Have Second-Tier Auditors Impacted Auditor Concentration? Analysis of Changes from 2002 to 2014

R. Mithu Dey
Howard University
Washington, D.C.
ratna.dey@howard.edu

Lucy Lim
Howard University
Washington, D.C.
lucy.lim@howard.edu

Abstract

Audit market concentration increases as the Big 5 auditors are reduced to Big 4 following Arthur Andersen's demise in 2002. Coupled with Sarbanes-Oxley Act of 2002 which limits certain non-audit services that can be performed by current auditors, the client's choice of auditors becomes limited. Limited auditor choice increases auditor's market dominance which may induce auditors to be more complacent and affect audit quality. This paper examines how the second-tier auditors help ease audit market concentration especially in the middle size clients' market and examines what industries they are successful in penetrating.

Keywords: Auditor choice, auditor concentration, second-tier auditors

Introduction

The strength of the second-tier auditors is important to the audit industry since it can alleviate auditor concentration by increasing auditor choice. High auditor concentration, a small number of firms such as the Big 4 having majority audit market share, is a concern to regulators since it reduces competition. Competition in the audit market influences audit fees and auditor choice. Since audits are required and regulated but the audit fees are not, regulators are interested in ensuring that auditor concentration is not too high. Chairman Doty (PCAOB, 2012) noted at the Public Company Accounting Oversight Board (PCAOB) public meeting on March 22, 2012 that "Many public companies in certain industries have very limited choices with respect to the audit firms with appropriate expertise." Auditor concentration and industry expertise is important to regulators.

One effective way of reducing auditor concentration is to increase the market share of non-Big 4 auditors. The firms closest to the Big 4 in terms of size include BDO, Grant Thornton, Crowe Horwath, and RSM. Regulators have identified these firms as alternatives to the Big 4. They are commonly referred to as the second-tier or medium size auditors.

The Government Accountability Office (GAO) published a report that examined the concentration in audit markets since the demise of Arthur Andersen, from 2002 to 2006

(GAO-08-163, 2008). The purpose of our paper is to extend the period of evaluation and offer explanations for why the trend found and expected to continue instead encountered several challenges.

Audit Market Concentration and the Second-Tier Auditors

With the collapse of Arthur Andersen in 2002, the audit market for large clients became more concentrated as the big auditors are reduced from five to four. Concern regarding the impacts of the increased market concentration have fueled research on this topic. Feldman (2006) shows an increase in audit fees as the market concentration increases enabling the Big 4 auditors to exercise market power. On the other hand, GAO (2008) finds that audit fee increases in 2002 – 2006 can be explained by factors other than increase in market concentration, possibly the expansion of accounting and auditing rules. Dunn, Kohlbeck, and Mayhew (2011) suggests further that although market concentration increases, Big 4 have more equal market share than Big 5 which dampens the audit fee increase.

Clients are forced to choose an auditor for the primary audit and others for non-audit services. Following Arthur Andersen's collapse, Congress passed Sarbanes-Oxley Act of 2002 (SOX) which limits auditors from performing certain non-audit services when it is the primary auditor. The client's auditor choice is constrained after choosing one as the primary auditor, one for advisory, and one for tax. When forced to choose what service to offer a potential client, the auditor may forgo audit service for the more lucrative non-audit service (Dey, Robin, & Tessoni, 2012). Dunn et al. (2011) show that the four largest audit clients in an industry are more likely to share the same auditors after Arthur Andersen's collapse, again constrained choice in auditor.

There are some concerns with limited auditor choice. Auditor's market dominance leads them to be less critical in providing audit services, resulting in lower audit quality. Boone, Khurana, and Raman (2012) find that there is a higher likelihood of earnings management as auditor concentration increases. Higher likelihood of earnings management indicates lower audit quality.

The consequences of limited auditor choice may also influence federal government actions as it relates to the Big 4. Specifically, there was a concern that the U.S. Department of Justice did not file charges on cases where Big 4 could have been criminally indicted due to the fear of increasing concentration (Gerakos & Syverson, 2015). This is important because a criminally indicted auditor cannot perform audits for SEC registrants. Gerakos and Syverson (2015) also show that the disappearance of a Big 4 audit firm could result in audit fee increases.

Prior research provides guidance on the barriers faced by second-tier auditors as they attempt to ease audit market concentration. It may not be easy for the second-tier auditors to penetrate the market, due to barriers of entry in the market for large audit clients. These barriers include geographic presence, industry expertise, and reputation.

Literature on the success of the second-tier auditors include impact on stock market, audit fees, audit quality, and client portfolio risk. Prior research (Cullinan, Du, & Zheng, 2012; Whisenant, 2006) finds that the market does not react more negatively when clients move from a Big 4 to a second-tier auditor than when clients move from one Big 4 to another Big 4 auditor. Moreover, Keune, Mayhew, and Schmidt (2016) shows that non-Big 4 local market leadership is associated with lower audit fees in the local market. Lower audit fees does not necessarily indicate lower audit quality. Boone, Khurana, and Raman (2010) finds little difference in actual audit quality but more differences in perceived audit quality for second-tier versus Big 4 auditors. Audit quality is important because it is assumed that large risky clients are moving from the Big 4 to the second-tier. Dey and Robin (2012) find that client portfolio risk remains relatively unchanged as the second-tier auditors accept new large risky clients, and dismiss or resign from other risky clients.

The second-tier auditors have translated their success to increased revenues. Since SOX limits the amount of advisory work that the primary auditor can do, clients generally have a different public accounting firm for audit, another for tax, and yet another for advisory. Thus, for a large client, there is no choice when choosing a new auditor. Having a choice of auditors outside the Big 4 would help clients dealing with constrained auditor choice. The GAO (2008) noted that auditor concentration was decreasing in certain revenue size clients such as those below $500 million; however, growth for publicly traded audit clients for the second-tier auditors was constrained for several reasons. The GAO noted the following reasons: lack name recognition and reputation needed for large clients, lack adequate staff and geographic coverage to audit large public companies, the resources needed to develop technical capability, and lack some industry specialization. They also noted that some of the non-Big 4 firms were not interested in serving as auditor for additional large public companies. Reasons cited for this include beneficial additional revenue from non-audit services and the possibility of being sued because the failure of one large client could jeopardize the audit firm. Since SOX prohibits auditors from providing non-audit services if they are the primary auditor, non-Big 4 firms have steadily moved into advisory services.

From 2002 to 2006, it appeared that the second-tier auditors were making progress in increasing their market share in larger clients market (GAO, 2008). However, several key events have occurred that warrant our examination of the trend that GAO (2008) found. Factors that have influenced auditor choice since 2002 among other things: the demise of Arthur Andersen, passage of SOX, effective date of SOX Section 404 which resulted in audit capacity constraints of Big 4 and movement of clients to second-tier, expiration of non-compete agreements by 2007 for advisory arms that were sold for three of the four Big 4, the financial crisis of 2008, the growth and influence of the PCAOB, public firms going private, and other economic factors. Several changes in the industry have impacted auditor choice decisions and justified our continued examination of auditor concentration.

Methodology and Data

We examine auditor concentration from 2002, in order to contribute to our understanding of the strength and ability of the second-tier auditors to influence auditor concentration. We use two data sources, Public Accounting Report and Audit Analytics. From Audit Analytics, we obtain auditor client data. We based our main analysis on this dataset. Our data sources are consistent with GAO (2008); however, we note that auditor client data becomes more complete as time passes due to late filings, restatements and other reasons. Following GAO (2008), our sample consists of public companies. We deleted funds, plans and trusts, subsidiaries with parent data already included, blank check and non-operating entities, and duplicate entries. From the annual survey data of the top 100 accounting firms in the United States as published by Public Accounting Report, we examine second-tier overall revenue (from public and private clients) in 2014 in comparison to the Big 4 average.

A traditional method of measuring auditor concentration is the Herfindahl-Hirschman Index (HHI). We calculate HHI to determine the change in auditor concentration. The U.S. Department of Justice uses this measure to prevent enhanced market power in a merger. The HHI is calculated by squaring the market share of each firm competing in the market and then summing the resulting numbers. HHIs are categorized in the following manner: HHI below 1000 is unconcentrated, HHI from 1000 to 1800 is moderately concentrated, and HHI above 1800 is highly concentrated. Even though DOJ redefined the HHI scale in late 2010, we maintain the prior definition since it is consistent with a majority of our data period.

Due to resources available to the second-tier auditors, we recognize that client size may influence auditor choices. Thus, we first segregate the data by client size into four client revenue levels: <$100 million, $100 to $500 million, >$500 million to $1 billion, and >$1 billion, labelled as small clients, mid-size 1 clients, mid-size 2 clients, and large clients respectively. For each client category, we examine the change in market share for the second-tier in total and individually, the change in auditor concentration, and the trends in each client category from 2002 to 2014. Finally, we delve further into the analysis by examining the industries that the second-tier focus on and have successfully increased auditor choice.

Major Findings

Increase in mid-size Client Engagements. In general, we find that the second-tier auditors have been most effective in penetrating the two mid-size client markets ($100M-$500M and >$500M-$1B), resulting in a lower market concentration over the years for the mid-size client market. However, the market for the large client group is still dominated by the Big 4, approximately 98 percent, while the market for the small client group is mainly held by the small auditors, approximately 50 percent. Second-tier auditors who have successfully increased their market shares among the mid-size clients are Grant Thornton and BDO.

The following four sections are partitioned by client size to understand the effect of the second-tier auditors in each of the four markets.

Less than $100 million (small clients). In the <$100 million revenue clients, market share has not changed significantly for the second-tier firms (with the exception of BDO that has an increase of approximately 3 percent in market share from 2002 to 2014). Auditor concentration, as classified by the DOJ, decreased to unconcentrated till 2010 and then increased to moderately concentrated by 2014.

Most auditors – small, second-tier, and Big 4 – have resources to serve clients with revenue below $100 million; therefore, competition should be the greatest in this revenue group. Market share in this client-category has seen the greatest transformation since the passage of SOX resulting in gains for small auditors and losses for the Big 4.

Figure 1 shows that the small auditor's market share has increased significantly from approximately 43 percent in 2002 to 61 percent in 2006, holding steady at 62 percent by 2010, and decrease again to 46 percent in 2014. For the second-tier auditors, the market share in this category did not change significantly. It was holding steady at approximately 11 percent in 2002 and 2006, 12 percent in 2010, and increase to 16 percent in 2014. For the Big 4, market share decreased significantly up to 2010 (47 percent in 2002, 28 percent in 2006, 26 percent in 2010) and bounced back up by 2014 (38 percent). Overall, small client market share has shifted from the Big 4 to the small auditors, while the second-tier has increased slightly.

In the <$100 million client category, the auditor concentration moves from moderately concentrated in 2002 to unconcentrated in 2006 and 2010 and to moderately concentrated in 2014 (Figure 2). The shift in clients from the Big 4 to small auditors changed the auditor concentration in this client category, creating a more competitive market up to 2010 and the market became more concentrated again by 2014, as the Big 4 increase market share in this small client category.

We also examined each of the second-tier auditors to determine if individually there was any change in this client category. In Figure 3, from 2002 to 2014. The second-tier auditor with the largest increase in this client size is BDO, which doubled its share from 3 percent in 2002 to 6 percent in 2014. Grant Thornton reduced the number of clients in this revenue category. While there was only a slight increase for Crowe Horwath and RSM, they both had 2 - 3 percent by 2014.

Figure 4 shows that BDO has decreased the number of clients in Manufacturing and Wholesale Trade and increased number of clients in Finance and Insurance and Professional, Scientific, and Technical Services. For Crowe Horwath, there is a noticeable decrease in the Finance and Insurance industry. For RSM, there is a decrease in Finance and Insurance and an increase in Manufacturing. Overall for the <$100 million client category, the second-tier auditors are decreasing the number of clients, in various industries for Grant Thornton and in Finance and Insurance for Crowe Horwath. Also, BDO and Crowe experienced an increase in clients from Finance and Insurance, while the other two auditors experienced a decrease.

Figure 1: Auditor Market Share by Client Revenue

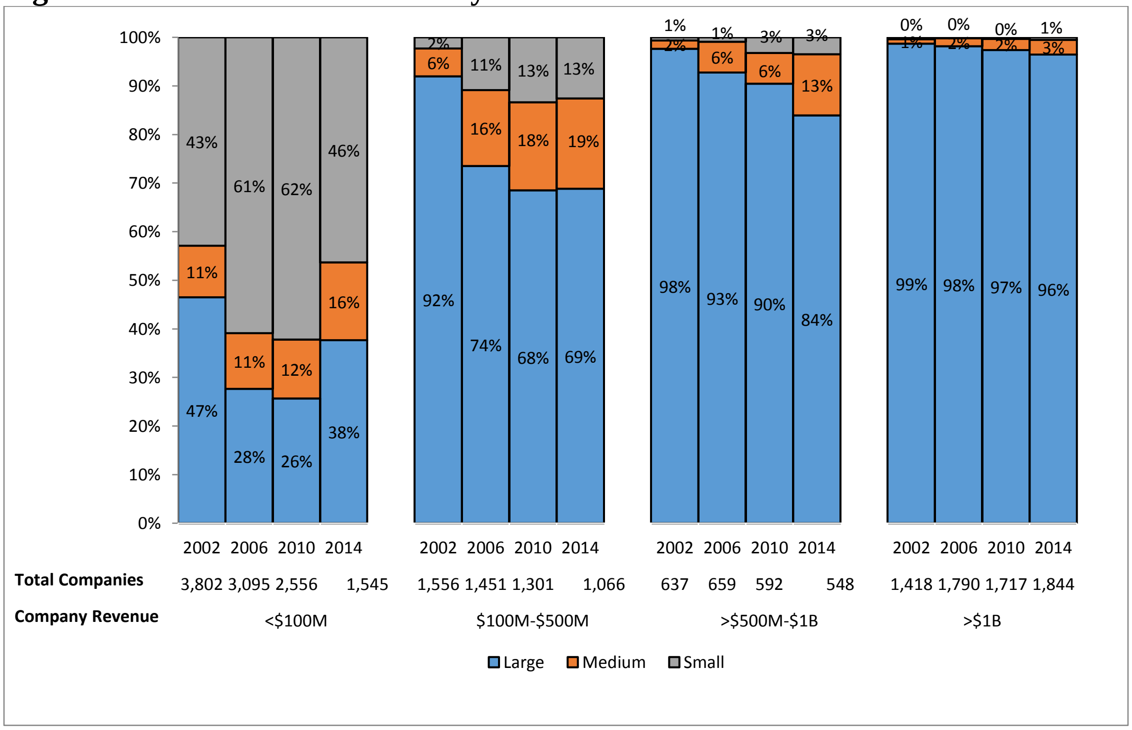


Figure 2: Auditor Concentration HHI

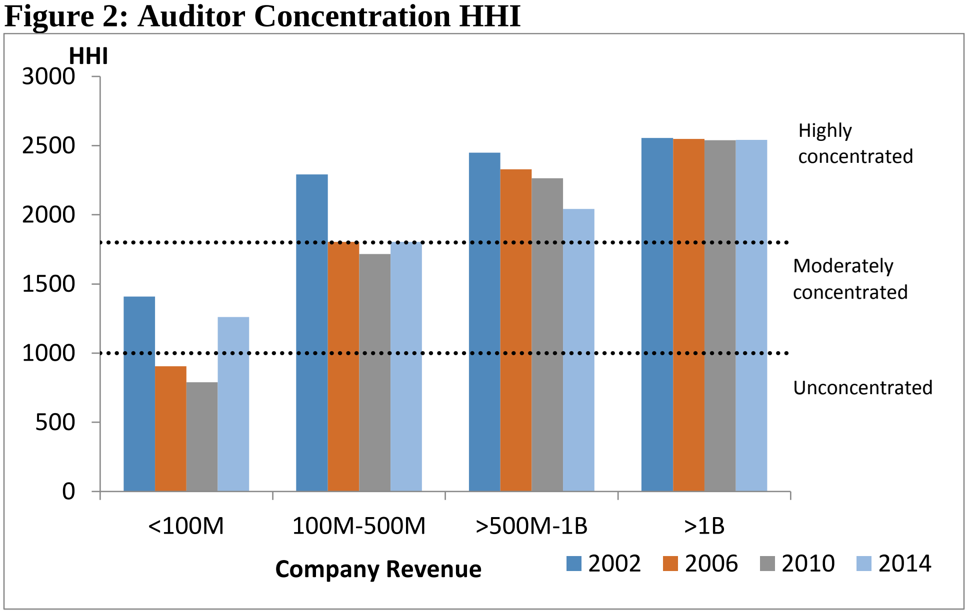
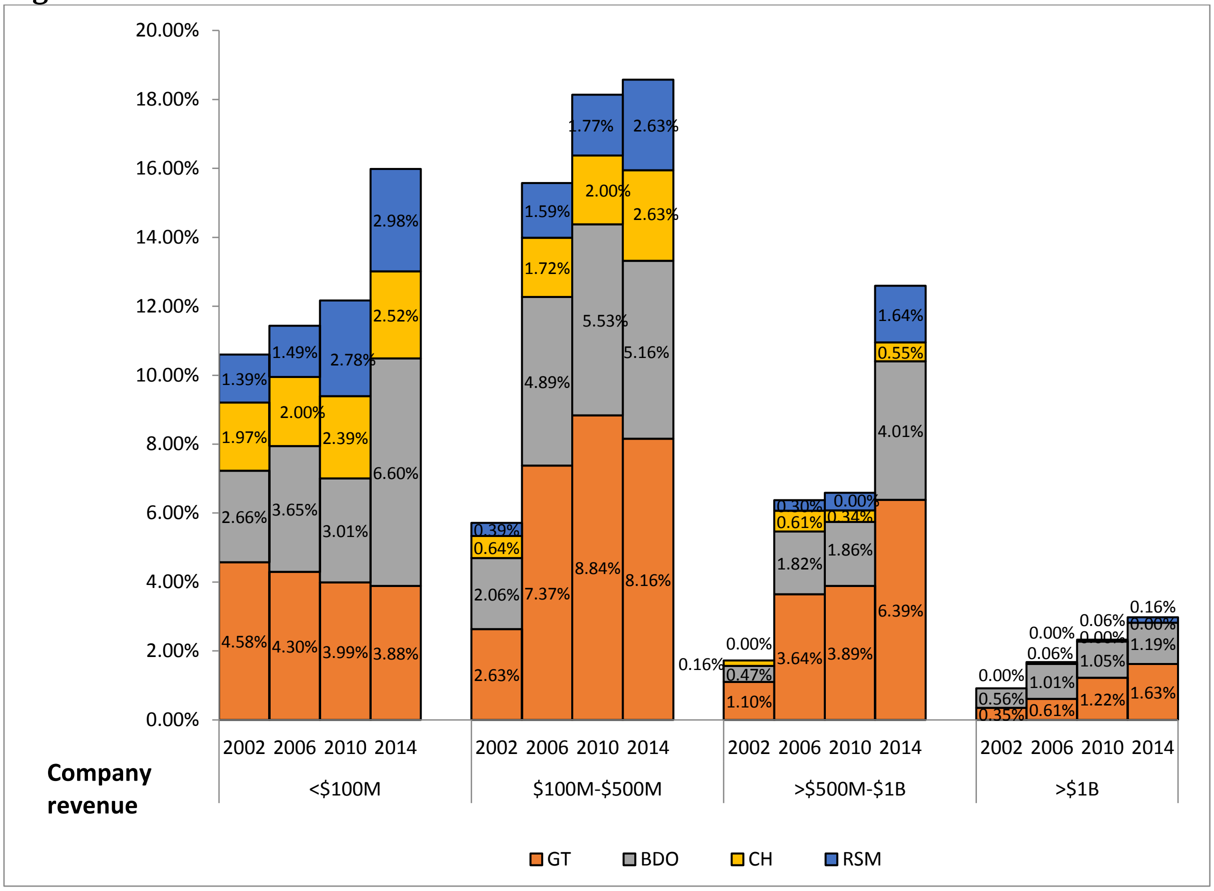


Figure 3: Second-tier Market Share Breakdown



$100 to $500 million (mid-size 1 clients). In this subset of the market, the Big 4 lost their share to both the second-tier and small auditors. The largest gain was for the second-tier auditors, especially Grant Thornton. The HHI decreased from highly concentrated in 2002 to moderately concentrated in 2014.

Like the <$100 million client category, this client revenue category also experienced significant market share shift but in different ways. Figure 1 shows that for small auditors, market share has increased from approximately 2 percent in 2002 to 11 percent in 2006 to 13 percent in 2014. For the second-tier auditors, market share increased from approximately 6 percent in 2002 to 16 percent in 2006 to 18 percent in 2010 and continued to rise to 19 percent in 2014. For the Big 4, market share decreased from 92 percent, to 74 percent, to 68 percent, and up slightly to 69 percent, respectively in 2002, 2006, 2010, and 2014.

The HHI for this client category has shifted to reflect the change in market share. Figure 2 shows that HHI in 2002 was highly concentrated and decreased to moderately concentrated in 2006 and continues to remain in this category in 2010 and 2014. Therefore, auditor choice has increased for mid-size 1 clients.

The market share for each of the second-tier members also changes during this time period. Figure 3 shows that Grant Thornton's market share steadily increased from approximately 3 percent in 2002, to 7 percent in 2006, to 9 percent in 2010, and to 8 percent in 2014. BDO market share was approximately 2 percent in 2002, 5 percent in 2006, 6 percent in 2010, and 5 percent in 2014. Crowe Horwath's market share was approximately less than 1 percent in 2002, 2 percent in 2006 and 2010, and 3 percent in 2014. RSM's market share remained constant at approximately less than 1 percent in 2002, to 2 percent in 2006 and 2010, and to 3 percent in 2014. In this client category, Grant Thornton and BDO are having more success in gaining market share while there is little growth for Crowe Horwath and RSM.

Market share increased for all of the second-tier auditors in various industries with no significant decreases in any industry. Specifically, Figure 4 shows that compared to 2002, Grant Thornton increased the number of clients in four industries, Finance and Insurance, Information, Manufacturing, and Mining, Quarrying, and Oil and Gas Extraction). For BDO, there was also an increase mainly in four industries (Professional, Scientific, and Technical Services, Finance and Insurance, Information, and Manufacturing). For Crowe Horwath, there is an increase in the number of clients in the Finance and Insurance industry. For RSM, the notable increase in the number of clients is in two industries (Finance and Insurance, and Manufacturing). Overall for the $100 to $500 million client category, the second-tier auditors are increasing the number of clients in several industries; however, Grant Thornton and BDO have increased their client base in this category more aggressively across several industries than Crowe Horwath and RSM which seem to concentrate only in certain industries. Also, all four auditors found increase in Finance and Insurance in this mid-size 1 client segment.

Greater than $500 million to $1 billion (mid-size 2 clients). Overall in this client size market, the non-Big 4 have been successful in obtaining market share in the $500 million to $1 billion client category from the Big 4 from 2002 to 2014. Within the second-tier auditors, Grant Thornton gained most of the market share followed by BDO but with little change for both Crowe Horwath and RSM. Auditor choice for this size client is still difficult but slowly improving.

Clients with revenue greater than $500 million to $1 billion experienced some changes since SOX. Clients of this size appear to be very slowly moving to the non-Big 4. Figure 1 shows that the small auditor's market share was approximately 1 percent in 2002 and 2006, and, 3 percent in 2010 and 2014. Second-tier auditor's market share was approximately 2 percent in 2002, 6 percent in 2006 and 2010, and 13 percent in 2014. Big 4 market share was approximately 98 percent in 2002, 93 percent in 2006, 90 percent in 2010, and 84 percent in 2014. From 2002 to 2014 in this client category, the Big 4 has lost approximately 14 percent market share, 3 percent to the small auditors and 11 percent to the second-tier auditors.

Figure 2 shows that this client category remains at the highly concentrated classification, the maximum classification; however, the HHI number has decreased steadily from approximately 2400 to 2050.

Market share within the second-tier has changed, especially for Grant Thornton. Figure 2 shows that Grant Thornton market share was approximately 1 percent in 2002, 4 percent in 2006, 4 percent in 2010, and 6 percent in 2014. BDO market share rose slowly from less than 1 percent to 4 percent. Crowe Horwath and RSM have had market share of less than one percent for most of the 2002 to 2014 time period, with the exception of RSM which increased to approximately less than 2 percent in 2014.

Finally, Figure 4 shows that Grant Thornton made a modest entry in a few of the industries for clients of this revenue size, and had the most success with Manufacturing clients. It was a similar story for BDO. Crowe Horwath and RSM had a modest client or two growth in some industries with clients of this size. At the >$500 million to $1 billion client revenue range, the Manufacturing industry proved to be the most successful for the second-tier to penetrate.

>$1 billion (large clients). Auditor choice has not improved for large clients. A client in this market has a little choice but to choose Big 4 auditors. Over 96 percent of the market is controlled by the Big 4 while Grant Thornton and BDO have had limited success in penetrating this market. Factors that influence the concentration found in the 2008 GAO survey and most likely hold true today include expertise, international access, staff to man these engagements, and other factors.

Market share in the large client category has remained relatively static from 2002 to 2014. Figure 1 shows that small auditors market share was at less than one percent from 2002-2010 and approximately 1 percent in 2014. Second-tier auditors have had modest growth in this client category from less than one percent in 2002 to 2 percent in 2006 and 2010, and to 3 percent in 2014. Big 4 market share was 99 percent in 2002, 98 percent in 2006, 97 percent in 2010, and 96 percent in 2014. Auditor choice is constrained the most for clients when revenue exceeds $1 billion dollars. This is reflected in the highest HHI score (Figure 2) for the large client category.

Figure 4: The Number of Industry Clients for Second-Tier Auditors

Grant Thornton Revenue	**< $100M**				**$100M-$500M**				**> $500M-$1B**				**> $1B**			
Industry Year	**2002**	**2006**	**2010**	**2014**	**2002**	**2006**	**2010**	**2014**	**2002**	**2006**	**2010**	**2014**	**2002**	**2006**	**2010**	**2014**
Accommodation and Food Services	6	2	3	2	1	8	7	4	0	0	0	0	0	1	1	0
Administrative and Support and Waste Management and Remediation Services	4	2	3	2	2	1	1	1	0	2	1	0	0	0	1	2
Agriculture	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Arts, Entertainment, and Recreation	2	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0
Management of Companies and Enterprises	0	0	0	0	0	0	2	2	0	0	0	0	0	1	1	1
Other Services (except Public Administration)	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Public Administration	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
Professional, Scientific, and Technical Services	12	22	20	8	3	11	9	7	0	0	1	0	1	0	0	1
Construction	4	1	0	0	1	2	2	1	0	0	0	1	0	0	0	0
Educational Services	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Finance and Insurance	37	26	12	3	4	12	12	7	1	1	0	1	1	0	0	0
Health Care and Social Assistance	0	1	0	1	0	1	4	2	0	0	0	0	0	0	0	0
Information	13	11	10	5	0	9	8	9	0	1	1	4	1	0	2	2
Manufacturing	70	51	38	30	18	41	48	38	4	13	12	17	0	1	2	6
Mining, Quarrying, and Oil and Gas Extraction	8	9	9	6	2	8	10	9	0	3	2	6	0	2	5	5
Real Estate and Rental and Leasing	1	0	4	2	1	1	1	1	0	0	0	0	1	2	1	0
Retail Trade	1	1	1	1	4	3	2	2	0	2	1	2	0	1	3	0
Transportation and Warehousing	2	1	0	0	1	5	5	3	0	0	1	2	0	1	2	5
Utilities	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1
Wholesale Trade	6	4	1	0	3	5	3	1	2	1	2	1	1	1	1	6

BDO Revenue	**< $100M**				**$100M-$500M**				**> $500M-$1B**				**> $1B**			
Industry Year	**2002**	**2006**	**2010**	**2014**	**2002**	**2006**	**2010**	**2014**	**2002**	**2006**	**2010**	**2014**	**2002**	**2006**	**2010**	**2014**
Accommodation and Food Services	1	2	0	1	2	5	4	3	0	0	0	1	0	0	0	0
Administrative and Support and Waste Management and Remediation Services	1	3	5	1	1	1	1	1	0	0	1	1	1	2	0	1
Arts, Entertainment, and Recreation	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Management of Companies and Enterprises	0	1	0	4	1	1	2	3	0	0	0	1	0	0	0	1
Other Services (except Public Administration)	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Public Administration	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Professional, Scientific, and Technical Services	5	14	8	9	5	11	7	10	0	0	1	0	0	1	0	1
Construction	2	3	3	2	1	0	0	0	0	1	0	0	0	0	1	1
Educational Services	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0
Finance and Insurance	10	15	8	29	4	10	8	7	0	1	2	0	0	1	2	2
Health Care and Social Assistance	2	3	3	1	1	3	4	3	0	1	0	0	0	0	0	0
Information	9	11	9	7	1	8	9	4	0	1	1	5	0	0	1	1
Manufacturing	57	49	33	42	7	17	27	18	2	6	5	9	4	7	4	3
Mining, Quarrying, and Oil and Gas Extraction	1	3	6	2	2	3	3	4	0	0	0	4	0	0	1	2
Real Estate and Rental and Leasing	1	1	1	1	1	1	2	0	0	1	1	0	0	1	1	2
Retail Trade	3	4	1	0	3	3	4	0	0	0	0	1	2	5	6	3
Transportation and Warehousing	0	0	0	0	2	3	2	0	0	0	0	0	0	0	0	1
Utilities	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Wholesale Trade	6	5	1	4	1	4	2	1	0	1	0	0	1	1	2	4

RSM Revenue	**< $100M**				**$100M-$500M**				**> $500M-$1B**				**> $1B**			
Industry Year	**2002**	**2006**	**2010**	**2014**	**2002**	**2006**	**2010**	**2014**	**2002**	**2006**	**2010**	**2014**	**2002**	**2006**	**2010**	**2014**
Accommodation and Food Services	0	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0
Administrative and Support and Waste Management and Remediation Services	2	0	1	0	0	0	1	2	0	0	0	1	0	0	0	0
Agriculture	0	0	2	1	0	0	0	1	0	0	0	0	0	0	0	0
Arts, Entertainment, and Recreation	0	1	2	0	0	0	1	0	0	0	0	0	0	0	0	0
Management of Companies and Enterprises	1	1	4	2	0	1	1	0	0	0	0	0	0	0	0	0
Public Administration	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0
Professional, Scientific, and Technical Services	1	1	4	4	0	2	4	0	0	0	0	1	0	0	0	0
Construction	1	1	0	1	0	1	1	0	0	0	0	1	0	0	0	0
Finance and Insurance	24	21	18	10	1	9	4	9	0	0	2	2	0	0	0	1
Health Care and Social Assistance	1	1	2	1	0	1	0	0	0	0	0	0	0	0	0	1
Information	0	3	1	1	1	1	2	1	0	0	0	1	0	0	0	0
Manufacturing	16	14	35	25	4	8	9	7	0	1	1	3	0	0	0	0
Real Estate and Rental and Leasing	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Retail Trade	0	0	1	0	0	0	1	2	0	0	0	0	0	0	0	0
Transportation and Warehousing	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Utilities	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Wholesale Trade	1	2	2	1	0	1	0	2	0	1	0	0	0	0	1	1

Crowe Horwath Revenue	**< $100M**				**$100M-$500M**				**> $500M-$1B**				**> $1B**			
Industry Year	**2002**	**2006**	**2010**	**2014**	**2002**	**2006**	**2010**	**2014**	**2002**	**2006**	**2010**	**2014**	**2002**	**2006**	**2010**	**2014**
Administrative and Support and Waste Management and Remediation Services	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
Management of Companies and Enterprises	1	1	4	4	0	1	0	2	0	0	0	0	0	0	0	0
Professional, Scientific, and Technical Services	0	0	1	1	0	1	0	0	0	0	1	1	0	0	0	0
Finance and Insurance	68	62	54	29	6	17	19	20	1	1	0	1	0	0	0	0
Information	1	0	2	2	0	2	2	1	0	0	0	0	0	0	0	0
Manufacturing	4	0	3	2	3	4	5	3	0	2	1	1	0	1	0	0
Real Estate and Rental and Leasing	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
Retail Trade	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
Wholesale Trade	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

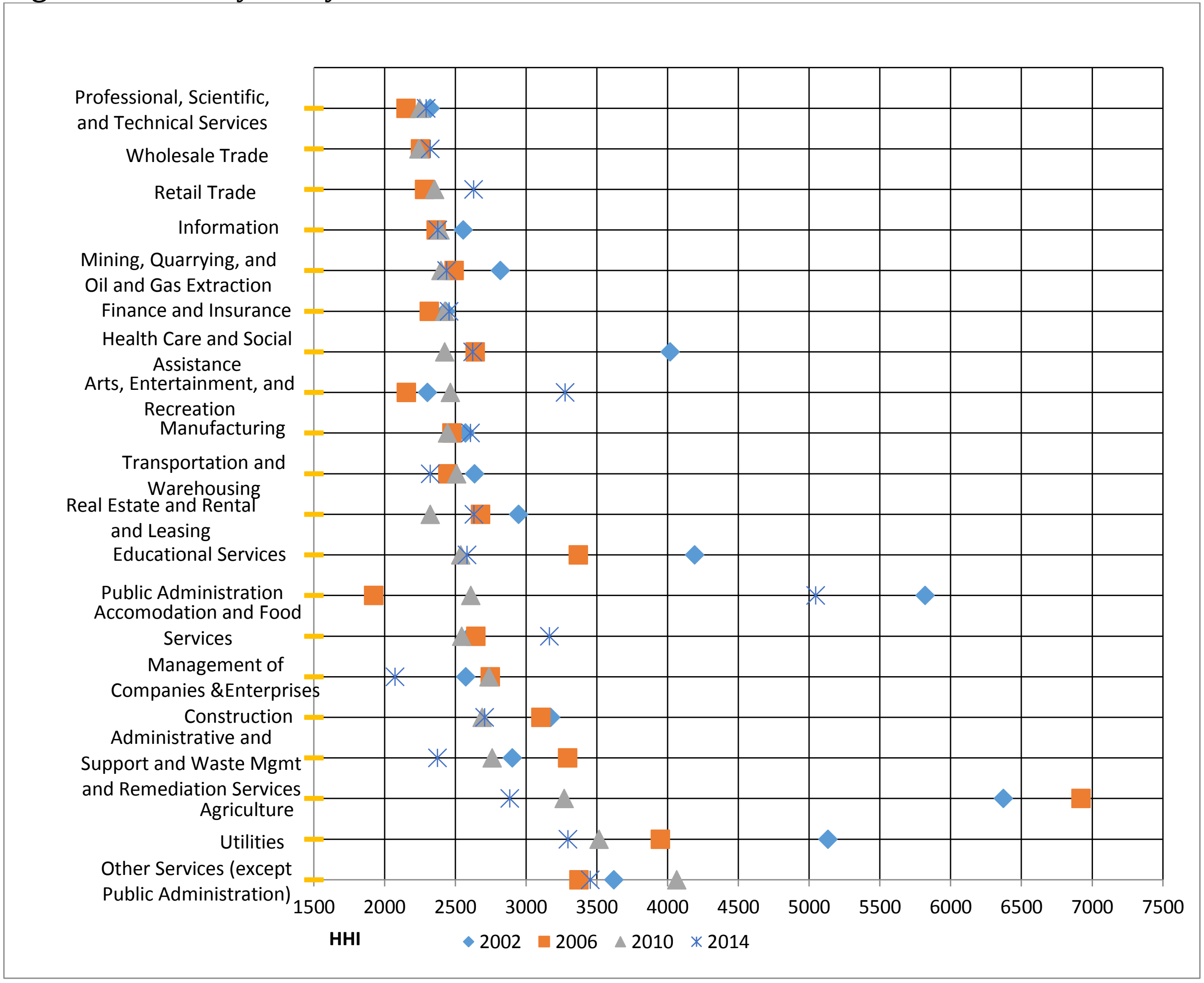
Market share within the second-tier has shifted little. Grant Thornton has steadily increased from less than one percent market share in 2002 to less than two percent in 2014 as has BDO (Figure 3). However, both Crowe Horwath and RSM have less than one percent for the large client category.

Figure 4 shows that Grant Thornton experienced the most success in the Manufacturing, Transportation and Warehousing, Mining, Quarrying and Oil and Gas Extraction industries, and Wholesale Trade while BDO succeeded in moderate increase in several industries, including Retail Trade industry.

Changes in Concentration by Industry

While Figure 4 examines the changes in the number of clients in each industry, in Figure 5, we examine the consistency in industry concentrations. For example although we notice increase in the number of manufacturing clients for Grant Thornton, but industry concentration in manufacturing remain the same indicating that Grant Thornton is possibly just a replacement for Arthur Andersen. Public Administration, Accommodation and Food becomes more concentrated indicating that clients in those industry choose certain auditors only, possibly when Arthur Andersen collapse, ex-Arthur Andersen’s clients in that industry choose auditors that have been the main player in the industry, causing the concentration to increase. A notable decrease in concentration is in Agriculture. Although it is still considered highly concentrated, HHI has decreased from approximately 6,500 in 2002 to approximately 2,500 in 2014. Since we do not see a notable increase in the second-tier clients in Agriculture, it is possible that audit clients in this industry are now more dispersed among small and large auditors.

Figure 5: Industry Analysis



Revenue Analysis

In this section, we compare some of the characteristics of the second-tier auditors to the Big 4. The purpose of this comparison is to understand why the second-tier auditors experience difficulty in penetrating the large client market. Figure 6 shows the average audit and non-audit fees collected from public and private clients is $1,004 million for second-tier auditors and $10,044 million for the Big 4. The revenue collected by the Big 4 is about 10 times as much as the second-tier. The revenue per partner is about double, which may indicate more efficient or effective partners in the Big 4 compare to the second-tier. Also, the number of professionals is no match to the Big 4 who average 29,722 employees to 3,515 for the second-tier. However, the gap in the average number of offices is not so large, 52 for second-tier and 87 for Big 4. These may indicates that second-tier auditors need to manage their human resources better and increase their geographic presence in order to compete with Big 4.

Although we examined the averages of the second-tier to the Big 4, it is important to understand that the second-tier is not homogenous. For example, the revenue collected by Grant Thornton and RSM in 2014 is approximately $1,300 million each while for BDO and Crowe Horwath, it is approximately $600 million each. We also note that Grant Thornton and RSM have more offices than the other two second-tier auditors.

Figure 6: Snapshot of Second-Tier vs. Big 4 Revenue in 2014

	Partners	Professionals	Offices	Revenue ($ millions)	Revenues per Partner	Revenues per Professional	Professionals per Partner
Grant Thornton	523	4,668	56	1,303	2,491,071	279,098	9
BDO	305	2,339	49	683	2,239,344	292,005	8
Crowe Horwath	255	2,244	28	665	2,606,353	296,176	9
RSM	617	4,810	75	1,367	2,214,895	284,114	8
Total Second-tier	1,700	14,061	208	4,017	9,551,663	1,151,394	33
Second-tier Average	425	3,515	52	1,004	2,387,916	287,849	8.30
Big Four Average	2,497	29,722	87	10,044	4,022,730	337,920	12

Conclusion

Our examination of auditor market share and auditor concentration finds improvements in auditor choice in smaller markets but not larger markets. Specifically, in the small client category, we find that market share is shared by small, second-tier, and Big 4 auditors. With the most choices available to clients in this industry, the auditor concentration is closer to the unconcentrated range. In the mid-size 1 client category, we find that the second-tier and small auditors have the most success in increasing market share. The auditor concentration is closer to the moderately concentrated range. In the mid-size 2 client category, we find that the second-tier have the most success in increasing market share. However the auditor concentration remains in the highly concentrated range since the Big 4 dominate this market. Finally, in the large client category, 97 percent of this market is controlled by the Big 4. The impact of the second tier in the large client market is small. We examine characteristics such as number of offices, professionals, amount of revenue to understand how large the Big 4 still are relative to the second-tier auditors.

Our study will inform regulators and legislators about auditor concentration by client size. Auditor choice has improved for small clients but not for large clients. Additionally, the second-tier auditors have had success in increasing market share in the mid-size client category.

References

Boone, J., Khurana, I., & Raman, K. (2010). Do the Big 4 and the second-tier firms provide audits of similar quality? *Journal of Accounting and Public Policy*, 29(4), 330-352.

Boone, J., Khurana, I., & Raman, K. (2012). Audit market concentration and auditor tolerance for earnings management. *Contemporary Accounting Research*, 29(4), 1171-1203.

Cullinan, C., Du, H., & Zheng, X. (2012). Barriers to entry to the big firm audit market: Evidence from market reaction to switches to second tier audit firms in the post-so period. *Research in Accounting Regulation*, 24(1), 6–14.

Dey, R. & Robin, A. (2012). The post-SOX evolution of the client portfolio of the second tier: A focus on restatement and Internal Control Risk. *International Journal of Auditing*, 16(3), 308-334.

Dey, R., Robin, A., & Tessoni, D. (2012). Advisory services rise again at large audit firms: Like a phoenix, revenues reborn amid renewed concerns. *CPA Journal*, 82(8), 58-67.

Dunn, K., Kohlbeck, M., & Mayhew, B. (2011). The impact of the Big 4 consolidation on audit market share equality. *Auditing: A Journal of Practice & Theory*, 30(1), 49-73.

Feldman, E. (2006). A basic quantification of completive implication of the demise of Arthur Andersen. *Review of Industrial Organization*, 29(3), 193–212.

GAO. (2008). Audits of Public Companies: Continued Concentration in Audit Market for Large Public Companies Does Not Call for Immediate Action. *GAO-08-163*. Washington, D.C.: GAO.

Gerakos, J. & Syverson, C. (2015). Competition in the audit market: Policy implications. *Journal of Accounting Research*, 53(4), 725-775.

Keune, M., Mayhew, B., & Schmidt, J. (2016). Non-Big 4 local market leadership and its effect on competition. *Accounting Review*, 91(3), 907-931.

Public Company Accounting Oversight Board. (2012). Public Meeting on March 22, 2012 on Auditor Independence and Audit Firm Rotation. [PDF document]. Retrieved from https://pcaobus.org/Rulemaking/Docket037/2012-03-22_Transcript-Notice.pdf

U.S. Department of Justice and the Federal Trade Commission. (2010). Horizontal merger guidelines. Washington, D.C.: U.S. Department of Justice and Federal Trade Commission.

Whisenant, S. (2006). An analysis of the information content of auditor change announcements: Grant Thornton LLP engagements. *Grant Thornton Commentary Series*, 1(1).

Biographies

R. Mithu Dey is an Associate Professor of Accounting at Howard University in Washington, D.C. Mithu is an active CPA who worked for PWC and ExxonMobil for several years prior to pursuing her Ph.D. in Accounting from the George Washington University. She conducts research in auditing, auditor choice, auditor concentration, and diversity of workforce in the accounting industry.

Lucy Lim is an Associate Professor of Accounting at Howard University in Washington, D.C. She has a Ph.D. in Accounting and an MBA in Management Decision Technology from the George Washington University, and a BA in Accounting from Universitas Airlangga. She conducts research in auditing, corporate governance, and minority studies in the accounting industry.