg	**8,285**	**257**	**71**	**17**	**92**	**14**	**174**	**12**

Our findings are consistent with Carson (2019), who reported that Big 4 audit firms are associated with the largest clients (median total assets of $161 million) and a large difference between the mean and median values for total assets. She also reported that the large non-Big 4 firms serve smaller clients (median assets of $14 million), while both medium and small non-

Big 4 firms cater to similar-sized client segments (median assets of $8 million and $9 million, respectively).

The analysis presented in Table 4 sugests that market share of the different types of audit firms will vary across client market segments based on client size. Therefore, Table 5 categorizes our sample companies into four distinct client market segments based on their total assets at the end of each year: the top 200 largest clients, the next 300 largest clients, medium size clients and the 500 smallest clients.

Table 5: Market Share Based on Number of Listed Companies Categorised by Client Size

Year	Big4 No.	Big4 (%)	Large Non-Big4 No.	Large Non-Big4 (%)	Medium Non-Big4 No.	Medium Non-Big4 (%)	Small Non-Big4 No.	Small Non-Big4 (%)
Panel A: Very Large Clients (Top 200 by Assets)								
2019	191	95.50	1	0.50	6	3.00	2	1.00
2020	189	94.50	2	1.00	7	3.50	2	1.00
2021	191	95.50	1	0.50	5	2.50	3	1.50
2022	193	96.50	2	1.00	2	1.00	3	1.50
Panel B: Large Clients (201-500 by Assets)								
2019	236	78.67	21	7.00	39	13.00	4	1.33
2020	237	79.00	20	6.67	37	12.33	6	2.00
2021	234	78.00	25	8.33	37	12.33	4	1.33
2022	228	76.00	27	9.00	41	13.67	4	1.33
Panel C: Medium Clients (Others by Assets)								
2019	377	37.33	233	23.07	319	31.58	81	8.02
2020	370	35.85	224	21.71	387	37.50	51	4.94
2021	363	32.21	266	23.60	427	37.89	71	6.30
2022	355	31.36	266	23.50	431	38.07	80	7.07
Panel D: Small Clients (Bottom 500 by Assets)								
2019	50	10.00	126	25.20	265	53.00	59	11.80
2020	43	8.60	122	24.40	274	54.80	61	12.20
2021	39	7.80	119	23.80	280	56.00	62	12.40
2022	31	6.20	120	24.00	298	59.60	51	10.20

The Big 4 audit firms dominate the audit market of the 200 largest companies. They audited between 94.50% and 96.50% of the largest 200 clients during our sample period. For the group of the next largest 300 clients, the Big 4 firms audited between 76.00% and 78.67% of the companies in the segment. Notably, the Big 4 audit firms experienced a small reduction in their market share in this market segment over the course of our study. Big 4 firms audited over one-third of the medium-sized clients, but their market share in this category experienced a decline from 37.33% in 2019 to 31.36% in 2022. In contrast, for the smallest clients, the Big 4 auditors were engaged in auditing less than 10% of these clients. Over the study period, their market share within this market segment decreased from 10% in 2019 to 6.20% to 2022.

In the context of the next 300 largest companies, a significant portion of the companies in this segment were audited by Big 4 auditors. In contrast, large non-Big 4 auditors were responsible for auditing less than 10% (ranging from 6.67% to 9.00%) of these companies. The medium non-Big 4 held a market share ranging between 12.33% and 13.67% of the companies in this segment of the market.

For small and medium size clients, the dynamics are quite a bit different. For medium sized clients, medium non-Big 4 audit firms hold a significant market share and for small clients, the majority of the companies in this segment were audited by medium non-Big 4 auditors. Meanwhile, small non-Big 4 auditors maintained a relatively stable market share ranging from 10.20% to 12.40% for small clients.

The findings reported in Table 5 underscore the pronounced dominance of Big 4 auditors within the realm of the top 500 ASX listed companies, especially for very large clients (Top 200), however, the findings also show a decline in their market share in the large, medium and small client segments. This continues the trend identified in Carson (2019), which identified a decline in market shares held by Big 4 auditors across the large, medium, and small client segments during her study period. Carson (2019) also highlighted an expansion in the market share of medium non-Big 4 auditors across the large, medium, and small client segments and large non-Big 4 auditors maintained relatively stable market shares in these markets. However, the smallest audit firms experienced an overall decline in their market share, as outlined in Carson (2019).

Table 6: Market Share Based on Number of Listed Companies Categorised by Industry

Year	Total	Big4 No.	Big4 (%)	Large Non-Big4 No.	Large Non-Big4 (%)	Medium Non-Big4 No.	Medium Non-Big4 (%)	Small Non-Big4 No.	Small Non-Big4 (%)
Panel A: Mining Industry (GICS Code 1510)									
2019	607	137	22.57	141	23.23	264	43.49	65	10.71
2020	630	129	20.48	136	21.59	312	49.52	53	8.41
2021	704	129	18.32	156	22.16	354	50.28	65	9.23
2022	737	132	17.91	162	21.98	377	51.15	66	8.96
Avg	**670**	**132**	**19.68**	**149**	**22.22**	**327**	**48.81**	**62**	**9.30**
Panel B: Other Industries									
2019	1,403	717	51.10	240	17.11	365	26.02	81	5.77
2020	1,402	710	50.64	232	16.55	393	28.03	67	4.78
2021	1,423	698	49.05	255	17.92	395	27.76	75	5.27
2022	1,395	675	48.39	253	18.14	395	28.32	72	5.16
Avg	**1,406**	**700**	**49.80**	**245**	**17.43**	**387**	**27.53**	**74**	**5.25**

Table 6 presents the findings for market shares after disaggregating the results into two categories - the mining industry (GICS code 151040) and other industries. We present this breakdown because of the large number of listed mining companies in Australia. The roster of mining companies included in our analysis increased from 607 in 2019 to 737 in 2022.

Notably, the market share held by Big 4 audit firms within the mining industry decreased from 22.57% in 2019 to 17.91% in 2022. Correspondingly, their market share in other industries also experienced a downturn, decreasing from 51.10% in 2019 to 49.39% in 2022. This aligns with Carson's (2019) observation that Big 4 auditors tend to hold a relatively lower market share for mining clients compared to their market share in other industries.

The market share of large non-Big 4 auditors also exhibited a decline within the mining industry, dropping from 23.23% in 2019 to 21.98% in 2022. Nonetheless, they noted an uptick in market share from 16.55% in 2020 to 18.14% in 2022 within other industries.

Meanwhile, medium non-Big 4 auditors experienced a surge in market share within the mining industry, ascending from 43.49% in 2019 to 51.15% in 2022. Moreover, they broadened their client base from other industries, growing from 26.02% in 2019 to 28.32% in 2022.

In the sphere of small non-Big 4 auditors, their market share within the mining industry decreased from 10.71% in 2019 to 8.96% in 2022. However, their market share within other industries remained relatively steady, fluctuating between 4.78% and 5.77% over our study duration. The findings from Carson's (2019) research also align with our current observations, reinforcing the notion that other audit firms command a relatively larger portion of clients within the mining industry.

Market Share based on Audit Fees and Trends in Audit Fees

We present the outcomes of our examination of the Australian listed market using audit fees as the base in Tables 7-10. Consistent with Carson (2019), our evaluation of total audit fees encompasses payments to the principal (signing) auditor. Moreover, these fees encompass audit fees extended to entities within the network of the principal auditor. In addition, our analysis encompasses expenses associated with audit-related services, offering a comprehensive view of expenditures linked to auditing activities. This methodological alignment with Carson (2019) ensures uniformity and facilitates meaningful comparisons between our findings and those reported in Carson (2019).

Table 7: Market Share Based on Total Audit Fees of Listed Companies

Year	Total Audit Fees ($ mill.)	Big4 Audit Fees ($ mill.)	Big4 Audit Fees (%)	Large Non-Big4 Audit Fees ($ mill.)	Large Non-Big4 Audit Fees (%)	Medium Non-Big4 Audit Fees ($ mill.)	Medium Non-Big4 Audit Fees (%)	Small Non-Big4 Audit Fees ($ mill.)	Small Non-Big4 Audit Fees (%)
2019	603.515	519.950	86.15	32.927	5.46	42.631	7.06	8.007	1.33
2020	636.701	545.479	85.67	35.441	5.57	48.575	7.63	7.206	1.13
2021	684.904	577.050	84.25	46.319	6.76	53.264	7.78	8.271	1.21
2022	717.599	596.105	83.07	49.957	6.96	62.274	8.68	9.262	1.29
Avg	**660.680**	**559.646**	**84.79**	**41.161**	**6.23**	**51.686**	**7.82**	**8.187**	**1.24**

Table 7 depicts the evolution of total audit fees over our sample period, showing a rise from $603.515 million in 2019 to $717.599 million in 2022. The audit fees attributed to Big 4 auditors increased from $519.950 million in 2019 to $596.105 million in 2022. However, the market share of the Big 4 on these audit fees declined from 86.15% in 2019 to 83.07% in 2022. This trajectory aligns with findings in Carson (2019), which also documented a diminishing market share for the Big 4 firms based on audit fees between 2012 and 2018.

The audit fees for large non-Big 4 auditors grew from $32.927 million in 2019 to $49.957 million in 2022. Their market share also expanded, increasing from 5.46% in 2019 to 6.96% in 2022. Notably, medium non-Big 4 auditors experienced a significant upswing in total audit fees, increasing from $42.631 million in 2019 to $65.274 million in 2022. Total audit fees for small non-Big 4 auditors likewise exhibited an uptick, increasing from $8.007 million in 2019 to $9.274 million in 2022. However, their market share remained relatively stable, ranging from 1.13% to 1.33%. Overall, these findings echo the patterns observed in Carson (2019).

Table 8 disaggregates the results presented in Table 7 into four client market segments, offering a breakdown of the total fees within each client segment categorised by audit firm type for each year.

Table 8: Market Share Based on Audit Fees of Listed Companies Categorised by Client Size

Year	Total Audit Fees ($ mill.)	Big4 Audit Fees ($ mill.)	Big4 (%)	Large Non-Big4 Audit Fees ($ mill.)	Large Non-Big4 (%)	Medium Non-Big4 Audit Fees ($ mill.)	Medium Non-Big4 (%)	Small Non-Big4 Audit Fees ($ mill.)	Small Non-Big4 (%)
Panel A: Very Large Clients (Top 200 by Assets)									
2019	406.166	402.264	99.04	0.169	0.04	3.326	0.82	0.408	0.10
2020	420.064	415.243	98.85	0.365	0.09	3.817	0.91	0.64	0.15
2021	450.945	447.803	99.30	0.206	0.05	2.211	0.49	0.726	0.16
2022	443.820	440.136	99.17	0.707	0.16	2.173	0.49	0.804	0.18
2019	406.166	402.264	99.04	0.169	0.04	3.326	0.82	0.408	0.10
Panel B: Large Clients (201-500 by Assets)									
2019	83.668	71.672	85.66	5.217	6.24	6.349	7.59	0.430	0.51
2020	96.700	82.388	85.20	7.498	7.75	5.849	6.05	0.965	1.00
2021	99.130	82.050	82.77	10.254	10.34	6.280	6.34	0.546	0.55
2022	118.781	99.543	83.80	10.291	8.66	8.672	7.30	0.275	0.23
Panel C: Medium Clients (Others by Assets)									
2019	93.007	43.320	46.58	21.689	23.32	22.624	24.33	5.374	5.78
2020	99.469	45.821	46.07	21.749	21.87	28.332	28.48	3.568	3.59
2021	113.192	45.071	39.82	30.040	26.54	33.251	29.38	4.829	4.27
2022	129.763	52.983	40.83	32.128	24.76	38.176	29.42	6.476	4.99
Panel D: Small Clients (Bottom 500 by Assets)									
2019	20.674	2.695	13.04	5.852	28.31	10.332	49.98	1.794	8.68
2020	20.468	2.027	9.90	5.829	28.48	10.578	51.68	2.033	9.93
2021	21.637	2.126	9.83	5.819	26.89	11.521	53.25	2.171	10.03
2022	25.235	3.444	13.65	6.831	27.07	13.253	52.52	1.707	6.76

Within the cohort of top 200 clients, the aggregate audit fees demonstrated an ascending trajectory, rising from $406.166 million in 2019 to $450.945 million in 2021, followed by a slight downturn to $443.820 million in 2022. The total audit fees paid to Big 4 auditors for these top 200 clients Increased from $402.264 million in 2019 to $440.136 million in 2022. Notably, the Big 4 auditors received nearly 99% of the total audit fees for this segment.

For the segment comprising the next 300 largest clients, the Big 4 auditors also commanded a substantial market share, encompassing between 82.77% and 85.66% of the aggregate audit fees. Their collective audit fees in this category witnessed growth, increasing from $71.672 million in 2019 to $99.543 million in 2022. For the medium-sized clients, the total audit fees paid to Big 4 auditors increased from $43.320 million in 2019 to $52.983 million in 2022. However, their market share within this segment declined from 46.58% in 2019 to 40.83% in 2022.

Table 8 also highlights significant changes in the distribution of audit fees among different audit firm categories within various client segments. Specifically, for the large non-Big 4 auditors within the large client segment, there was a notable growth in aggregate audit fees, increasing from $5.217 million in 2019 to $10.291 million in 2022.

In the context of large non-Big 4 auditors operating within the medium client segment, a substantial increase in total audit fees was observed, surging from $21.689 million in 2019 to $32.128 million in 2022. This growth was accompanied by a minor upswing in their market share, progressing from 23.32% to 24.76%.

An analogous trend was identified for medium non-Big 4 auditors within the medium client category. Here, both the total audit fees and market share increased. Their aggregate audit fees increased from $22.624 million to $38.176 million, while their market share grew from 24.33% to 29.42%.

A similar pattern was evident for the smallest clients, where the market share of medium non-Big 4 auditors, in terms of both total audit fees and market share, experienced growth, rising from $10.332 million to $13.253 million and 49.98% to 52.52%, respectively.

This analysis highlights the shifting dynamics of audit fees, revealing disparities in fee distribution across distinct client segments and different audit firm types. They reveal noteworthy shifts in the market shares and overall fees earned by different categories of audit firms across distinct client segments.

Table 9: Mean and Median Audit Fees for the Market and Each Type of Audit Firm

Year	Market		Big4 Audit Fees		Large Non-Big4 Audit Fees		Medium Non-Big4 Audit Fees		Small Non-Big4 Audit Fees	
	Mean	**Median**	**Mean**	**Median**	**Mean**	**Median**	**Mean**	**Median**	**Mean**	**Median**
2019	313,337	58,175	608,841	151,337	86,422	55,000	67,775	42,000	54,840	32,136
2020	322,005	59,843	650,154	162,889	96,307	54,773	68,901	44,500	60,047	31,825
2021	336,585	70,428	697,763	159,337	112,697	66,000	71,113	46,500	59,079	32,790
2022	318,046	60,940	738,668	205,068	120,380	76,004	80,666	50,500	67,115	40,000
Avg	**313,337**	**58,175**	**673,857**	**169,658**	**103,952**	**62,944**	**72,114**	**45,875**	**60,270**	**34,188**

Table 9 presents the mean and median audit fees for the market and each type of audit firm per year. For the market, the mean and median audit fees both followed an upward trajectory, increasing from $313,337 (median of $58,175) in 2019 to $336,046 (median of $70,428) in 2021. This represents a 15.02% (4.75%) increase in average (median) audit fees. However, a minor decline occurred in 2022 with the mean audit fee decreasing to $318,046 (median of $60,940). This trend indicates that, on average and in the middle, audit fees experienced a general increase over our sample, although a slight reduction was recorded in the final year of the analysis.

We also note that there are significant differences between the mean and median audit fees during our sample period with the mean fee being much higher than the median audit fee.

This indicates that there are a few companies with very large audit fees compared to the rest of the companies in our sample.

The findings in Table 9 indicate that the mean and median audit fees for Big 4 auditors exhibited a significant increase from $608,841 (median of $151,337) in 2019 to $738,668 (median of $205,068) in 2022. A similar trend was observed among large non-Big 4 auditors, with mean (median) audit fees growing from $86,422 ($55,000) in 2019 to $120,380 ($76,044) in 2022. For medium non-Big 4 auditors, there was also a substantial increase in mean (median) audit fees, moving from $67,775 ($42,000) in 2019 to $80,666 ($50,500) in 2022. Likewise, small non-Big 4 auditors experienced a notable increase in mean(median) audit fees, rising from $54,840 ($32,136) in 2019 to $67,115 ($40,000) in 2022. These findings highlight the evolving patterns of audit fees across various categories of audit firms, emphasizing the shifts in both mean and median values over the course of the study period.

Carson (2019) documented that the average audit fee for clients of the Big 4 audit firms exhibited an upward trajectory, climbing from $579,212 in 2012 to $726,838 by 2018. This represents a notable increase of 25.48% over this period. Carson (2019) also notes that by 2018, the average audit fee for clients served by BDO and Grant Thornton was slightly below $80,000, approximately $65,000 for clients of medium non-Big 4 firms, and slightly above $50,000 for clients of small non-Big 4 firms. This pattern aligns with the varying sizes of clients within each audit firm category. It is worth highlighting that both mean and median audit fees experienced an upward trend for large and medium non-Big 4 firms. Specifically, there was a 19.64% increase in mean fees and an 11.86% increase in median fees for large non-Big 4 firms, as well as a 17.55% increase in mean fees and an 11.74% increase in median fees for medium non-Big 4 firms. In contrast, audit fees for small non-Big 4 audit firms declined over the 2012-2018 period, displaying greater yearly fluctuations in mean and median fees within this client category.

The findings presented in Table 10 provide an overview of the mean and median audit fees for each of the six largest audit firms. Notably, among the Big 4 audit firms, PwC stands out with the highest mean audit fee, which is reported as $1,031,289. On the other end of the spectrum, DTT had the lowest mean audit fee during our sample period, amounting to $396,652. Between 2019 and 2022, the mean audit fees increased for three of the Big 4 firms, DTT, KPMG and PwC. DTT and PwC experienced steady increases in their mean audit fees each year, while KPMG experienced a decline in 2020, which was followed by increases in 2021 and 2022. In contrast, the mean audit fee received by EY increased in 2020 and 2021, then decreased to $$662,041 in 2022, which was below the level in 2019, which may reflect the loss of one or more large clients. With respect to the large non-Big 4 audit firms, BDO and Grant Thornton, we note that their mean and median audit fees are considerably smaller when compared to the audit fees for the Big 4 auditors. In 2019, the mean audit fee for BDO was $84,749, and for Grant Thornton, it was $89,368. By 2022, these mean audit fees increased to $118,927 for BDO and $123,232 for Grant Thornton. This represents a growth of approximately 40% for BDO and 38% for Grant Thornton from their respective mean audit fees in 2019.

Table 10: Mean and Median Audit Fees for Each of the Six Largest Audit Firms

Year	DTT		EY		KPMG	
	Mean	**Median**	**Mean**	**Median**	**Mean**	**Median**
2019	332,615	140,400	663,610	172,222	570,337	102,536
2020	373,367	162,889	749,360	168,500	522,267	84,998
2021	386,624	185,000	798,352	150,000	562,396	90,750
2022	494,002	315,000	662,041	158,300	619,809	132,250
Avg	**396,652**	**200,822**	**718,341**	**162,256**	**568,702**	**102,634**
	PwC		**BDO**		**Grant Thornton**	
	Mean	**Median**	**Mean**	**Median**	**Mean**	**Median**
2019	843,939	215,457	84,749	52,427	89,368	58,611
2020	976,487	269,142	97,619	52,760	93,961	60,750
2021	1,036,086	254,375	111,913	61,728	114,232	74,816
2022	1,268,643	325,500	118,927	67,000	123,232	90,102
Avg	**1,031,289**	**266,119**	**103,302**	**58,479**	**105,198**	**71,070**

With respect to median audit fees, the average median audit fees were highest for PwC ($266,119), followed by DTT ($200,822), EY ($162,256), KPMG ($102,634), Grant Thornton ($71,070 and BDO ($58,479). The rankings based on median audit fees are different than those based on mean audit fees. We note that the mean audit fees are much higher than the median audit fees. This highlights how the presence of a few substantial audit fees paid by large clients can influence the distribution, leading to skewed results. These findings demonstrate the range of audit fees across different audit firms and underscore how a few significant clients can impact the overall distribution.

These results mirror the observations made by Carson (2019), who found that PwC had the highest average audit fees at $969,527, while DTT had the lowest at $308,654. Additionally, BDO and Grant Thornton displayed similar mean (median) audit fees, averaging around $103,302 and $105,198 ($58,479 and $71,070) respectively. Taken together, these findings emphasize the wide range of client sizes and attributes present within the Big 4 audit firms when compared to the large non-Big 4 audit firms.

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

Regulators and policymakers commonly focus their attention on metrics such as concentration ratios and the Herfindahl-Hirschman Index (HHI) to gain valuable insights into the competitive nature, or lack thereof, within a specific market. These metrics assist regulators and policymakers in making informed decisions about potential competition-related issues arising from mergers and market dynamics. The ACCC merger guidelines from 2008 outline that the HHI serves as the primary indicator to assess the potential for a merger to raise concerns about competition. Under this framework, markets are categorised based on HHI values. A market with an HHI of less than 1,500 is regarded as competitively structured. An HHI ranging from 1,500 to 2,500 indicates moderate concentration, while an HHI equal to or exceeding 2,500 signifies high concentration.

Our study investigates the concentration of market power within different audit market segments by examining concentration ratios and the HHI. These metrics provide a quantifiable and systematic way to assess the level of competition within each segment based on audit fees and client counts. This approach enables a nuanced understanding of market dynamics across various tiers of audit firms and helps to identify any trends or patterns that might indicate shifts in market competitiveness.

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	
	Audit Fees %	Clients %	Audit Fees %	Clients %	Audit Fees %	Clients %	Audit Fees	Clients
2019	86.15	42.49	91.61	61.45	98.67	92.74	2072	763
2020	85.67	41.29	91.24	59.40	98.87	94.09	2049	740
2021	84.25	38.88	91.02	58.20	98.79	93.42	2029	740
2022	83.07	37.85	90.03	57.32	98.71	93.53	1928	738

Table 11 presents the results for concentration ratios (CR) and the Herfindahl-Hirschman Index (HHI), based on both audit fees and the number of clients as metrics to evaluate the distribution of market share. This examination covers several distinct market segments: the largest 4 firms (CR-4), the largest 6 firms (CR-6), the largest twenty firms (CR-20), and the entire market. These segments correspond to different categories of audit firms, namely the Big 4, the Big 4 along with large non-Big 4 firms (specifically, BDO and Grant Thornton), and the Big 4 combined with large and medium non-Big 4 auditors.

An analysis of the data reveals several significant findings regarding the distribution of audit fees in the Australian market. Notably, the Big 4 audit firms have maintained a substantial share of total audit fees, accounting for 86.15% of these fees in 2019. This share slightly decreased to 83.07% by 2022. It is noteworthy that the percentage of clients audited by the Big 4 declined throughout the study period (decreased for 41.29% to 37.85&), while their overall share of audit fees experienced only a modest decline.

When the focus shifts to CR-6, which includes both the Big 4 and large non-Big 4 auditors, i.e., the 6 largest audit firms, it becomes evident that they collectively garnered a significant portion of the audit fee revenue. In 2019, these six firms captured 91.61% of total audit fees, which then decreased slightly to 90.03% by 2022. Similarly, their market share in terms of the number of clients also saw a decline, moving from 61.45% in 2019 to 57.32% in 2022, which suggests the audit market is becoming less concentrated and, thus, more competitive.

These findings underscore the strong dominance of the largest audit firms, particularly in terms of the revenue generated from audit fees. The concentration of audit fee revenue among the largest six audit firms remains notably high, aligning with the observations previously reported by Carson (2019). This suggests a pattern of stability in the distribution of audit fees among these prominent audit firms over the studied years.

Table 11 also presents the Herfindahl-Hirschman Index (HHI) using both audit fees and the count of clients as measurement metrics. The HHI serves as an indicator of market concentration, where high values signify reduced market competition. This metric reflects the extent of disparity between the market shares held by major players and those held by smaller participants.

The HHI based on audit fees indicates a moderate level of concentration within the Australian market for audit services. This concentration displays a decreasing trend over the study period, with the HHI based on audit fees decreasing from 2072 in 2019 to 1928 in 2022. Our findings align with those reported in Carson (2019). Guidelines suggested by the ACCC are that an HHI around 2000 signifies a threshold beyond which merger activities could potentially raise competitive concerns. The HHI based on audit fees calculated in our study indicate that the market falls just below this threshold in terms of revenue concentration. Consequently, the likelihood of the ACCC supporting any merger endeavours among the Big 4 auditors in Australia appears to be low.

In contrast, when the HHI is calculated based on the number of clients, the market demonstrates notably lower concentration. The HHI values vary from a maximum of 763 in

2019 to a reduced figure of 738 in 2022., which indicates the audit market is competitively structured. This observation indicates that the HHI based on client count does not reach a level that would elicit significant concerns from the ACCC regarding market competitiveness.

To summarize, the analysis of HHI based on audit fees indicates a moderate level of market concentration, potentially sparking competition-related concerns, particularly within the domain of the Big 4 auditors. In contrast, the HHI calculated based on the number of clients indicates a competitively structured market, thus diminishing the likelihood of substantial competition concerns according to ACCC benchmarks.

Table 12 presents the results when we compute the Concentration Ratio (CR) and Herfindahl-Hirschman Index (HHI) after disaggregating the market into four distinct market segments based on client size, which is measured as total assets.

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

Year	CR-4 Audit Fees (%)	HHI Audit Fees	CR-4 Clients (%)	HHI Clients
Very Large Clients (Top 200 by Assets)				
2019	99.04	2848	95.50	2422
2020	98.85	2889	94.50	2365
2021	99.30	2976	95.50	2438
2022	99.17	2927	96.50	2420
Large Clients (201–500 by Assets)				
2019	85.66	1914	78.67	1569
2020	85.20	1850	79.00	1562
2021	82.77	1738	78.00	1523
2022	83.80	1774	76.00	1463
Medium Clients (Others by Assets)				
2019	46.58	561	37.33	359
2020	46.07	544	35.85	339
2021	39.82	404	32.21	283
2022	40.83	433	31.36	273
Small Clients (Bottom 500 by Assets)				
2019	13.04	46	10.00	30
2020	9.91	30	8.60	25
2021	9.83	34	7.80	21
2022	13.65	66	6.20	13

For the largest 200 ASX listed companies, the Big 4 auditors garnered over 99% of the audit fees, indicating a very high level of market concentration. Over time, this concentration increased from an HHI of 2848 in 2019 to 2976 in 2021, then slightly decreased in 2022. Regarding the number of clients within the largest 200 companies, the market share held by the Big 4 auditors remained relatively stable throughout the study period (ranging from 94.50% to 96.50%). Despite this stability, the market remained highly concentrated, as evidenced by Herfindahl-Hirschman Index (HHI) values ranging from 2365 to 2436. The level of concentration, as indicated by HHI, remained consistent over the study period. The market for the largest 200 companies is categorised as highly concentrated, which suggests low levels of competition in this market segment.

For the segment containing the next 300 largest companies, the Big 4 auditors captured more than 80% of the audit fees (ranging from 82.77% to 85.66%) and between 76.00% and 79.00% of the clients. The HHI based on audit fees declined from 1914 in 2019 to 1738 in 2021, before experiencing a slight increase to 1774 in 2022. The HHI based on the number of clients declined from 1569 in 2019 to 1463 in 2022. The results for the HHI indicate that this segment of the market is moderately concentrated.

Regarding medium-sized clients, the market share held by the Big 4 auditors based on audit fees decreased from 46.58% in 2019 to 38.82% in 2021, followed by a slight increase to 40.83% in 2022. During this same time period, their market share based on the number of clients decreased from 37.33% to 31.36%. The market for this segment is regarded as competitively structured with increasing levels of competition as evidenced by HHI scores well below 1500 and decreasing HHI scores during our sample period. For small-sized clients, the market share of the Big 4 auditors is not concentrated and the market is categorised as very competitive.

These findings shed light on the varying degrees of concentration across different segments of client size. The results indicate shifts in concentration levels and their corresponding HHIs over time, underlining the nuanced dynamics of market competitiveness across distinct client categories. Notably, the market for very large clients maintained a high level of concentration over the study period, while the market for large clients is classified as moderately concentrated. The medium and small client market segments remained competitive over our sample period.

Audit Firm Switching

We also examined the number and percentage of companies that switched auditors and what happened to their audit fees after switching auditors.

Table 13 presents data on auditor changes from 2019 to 2022[4], including both the count and percentage. Across the study period, the number of clients switching auditors ranges from

[4] In the absence of information regarding the auditor's appointment date, we employ a retrospective approach by reviewing annual reports for as many past years as feasible to ascertain the identity of the most recent auditor. It's important to note that both Table 13, 14 and 15 exclude companies that lack the previous year's annual report.

151 to 224. The highest percentage of clients switching auditors occurred in 2021 at 10.94%, with the second-highest rate recorded in 2019 at 7.65%.

Table 13: Number and Percentage of Clients Switching Auditors

Year	Total	No. of Changes	% of Changes
2019	1,974	151	7.65
2020	1,986	204	10.27
2021	2,048	224	10.94
2022	2,107	180	8.54
Avg	**2,029**	**190**	**9.35**

Table 14: Number and Percentage of Clients Switching Auditors Categorised by Client Size

Year	Total	No. of Changes	% of Changes
Very Large Clients (Top 200 by Assets)			
2019	200	5	2.50
2020	200	7	3.50
2021	200	3	1.50
2022	200	7	3.50
Large Clients (201–500 by Assets)			
2019	300	19	6.33
2020	300	21	7.00
2021	300	17	5.67
2022	300	11	3.67
Medium Clients (Others by Assets)			
2019	1,010	69	6.83
2020	1,032	123	11.92
2021	1,127	135	11.98
2022	1,132	101	8.92
Small Clients (Bottom 500 by Assets)			
2019	500	58	11.60
2020	500	53	10.60
2021	500	69	13.80
2022	500	61	12.20

Table 14 complements this information by presenting the data on auditor switches disaggregated by the four client market segments. The findings reveal that auditor changes vary by year and are more frequent among smaller clients compared to larger ones. We note that the pattern of auditor switches is consistent with the different levels of competition in the four client market segments. The lowest incidence of auditor changes is observed among the top 200 clients, with percentages ranging from 1.50% to 3.50%. This is the client market segment that is the least competitive as it is the most concentrated market. Auditor switches are most

This exclusion is necessary because we require data of the auditor for that specific year to calculate and track auditor changes accurately and thus, the sample sizes are different.

prevalent among medium and small clients, which is consistent with these market segments being competitively structured as reflected in the CR and HHI scores discussed previously.

Table 15 provides a comparative analysis of audit fees charged by the predecessor audit firm and successor audit firm. Audit fees increased by more than 5 percent for a significant proportion of companies that switched auditors, ranging from 46.36% to 68.33% of clients. Audit fees also decreased by more than 5 percent for a significant proportion of companies that switched auditors, ranging from 22.22% to 40.40% of clients. The percentage of companies experiencing a small change in audit fees (-5% - +5% change in audit fees) after switching auditors is much lower than companies that experienced large audit fee increases or decreases. For companies that switched auditors, the percentage that experienced an audit fee change of between a negative 5 percent to positive 5 percent ranges from 8.89% to 18.63% of clients. The findings demonstrate that changing auditors presents an opportunity for some clients to negotiate lower audit costs; however, the majority of clients that change auditors either wind up paying a much larger audit fee or an audit fee that is not substantially different than the audit fee that was paid to their predecessor auditor.

Table 15: Changes in Audit Fees for Clients Switching Auditors

Year	No. of Changes	% of Changes with Audit Fees Increasing by more than 5%		Audit Fees Changes between -5% and +5%		Audit Fees Decreasing by more than 5%	
2019	151	70	46.36	20	13.25	61	40.40
2020	204	95	46.57	38	18.63	71	34.80
2021	224	129	57.59	24	10.71	70	31.25
2022	180	123	68.33	16	8.89	40	22.22
Avg	**190**	**104**	**54.71**	**25**	**12.87**	**61**	**32.17**

Audit Firm Tenure

We also examined the length of the relationship between audit firms and their clients (auditor tenure).

Table 16 presents data on the tenure[5] of audit firms, including average, minimum, and maximum number of years. Across the study period, the average audit firm tenure is relatively stable, ranging from 7.01 to 7.43 years. Notably, the maximum audit firm tenure is 58 years.

[5] As previously noted, since information regarding the auditor's appointment date is unavailable, we employ a retrospective approach by examining annual reports from as many past years as feasible to determine the duration of the auditor's tenure with the client.

Table 16: Audit Firm Tenure

Year	Total	Average	Minimum	Maximum
2019	2,010	7.26	1	55
2020	2,032	7.25	1	56
2021	2,127	7.01	1	57
2022	2,132	7.43	1	58

Table 17: Audit Firm Tenure Categorised by Client Size

Year	Total	Average	Minimum	Maximum
Very Large Clients (Top 200 by Asset)				
2019	200	13.06	1	55
2020	200	12.80	1	56
2021	200	13.29	1	57
2022	200	13.17	1	58
Large Clients (201–500 by Asset)				
2019	300	8.01	1	39
2020	300	8.21	1	40
2021	300	8.31	1	41
2022	300	9.16	1	42
Medium Clients (Others) Asset				
2019	1,010	6.49	1	32
2020	1,032	6.37	1	33
2021	1,127	6.26	1	34
2022	1,132	6.63	1	35
Small Clients (Bottom 500 by Asset)				
2019	500	6.06	1	31
2020	500	6.26	1	32
2021	500	5.40	1	33
2022	500	5.91	1	34

Table 17 presents data on audit firm tenure categorised by client size. The patterns are consistent with the different levels of competition in the different client market segments with longer average audit firm tenure in the less competitive client market segment and shorter average audit firm tenure in the more competitive client market segments. The data are also consistent with the auditor switching findings discussed earlier. Average audit firm tenure for the top 200 companies is the lengthiest, ranging from 13.29 to 15.80 years. For the next 300 largest companies, the average audit firm tenure falls within the range of 8.01 to 9.16 years. The shortest average audit firm tenure is observed in the medium- and small client market segments.

Conclusion

The research extends Carson (2019) by utilizing more recent data from ASX-listed companies spanning the years 2019 to 2022. Our focus is on examining the structure, competitiveness, and concentration of the Australian audit market. Globally, regulatory bodies have voiced concerns about the potential negative consequences that might arise from market concentration in the market for audit services. They are particularly concerned that a decline in competition might result in adverse effects on both the pricing and quality of audit services. The primary area of concern revolves around the dominance and concentration of the Big 4 audit firms observed within the audit market, coupled with concerns regarding potential mergers involving the Big 4 audit firms. Our study aims to address these concerns and offer an up-to-date analysis of the landscape within the Australian audit services market.

Globally, the Big 4 audit firms have maintained a dominant presence in the market share, as evident in the United States, Europe and the UK. In 2022 in the US, The Big 4 firms audited a substantial portion of public companies (46% of public companies, 51% if Special Purpose Acquisition Companies are excluded) and accounted for a significant share of total audit fees. Similarly, in the UK, the Big 4 firms held a considerable market share and commanded a large portion of audit fees in their primary market (61% of companies listed on the London Stock Exchange and 96% of audit fees). In Europe, the Big 4 firms dominated the market with a market share of 93% of the 2022 audit fees for all listed companies on regulated European Exchanges (Audit Analytics, June 2023 and December 2023). In contrast, in Australia the market share of Big 4 audit firms is now less than 38% of listed companies, but these firms received 83% of the audit fees paid by listed companies in 2022. This is considerably less concentrated in other jurisdictions in 2022. Our analyses show that the Australian audit market is highly segmented with differing levels of concentration across the client segments investigated. The largest and most complex clients are mainly audited by the Big 4 audit firms, while smaller clients are audited by a range of other auditors. This is consistent with what occurs globally where Big 4 audit firms dominate the market for audit services provided to large and complex companies. We also find that the Australian audit market has experienced a shift in market share dynamics from 2019 to 2022. Both the Big 4 and smaller audit firms saw their market share decline during this period. Meanwhile, large and medium-sized non-Big 4 audit firms gained market shares.

In the Australian audit landscape, the Big 4 audit firms have the largest market share of listed companies; however, their market share based on both number of clients and audit fees decreased during our sample period. The next two largest audit firms, BDO and Grant Thornton, hold significant market shares, but their clients are, on average, much smaller than the clients of the Big 4 firms. Their market shares increased slightly over our sample period.

The medium non-Big 4 audit firms have significant market shares in the medium and small client market segments.

The Big 4 audit firms clearly dominate the largest and most complex clients, auditing approximately 96% of the top 200 companies in 2022 and capturing a substantial portion (99%) of audit fees. For the next 300 largest clients, the Big 4 firms maintain a strong presence, with 76% of the clients in this segment in 2022 and securing a significant share (84%) of audit fees however, their market share decreased during our sample period, while the market share of the large non-Big 4 audit firms increased slightly. In the medium and small size client markets, the market share of the Big 4 firms decreased based on both number of clients and audit fees, the large non-Big 4 audit firms experienced a small increase in market share and the medium non-Big 4 audit firms experienced a significant and increasing market share. In the small client market segment, the Big 4 audit firms have a very low market share, the large non-Big 4 audit firms have a significant and relatively stable market share, the medium non-Big 4 audit firms have the largest market share and their share in this market increased during our sample period, and the small non-Big 4 auditors have a small and decreasing market share.

The trajectory for the Big 4 audit firms in Australia has been one of decreasing market share, both in terms of listed companies and audit fees. These trends reflect changing dynamics in the Australian audit services sector. In contrast, large non-Big 4 audit firms in Australia have experienced a slight increase in their market share, while medium-sized non-Big 4 firms have witnessed growth. These shifts indicate changing dynamics within the Australian audit market, with some non-Big 4 firms gaining ground in terms of market share and audit fees.

With respect to the different client market segments based on client size, the Big 4 audit firms have the largest market for the largest 200 companies based on total assets. Their market share for this client market segment increased. With respect to the next 300 largest clients, the Big 4 audit firms experienced a slight decline in their market share of clients and audit fees. At the same time, the large non-Big 4 increased their market share of both clients and audit fees. In the medium size client market segment, the Big 4 audit firms experienced a decline in their share of clients and audit fees. The market share of clients in this segment for the large non-Big 4 audit firms remained relatively stable although they experienced a slight increase in their share of audit fees. In the medium size client market, the medium non-Big 4 audit firms increased their market share of clients and audit fees. In the small client market segment, the Big 4 audit firms have a very low market share and their share of companies decreased although their share of audit fees increased slightly. In the small client market segment, the large non-Big 4 audit firms market share of clients and audit fees experienced a slight decrease. The medium non-Big 4 audit firms market share of companies and audit fees substantially. The small non-Big 4 audit firms experienced small declines in both their share of clients and audit fees in the small client audit market segment. These findings emphasize the Big 4 audit firms' strong foothold in the largest and most complex client categories, while also indicating shifts in the market shares of the different audit firm categories across the different client market segments in Australia.

Regarding the individual market shares of each of the Big 4 audit firms based on the number of listed client companies in our sample, EY held the largest market share among the Big 4 firms, followed by KPMG with both firms having relatively stable market shares. In contrast, both DTT (Deloitte) and PwC experienced a reduction in market share. For the large non-Big 4 audit firms, the market shares for both BDO and Grant Thornton increased slightly during our sample period. Interestingly, BDO holds the largest market share of clients, but these clients, on average, are much smaller than the EY's clients. These variations in market shares highlight the shifting dynamics among the Big 4 audit firms, with some firms maintaining consistent shares while others experienced changes over the study period.

In evaluating the concentration of the audit market, measured by concentration ratios, we find that the Big 4 audit firms were responsible for auditing a significant portion of the companies in our sample, with an average market share of 40% of the listed companies. In terms of audit fees, their combined market share exhibited some fluctuations, but it remained substantial. When we broaden our analysis to include the six largest audit firms, known as the Big 6, which includes BDO and Grant Thornton along with the Big 4, these firms collectively audited approximately 57% of the companies in our study in 2022. Their share of audit fees also remained significant. Extending our examination to the largest 20 audit firms, we see that they audited approximately 93% of the listed companies in 2022, with a consistent share of audit fees. These concentration ratios shed light on how audit services are distributed across different tiers of audit firms and their collective prominence in the market.

The analysis of market concentration using the Herfindahl-Hirschman Index (HHI) reveals interesting patterns in the ASX audit market with different conclusions depending on whether the metrics are based on the number of clients or audit fees. Overall, the analysis of HHI based on audit fees indicates a moderate level of market concentration, potentially sparking competition-related concerns, particularly within the domain of the Big 4 auditors. In contrast, the HHI calculated based on the number of clients indicates a competitively structured market, thus diminishing the likelihood of substantial competition concerns according to ACCC benchmarks. When we analyse the different client market segments based on client size, our analysis reveals a fragmented market with different levels of competition within the different market segments. The market for very large clients maintained a high level of concentration over the study period and is dominated by the Big 4 audit firms while the market for large clients is classified as moderately concentrated. The medium and small client market segments remained competitive over our sample period. These HHI assessments offer insights into how market concentration varies across different client segments in the audit industry.

The results indicate shifts in concentration levels and their corresponding HHIs over time, underlining the nuanced dynamics of market competitiveness across distinct client categories. Notably, the market for very large clients maintained a high level of concentration over the study period, while the market for large clients is classified as moderately concentrated. The medium and small client market segments remained competitive over our sample period.

Audit fees experienced a consistent upward trajectory during our study period. Notably, PwC stands out with the highest average audit fee per client, which increased consistently throughout our sample period. EY also saw an increase in their average audit fee, as did KPMG and Deloitte (DTT), albeit with varying degrees of growth. Among the large non-Big 4 auditors, Grant Thornton (GT) and BDO also exhibited significant increases in their average audit fees. These findings highlight the overall increase in average audit fees among both Big 4 and large non-Big 4 audit firms in Australia during our sample period.

Our research examined auditor switches during the study period. The findings reveal that auditor changes vary by year and are more frequent among smaller clients compared to larger ones. We note that the pattern of auditor switches is consistent with the different levels of competition in the four client market segments. The lowest incidence of auditor changes is observed among the top 200 clients. This is the client market segment that is the least competitive as it is the most concentrated market. Auditor switches are most prevalent among medium and small clients, which is consistent with these market segments being competitively structured as reflected in the CR and HHI scores.

We also conducted an analysis of changes in audit fees when clients switched auditors. In a significant substantial portion of our sample that switched auditors, clients experienced an increase in audit fees of more than 5 percent. At the same time, a smaller but still substantial portion of our sample that switched auditors, clients experienced a decrease in audit fees of more than 5 percent. Around 13% of companies that switched auditors experienced a small change in audit fees. The findings demonstrate that changing auditors presents an opportunity for some clients to negotiate lower audit costs; however, the majority of clients that change auditors either wind up paying a much larger audit fee or an audit fee that is not substantially different than the audit fee that was paid to their predecessor auditor. These findings highlight the variety of audit fee outcomes when clients switch auditors.

In our analysis of audit firm tenure, we find that average audit firm tenure is a little over 7 years, with some variation observed, including one exceptional case stretching to 58 years. When we examined these relationships based on client size, the patterns are consistent with the different levels of competition in the different client market segments with longer average audit firm tenure in the less competitive client market segment and shorter average audit firm tenure in the more competitive client market segments. The data are also consistent with the auditor switching findings. The top 200 companies stood out with the lengthiest average tenures, reflecting their preference for Big 4 auditors. The next largest 300 companies also leaned towards Big 4 firms, showing moderately long tenures. In contrast, medium-sized clients had somewhat shorter average tenures, while the shortest average tenures were observed for the smallest 500 clients. These findings highlight how client size influences the duration of these audit firm relationships within the study period.

This report offers insights on the market for audit services for any decision-making process aimed at restraining or regulating the conduct of participants in the audit market by presenting a recent overview of the Australian listed company market for audit services. The findings indicate that the consequences of mergers on market structure and competition may not be uniform across all segments of the audit market. When analysing future regulations or potential mergers it is important to take into account the effects on different client market segments.

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