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Naqi Sayed

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Naqi Sayed

Faculty of Business Administration,
Lakehead University,
955 Oliver Road,
Thunder Bay ON P7A7Z4, Canada
Email: snaqi@lakeheadu.ca

Abstract: The study reviews 438 journal articles that were published during 1980–2017 relating to audit fee determinants and identifies journals, articles, and authors that have contributed substantially to the discourse as measured by citations. The review is based on articles available on ABI/Inform, Science Direct, ProQuest, and Wiley Online Library. Total citations, threshold citations, fractional citations, and citation per year techniques were used for the analysis. To our knowledge, there are no known systematic reviews of research literature that assesses the influence of journals, research papers, and authors who have helped shape the discourse around this issue. Among other insights, we found that the literature on audit fee determinants exhibits three distinct periods in terms of research impact. Post 2008 have seen significant increase in number of articles, however, with limited impact.

Keywords: audit fee; systematic literature review; citation analysis; threshold citations; fractional citations.

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Biographical notes: Naqi Sayed joined Lakehead University in August 2002 with an appointment to the Accounting Discipline in the Faculty of Business Administration. He holds a Master of Business Administration from Pakistan and a Masters in Banking Management from the UK. He has gained extensive working experience in non-banking financial institutions and commercial banks in small business and corporate finance. Prior to joining Lakehead University, Naqi taught Accounting and Management Accounting in Australia while working for his PhD in Accounting and Finance. He received his Certified Management Accountant designation in Ontario, Canada in 2009. His teaching interests include management accounting, performance management and strategy. His management accounting publications and research interests include performance management, balanced scorecard and multi-criteria decision models. He has also published in the area of equity finance (especially venture capital), resource-based theory and accounting education.

1 Introduction

Audit fee has received a great deal of attention from researchers over the last few decades. The interest spans audit contracting, pricing and production (Owens-Jackson et al., 2009; Casterella et al., 2004; O’Keefe et al., 1994). As dynamics in the audit fee market have continued to evolve over the years, interest in this topic seems to continue to

increase. Most of the research in this field is focused on determinants of audit fees (Hay et al., 2006; Habib, 2013). Interest in audit fees is probably driven by concerns about audit quality, therefore, the association of audit fees and reporting quality, including earnings management has been covered in both the popular press and academic research (Frankel et al., 2002). Research covering audit fee literature frequently cites Simunic's (1980) paper as seminal work which spawned interest in this topic. Since then, audit fees have been associated with a complex set of factors, which can be classified as audit firm related (e.g., cost of the audit, reputation, size, etc.), auditee related (e.g., complexity, risk, size, etc.), environment-related (e.g., competition, norm, location, etc.). A few studies have examined the literature on audit fees using a meta-analysis approach (Habib 2013; Hay et al., 2006; Hay, 2013). Existing literature has followed the traditional meta-analysis approach and highlighted factors that have been found to significantly contribute to audit fee determinations. This paper goes a little further not only in terms of the time period but also in terms of examination of influential literature by using a non-traditional approach.

We examine a large body of literature related to audit fee determinants over the last 30 years and highlight journals, research papers and authors who have played an important role in this discourse as determined by the number of citations. Number of citations are often considered a measure of the influence of research papers in academic circles (Liu et al., 2013). Citations reflect quality, rigor, and value-added contribution by a research paper as it not only helps produce a number of more papers but also reflects dependence of later publications.

The paper makes contribution to existing literature in multiple ways. To our knowledge, there have been few attempts to examine the literature on audit fee determinants using citation analysis. This study adds to the previous and existing literature on audit fees by examining relevant literature from a unique viewpoint and identifies important trends and players which have shaped the discourse around this topic. It also highlights the direction of the discourse over time and unravels themes and commonalities within the literature.

Traditional meta-analysis is primarily a statistical technique which synthesises findings of previous research studies and draws more robust conclusions than what can be achieved by analysing each study individually. The goal of a meta-analysis is to provide a quantitative summary of the available evidence, increasing the statistical power and generalisability of the results by pooling data from multiple studies.

Our paper expands on the existing literature by providing further information about historical trends and interest in the topic, scholarly impacts over the years, authorship and research quality. It also specifically identifies influential works, key authors, impactful journals and influential research networks. The paper is of benefit to several stakeholders in this area of research. To new and existing researchers, it provides a ready reference to focus on important work and determine potential in this area of research, themes that are more impactful and any existing gaps that may exist. To journal editors it provides access to all important literature and helps determine the quality and contribution of submitted manuscripts and draw comparisons. To publishers, it helps elevate ranking of a journal by providing information about research trends, journal impact and the kind of literature that carries greater influence. In general terms, it provides a fascinating example of how literature tends to evolve over a period of time.

We found that the origin of research in Audit fee determinants can be traced to Simunic's (1980) research paper which spawned a flurry of research endeavours.

Although 2010-2014 turned out to be the most prolific period of research, the literature review displays three distinct periods of research interests. The *Journal of Practice and Theory* seems to have published most influential articles if we discount Simunic's (1980) seminal work which was published in *Journal of Accounting Research*. Other than Simunic, Simon D.T. and Francis J.R. were the leading contributors in this area of research and, other than Simunic (1980) paper, Craswell et al. (1995) has been the most cited research paper. We found that Francis J.R., Choi J.H., Kim J.B. and Raghunandan, K. form the most influential network of authors. We were also able to extract most often used audit fee determinants from the influential research papers.

The remainder of this paper is organised as follows. In Section 2 we present a brief overview of existing literature on audit fees. Section 3 includes the data collection process and methodology. Section 4 presents results and discussion and analysis of the top 10 most influential research papers, as determined by citation results, followed by our conclusion in Section 5.

2 Literature review

The audit is a mechanism implemented to reduce information asymmetry problems that arise between shareholders and agents (Manita and Elommal, 2010). The main purpose of an audit is to reassure financial statement users of the reliability of the financial information communicated, through financial statements (Manita and Elommal, 2010). A demand for audits exists; because of the agency and contracting theory, which supports the demand for quality differentiated audits by groups in agency relationships (Craswell et al., 1995). Financial statements are used to reduce information asymmetry, which exists between stakeholders and managers. Specifically, an audit is a mechanism that reduces negative externalities that arise from information asymmetry. Current literature has explored the question of how and why audit fees charged by the audit firms are important. This question has instigated numerous studies to investigate how audit fees are determined.

Despite sizable literature, only a few meta-analyses have been performed on audit fee determinants (Hay, 2013; Hay et al., 2006). Hay et al. (2006) examined research literature published on audit fee determinants between 1977 to 2003 which included papers that used audit fee as a dependent variable in an empirical mode. They used meta-analysis techniques which convert p-values to z scores by using Stouffer combined test. Z Scores were then added and divided by the square root of the number of tests. Further refinement to the data were performed to account for the 'file drawer' effect. The resultant determinants identified were broadly divided into client attributes, auditor attributes and engagement attributes. According to Hay et al. (2006) client attributes have the greatest impact on determining the audit fees, which primarily include the size, complexity, inherent risk, profitability, leverage, form of ownership, internal control, governance, and industry. More audit resources are needed by audit firms if the audit is larger, not just in terms of total assets but geographic spread, thereby leading to higher audit fees. An analysis conducted to determine the effect of client size on audit effort confirms that the size of a client is associated with an increase in labour cost, which plays a significant role in the fees to be charged (Dopuch et al., 2003). Size, which explains in excess of 70% of the variation in audit fee, is normally measured by taking the natural log of the total

assets (Hay et al., 2006). In some cases, revenue was also used as a proxy for size. They posit that the explanatory power of size to determine audit fee may be less significant for smaller firms.

Hay et al. (2006) identified 33 specific metrics that previous research has used as a proxy for complexity. Some of the more common ones include the number of branches and subsidiaries of the company being audited, its geographic spread and operational diversity (Simunic, 1980). Inherent risk is mostly measured in the literature by the amount of receivable and inventories or both (Hogan and Wilkins, 2008; Abbott et al., 2003). Less popular are current assets and systematic risk (Ferguson et al., 2003). Leverage which is normally measured by ratio of debt to total assets and quick ratio has been found to have a significant relationship with audit fee in previous studies (Choi et al., 2010). In terms of ownership, strongest results have been obtained when public and private companies are compared. Results have been mixed in terms of different proxies for internal control, governance and industry (Hoitash et al., 2008; Yatim et al., 2006; Francis et al., 2005).

In terms of auditor characteristics, the more the audit firm is respected the greater position it is to charge higher fees for the services they provide (El-Gammal, 2012). Clients are willing to pay more for international big firms due to their brand name and reputation for high audit quality (Fargher et al., 2001). Firms build or maintain their reputation by hiring qualified individuals, investing in employee training programs and advertising (Che-Ahmad and Houghton, 1996; El-Gammal, 2012). There seems to be indications that Audit specialisation, as represented by the share of the audit fee in a particular industry, may be associated with higher audit fee, but the literature in this area is scant and still evolving (Craswell et al., 1995). Audit tenure as represented by a dummy variable for change in auditor in the last 1 to 3 years has also been used (Hogan and Wilkins, 2008). Based on the observation that some places are more expensive than others, previous research also measured the association of particular location with audit fee with mixed results (Palmrose, 1986).

In terms of relationship attributes, report lag, which indicate the length of an audit indicating problems, has been found to associate with audit fee, although the results have not been significant in all studies (Naser and Nuseibeh, 2008). Similarly, some studies have used audit opinion to proxy for audit problems. While this attribute was more nuanced in terms of conclusive results, the results vary in terms of countries and industry (Craswell et al., 1995; Gul, 2006). There is argument for both higher and lower audit fee if non audit fee constitutes a large part of overall audit fees. Overall results were however show a strong positive relationship between non-audit fee and overall audit fees (Antle et al., 2006; Hoitash et al., 2008). Hay et al. (2006) concluded that there was enough evidence to conclude now that internal control and governance is associated with audit fee. They however note that governance issues have proved to be more complex in existing research.

In continuation to their previous research, Hay et al. (2006) conducted a follow-up study (Hay, 2013) which included more recent publications but followed prior technique which also used Stouffer Combined test. While the previous paper was inconclusive about the relation of internal control to audit fee, the current research confirmed that both are positively related. Moreover, improved governance through more active directors, though a little nuanced, was also found to be positively related to audit fee. The rest of the paper confirmed other findings of the previous paper.

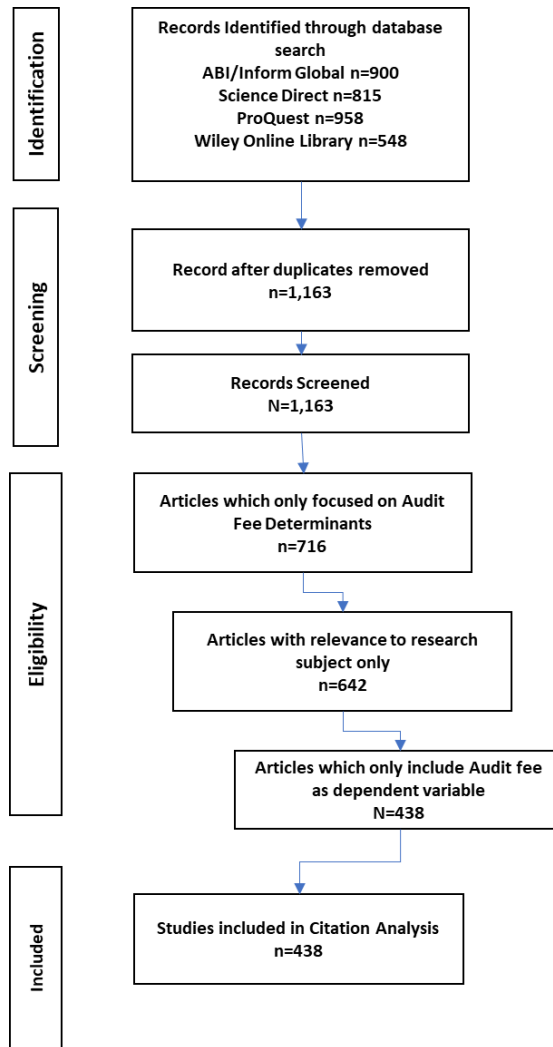
Both meta-studies (Hay et al., 2006, Hay, 2013) used previous research and the weaknesses in the studies were translated into the meta-analysis. Although file drawer effect was calculated for both meta-analyses it did not make any distinction between papers in terms of quality, contribution of authors, journals, and development of the literature on audit fee overtime. Hay (2013) recommended that future studies should consider even longer periods of audit fee research.

Based on 121 comparable studies, Widmann et al. (2021) conducted an analysis which was more focused on finding significant audit fee determinants as determined by articles published in higher ranking journals rather than their impact. Their findings were similar to Hay et al. (2006) and Hay (2013).

3 Selection of articles

A comprehensive article search was conducted to develop a database of publications which are most relevant to the subject of audit fee determinants. The following steps were taken to ensure identification and selection of articles which has been encapsulated in a PRISMA flowchart (Figure 1)

- 1 Literature on audit fee was searched on popular business databases such as ABI/Inform, Science Direct, ProQuest and Wiley Online Library. The key word used to search was ‘Audit fee(s)’. A search was conducted on ABI/Inform Global for the key term between 1980 and 2017 which yielded 900 scholarly journal articles. A similar search for research articles on Science direct yielded 815 articles. A search on ProQuest and Wiley Online Library yielded 958 and 548 journal articles respectively.
- 2 The articles were then exported to Refworks – bibliographic management software-where duplicate entries were eliminated. The resulting 1,163 articles were exported to Microsoft Excel for further examination. The column headings in the Microsoft excel included ID, no. of authors, time frame, authors, title, abstract, number of citations, journal, year, country of research, etc. Afterwards, only those column heading was retained which related directly to the research objectives.
- 3 An examination of article titles was carried out and articles which apparently examined aspects of audit fee other than determinants were eliminated. In the second iteration abstracts of all journal articles were closely examined to determine their relevance to research objectives and further articles were eliminated from our database. In the last phase we examined each paper which does not include audit fee as dependent variable in an empirical model following Hay et al. (2006). This process yielded a final tally of 438 scholarly peer reviewed articles published between 1980 and 2017. After merging results of a few journals which seem to have changed their names between this period, the final number of journals were 94.
- 4 Each article was then searched on Google Scholar to get the citation count. Articles were then given a unique numerical identifier which remained the same in all subsequent analyses. Similarly, alphabetical coding with each code having a unique identity throughout the database was developed for all items within each category and was preferred over numerical codes.

Figure 1 PRISMA flowchart (see online version for colours)

3.1 Citation and threshold analysis

Citation and co-citation analysis began in late 1960s and cemented its importance as a popular tool in management discipline to determine influence in academia (Liu et al., 2013; Garfield, 1972). Examining the number of times, a research article has been cited by peers, is considered a relatively low cost and useful tool to not only evaluate scientific performance of journals, authors and articles but also provides information about development of relevant literature over time (Chatha and Butt, 2015; Jeung et al., 2011; Liu et al., 2013; Guerras-Martín et al., 2014; McLaren and Burner, 2022). Although this methodology has faced some criticism for failing to account for self or negative citations (Garfield, 1979), it continues to be used. Reputable journals have acknowledged the

legitimacy of citation and co-citation analysis by publishing article based on this methodology (Chan et al., 2012; Hoepner et al., 2012; Calma and Davies, 2016).

Citation analysis rests on several insights. First, citation frequency, whether negative or positive, is an indication of professional interest in the contents of the publication. Second, being cited often means that ideas contained in the publication are important, ground-breaking or add considerable value to existing literature. Third, often cited can also indicate that the ideas expressed in the publication are worthwhile to be explored further in later research endeavours (Jeung et al., 2011). An avenue to access credible information relating to citation count is Google Scholar which offers a multidisciplinary bibliographic database due to its interdisciplinary nature, distinguishing features, convenience, and low cost (Chatha and Butt, 2015; Hoepner et al., 2012).

4 Results and analysis

Figure 2 present the number of articles published on the topic of determinants of audit fee from 1980 onwards. It seems that 1980 was an exceptional year in audit fee determinant debate when (Simunic, 1980) published their seminal paper. It also remains the most cited paper on the topic. Since 1980 we notice a steady increase in the number of article and an unusual surge in the topic in 2007. Most of this surge is accounted for by publications in the USA of UK's market. As compared to seven articles related to UK/USA which accounted for 50% of the articles in 2006, 2007 saw 27 of the 34 publications relating to UK/US. This interest in audit fee research in UK seems to have coincided with UK Audit Act 2007. The most impactful articles of 2007 include Srinidhi and Gul (2007) and Hoitash et al. (2007). 2010–2014 was the most prolific period of audit fee determinants research with the number of articles peaking in 2014 followed by a consistent and sharp decline. While US markets seemed to have retained its share of the audit fee papers in peak year of 2014 (around 50% of articles in our database), the rest were spread out in different geographical areas. It is interesting to note that our database did not contain any paper based in the UK market for 2017. A declining trend in terms of number of average citations since 2016 is also noticeable. We acknowledge that the length of time a paper is available increases its citation numbers, however, research articles may cite more recent articles to keep their bibliography section current.

The literature produced since 1980 seems to display 3 distinct periods: pre-1997, 1998-2007 and 2008-2017. Figure 3 shows citation trends by each period. Though the total number of articles show consistent increase over the time periods, number of citations from articles published between 2008-2017 show a decline. 2008-2017 accounted for more than half of the articles published since 1980 but account for a mere 20% of the citations. The last ten years have produced more research articles, but their impact has been limited. Pre-1997 period which produced 17% of the articles accounted for more than 40% of citations. 80% of the citations come from papers published before 2007. 1998-2007 saw highest number of citations per year of 11.48 and can be considered as the most impactful period in audit fee determinant research.

Figure 2 Number of articles and citations per year (see online version for colours)

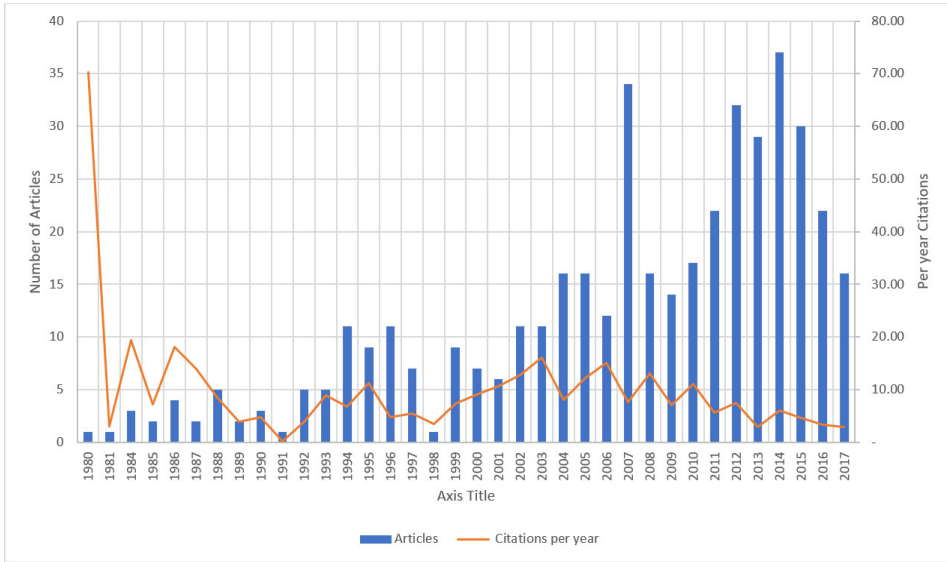
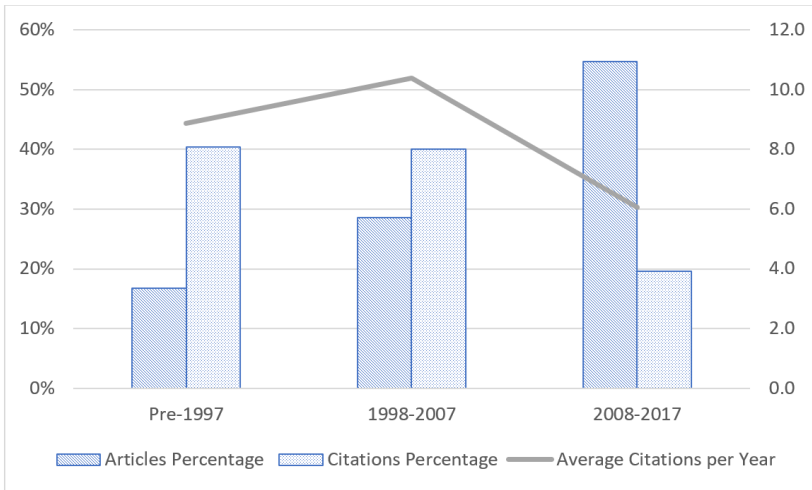


Figure 3 Citation trend by timeframe (1980–2016) (see online version for colours)



4.1 Most influential journal

Figure 4 includes data relating to impact and productivity of different journals on accounting research. The data has been limited to 100 citations and 10 or more articles to flush out the most influential journals. Our data shows that *Auditing: A Journal of Practice and Theory* leads in terms of number of articles published on the topic of audit fee determinants, however, *Journal of Accounting Research*'s citations appear to considerably more relative to the number of articles published in the journal. This figure

exaggerates the contribution of the *Journal of Accounting Research* since only one article (Simunic, 1980) accounts for more than a quarter of its total citations between 1980 and 2017. However, even adjusted for the one outlier, *Journal of Accounting Research* seems to exhibit considerable influence on the discussion related to audit fee determinants. Another interesting outlier is the *Managerial Auditing Journal* which seems to have published relatively more articles compared to the total citations those articles has received.

Figure 4 Journals: total citations and number of articles (1980–2016) cutoff (top 10 highest citations) (see online version for colours)

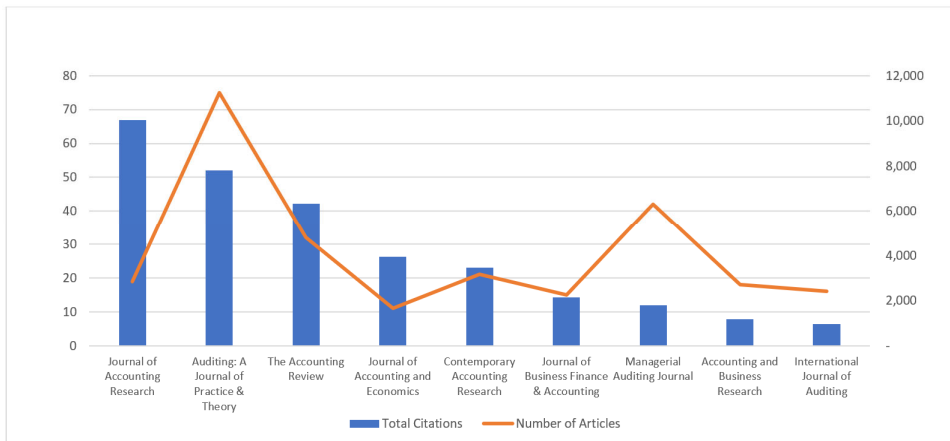
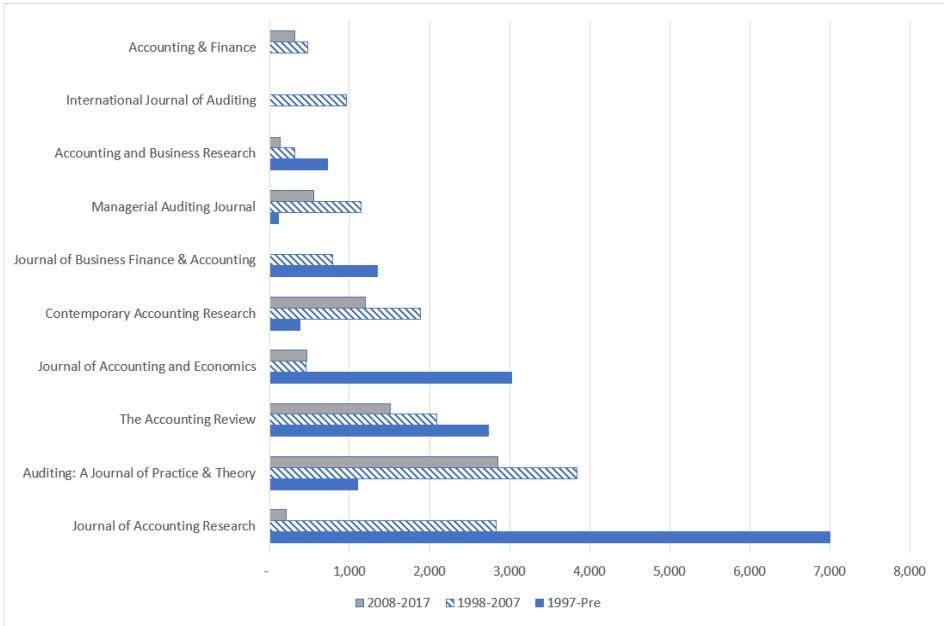


Figure 5 details the influence of journals with more than 1,000 citations over the three time periods. The most impactful research, as measured by number of citations, related to audit fee determinants was published in *Journal of Accounting Research* and *Journal of Accounting and Economics* pre-1997. In case of *Journal of Accounting Research* it is true even if adjusted for Simunic (1980). Citations from the journals published post 2008 have considerably decreased compared to other journals in this category. Post 1998, *Auditing: A Journal of Practice and Theory* has the most citations on the topic. Post 2007, articles published in *Auditing: A Journal of Practice and Theory*, *Contemporary Accounting Research* and *Accounting Review* are cited more often and seems to be contributing more to this topic.

An analysis of average citations (not shown here) reveals that *Journal of Accounting Research* still seem to lead the group. However, when adjusted for Simunic (1980) it is comparable to *Journal of Accounting and Economics* in terms of how often it is cited on average. It is interesting to note that ABDC ranking closely matches average citations for each of the listed journal except for *Review of Quantitative Finance and Accounting* which is ranked as a B journal by ABDC.

Figure 5 also shows journal ranking by ABDC which seems to match the average citations number for each journal.

Figure 5 Number of citations (top 10 journals by total citations) (see online version for colours)



4.2 Most influential and prolific authors

Figure 6 and 7 shows a comparison of number of authors, articles and citations. It seems that most of the articles on audit fee determinants were published by less than four authors. Pre-1997 authorship was evenly spread out between 1–3 authors. However, this trend seems to have changed over the later years. During 1998–2017 most articles were published by team of 2–3 authors, however the trend seems to have changed in favour of 3-member team of authors. Citation trends also seem to replicate the number of numbers of article trends except that pre-1997 single author papers were cited more often. Our analysis shows some interesting differences between journals in terms of authorship. While *Auditing: A Journal of Practice and Theory* has published papers, which are consistent with overall authorship number, *The Accounting Review* and *Contemporary Accounting Research* has published very few articles with a single author, in fact, roughly 80% of articles published on the topic in *Accounting Review* were by three or more authors.

Figure 8 and 9 shows data relating to individual authors based on number of appearances in the publication and fractional citations. In terms of productivity, Simon D.T. and Francis J.R. lead the pack with, however, Francis J.R.’s work seems to be much more influential in terms of citations. Since there is no untenable weighing scheme to determine contribution from each author, we assume contribution of all authors as equal. Thus, in our calculation of fractional authorship, as shown in Figure 8, an author gets a credit of 1 if the publication has a single author and 0.5 if it has two authors. While fractional citations more or less confirm influence of authors it also highlights authors like Palmrose, Z.V who have been exceedingly influential despite fewer papers.

Figure 6 Number of authors and articles (see online version for colours)

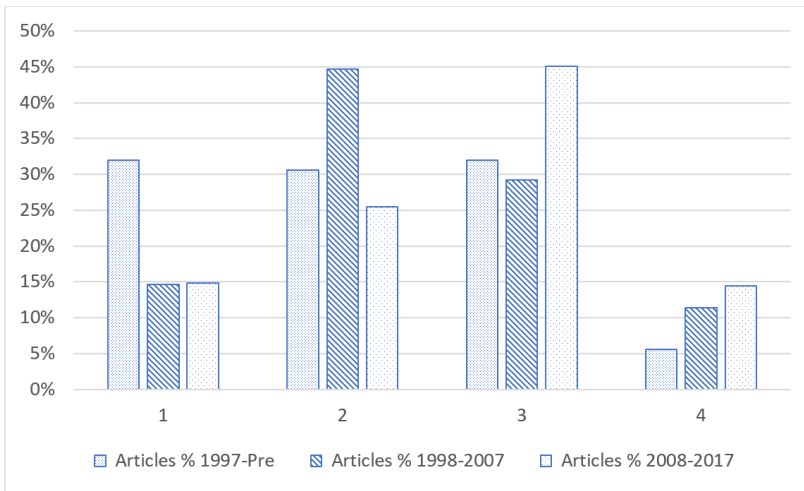
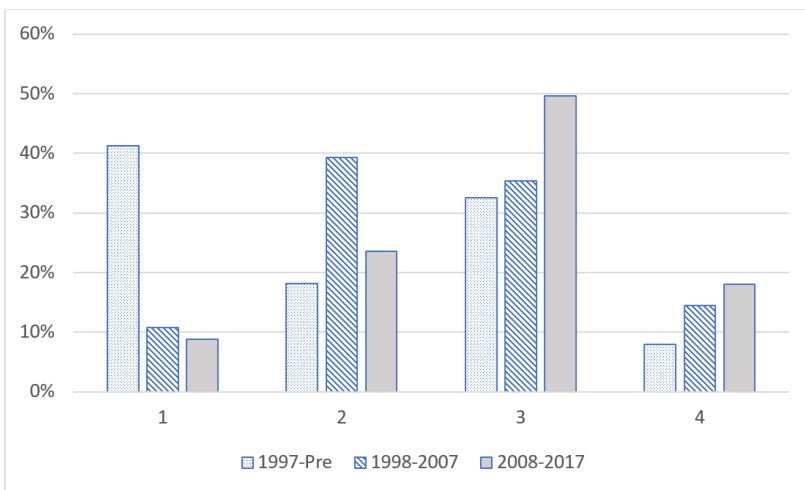


Figure 7 Number of authors and citations (see online version for colours)



We examined top 50 papers in terms of authorship and found that a number of authors appear repeatedly in these papers. Francis J.R., Choi J.H., Kim J.B. and Raghunandan, K. are at the centre of most influential author networks. Only Choi J.H. and Kim J.B. seems to have often collaborated with each other as well as with Simunic D.A.

Figure 8 Total citations and appearances (top 10 authors) (see online version for colours)

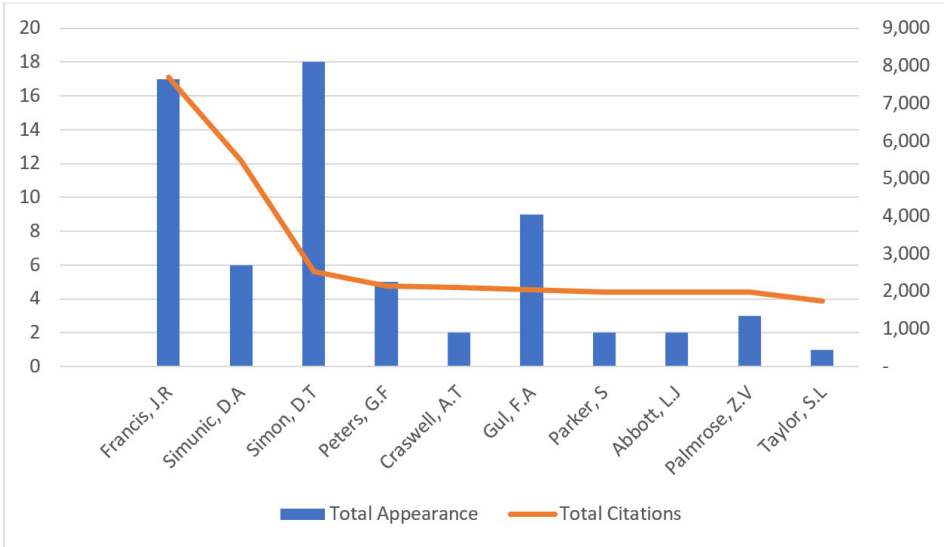
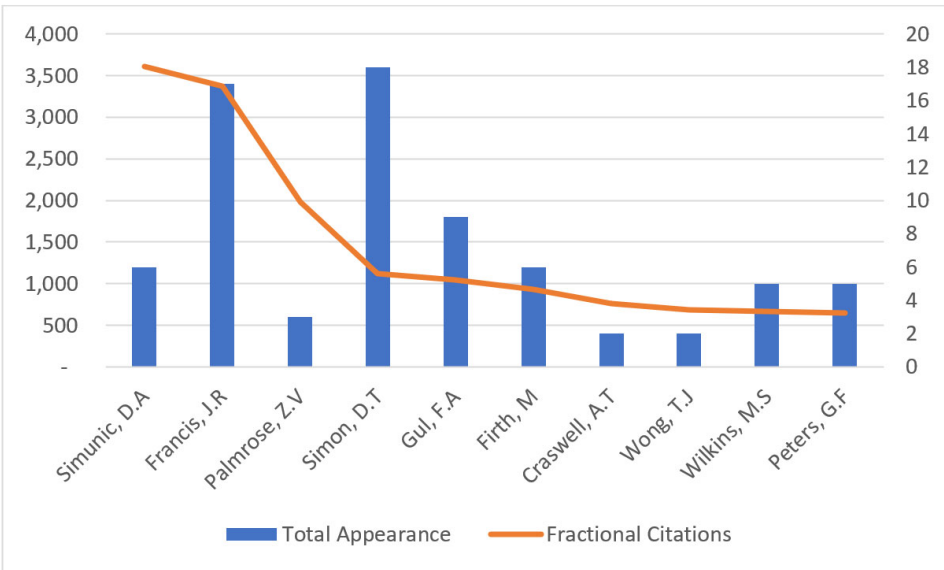


Figure 9 Total appearances and fractional citations (top 10 authors) (see online version for colours)



4.3 Most influential article

Table 1 present the ranking of ten highest cited articles on average per year since the date of publication. Since it is argued that older articles tend to be cited more, citation per year

since publication, to some extent, is a better measure of influence that an article has exercised over the years.

Table 1 Top 10 articles by citations average

<i>Ranking</i>	<i>Articles</i>	<i>Total citations up to 2017</i>	<i>Citations avg. per year</i>	<i>Country of research</i>
1	Fan and Wong (2005)	1012	77.85	Multi country (emerging markets)
2	Craswell et al. (1995)	1736	75.48	Australia
3	Simunic (1980)	2672	70.32	USA
4	Hribar et al. (2014)	210	52.50	USA
5	Francis et al. (2005)	646	49.69	USA
6	Carcello et al. (2002).	789	49.31	USA
7	Choi et al (2010)	372	46.50	USA
8	Hogan and Wilkins (2008)	447	44.70	USA
9	Palmrose (1986)	1372	42.88	USA
10	Choi et al. (2008)	417	41.70	Multi country

Our examination of the top 10 papers which cover audit fee determinants produced the following basic themes.

External auditors and corporate governance: Several papers, such as Fan and Wong (2005) and Carcello et al. (2002), explore the role of external auditors in promoting corporate governance. They examine the impact of external audits on firm performance, financial reporting quality, and transparency. The studies generally find a positive relationship between the presence of external auditors and improved corporate governance practices.

Auditor reputation and industry specialisation: Craswell et al. (1995) and Francis et al. (2005) investigate the association between auditor reputation, industry specialisation, and audit fees. They examine how auditor brand names and industry-specific expertise affect the perceived quality of audits and pricing decisions. The studies highlight the importance of auditor reputation and specialisation in influencing audit fees and client choices.

Audit pricing and determinants: Simunic (1980), Choi et al. (2010), Hogan and Wilkins (2008), and Choi et al. (2008) delve specifically into the determinants of audit pricing. They explore factors such as audit office size, audit quality, legal liability regimes, and the presence of internal control deficiencies. These studies provide insights into the drivers of audit fees and shed light on the economic considerations in pricing audit services.

Audit quality and accounting measures: Hribar et al. (2014) and Palmrose (1986) focus on the measurement and evaluation of audit quality. They propose new metrics for assessing audit quality and examine the relationship between audit fees, auditor size, and audit quality. The studies contribute to the understanding of factors influencing audit quality and its impact on financial reporting.

The most influential paper in audit fee determinant by Fan and Wong (2005), examines audit fee as a function of agency issues. It started with the premise that external auditors can be used to alleviate agency conflict issues. To conduct their analysis, the authors gathered data from 3,000 publicly listed companies from nine East Asian economies between 1994–1996. They found that firms facing agency issues emanating from more diverse ownership structures and high voting controls, are more likely to employ big five auditors. They concluded that this happens because auditors in these situations tend to play a greater bonding and monitoring role. They also found that big five audit firms also charge higher audit fees from clients with more acute agency issues in Hong Kong and Singapore.

It is interesting to note that the following two articles by Simunic (1980) and Craswell et al. (1995) are not only highly cited but also one of the highest citation average. Simunic (1980) which is considered a seminal work in the area of audit fee was motivated by the existence of competition among auditors and the possibility that “‘Big Eight’ audit firms are enjoying monopoly status. The paper sought to establish a positive model of process by which audit fees are determined. Unlike most other papers in this field, a survey approach was used, and the analysis was based on businesses being audited by “‘Big eight” and non-big-right auditors. The paper used a three sets of control variable, variables for differences in loss exposure, variables for differences in assessed loss-sharing ratios and variable for differences in auditor production function. The paper found that all variables related to differences in loss exposure as represented by size of auditees, complexity of auditee’s operations (number of consolidate subsidiaries and foreign assets divided by total assets at year end), size of receivables and inventories and the industry of the auditees were associated with audit fee. As for difference in loss exposure, net loss during any one of the current or two prior fiscal years and nature of audit opinion (qualified or unqualified) were also found to be associated with audit fee.

Craswell et al. (1995), which was conducted in Australia seemed to be closely related to Simunic (1980)’s work. Using a larger sample than prior studies it replicated some earlier studies related to the fee premium that is believed to be charged by the Big eight audit firms. They argued that prior studies have confounded two elements of audit pricing: general brand name premium and industry specific premium. The model developed by the study estimated that firms charge a premium of 28%–39% for brand recognition and about 34% premium because of specialisation compared to non-specialist big eight firms. Unlike Simunic (1980), the study relies on secondary data some of which was hand collected from annual report of companies. Like Simunic (1980) the study used auditee size, audit complexity and audit-auditee risk sharing as control variable and found them to be associated with audit fee. They found confirmation of their hypothesis that audit firms charge premium for fees for both general brand name and industry specialisation.

As indicated in Table 1, 7 of the 10 most influential studies have been conducted in the USA. In order to gain further insight into most influential studies, we examined themes related to our top 50 papers (not listed) as well. First, we looked at audit fee models of the top fifty articles based on average citations per year since publication. Control variables used in these papers can be divided into three broad categories: auditee characteristics, auditor characteristics and relationship characteristics and confirms Hay’s (2013) findings. Auditee characteristics include some conventional financial factors such as total assets, current ration size, return on assets, accounts receivable etc. and non-financial factors such as number of subsidiaries, business segments and audit opinion.

Less common are audit hours, cross listing and pension or post-retirement plans. Auditor characteristics invariably include from the 'Big 4' to the 'Big 8' audit firms depending on the country and the time period when the research was conducted. However some studies have included industry expertise, audit firm market share as well as the percentage of assets audited by a firm in a particular client industry (Rahmat et al, 2010). Relationship characteristics include audit tenure, auditor change and even physical distance of auditor from auditee.

Table 2 presents a summary of the variables used more than once in order of number of times that they have appeared in these papers. It seems that all papers have been consistent in terms of a limited number of control variables. However, papers vary in terms of reported significance. It is also understandable that almost all often used control variables rely on information gleaned from annual reports of companies. Thus credible research is limited to countries with robust financial markets and filing requirements. Almost 43 out of 50 papers have been published in A* journals as per ABDC ranking.

Overall, these research articles contribute to our understanding of external audits, audit fees, audit quality, auditor specialisation, and the broader implications for corporate governance. They provide insights into the factors that influence audit pricing decisions, the role of auditors in promoting transparency and accountability, and the impact of regulatory changes on the audit profession.

Table 2 Variables ranking

<i>Ranking</i>	<i>Variables category</i>	<i>Variables used</i>
1	Size	Total assets
2	Leverage	LTD to total assets, liabilities, leverage, total debt over assets, debt/equity
3	Number of sub-units	Number of segments, number of consolidated subsidiaries, number of unique business segments, number of geographic segments, number of subsidiaries
4	Accounts receivables	Accounts receivable by total assets
5	Inventory	Inventory by total assets
6	Foreign operations	Foreign income tax, foreign sales, ratio of foreign sales, foreign operations, number of foreign subsidiaries, proportion of foreign subsidiaries, ratio of foreign operations
7	Loss	Extraordinary gains/losses, loss, loss year end
8	Return on assets	Return on assets, five-year return on assets
9	Current assets	Current ratio, current assets to total assets, current assets
10	Quick ratio	Quick ratio
11	Audit opinion	Audit opinion, going concern opinion
12	Others	Return on investment, book value of equity by Mkt value of equity, number of employees, engaged in M&A, IPO, litigation risk, non-audit fee, number of audit reports, inherent risk, business risk

Auditing: A Journal of Practice and Theory, *Contemporary Accounting Research*, *Journal of Accounting Research* and *The Accounting Review* share most of highly cited research papers in audit fee determinants. Unsurprisingly most of the research has been

conducted on public listed companies in USA. After USA, research papers studying audit fee determinants in Australia have been cited most often. Most papers use secondary data where financial institutions are expressly excluded because of their unique status. Only one study specifically studying banks feature in the most cited paper. It may mean that there is further opportunity of studying this phenomenon in financial setting. Sample size has been mostly expressed in terms of firm year and number of firms.

5 Conclusions

The paper examined the literature relating to audit fee determinants using citation analysis. Although audit fee determinants have been studied extensively, there have been only two meta-analysis studies relating to this topic, both by the same author, using traditional meta-analysis approach. Citation analysis is a comparatively newer meta-analysis technique, which has been facilitated by electronic records which were not available in the past. Citation analysis can produce insights which are not usually available using the traditional literature review techniques. Citation analysis is increasingly being cited as a credible meta-analysis technique and is being published in reputable journals.

Through our analysis we found that the since 1980 audit fee determinants has become a prolific area of research. Most of the initial surge in the interest in the topic was accounted for by USA and UK. 2010–2014 was the most productive period as determined by the number of articles published. Since then, the topic has experienced a decline in interest. The literature on the topic exhibits three distinct periods. Pre 1997 period accounted for more than 40% of citations compared to 17% share of the number of articles. Post 2008 have seen significant increase in number of articles with limited impact. We found that *Journal of Accounting Research*, *Auditing: A Journal of Practice and Theory* and *The Accounting Review* have published work of significant importance. We also found that post 1998, most impactful articles were published by between 1–3 authors. There seems to be an increasing trend toward publishing a 3-author paper. We also found that Simunic D.A. and Francis J.R have been the most influential authors in this area of research.

The study provided an alternative meta-analysis framework to examine audit fee. Research studies have explored many aspects of audit fee determinants but audit fee's effect on relationship characteristics remains relatively under-explored. We also found that there is dearth of research studies which examine Audit fee from pricing strategy perspective. Moreover, audit fee's response to exogenous shock remains a rich area of research. COVID-19 offers such an opportunity.

We would like to acknowledge that citation analysis methodology has its shortcoming. First, we only consider citation as a measure of influence whereas it is possible to be influence by some work without necessarily citing it. Second, sometime authors cite later articles which have build on a earlier work without citing the original. Third, citation database does not necessarily account for all citations and are still a work in process.

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