

Audit pricing and the emergence of the Big 4: Evidence from Australia*

Colin Ferguson, Matthew Pinnuck, and Douglas J. Skinner

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Abstract:

We use evidence from a large panel of Australian audit market data to shed light on a number of questions in the auditing literature. The panel spans nearly 50 years, and begins before the emergence of the Big 4 in Australia. We provide evidence on the economic forces that lead to the emergence of the Big 4, as well as on related questions of how these forces affect audit pricing. Our evidence is consistent with the Big 4 emerging as a result of changes in the demand for and supply of audit services. Over our sample period, the size distribution of companies becomes increasingly skewed to the point that it is dominated by a relatively small number of very large companies. Along with increasingly complexity of accounting and auditing, this change necessitates an investment by audit firms in endogenous sunk costs (Sutton, 1991) and so leads to the emergence of a small set of increasingly dominant audit firms (the Big 4). We also report on a corresponding structural shift in audit costs and pricing. The results have implications for the current regulatory debate on audit market concentration.

*Ferguson and Pinnuck are from the University of Melbourne, Faculty of Business and Economics; Skinner is from the University of Chicago, Booth School of Business. Skinner acknowledges financial support from Chicago Booth. We have benefited from comments on initial results from workshop participants at Florida International University, the University of Melbourne, and MIT.

1. Introduction

We use an extensive panel of Australian audit firm data to address fundamental questions related to the determinants of audit market structure and audit pricing. Because the data begin in the early 1960s, a period that we show predates the Big 8 in Australia, and extends through the present time, we are able to examine factors that determine the emergence of the Big 8, which helps us understand the economics of the current Big 4.¹ Our evidence is consistent with the Big 4 emerging after an increase in both overall market size and the relative importance of large, complex client companies in the economy. As such, the evidence is consistent with audit market concentration being driven by changes in the structure of the underlying economy that drive changes in the relative importance of endogenous sunk costs (Sutton, 1991).

Over the last 50 years, these changes have led to fundamental changes in the cost structure of the audit industry, as well as to a bifurcation of the market that is now dominated by the Big 4. These changes have led to corresponding changes in the pricing of audit services. We provide evidence on systematic changes in the pricing of audits that is consistent with what the market structure analysis implies. Overall, our study provides novel evidence on the economic forces that led to the emergence of a few dominant audit firms, and suggests that this market structure is driven by systematic changes in the underlying market for audit services. We believe our evidence helps to inform the current regulatory debate about the role of the Big 4 in the global economy.

¹ In most countries around the world the audit market is dominated by the Big 4 (Deloitte, Ernst & Young, KPMG, and PricewaterhouseCoopers), which evolved, through merger and attrition, from the Big 8, the Big 6, and the Big 5. To avoid confusion, we hereafter refer to this set of audit firms collectively as the Big 4 even though the number of such firms has actually ranged from eight to four.

The role of the Big 4 remains unclear and controversial.² One view is that the Big 4 provides higher quality audit services and so receives a corresponding premium in the market for audit services. Under this view, the existence of a two-tiered audit market is justified by economics. For example, there may be economies of scale or scope in the audit production function that prevents smaller audit firms from being substitutes for Big 4 firms. This view is largely consistent with our arguments and evidence. However, Sutton's framework implies that the Big 4/non-Big 4 distinction is not simply due to differences in scale or scope and does not necessarily imply that there will be a difference in audit quality, as we explain further below.

Another non-mutually exclusive possibility is that auditor size and reputation is a way for the Big 4 to credibly commit to high quality audits (DeAngelo, 1981; Watts and Zimmerman, 1981, 1983). Under this general view the Big 4 deliver a product distinct from that delivered by other firms, justifying a pricing premium, and their incentives to deliver higher quality audits arise (i) to preserve their reputation and stream of quasi-rents and/or (ii) because the size of these firms provides a firm of insurance, via litigation, to those who rely on audit reports.

Going back at least to the 1970s, regulators have had concerns about concentration in the market for audit services because of the potential for anticompetitive practices (Simunic, 1980). Given concerns about the increased concentration that arose after the merger that formed PwC and the demise of Andersen, regulators in the EU have made a number of proposals to reduce concentration in this market (EU, 2010). These proposals include mandating both audit firm rotation and a dual-auditor system under

² See, for example, GAO (2003), European Commission (2010), Oxera (2006) for regulatory reports on audit market concentration and other issues in the U.S., EU, and U.K., respectively.

which one auditor would be from outside the Big 4. In the UK, regulators have even suggested that the failure of another Big 4 firm should result in the remaining firms being broken up (Lennox and Liu, 2012). Regulators have also suggested an “audit only” model, under which audit firms are prohibited from offering non-audit services.³

Regulators also argue that the current level of concentration in the market for audit services poses a form of systemic risk because failure of one of the remaining Big 4 would reduce the supply of audit services and jeopardize the functioning of capital markets (EU, 2010; Oxera, 2006). The implicit assumption is that non-Big 4 firms are incapable of providing equivalent levels of audit services.

Regulators also express doubts about whether differences between the Big 4 and non-Big 4 firms are “real or perceived” (EU, 2010; Oxera, 2006). While it is clear that managers of large public companies prefer Big 4 auditors, regulators are unsure about whether this is due to real differences in the audit product or because of differences in perception. For example, a report commissioned by regulators in the U.K. mentions the “IBM effect,” under which choice of a Big 4 auditor is justified by the argument that “no one has ever been fired for hiring a Big 4 auditor” (Oxera, 2006).

Our evidence informs this regulatory debate because our predictions about how and why the Big 4 emerged in Australia are based on arguments about the economics of the audit market, and specifically about the economic forces that led to the emergence of a small set of dominant audit firms. These arguments (and our evidence) imply that there are structural differences in the audit capabilities of Big 4 and non-Big 4 audit firms

³ In the U.S., the Government Accountability Office (GAO) has issued two reports on the audit industry (GAO, 2003, 2008) the most recent of which concludes that there is no immediate need for regulatory action to address concentration. However, the U.S. Public Company Accounting Oversight Board (PCAOB) recently issued a concept release again suggesting mandatory audit firm rotation (PCAOB, 2011).

that are attributable to the underlying structure of the market for audit services. The nature of these differences implies that it would be costly for regulators to require large public companies to use non-Big 4 auditors or to forcibly break up the Big 4.

There are three broad findings that collectively support the idea that the audit market, including the emergence of the Big 4, evolved over time as a result of structural changes in both the demand for and supply of audit services. First, we show that the size distribution of public companies changes appreciably over time, from a distribution that was relatively homogeneous in the 1960s and early 1970s to a distribution that is increasingly dominated by the largest companies in the economy, such that a dual structure naturally emerges in the market for audit services. We show that the aggregate size of the market grew substantially over this period.

Second, we show that the size distribution of audit fees and the size and concentration of the audit market also changes over time. In the earlier part of our sample period (1960s and early 1970s), before the emergence of the Big 4, there is little evidence of audit market concentration. We show how the Big 4 emerges during the late 1970s and early 1980s, and that this set of firms increasingly dominates the market, especially the market for audits of large public companies. These changes are consistent with what the Sutton framework implies.

Third, the pricing of audit services changes systematically over time, consistent with changes in market structure. In the earlier part of our sample period, audit fees were essentially proportional to firm size although there was some modest evidence of fixed costs among the smaller company segment of the market. There is no evidence of a Big 4

premium in the earlier part of the sample period; the pricing function is similar across the size distribution.

In the latter part of the sample period, and roughly coincident with changes in the underlying size distribution and the emergence of the Big 4, the cost structure changes significantly, with clear evidence that fixed costs become more important over time, and marked differences in pricing between the large and small company segment of the market. Further, an economically significant Big 4 premium emerges in the small company segment of the market. These results suggest that while most audit costs appear to have been variable in nature (presumably largely labor costs) early on, over time auditing has become more of a fixed cost business where larger firms are able to take greater advantage of operating leverage. Consistent with the Sutton (1991) framework, our evidence supports the view that the Big 4 incurred relatively large fixed costs, likely due to the increased use of information technology, the establishment of centralized technical expertise, recruiting staff, etc., and that these fixed costs help explain the emergence of the Big 4 firms.

Our findings are important in a number of respects. First, there is an extensive literature on audit pricing but a number of important issues remain unresolved, including the existence and economic nature of the Big 4 premium (see Causholli et al., 2011, for a review of the literature, which we discuss in more detail in Section 2). Second, important issues related to structure and pricing of the audit market remain unresolved at a time when regulators are struggling to reach conclusions about what to do about unprecedented levels of market concentration, discussions that have become more urgent in the wake of the recent global financial crisis.

Section 2 provides a fuller discussion of the Sutton (1991) framework, as well as the existing auditing literature as it pertains to our research question. Section 3 provides details of our sample and data. Section 4 reports our evidence. Section 5 provides a summary and discusses implications.

2. The emergence of the Big 4 and audit pricing

2.1 Economic framework

The goal of our empirical analysis is to provide evidence on the economic forces that led to the emergence of the Big 4 in Australia. To develop empirical predictions, we use a framework developed in the industrial organization literature by Sutton (1991). As well as providing evidence on the evolution of market structure in the Australian audit market, we use data on audit fees to examine the implications of this theory for audit pricing.⁴

Sutton's framework has spawned a large amount of empirical work in economics (see Sutton, 2007, for a review). The basic goal of his work is to develop a robust theory to explain market structure across a broad range of industries, and in particular to model the relationship between market size and structure, where structure refers to concentration.

The basic insight of Sutton's model is that the nature of sunk costs in an industry plays an important role in determining its structure. Sutton distinguishes two types of sunk cost. "Exogenous" sunk costs are determined by technological characteristics of the industry and can be thought of as those costs that determine minimum efficient scale (MES) in an industry. If such exogenous sunk costs are all that is important in an industry, concentration will decline as market size increases, as more firms are able to

⁴ Sirois and Simunic (2011) also apply the Sutton framework to the audit market but do not test the implications of the model empirically.

achieve MES. This is consistent with basic intuition that an industry will support more firms of a given size as it grows.

Sutton argues that “endogenous” sunk costs are also important in certain industries. By investing in these costs, firms increase the demand for their products and so the price customers are willing to pay (demand shifts outwards). Sutton uses R&D and advertising as examples of endogenous costs but there is no reason that other fixed costs could not play the same role. Such costs are endogenous in the sense that they are firm-level choices.⁵ Sutton describes this in terms of an “arms race” in spending in which a small number of firms aggressively increase spending to increase their shares and margins. This leads to the prediction that concentration increases with market size in industries where endogenous sunk costs are important.

Sirois and Simunic (2011) use Sutton’s endogenous sunk cost argument to explain concentration in the audit market. They argue that the extant auditing literature largely takes the existence of the Big 4 as given and tests cross-sectional predictions about differences between Big 4 and non-Big 4 firms. They further argue that the Big 4 emerges endogenously as a result of investments in “technology,” broadly defined to include various types of fixed cost investments by audit firms. These investments lead to increases in audit quality that are priced in the market for audit services and that lead to a Big 4 premium. Similar to the way that Coke and Pepsi emerged as the dominant players in soft drinks, the Big 4 emerged as dominant players in the audit industry, leading to a

⁵ For example, in the early years of the U.S. soft drink industry, Coke and Pepsi invested large amounts in advertising to increase market share, which eventually led to a “dual” industry structure under which these two companies had very large shares while the rest of the industry comprised small firms that did not spend on advertising.

dual structure in which a small number of large firms coexist with a large number of smaller firms.

While this argument provides a useful understanding of the forces that drive the structure of the audit market, we believe it is incomplete in the sense that it is largely a supply-based view that does not explain why changes in the market occurred when they did. A critical element of Sutton's argument is that customers are willing to pay for the product enhancements that result from endogenous sunk cost expenditures.

We predict that the Big 4 emerges in Australia as a result of structural changes in the nature of the underlying economy that leads to such a demand shift. As we document below, beginning in the 1970s the skewness of the size distribution of publicly-listed Australian companies becomes increasingly more pronounced. The emergence of large, complex client companies such as BHP and Westpac led to a demand for audit firms that had sufficient capacity to effectively audit large entities. Auditing these large and complex entities necessitated investment in endogenous sunk costs of the type described by Sutton. For example, as audit firms grew to meet client demand, it became increasingly important to maintain staff quality (through more sophisticated hiring and training programs) and to invest in technology to enhance auditor efficiency as the necessary scale increased.⁶ Both types of investments fit Sutton's notion of endogenous sunk costs.

⁶ More specifically, from discussion with prior and current partners of Big 4 firms, these fixed costs include the establishment of human resource departments, recruitment costs, staff training, development of audit programs, substantial investment in information technology which began in the 1980s; investment in technical departments to provide accounting guidance to staff and develop technical bulletins for clients, and investment in promotional material including advertising, sponsorship and corporate style offices. Material investment in these fixed costs began in the late 1970s and escalated significantly during the 1980s through to the present. Some circumstantial evidence consistent with the timing of the emergence of these fixed costs is for example, in Australia it was only in 1970 that accounting firms began requiring new employees to have an accounting degree; it was not until 1972 that large accounting firms began to require

This argument parallels Watts and Zimmerman's (1983) characterization of the emergence of audit firms in England in the second half of the 19th century. Watts and Zimmerman point to three factors that led to the emergence of audit firms during this period: increasing complexity in the accounts, increasing size and number of companies driven by an expansion in the size of capital markets, and the introduction of legal liability for company directors.

Based on these arguments, we investigate whether the emergence of the Big 4 in Australia is related to changes in the size distribution of publicly-listed Australian companies.

Over the sample period (1960s to the present) it is also likely that the relative importance of fixed and variable costs changes for the audit industry as a whole. In the 1960s, auditing in Australia was essentially a variable cost business, with labor as the primary input. Over time, advances in technology and increasing complexity of accounting and auditing rules, including more rigorous regulation of the industry, likely meant that fixed costs became relatively more important for the audit industry as a whole, increasing the MES of audit firms (these are Sutton's *exogenous* sunk costs).⁷ Thus, we

staff members to undertake a Professional Year examination to become members of accounting associations. Consistent with this, the annual percentage growth in membership of the Institute of Chartered Accountants in Australia shifted from 2.3% during the 1960 to 1969 period to 7.05% during the 1970 to 1979 period. Finally, it was not until the late 1970s that large accounting firms first employed partners who were solely responsible for technical advice to staff and clients (Burrows 1996).

⁷ There was a significant increase in the level of financial statement disclosure and thus fixed disclosure cost from the 1960s to the present, due to both increased mandated disclosure by accounting standards, legislation, and increased regulation of the audit industry. The first technical accounting standards in Australia were introduced in 1970. Subsequently over the period until 2007 the number of standards has increased to 45 pronouncements. As an example of the fixed costs associated with this mandated disclosure the length of the annual report of Woolworths Limited, a large retailer, increased from 11 pages in 1960 to 160 pages in 2007. The Australian Audit Standards Committee was not established until 1974 at which point there was only a single audit standard on the general principles of auditing. Subsequently over the period to 2007 the number of auditing standards has increased to 40 pronouncements. In summary, in the early part of our sample period, the 1960s, the mandated disclosure and thus fixed disclosure costs

expect to see fixed costs become more important over time for all audit firms, but that this would be most pronounced at the top end of the market where the larger audit firms also invest in endogenous sunk costs. Further, we expect that small audit firms (that fall below MES) do not survive in the market for publicly-listed companies.

This argument does not necessarily imply that audits by the Big 4 are of higher quality than those of non-Big 4 firms, which is the argument conventionally used in the literature to explain the Big 4 audit pricing premium. Instead, changes in the size and complexity of audit clients (on the demand side) led to increasing endogenous sunk cost investments by the large audit firms (on the supply side). That is, over time the Big 4 and non-Big 4 adopt different production functions which led to different cost structures, which in turn implies differences in pricing (assuming some level of competitiveness). The Sutton argument implies that the large audit firm segment of the market is characterized by investment in endogenous fixed costs, so that fixed costs became relatively more important in this segment of the market. We test this idea by looking at how changes in audit pricing differ across the two market segments.

The reputation/litigation arguments conventionally advanced in the literature to explain the Big 4 premium are complementary to our arguments. As Sirois and Simunic (2011) point out, however, the reputation/litigation argument does not explain the emergence of the Big 4. Nor does this view predict that this emergence occurs as a response to changes in the size distribution of the underlying set of public companies. On the other hand, if the Big 4 premium is partly due to auditor reputation, consistent with

associated with producing and auditing financial statements were insignificant and at the end of our sample period they were substantial.

the traditional view, it could be that investment in reputation is one of the endogenous sunk costs.

Several testable predictions follow from these arguments:

- In the early part of the sample period: (a) audit pricing is consistent with an underlying variable cost structure that is similar across the entire market; that is, there is a linear relation between total audit costs (which we measure as total fees) and client size; (b) there is no evidence of a Big 4 premium;
- In the later part of the sample period (a) audit pricing is consistent with the emergence of a fixed cost structure that is more evident in the large company segment of the market, consistent with the large audit firms investing in endogenous sunk costs; (b) there is evidence of a Big 4 premium that is more pronounced in the small company segment of the market (if smaller companies want the signal, they need to incur the additional fixed costs, which could include reputation).

The early part of the sample period refers to the period before the emergence of a two-tiered structure in the market for audit services (before the emergence of the Big 4); the later part of the sample period refers to the period after this.

There is no implication in our argument that the Big 4 collude on price and/or earn economic rents, a claim sometimes made by regulators. Instead, as in Sutton's framework, the market for audits among the Big 4 firms could be highly competitive, with these firms earning normal returns on cost structures that are different from those of the non-Big 4, and which naturally lead to differential pricing. That is, there are two distinct audit markets: a market for audits of the largest public companies dominated by

the Big 4, and a market for audits of the large number of much smaller public companies, which is less likely to be dominated by the Big 4.

2.2 Previous literature

A large body of research examines audit fee pricing and is reviewed in Hay et al. (2006), Causholli et al. (2011), and Hay (2012). The bulk of this research is cross-sectional and focuses on the determinants of audit fees, classified by Hay et al. (2006) into: (1) client attributes, (2) auditor attributes, and (3) engagement attributes, with size being the most important determinant of audit fees. As recognized by Causholli et al. (2011), there have been very few longitudinal studies of audit fees and we are not aware of any study that examines how audit fees have behaved over a time-period of 50 years.

A large number of papers investigate the effect of the Big 4 on audit fees. In these papers the predicted effects are usually attributed to either the litigation effects of Simunic (1980), the audit quality effects of DeAngelo (1981), or to market concentration and competition effects. Both Causholli et al. (2011) and Hay (2012) conclude that the evidence in regard to the existence of Big 4 premium is mixed and that there are a wide variety of results.⁸ In summary, there is little consensus as to either (i) the existence of the Big 4 premium, or (ii) the reason for its existence.

While our study does not hypothesize or test for audit quality effects of the Big 4 this stream of research is of some indirect relevance. There are some empirical studies, based on the predictions of DeAngelo (1981), and using a variety of audit-quality proxies,

⁸ Some studies find no audit fee premiums in either large or small companies [Simunic 1980; Chung and Lindsay 1988; Rubin 1988; Firth 1985; Firth 1997], some find premiums in both the large and small segments of the market [Francis 1984; Chan et al. 1993; Anderson and Zéghal 1994; Gul 1999; Su 2000], and some find premiums only for small clients [Francis and Stokes 1986; Palmrose 1986; Lee 1996]. More recently Carson et al. (2012) report evidence of an increase in the Big 4 premium over the period of 1996-2007 in Australia which they attribute to increasing market power. However Lennox and Liu (2012) find that an audit market with just a few large audit firms can deliver lower audit fees.

that find evidence suggesting that Big 4 auditors provide higher-quality audits than non-Big 4 auditors (e.g., Palmrose 1988; Becker et al. 1998; Khurana and Raman 2004; Behn et al. 2008). However, Lawrence et al. (2011) find that after controlling for client characteristics using matching models, the effects of Big 4 auditors on audit quality are insignificantly different from those of non-Big 4 auditors. Their results suggest that differences in these proxies between Big 4 and non-Big 4 auditors largely reflect client characteristics and, more specifically, client size. Our theory and empirical predictions provide an explanation for why Big 4 and non-Big 4 auditors have different sized clients and predict that there will be no difference in audit quality.

3. Sample and Data Sources

This section describes our panel of audit firm, audit fee, and client company data.⁹ In brief, we have data on audit firms, their client companies, and audit fees from the 1960s to 2007. Prior to 1978, we have data that covers around 40% of listed companies in Australia but that over-samples large companies, so our coverage is substantially larger than 40% when value-weighted. From 1978 to the present our sample covers approximately 80% or more of listed Australian companies.

The disclosure of audit fees was mandated in Australia beginning in the early 1960s.¹⁰ This means that we have a much longer time series of audit fee data than is available in previous studies (the disclosure of audit fees was mandated in the U.S. in 2001 and in the U.K. in 1992). This also means that we have audit fee data that predates

⁹ To avoid confusion, we use “firm” to refer to audit firms, and “company” to refer to publicly-traded companies that are the audit firm clients.

¹⁰ Over the period 1961 to 1962 the states of Australia adopted what came to be known as the *Uniform Companies Acts* of 1961-1962, one goal of which was to make the Acts consistent across different states (See <http://cclsr.law.unimelb.edu.au/go/history-of-australian-corporate-law-/index.cfm> last accessed April 5, 2012). Part of this legislation mandated the disclosure of statutory audit fees, a requirement which took effect for annual reports filed in 1962.

the emergence of the Big 4 in Australia, an important advantage of our data. The sample is comprehensive, covering the majority of listed companies in Australia.

We obtain audit firm and fee data from: (a) the AGSM database of Annual Reports, which contains reports for around half of publicly-listed Australian companies from 1950 to 1985; (b) the Craswell (1999) “Who Audits Australia” database of audit fees for listed companies from 1980 to 1999; (c) hand-collected annual report data on audit fees paid to auditors of Australian public companies from 2000 through 2007; (d) hand collected data on auditor names from the Jobson yearbook for the period from 1959 until 1979.¹¹

We first use the sample of observations for which we have company/year data on both audit fees and total assets. This yields an initial sample of 41,041 company-year observations from 1962 through 2007 (see column (2) of Table 1, labeled Sample 1).

Table 1 shows that this sample covers a large fraction of Australian listed companies, beginning at around 35% in 1962 but soon increasing to over 40% for the remainder of the decade. This fraction falls to the mid-30% range in the first part of the 1970s but then increases to over 70% and more typically 80% or more for the remainder of the sample period.¹²

For our audit pricing tests we also require audit firm name and certain company variables; we label this Sample 2. We remove 78 observations for which we unable to find the original annual report (for auditor name). Company-year observations were then dropped if they did not have the variables necessary for the audit pricing regressions. From 1962 to 1979, the company variables were sourced from the AGSM database.

¹¹The Jobson yearbook is an annual digest of significant financial and non-financial information for Australian listed companies.

¹² The denominator of this fraction (the number of listed firms in Australia) is approximate before 1970.

From 1980 to 1985 we obtain these variables from the Craswell database, which provides a more limited set of variables (AGSM does not provide coverage during this period). After 1985 we obtain these variables from both the AGSM database and the Craswell database. For the period after 1985, the data also become available from *Aspect Huntley*¹³ Overall, requiring companies to have data for net profit, accounts receivable, inventory, and long-term debt results in a loss of 8,216 company-year observations mainly attributable to the 1980s and early 1990s when there was no source of these data (note especially the attrition in the late 1980s).

A significant break in the sample occurs in 1977 when the number of companies for which the AGSM database collected financial accounting variables almost doubles. In the periods before and after this point our sample coverage relative to the set of all listed Australian firms is relatively constant: before 1977 our sample size is approximately 40% of the population of listed companies; after 1977 our sample size is typically 80% or more of the population of listed firms.

Prior to 1977 the AGSM focuses on larger companies. The median company in the pre-1977 *sample* lies approximately at the 65th percentile of the size distribution of the *population* of listed companies (size is measured as total assets). This means that 50% of the companies we sample before 1977 are above the 65th size percentile of the set of companies we sample after 1977. To maintain consistency in the attributes of sample companies over time, we report results for two subsamples: companies above and below the estimated 65th size percentile of the set of listed firms. From 1962 to 1976 (1977 onwards) companies above the 65th percentile of size distribution of all listed companies

¹³*Aspect Huntley* began covering Australian firms in the late 1980s and has become the standard data-base of financial statement variables used in empirical archival studies of Australian firms. These studies typically have the early 1990s as their starting point.

are those above the 50th (65th) size percentile of the sample. For convenience, we refer to these subsamples as the set of large and small companies, respectively, even though the “small” firms include some firms above the median of the size distribution. This partition is an important feature of our tests because our predictions about market structure differ for the large and small company segments of the audit market.

4. Evidence

4.1 Evolution of the size distribution of public companies in Australia

Our central thesis is that a dominant set of large audit firms (the Big 4) emerges in response to changes in the size distribution of the underlying population of listed companies—there was not only an increase in market size, but also an increase in the importance of the largest companies in the economy (an increase in concentration). We predict that an increased divergence between the size of the largest listed companies and the remaining companies led to an increasing demand for the type of large audit firms necessary to service these companies.

We first report, in Table 2, on the size distribution of listed companies and how it changes from 1962 to 2007. We measure size as total assets, in thousands of (constant 2007) Australian dollars. As discussed in Section 3, we report results for the large and small subsamples of companies as well as for the sample as a whole (where large firms are those above the 65th percentile of the size distribution and “small” firms are the rest). To economize on the numbers we report, in most tables we provide summary statistics for five year sub-periods, 1962-1965, 1966-1970, etc., through the final two-year sub-period, 2006-2007, rather than reporting the full set of annual numbers.

Panel A of Table 2 shows that average company size increases significantly over the sample period while the median declines, consistent with an increase in right skewness. The increasing spread of the distribution is also evident from the steady increase in the coefficient of variation, from 4.01 in the first half of the 1960s (1962-1965) to 10.52 in 2006-2007.

For the subsample of smaller companies (below the 65th percentile—see Panel B and Figure 1B), after 1975 the mean and median are roughly flat to declining across the full sample period, and the mean is not markedly above the median. In the latter half of the 1960s, mean (median) size is around \$26 million (\$22 million) compared to \$20 million (\$12 million) for 2006-2007. The coefficient of variation is smaller than that for the sample overall and increases modestly, from 0.68 in the latter half of the 1960s to 0.96 in 2006-2007. Thus, small firms tend to remain small over the full sample period.

In contrast, the size distribution for large firms (Panel C and Figure 1A) shows a strong upward trend in right skewness, indicating that the distribution is increasingly dominated by the very largest firms. For this set of firms, there is some tendency for the median to increase through the early 1980s (from \$157 million in the early 1960s to \$316 million in the early 1980s) but after that it does not show a clear trend. In contrast, the mean increases monotonically from around \$400 million in the early 1960s to over \$6 billion in 2006-2007, while the coefficient of variation increases from 2.92 to 6.16. The increase is concentrated in the very largest firms, as evidenced by substantial increases in both the 95th and 99th percentiles (but not the 75th percentile).

We next use data on total assets for sample companies to estimate the total size of the audit market as well as growth therein.¹⁴ We report this aggregate audit market data in Figure 2 (using a log scale in billions of real Australian dollars), which shows market size in total, as well as for the large and small company segments (as previously defined—note that the line for the total market essentially sits under that for the large company line, and so is not visible).

The size of the market grows significantly over time, from less than \$100 billion in the early 1960s to about \$3,400 billion in 2007.¹⁵ More relevant for our purposes, however, is that this growth in market size is due almost exclusively to the large firm segment of the market. The total size of the market for audits of small companies is roughly flat in real terms over the full period, varying between \$10 billion and \$20 billion from 1974 to the present. Because the number of listed companies has increased over time, this is consistent with the Table 2 numbers that show a decline in average and median size of the smaller companies. In contrast, the market for large company audits grows from \$187 billion in 1970 to \$3,361 billion in 2007, largely due to increases in the size of the very largest companies. This shows the increased concentration of aggregate corporate assets in a relatively small group of very large companies.

Overall, our evidence on the size of public companies in Australia shows a clear tendency for smaller companies to get smaller while the very largest companies get larger, consistent with an increasingly dichotomous size distribution. This leads to an increasing two-tiered market for audits, divided between a large number of increasingly small

¹⁴ To the extent we do not have the full set of Australian public companies in our sample, this computation understates the size of the Australian audit market. This number excludes audits of private companies and public sector (government) entities, which likely represent a significant part of the market for audit services.

¹⁵ About half of this latter amount is attributable to the four largest Australian banks (Commonwealth Bank of Australia, Westpac, National Australia Bank, and ANZ).

companies that account for a stable aggregate amount of corporate assets and a small number of increasingly large companies that account for the increasingly large majority of aggregate corporate assets. We next discuss evidence on changes in the size of audit firms.

4.2 Evidence on audit fees and audit market structure

Table 3 reports on the distribution of audit fees over time, for the sample as a whole as well as for the large and small company segments, again measured in real 2007 dollars. Median audit fees for the full sample are roughly flat over the full period. For example, the median audit fee in 1966 to 1970 was around \$63,000 while that in 2006 to 2007 was around \$66,000 although there is more time series variation than these endpoints imply. The mean increases from \$159,000 in the latter half of the 1960s to \$329,000 in 2006-2007, leading to increasing cross-sectional variation and positive skewness, although most of the increase occurs in the 1970s. This is expected given changes in the way the underlying distribution of company assets changes, per the discussion above.

Similar to what we observe for company size, there is much less evidence of skewness and increases therein for the audit fees of smaller companies (Panel B) while there is evidence of more skewness in the audit fees of the larger companies (Panel C) as well as more evidence of an increase in both mean fees and skewness. There is less of a tendency for skewness for the audit fees of large companies to increase as there is for the skewness of the size of the companies themselves to increase—for example, most of the increase in standard deviation and the 95th percentile occurs by the 1980s—something that becomes more explicit when we look at changes in audit fees deflated by total

company assets below (this is expected if there is an increasing fixed cost component embedded in audit fees).

Our main prediction is that the Big 4 emerges as a result of changes in the size distribution of underlying companies. To assess this, we next present evidence on changes in the size distribution of audit firms, including measures of industry concentration.

4.2.1 The Big 4 in Australia

We start by assessing when the Big 4 emerges in Australia. To do this in direct way, Table 4 reports the top ten audit firms by revenue at the beginning of each of the sub-periods, beginning with 1962 and ending in 2007.

We begin with the most recent year shown (2007) and work back in time to establish when the Big 4 first emerges in Australia. In 2007, the Big 4 is unambiguously defined as PwC, KPMG, E&Y, and Deloitte, which together account for 89.7% of total revenues. The next biggest firm, Pannell Kerr Foster, has a share of only 1.65%, so there is a clear demarcation between the Big 4 and other firms. The numbers are similar in 2002, with the Big 4 accounting for 92.9% of revenue, and the next largest firm, BDO, accounting for only 1.0%.

In 1997, before the demise of Andersen and the merger that brought about PwC, the Big 6 accounts for 88.1% of total revenue, with the smallest of this set (PwC) again being markedly larger, with a 7.16% share, than the next largest firm, BDO, at 1.94%. In 1992, the delineation between the then-Big 6 and the remaining firms is less clear: although these firms have 82.3% of revenue, the smallest Big 6 firm (E&Y) has 4.5% of

revenue which is not markedly greater than that of Duesburys, at 2.7%. Nevertheless, it seems clear that there is a definitive Big 4/6 during the 1990s and 2000s.

In 1987, the Big 8 accounts for 69.9% of revenues, but the smallest three firms in the Big 8 at this time—KMG Hungerfords (which becomes KPMG), Arthur Young, and Arthur Andersen—have revenues of 4.4%, 4.3%, and 3.9%, which is not very different to the next largest firms, Thompson Douglass & Co. and Parnell Kerr Forster, both at 2.9%. The distinction is even less clear in 1982—although the largest seven firms account for 59.4% of revenue, the break in the size distribution between the smallest of this group (Hungerford Hancock & Co., with 5.0%) and then next largest firm (Pannell Kerr Foster, with 2.8%) is less obvious than in later years. However, it does seem clear that the Big 8 had emerged in Australia by the early 1980s.

In 1977, while four firms that are identifiably Big 8 firms (Coopers & Lybrand, Price Waterhouse, Touche Ross, and Peat Marwick) are clearly large relative to other firms, with a total share of 42.3%, the next largest firm, Yarwood and Vane with 6.6%, is not much smaller than Peat Marwick (8.8%), and is not a firm we think of as being part of the Big 8. So the Big 8 as subsequently constituted in Australia (or as constituted in the U.S. by this time) had not fully emerged by 1977.¹⁶ The 1972 numbers show even less evidence of a Big 8. While Peat Marwick Mitchell & Co. has a share of 17.4% and Price Waterhouse has 9.8%, the third largest firm is Yarwood Vane with 6.8%, and the size of firms declines relatively smoothly after this, with no obvious breakpoint.

The distribution is even more fragmented in the 1960s, when there is little evidence of big firm dominance. This is so even though the Big 8 had clearly emerged in

¹⁶ Yarwood and Vane becomes Deloitte, Haskins & Sells in 1980, which we interpret as part of the emergence of the Big 8.

the U.S. by this time (Wootton and Wolk, 1992; Zeff, 2003). In 1967, there are three relatively large firms—Price Waterhouse, Yarwood Vane & Co., and Cooper Brothers & Co.—each with share of around 8% along with a number of smaller firms, with only small differences in size. In 1962 (the first year data are available), the largest firm is Flack & Flack (which eventually became part of Price Waterhouse), with 9.3% of total revenue, followed by Yarwood Vane & Co with 4.6%, and Cooper Brothers with 4.4%, after which there is a smooth decline in size. This evidence clearly indicates that what would become the Big 8 had not emerged in Australia during the 1960s, even though these firms were already dominant in the U.S. by this time.

In summary, the Big 8 in Australia did not clearly emerge until the late 1970s or early 1980s. To provide some corroborative contextual evidence for this view, we count the number of mentions of the term ‘Big 8’ (or ‘Big Eight’) in articles appearing in the Australian bi-monthly accounting publication, CHARTAC (self-described as “The Independent Digest of Latest Accounting News & Development”). This count is plotted in Figure 3. We start the count from 1990 (a point in time when we know that there is a significant Big 4 presence in Australia) and, going back in time, continue the count annually to a year when there are no mentions of the term. In 1990, there are 23 mentions; in 1985, there are 13 mentions; and, in 1980, there are five mentions. The trend continues downward until there is only one mention in 1977, and none in 1976. This evidence is consistent with our observations above about the emergence of the Big 8.

4.2.2 Changes in the size distribution of Australian audit firms

To investigate how concentration in the Australian audit market changes over the sample period, Table 5 reports on the size distribution of audit firms, while Table 6 reports several concentration measures.

To measure audit firm size we aggregate audit fee data by audit firm. To the extent these firms audit entities not captured by our data (including private companies and government entities), these numbers understate the size of audit firms. Because of our differential predictions regarding the two size segments of the audit market, we again report the data overall as well as partitioned into small and large company segments. Figures 4A and 4B plot the mean, median, and 75th percentile of the size distribution of audit firms in the two market segments. We again report real 2007 Australian dollars.

Tables 5 and 6 both show a fairly persistent decline in the number of audit firms over the sample period, from a high of 194 in the late 1970s to 90 in 2006 and 2007 (full sample data not reported in tables).¹⁷ Table 5 shows that in the small company segment, the number of audit firms increased from 105 in the early 1960s to 158 in the late 1970s, with the average and median size of these firms increasing as well. After this, however, the number of audit firms in this segment falls steadily, reaching 82 in 2006-2007. Over this same period (late 1970s through the 2000s), average firm size increases while median firm size does not, even showing some tendency to decline. So there is some evidence of increased concentration in the small company segment of the market (see also Figure 4A).

In the large company segment of the market, the number of audit firms peaks at 100 in the late 1960s, after which it declines steadily, reaching 34 in 2006-2007, less than half the number of firms in the small company segment. Consistent with our predictions,

¹⁷ The tables report the average number of audit firms by year for each subperiod. The numbers we report for 1976-1980 represent an average of 194 audit firms per year.

the skewness of this distribution increases substantially over this period, with a substantial increase in mean firm size (from \$527,000 in the late 1960s to around \$12 million in 2006-2007) accompanied by a decline in median firm size, from around \$484,000 in the late 1970s to \$179,000 in 2006-2007, with the 75th percentile also declining over most of this period (see also Figure 4B). This is evidence of a sustained increase in concentration in the large company segment of this market that is more pronounced than in the small company segment of the market.

The increased concentration is also clear in Table 6, which reports two concentration measures: (a) the Herfindahl Index, measured using both number of companies and total assets, and (b) the percentage of companies, audit fees, and assets accounted for by the Big 4 (defined as the largest 8 audit firms measured by number of clients prior to 1980, and as the conventionally-defined set of Big 8/6/5/4 firms thereafter).

The Herfindahl Index based on total assets shows a clear increase in concentration over the sample period for the large company subsample, increasing steadily from 0.06 in the early 1960s to around 0.31 in the 2000s. (As a benchmark, the U.S. Department of Justice considers index values of 0.15 to 0.25 to indicate moderate concentration, and values above 0.25 as indicating high concentration.) The index crosses the 0.15 threshold during the 1980s, roughly consistent with our claim above that this is when the Big 4 emerges in Australia.

The concentration numbers also reported in Table 6 confirm this impression and give a clearer picture of the timing of dominance of the market by the Big 4. For the smaller company segment, there is a steady increase in the market share of the largest

firms, from 17% of assets in the early 1960s to 54% in the early 1980s. (The fractions are similar if we look at the fraction of companies or fees rather than the fraction of assets.) After this, the Big 4 share increases to around 60% over the late 1980s and 1990s, before declining to 55% in the early 2000s and then to 45% in 2006-2007. The relatively modest Big 4 market share for the smaller company segment as well as the decline in that share in the 2000s is consistent with our prediction that the increasingly fixed cost nature of the business likely makes it increasingly less likely that the Big 4 will audit relatively small companies.

In the large company segment of the market, concentration levels increase more rapidly than in the small company segment of the market, reaching 60% by 1980 (measured using fees or total assets). After this the fraction of assets audited by the Big 4 continues to increase, to 72% in the first part of the 1990s, 93% in the latter half of the 1990s, and then to 98% in the 2000s, with a very similar increase for share of fees (as expected, the numbers are not as large for the fraction of companies, which is 80% or just above that level for the 1990s and 2000s). The contrast between what we observe for the large and small companies is very clear in Figure 6.

4.3 Evidence on Audit Pricing

Section 2.1 develops a number of predictions regarding audit pricing, which include arguments about the nature of the audit cost structure (fixed versus variable), the existence of a Big 4 premium, and how both aspects of pricing change over time as the market for audit services evolves. To test these arguments, we first present evidence on average audit costs, defined as audit fees deflated by total assets, in both the small and large company segments, and how these change over time (Table 7 and Figure 7). We

then report OLS regressions, estimated by sub-period, of the natural log of audit fees on various hypothesized determinants, to investigate how the determination of audit fees change over time (Table 10). Tables 8 and 9 provide descriptive statistics for the companies in our audit pricing regressions.

We first discuss the average unit cost of audit services, defined using company-year observations as audit fees deflated by total assets, reported in Table 7 and Figure 7. We again report the data for all companies, as well as for the small and large company market segments. As expected, the distribution of this number is skewed, with means noticeably larger than medians (to address the small denominator problem that skews the mean, we report and discuss winsorized means).

For the full sample, winsorized mean (median) audit fees generally increase over the sample period, from 0.12% (0.10%) in the latter part of the 1960s to 0.48% (0.20%) in 2006-2007. The increase is not monotonic, however, with the numbers nearly doubling from the latter part of the 1960s to the latter part of the 1970s, when the winsorized mean (median) is 0.27% (0.18%). After this, the trend is flat or downward for the median, while the mean is roughly flat before substantially increasing in the 2000s (the median also increases noticeably in the 2000s). This indicates that the trends are not consistent across the sample, as is clear when we look at the size segments. In addition, it is clear that per unit audit costs generally increase over time—the median doubles over the sample period—so auditing generally has become more expensive, perhaps because of increased complexity, increased litigation, and/or related factors.

Panel B reports the numbers for the small company segment. Although the trend is not monotonic, per unit audit costs generally increase over the sample period for the

smaller firms, with the winsorized mean (median) increasing from 0.17% (0.13%) in the late 1960s to 0.50% (0.27%) by the early 1990s and then to 0.65% (0.32%) by the early 2000s (see also Figure 7, which plots the medians by year). This is a substantial increase in economic terms and is generally consistent with our prediction that fixed costs become more important relative to variable costs over time, which would result in an increase in per unit costs that manifests more strongly in the small company segment (for these firms, this is partly due to an increase in the Big 4 premium over time, as we show below).

In strong contrast, per unit audit fees in the large company segment generally display a flat or declining pattern after the latter part of the 1970s, also broadly consistent with the increasing importance of fixed costs (see Figure 7, which clearly shows the different trends for the large and small company segments of the market). In the latter part of the 1960s, mean (median) audit fees are 0.09% (0.08%), numbers slightly lower than those for the small company segment, suggestive of a modest level of fixed audit costs even at that time. Similar to the small company segment, these numbers increase through the late 1970s, to 0.14% (0.13%), with the median identical to that for the small company segment. After this, however, the numbers generally decline, to 0.08% (0.06%) in the early part of the 2000s, numbers substantially below those for the small company segment, of 0.65% (0.32%). This is evidence that different cost structures emerge for the large and small company segments of the market over the sample period, broadly consistent with our prediction that fixed costs become more important and do so to a greater extent in the large company segment of the market. We investigate these predictions more specifically in the regressions below.

Before turning to the regressions, we present descriptive statistics for the sample companies. Table 8 reports the industry distribution of the sample over time, again divided into the large and small company segments. There are a number of changes in the relative importance of different sectors, the most notable being the emergence of a large number of mining companies, especially smaller gold mining companies, over the sample period: by 1995, around 25% (9%) of smaller (larger) companies are in gold mining, and another 10% (6%) are in other types of mining. There are declines in the fraction of companies in the building materials, food, engineering, and retail sectors. The number of companies in investments and financial services declines in the small company segment but increases in the large company segment, indicating increased concentration in this sector. We use industry fixed effects in our regressions to account for these changes.

Table 9 reports descriptive statistics for two key variables that previous research finds are important in audit pricing, profitability and leverage (measured as net profit on assets and long-term debt on assets, respectively). Panel A shows the numbers for profitability. One notable feature of these numbers is the decline in overall profitability and the increase in the cross-sectional dispersion of profitability for the small company segment, with the majority of these firms reporting losses after the mid-1980s. In contrast, numbers for the large company segment are stable, with mean (median) profitability varying in a tight range between 3% and 5% although, similar to the small company group, cross-sectional variability increases after the mid-1980s.

Panel B of Table 9 reports on leverage. Consistent with prior research, larger firms are more highly levered (also expected given their higher levels of profitability),

with smaller firms displaying relatively low levels of leverage, with medians less than 5%. There is a modest upward trend in the leverage of the larger firms, with mean (median) leverage increasing from 13% (10%) in the late 1960s to 22% (20%) by the early 2000s. Overall, the evidence shows that the large company segment is characterized by firms with stable and moderate levels of both profitability and leverage, factors that are also (in addition to size) likely to make them attractive audit clients.

Table 10 reports OLS audit fee regressions similar to those conventionally estimated in the audit pricing literature. We regress the natural log of audit fees on a Big 4 dummy (as previously defined), the natural log of total assets, profitability, leverage, ARINV (the sum of receivables and inventory on total assets), and a loss dummy, as well as industry and firm fixed effects. Including firm fixed effects means that the R-squares are very high (well over 90%) but also allows us to interpret the coefficient on size more meaningfully.

Our main predictions relate to differences in the results for the large and small company segments as well as to differential time trends for the two sets of firms. Further, our main predictions relate to the Big 4 dummy and size variables, so we concentrate on these in our discussion (the profitability, leverage, and ARINV variables are sometimes significant, especially for the smaller companies, consistent with prior research). There are three key sets of results, which are related.

First, there is a downward trend in the coefficient on size for both sets of companies. For the large companies, the coefficient on size is around 1.0 for the latter part of the 1960s and early part of the 1970s but declines to around 0.5 in the early 1990s, 0.6 in the later 1990s, and 0.7 in the first part of the 2000s (because both variables are

natural logs, these coefficients can be interpreted as elasticities). For the small companies, the coefficient on size is around 0.8 in the latter part of the 1960s and 0.9 in the early 1970s—levels not very different to those of the larger companies—but decline more strongly over the sample period, to levels consistently around 0.3 from the latter part of the 1980s through the 2000s. The differential is consistent with the emergence of a fixed cost component to audit fees that is more important in the small company audit segment.

Second, there is a clear and distinct trend in the intercept in these regressions. For both sets of companies, the intercept is negative in the early part of the sample period but trends upward over time, becoming positive by the late 1980s (and earlier for the smaller companies). When combined with the results on the size coefficients, this is clear evidence of a change in the cost structure over time, with the coefficients on size (of around 1.0) being suggestive of an essentially proportional relation between audit fees and firm size, and so of a largely variable cost structure. Over time, however, the increasingly positive intercept and decline in the size coefficient are suggestive of an increase in the relative importance of fixed costs, with a much flatter relationship between fees and size, consistent with our predictions. We include Figure 8 to illustrate this more clearly (Figure 8A for smaller companies and Figure 8B for larger companies), where the lines are based on representative coefficients from the table.¹⁸

As shown in Figure 8A, the relation between audit fees and size is less than proportional for the smaller companies in the earlier part of the sample period, with fees

¹⁸ For the small companies, the lines plot the functions in the early (late) periods with an intercept of -4 (+6) and a size coefficient of 0.8 (0.3). In the later period, we show this same function with a Big 4 coefficient of 0.3. For the large companies, we use an intercept of -7 (+2) and a size coefficient of 1.0 (0.5) for the early (late) periods. There is no Big 4 coefficient for the larger companies. These numbers are rough averages taken from the Table 10 numbers.

increasing from about \$4,000 for a \$5 million company, to about \$12,000 for a \$20 million company, and then to about \$26,000 for a \$50 million company, so there are some evident economies of scale, perhaps due to labor costs (the cost of more senior audit personnel, such as partners and senior managers, are likely to have a fixed component which is likely to be important in small company audits). In contrast (see Figure 8B), in the early period for the large companies, fees are close to being directly proportional to size, from about \$91,000 for a \$100 million company, to \$456,000 for a \$500 million company, and to \$912,000 for a \$1,000 million company. Notice also the jump in fees from the small to the large company segment (from \$26,000 for a \$50 million small company to \$91,000 for a \$100 million large company), a rather steep jump perhaps indicating that there is a difference in the cost of auditing the largest companies before the emergence of the Big 4.

In the later period, the relation between audit fees and size is quite different in a way that is consistent with our arguments. For the small companies, audit fees increase substantially relative to the earlier period, presumably reflecting a significant increase in fixed costs (see Figure 8A). For example, for a \$5 million company, audit fees jump from around \$4,000 in the early period to around \$41,000 in the latter period, a tenfold increase; for a \$50 million company, the jump is from \$26,000 to \$82,000, a threefold increase. Further, there is now a clear scale effect—as company size increases from \$5m to \$20m to \$50m, audit fees increase from \$41,000 to \$51,000 to \$82,000, much less than proportionally. For large companies (Figure 8B), costs actually decline in real terms relative to the early period, with the decrease increasing in size due to the scale effect—for a \$100m company, audit fees decline from \$91,000 in the early period to \$74,000 in

the later period; for a \$500m company, the decline is from \$456,000 to \$165,000, a striking decline, and very different from what we observe for smaller companies. The scale effect is also evident within the large company segment.

As we had predicted, the Big 4 effect is not evident in either subsample in the earlier period, consistent with a single and relatively homogeneous audit market at this time. However, in the later period, we see clear evidence of a Big 4 premium for the smaller companies but not for the larger companies, consistent with our predictions. For the smaller companies, there is no evidence of a Big 4 premium until the later part of the 1980s, when we obtain a coefficient of around 0.3 (highly statistically significant). This timing coincides with our earlier evidence of when the Big 4 emerges. There continues to be a clear Big 4 premium after this time, with coefficient magnitudes of between 0.1 and 0.4, which is substantial in economic terms and highly significant statistically. The effect of this premium is illustrated in Figure 8A. This result suggests that those smaller companies that choose a Big 4 auditor in the later period pay a premium for the higher fixed costs, a result that can also be interpreted in terms of the conventional signaling/reputation view. In contrast, for the large companies, there is no evidence of a Big 4 premium (ignoring two subperiods, one early and one late). This is not surprising given our earlier arguments and evidence—this segment of the market is now essentially dominated by the Big 4.

Overall, this evidence suggests that there is a structural change in pricing in the Australian audit over time. In the earlier part of the sample period, before the emergence of the Big 4, audit fees are proportional to firm size, with modest evidence of a fixed cost component for smaller companies only. There is no evidence of a Big 4 (large audit

firm) effect at this time. In the latter part of the sample period, the relation between audit fees and firm size becomes much flatter, with clear evidence of a fixed cost component, which results in a clear increase (decrease) in audit costs for smaller (larger) companies. Further, there is evidence of an economically significant Big 4 premium in the latter part of the sample period for smaller but not larger companies. These results are generally consistent with our arguments about how audit costs would be expected to change as a result of underlying changes in the market for audit services in Australia.

5. Summary and Conclusion

We use data from the Australian audit market to provide evidence on how the audit market changes over time in response to changes in the economy. Specifically, we argue and provide evidence that our data predates the emergence of the Big 4 in Australia, which allows us to provide evidence on the economic factors that lead to the Big 4, and so more generally to provide evidence on why the audit market has naturally become concentrated over time to the point that four firms dominate the market for audit services among large public companies. Consequently, our evidence helps shed light on concerns of regulators about the dominance of the Big 4.

Before the Big 4 emerges, our evidence shows that the size distribution of publicly-listed companies becomes increasingly skewed, with a relatively small number of companies dominating the distribution. Combined with changes in the complexity of the economy and corresponding changes in the nature of accounting and auditing (for example, the emergence of increasingly detailed and complex accounting rules), we argue that this lead to investments by a small number of audit firms in what Sutton (1991) calls endogenous sunk costs, and so to the emergence of a small set of large audit firms,

which ultimately become the Big 4. We provide evidence that is generally consistent with this argument, including changes in the extent of concentration of the market for audit services, especially for large companies, as well as changes in the pricing and cost structure of audits. This evidence includes clear evidence of an increase in the importance of fixed costs relative to variable costs in this market and to the emergence of a Big 4 premium in the small company segment only.

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Figure 1A Size Distribution of Large Australian Companies

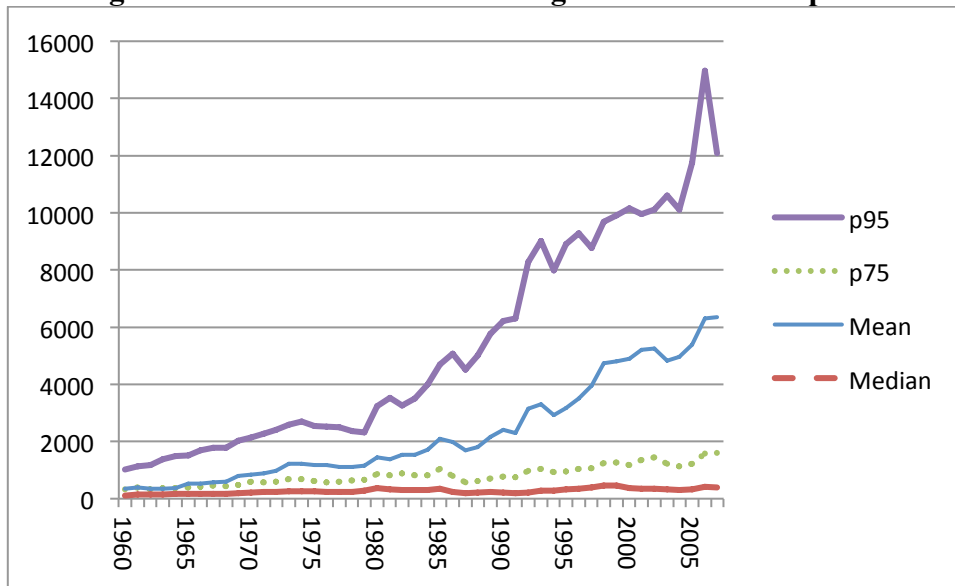


Figure 1B Size Distribution of Small Australian Companies

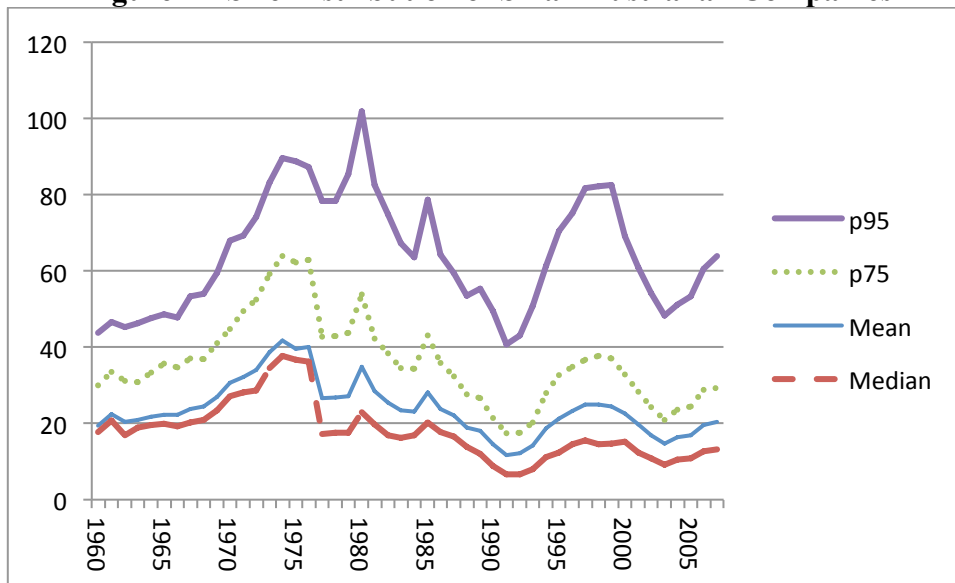


Figure 1A and 1B plots the size distribution of the Australian listed companies across time (x -axis). The size of companies (y -axis) is total assets in \$A millions measured using 2007 real dollars. Large (small) companies are those above (below) the 65th percentile of total assets in each year.

Figure 2 Total Market Size Log Scale (\$billions of total assets)

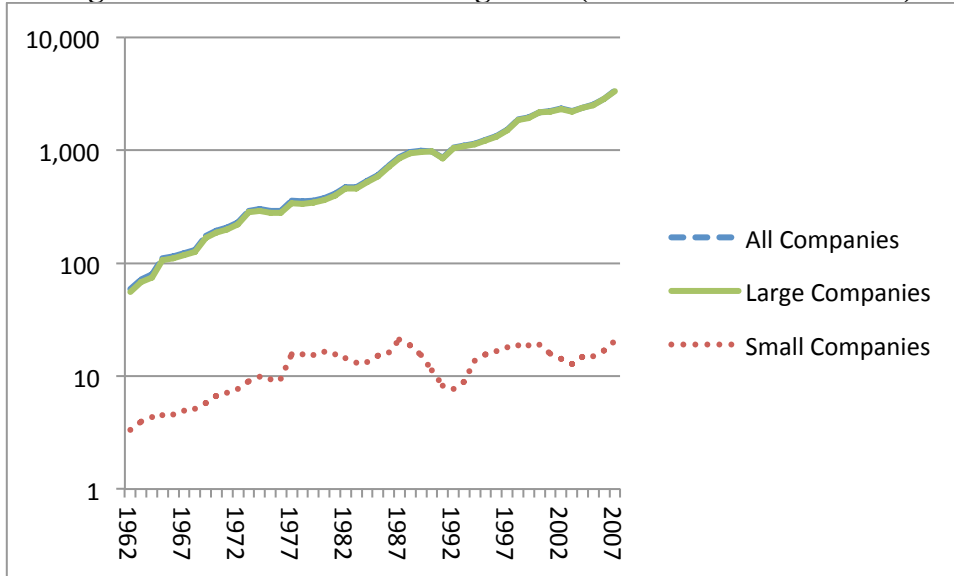


Figure 2 presents in log-scale the aggregate sum of the total assets of Australian listed companies (y -axis) across time (x -axis). Large (small) companies are those above (below) the 65th percentile of total assets in each year.

Figure 3 Count of mentions of “Big8” in the accounting industry journal

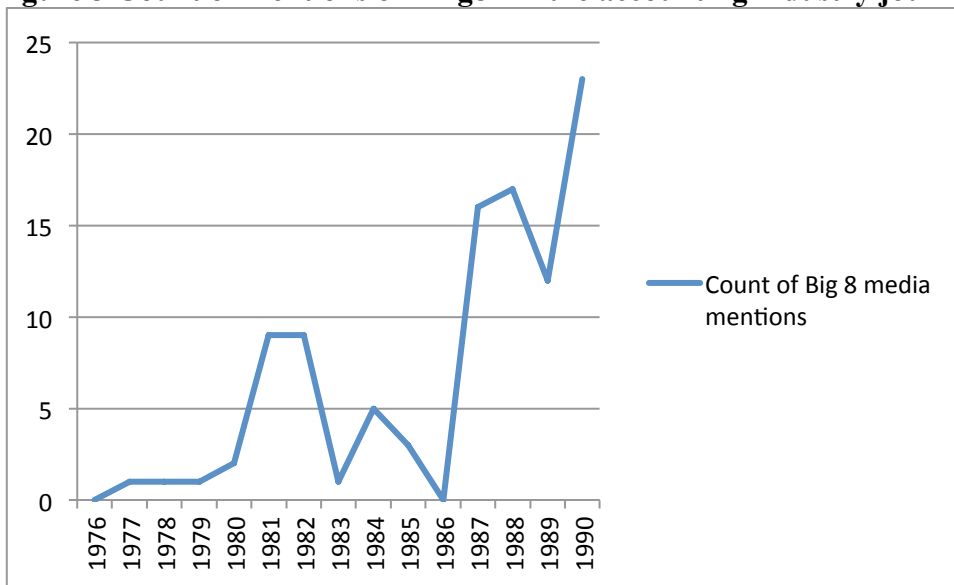
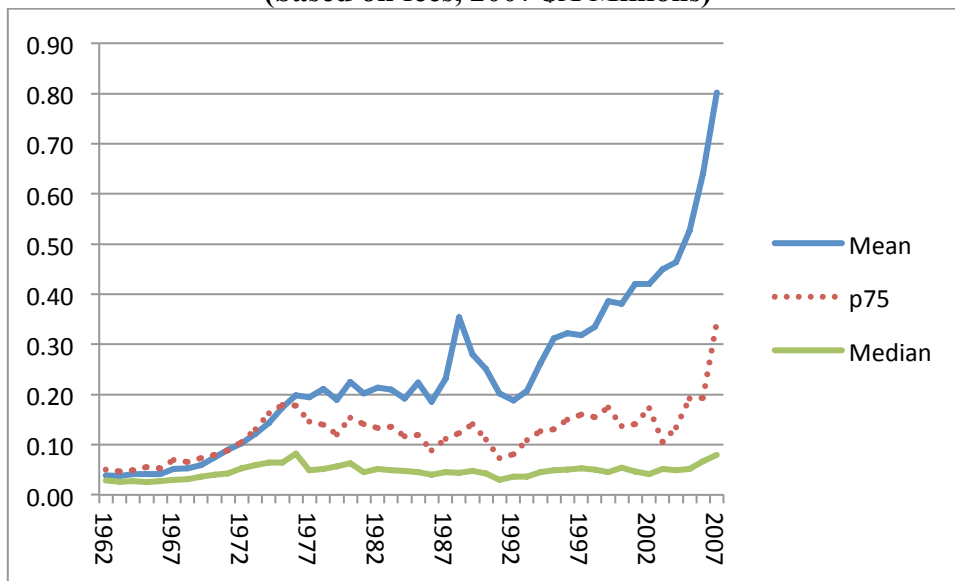


Figure 3 presents a count of the frequency with which the term ‘Big 8’ (or ‘Big Eight’) appears in articles appearing in the Australian bi-monthly accounting publication, CHARTAC (self-described as “The Independent Digest of Latest Accounting News & Development”) over the period from 1976 to 1990. We start the count from 1990 (a point in time when we know that there is a significant Big 4 presence in Australia) and, going back in time, continue the count annually to a year when there are no mentions of the term.

**Figure 4A Audit firm size in the Small Company Market
(based on fees, 2007 \$A Millions)**



**Figure 4B Audit firm size in Large Company Market
(based on fees, 2007 \$A Millions)**

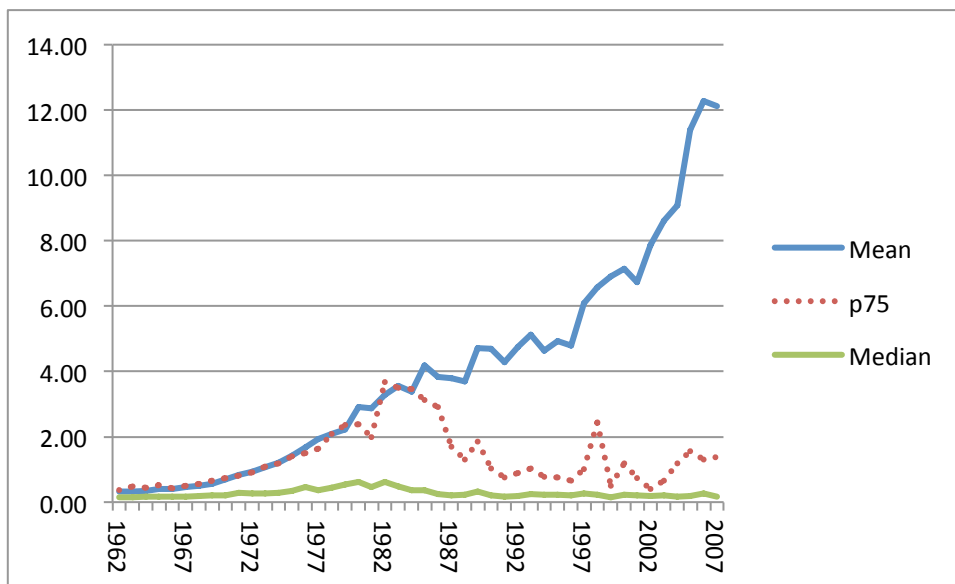


Figure 4A and 4B plots the size distribution of the Australian audit firms across time (x -axis). The size of audit firms (y -axis) is measured using audit fees in \$A millions using 2007 real dollars. Large (small) market segments are those companies above (below) the 65th percentile of total assets in each year.

Figure 5 Herfindahl Index for Australian audit market

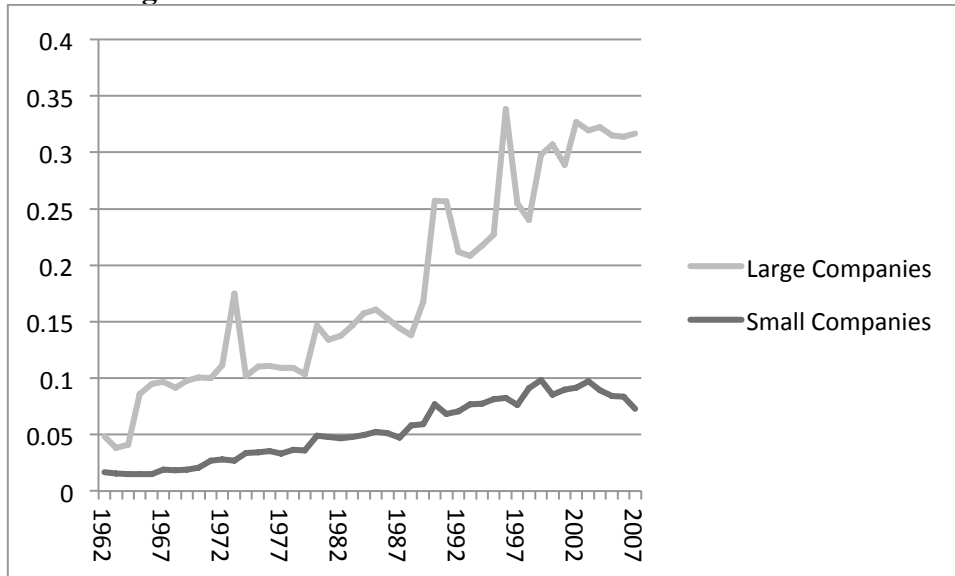


Figure 5 presents the *Herfindahl Index* for the Australian audit market over the period from 1962 to 2007 calculated for each year as the sum of the square of the each auditor's market share measured as the size of companies audited as a percent of total size of companies. Large (small) company market segments are those companies above (below) the 65th percentile of total assets in each year.

Figure 6 BIG 4 Market Share (percent of assets audited)

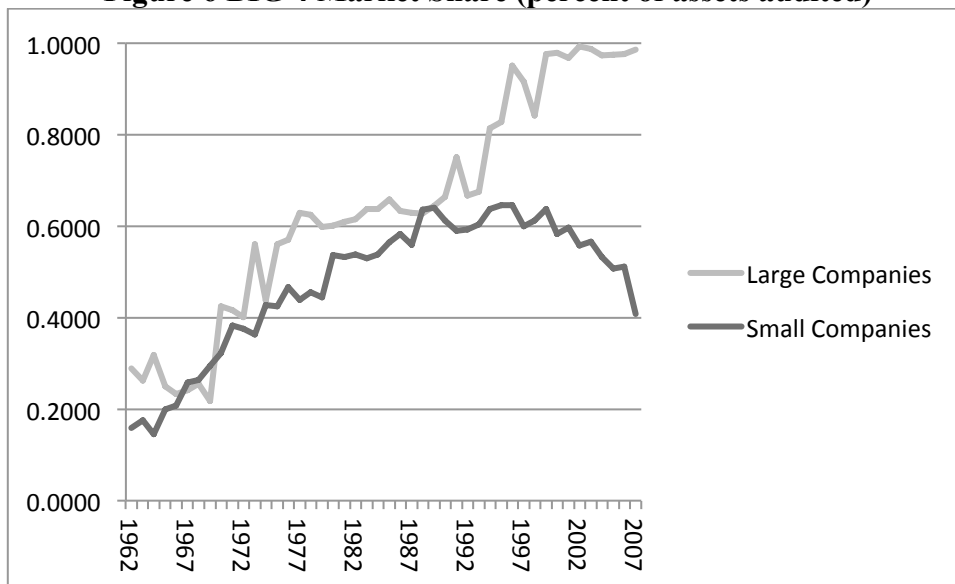


Figure 6 presents the percent of the large and small company market segments audited by the BIG 4 over the period from 1962 to 2007. Large (small) market segments are those above (below) the 65th percentile of total assets in each year. The *percent* (y-axis) is the sum of the total assets of the companies audited by the BIG 4 as a percent of the total assets of all companies. The BIG 4 subsequent to 1980 is taken to be the conventional Big Eight, then the Big Six, Big Five and Big Four. Prior to 1980 the top 8 ranked audit firms measured by number of companies was taken to be the BIG 4.

Figure 7 Median audit fees/total-asset ratio for large and small companies

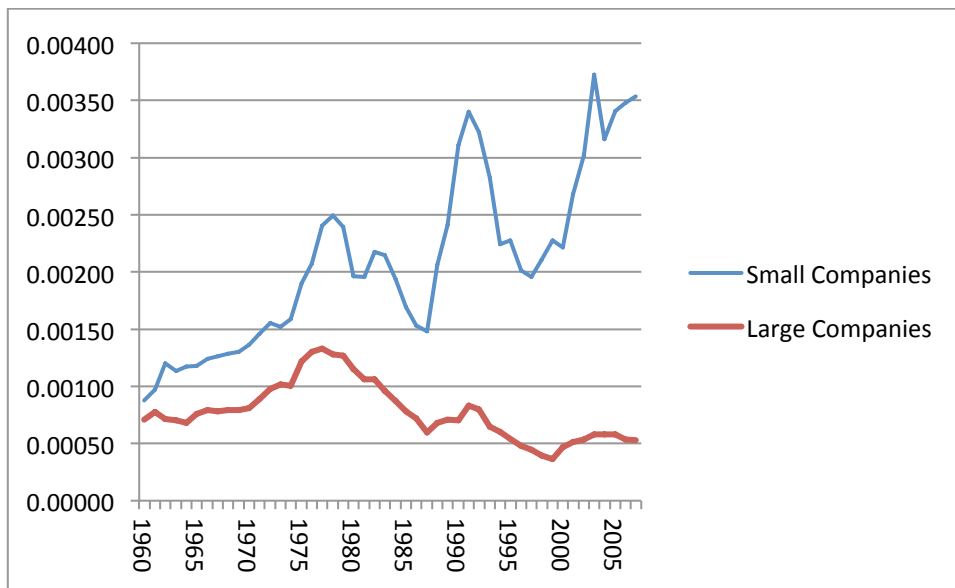


Figure 7 plots the median of the audit fees/total-asset ratio across time for large and small companies. Large (small) companies are those above (below) the 65th percentile of total assets in each year.

Figure 8A: Small company audit fees as a function of company size (2007 \$)

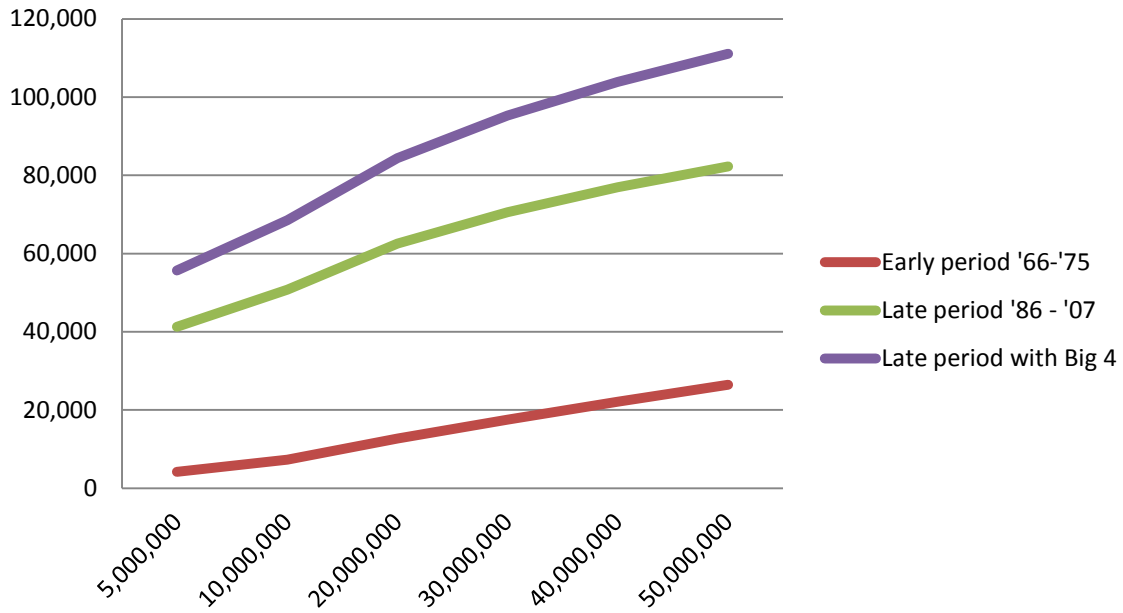


Figure 8B: Large company audit fees as a function of company size (2007 \$)

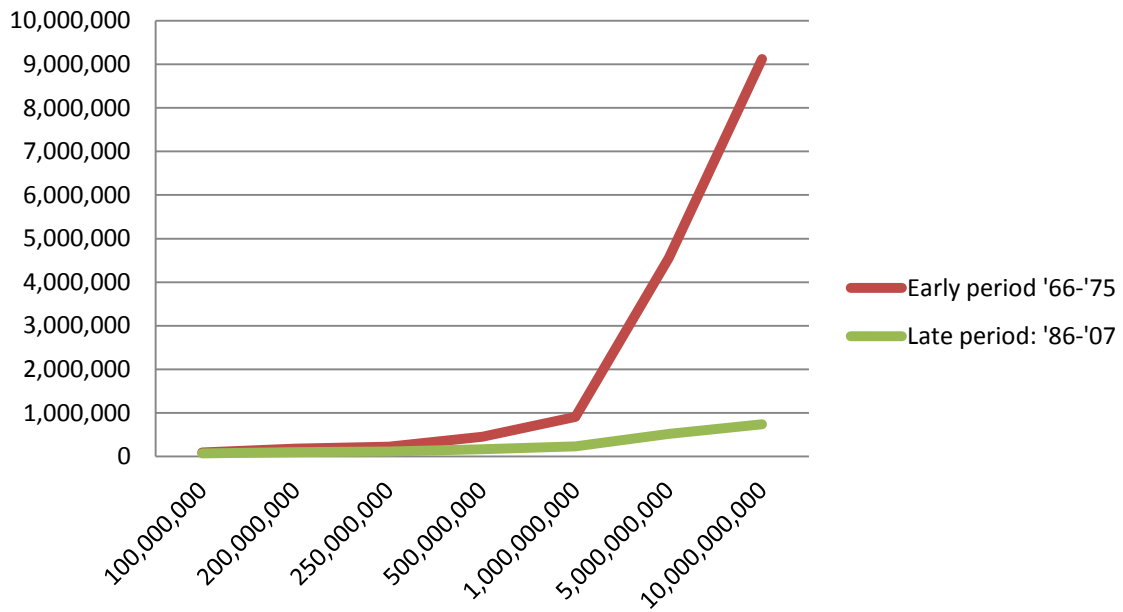


TABLE 1
Number of company observations by year

This table presents that number of company observations by year for each of the two samples used in this study. Sample1 are those company-year observations for which we have both audit fees and total assets. Sample2 are those company-year observations for which we have the control variables net profit, accounts receivable, stock and long-term debt. ASX Listed Population is the number of companies listed on the Australian Stock Exchange. Percent Coverage is the sample observations as a percent of the ASX Listed Population

	Observations		ASX Listed Population	Percent Coverage	
	Sample1	Sample2		Sample1	Sample2
1962	329	327	950	0.3463	0.3442
1963	383	381	950	0.4032	0.4011
1964	398	396	950	0.4189	0.4168
1965	404	402	950	0.4253	0.4232
1966	414	412	950	0.4358	0.4337
1967	418	416	950	0.4400	0.4379
1968	423	421	950	0.4453	0.4432
1969	429	427	940	0.4564	0.4543
1970	438	436	1092	0.4011	0.3993
1971	445	443	1257	0.3540	0.3524
1972	455	453	1317	0.3455	0.3440
1973	464	462	1350	0.3437	0.3422
1974	475	473	1358	0.3498	0.3483
1975	477	475	1313	0.3633	0.3618
1976	478	476	1254	0.3812	0.3796
1977	901	897	1183	0.7616	0.7582
1978	884	880	1124	0.7865	0.7829
1979	873	869	1070	0.8159	0.8121
1980	724	530	1043	0.6942	0.5081
1981	837	632	1010	0.8287	0.6257
1982	866	700	975	0.8882	0.7179
1983	861	671	956	0.9006	0.7019
1984	885	644	985	0.8985	0.6538
1985	820	540	1133	0.7237	0.4766
1986	1045	13	1375	0.7600	0.0095
1987	1459	23	1805	0.8083	0.0127
1988	1521	31	1869	0.8138	0.0166
1989	1297	563	1819	0.7130	0.3095
1990	1178	655	1604	0.7344	0.4084
1991	1074	683	1372	0.7828	0.4978
1992	964	696	1216	0.7928	0.5724

TABLE 1 (continued)
Number of company observations by year

	Observations		ASX Listed Population	Percent Coverage	
	Sample1	Sample2		Sample1	Sample2
1993	955	735	1162	0.8219	0.6325
1994	1118	913	1216	0.9194	0.7508
1995	1128	968	1220	0.9246	0.7934
1996	1093	985	1244	0.8786	0.7918
1997	1107	1022	1261	0.8779	0.8105
1998	1143	1051	1259	0.9079	0.8348
1999	1168	1110	1339	0.8723	0.8290
2000	1278	1233	1462	0.8741	0.8434
2001	1227	1190	1476	0.8313	0.8062
2002	1286	1256	1486	0.8654	0.8452
2003	1328	1297	1512	0.8783	0.8578
2004	1386	1363	1634	0.8482	0.8341
2005	1355	1340	1762	0.7690	0.7605
2006	1313	1310	1900	0.6911	0.6895
2007	1537	1530	2104	0.7305	0.7272
All years	41,041	32,730			

TABLE 2
Descriptive Statistics for Total assets ('000) reported in real dollars

The table reports the descriptive statistics, presented in five-yearly intervals, for total assets for the 41,041 company-year observations across the period from 1961 to 2007. All figures are in \$'000 and 2007 real dollars. Large (small) companies are those companies above (below) the 65th percentile of total assets in each year.

Year	Obs	Mean	Median	Std	Coeff Var	Skewness	p25	p75	p95	p99	Max
Panel A All Companies											
1962 to 1965	1514	212,096	51,591	851,778	4.01	20.12	18,893	157,129	867,478	2,169,089	25,849,260
1966 to 1970	2122	347,098	62,246	1,896,045	5.46	14.46	22,450	184,963	1,088,133	3,632,996	34,347,357
1971 to 1975	2316	569,864	88,329	3,305,171	5.80	12.39	32,713	252,221	1,441,243	5,956,271	55,534,223
1976 to 1980	3860	450,693	52,534	2,947,989	6.54	13.85	13,334	173,884	1,155,103	4,961,481	54,116,466
1981 to 1985	4269	586,672	40,040	4,613,829	7.86	16.74	12,102	167,477	1,588,183	5,776,698	111,055,983
1986 to 1990	6500	698,975	30,219	6,722,215	9.62	19.30	9,274	120,893	1,548,876	8,254,696	179,699,724
1991 to 1995	5239	1,030,972	24,102	9,337,941	9.06	15.50	5,689	129,852	2,470,982	11,793,927	200,602,410
1996 to 2000	5789	1,536,767	37,344	14,448,287	9.40	17.07	9,862	179,665	2,833,114	21,772,690	429,318,542
2001 to 2005	6582	1,782,284	25,243	18,525,022	10.39	17.88	7,222	143,542	2,876,032	27,963,805	447,047,652
2006 to 2007	2850	2,193,639	30,636	23,074,861	10.52	17.65	8,467	176,844	3,375,520	27,384,600	565,000,000
Panel B Small Companies											
1962 to 1965	756	21,391	18,890	14,289	0.52	0.43	9,190	32,717	47,348	51,011	54,755
1966 to 1970	1060	25,631	22,437	17,324	0.68	0.55	11,093	38,446	57,527	67,936	72,292
1971 to 1975	1156	37,335	32,683	24,692	0.66	0.44	16,416	56,842	81,538	91,285	95,646
1976 to 1980	2454	29,669	19,874	27,633	0.93	0.98	6,768	46,597	84,340	101,812	127,695
1981 to 1985	2795	25,674	17,820	22,624	0.88	1.06	7,658	38,782	72,657	89,145	102,511
1986 to 1990	4256	19,450	13,400	17,316	0.89	1.08	5,689	28,892	56,330	67,144	74,231
1991 to 1995	3430	15,815	8,758	17,325	1.10	1.56	3,355	22,495	54,067	72,154	85,287
1996 to 2000	3792	24,024	14,923	23,807	0.99	1.30	6,101	35,651	77,551	95,640	102,700
2001 to 2005	4311	16,889	10,724	16,484	0.98	1.29	4,404	24,155	53,387	65,018	77,844
2006 to 2007	1867	20,043	12,854	19,295	0.96	1.23	5,328	29,152	62,279	76,703	81,052

TABLE 2 (continued) Descriptive Statistics for Total assets ('000) reported in real dollars

Year	Obs	Mean	Median	Std	Coeff Var	Skewness	p25	p75	p95	p99	Max
Panel C	Large Companies										
1962 to 1965	758	402,299	157,093	1,174,604	2.92	15.10	84,519	372,051	1,376,234	2,686,516	25,849,260
1966 to 1970	1062	667,961	184,368	2,641,968	3.96	10.33	101,858	484,630	1,809,762	9,429,139	34,347,357
1971 to 1975	1160	1,100,557	251,177	4,610,281	4.19	8.78	138,839	625,179	2,477,940	26,696,917	55,534,223
1976 to 1980	1406	1,185,537	275,259	4,797,766	4.05	8.37	153,835	670,653	2,544,362	26,719,627	54,116,466
1981 to 1985	1474	1,650,437	316,428	7,742,709	4.69	9.86	156,907	887,532	3,854,861	31,848,025	111,055,983
1986 to 1990	2244	1,987,771	216,390	11,331,037	5.70	11.34	114,307	679,537	5,227,500	31,550,698	179,699,724
1991 to 1995	1809	2,955,786	261,437	15,714,909	5.32	9.06	120,764	933,472	8,103,456	128,291,750	200,602,410
1996 to 2000	1997	4,409,236	410,022	24,346,213	5.52	10.00	168,195	1,164,080	9,696,143	157,237,937	429,318,542
2001 to 2005	2271	5,133,504	324,921	31,269,064	6.09	10.46	131,342	1,253,182	10,561,211	90,730,189	447,047,652
2006 to 2007	983	6,321,924	401,961	38,970,633	6.16	10.32	166,111	1,597,645	13,623,189	126,000,000	565,000,000

TABLE 3
Descriptive Statistics for Audit Fees in real (2007) dollars

The table reports the descriptive statistics, presented in five-yearly intervals, for audit fees for the 41,041 company-year observations across the period from 1962 to 2007. All figures are in \$'000 and 2007 real dollars. Large (small) companies are those companies above (below) the 65th percentile of total assets in each year

Year	Obs	Mean	Median	Min	Std	Coeff Var	Skewness	Kurtosis	p25	p75	p95	Max
Panel A All Companies												
1962 to 1965	1514	114,133	47,250	197	173,853	1.52	3.07	11.36	17,766	135,070	478,188	1,416,009
1966 to 1970	2122	159,080	63,072	559	285,020	1.79	7.63	125.63	23,392	173,826	620,523	6,507,000
1971 to 1975	2316	279,119	115,479	832	491,275	1.76	6.22	70.19	42,179	304,538	1,109,155	7,866,440
1976 to 1980	3860	271,599	87,836	371	515,370	1.90	4.41	28.70	25,280	273,435	1,205,266	7,637,589
1981 to 1985	4269	273,884	57,337	278	667,643	2.44	5.08	31.71	20,342	195,310	1,228,211	8,003,802
1986 to 1990	6500	237,055	41,360	615	903,485	3.81	9.74	148.23	16,902	116,667	852,991	25,001,780
1991 to 1995	5239	251,656	41,002	149	923,628	3.67	7.61	72.31	14,858	127,189	870,708	16,893,498
1996 to 2000	5789	232,927	48,673	1,872	830,813	3.57	8.90	105.24	20,592	132,769	836,173	16,747,658
2001 to 2005	6582	268,112	54,667	1,145	1,048,837	3.91	10.28	134.05	24,484	143,021	963,339	20,234,080
2006 to 2007	2850	328,722	65,913	2,020	1,261,839	3.84	11.22	180.56	30,500	176,493	1,283,069	30,700,000
Panel B Small Companies												
1962 to 1965	756	27,323	19,087	197	25,448	0.93	1.96	5.24	9,993	37,934	76,896	173,775
1966 to 1970	1060	36,200	25,181	559	33,960	0.94	1.96	5.47	12,842	50,352	103,535	254,259
1971 to 1975	1156	67,145	44,575	832	66,600	0.99	2.01	5.53	21,378	93,618	195,316	473,465
1976 to 1980	2454	67,109	38,480	371	76,947	1.15	2.06	5.06	13,404	92,123	223,832	475,118
1981 to 1985	2795	49,844	28,899	278	57,534	1.15	2.85	13.53	13,913	63,259	168,631	659,344
1986 to 1990	4256	38,907	24,007	615	130,814	3.36	56.48	3504.83	12,083	46,870	113,008	8,166,864
1991 to 1995	3430	36,306	21,246	149	48,095	1.32	9.04	194.12	10,843	45,503	117,922	1,364,910
1996 to 2000	3792	45,351	28,331	1,872	64,557	1.42	14.05	365.34	15,279	56,377	134,099	2,120,755
2001 to 2005	4311	49,652	33,175	1,145	51,881	1.04	3.32	18.04	18,057	62,954	145,401	564,013
2006 to 2007	1867	63,008	41,442	2,020	66,557	1.06	3.64	22.42	23,929	76,555	181,788	845,110

TABLE 3 (continued) Descriptive Statistics for Audit Fees in real (2007) dollars

	Obs	Mean	Median	Min	Std	Coeff Var	Skewness	Kurtosis	p25	p75	p95	Max
Panel C	Large Companies											
1962 to 1965	758	200,715	133,576	5,876	211,498	1.05	2.20	5.45	65,625	235,851	684,316	1,416,009
1966 to 1970	1062	281,729	168,711	7,113	362,082	1.29	6.44	86.52	90,947	343,538	945,000	6,507,000
1971 to 1975	1160	490,362	285,411	3,327	623,040	1.27	5.09	46.00	145,451	610,010	1,599,735	7,866,440
1976 to 1980	1406	628,511	388,208	2,423	720,186	1.15	2.89	12.59	191,303	787,500	2,031,899	7,637,589
1981 to 1985	1474	698,708	321,504	9,247	1,004,703	1.44	3.00	10.46	150,727	797,669	2,952,523	8,003,802
1986 to 1990	2244	612,865	169,024	2,847	1,454,955	2.37	5.90	55.35	78,749	439,463	3,056,568	25,001,780
1991 to 1995	1809	659,976	185,731	3,120	1,487,387	2.25	4.44	24.16	88,102	468,042	3,605,422	16,893,498
1996 to 2000	1997	589,107	186,136	3,645	1,341,604	2.28	5.32	37.15	84,607	446,872	2,629,382	16,747,658
2001 to 2005	2271	682,810	212,264	3,678	1,709,212	2.50	6.15	47.09	96,964	517,937	2,632,251	20,234,080
2006 to 2007	983	833,388	274,068	3,754	2,054,711	2.47	6.80	65.97	116,797	611,116	3,002,000	30,700,000

TABLE 4
Top ten audit firms (by fee revenue) across time and market percentage

The Table reports the top ten audit firms across time at five yearly intervals. Audit firm size was measured based on total fees earned and is reported in real 2007 \$AMillions. Percentage fees (clients) is the audit firms fraction of the market wide fees (number of clients) in that year.

Year	Audit Firm	Fee Revenue (\$Mill)	Number Clients	Percentage Fees	Percentage Clients
1962	Flack & Flack	3.14	14	9.33%	4.47%
1962	Yarwood Vane & co	1.55	9	4.61%	2.88%
1962	Cooper Brothers & Co	1.48	8	4.40%	2.56%
1962	Fuller, King & Co	1.25	7	3.71%	2.24%
1962	Harris & Horne	1.08	3	3.21%	0.96%
1962	Cooper Brothers & Co, Way & Hardie	1.07	8	3.17%	2.56%
1962	G. A. Parkhill, Lemm & Bell	1.01	4	3.00%	1.28%
1962	L. B. Wallace & Son	0.94	2	2.79%	0.64%
1962	Brentnall, Mewton & Butler	0.80	3	2.37%	0.96%
1962	Smith , Johnson & Co	0.79	5	2.36%	1.60%
1967	Price Waterhouse	4.33	15	8.47%	4.13%
1967	Yarwood Vane & co	4.32	13	8.45%	3.58%
1967	Cooper Brothers & Co	3.94	23	7.70%	6.34%
1967	Arthur Andersen & Co	1.66	7	3.25%	1.93%
1967	Brentnall Dale & Co	1.65	3	3.24%	0.83%
1967	Peat Marwick Mitchell & Co	1.56	14	3.06%	3.86%
1967	Spry Walker & Co	1.53	9	2.99%	2.48%
1967	F. W. Duesbery & Co	1.38	4	2.69%	1.10%
1967	L. B. Wallace & Son	1.14	2	2.22%	0.55%
1967	Priestly & Morris	1.03	7	1.93%	2.02%
1972	Peat Marwick Mitchell & Co	18.77	38	17.38%	8.72%
1972	Price Waterhouse	10.55	32	9.77%	7.34%
1972	Yarwood Vane & Co	7.35	21	6.80%	4.82%
1972	Cooper Brothers & Co	5.05	21	4.68%	4.82%
1972	Brentnall Dale & Co	4.31	5	3.99%	1.15%
1972	Arthur Andersen & Co	3.77	12	3.49%	2.75%
1972	Spry Walker & Co	3.53	11	3.27%	2.52%
1972	E. V. Nixon & Partners	1.81	14	1.67%	3.21%
1972	Offenr, Hadley & Co	1.80	7	1.66%	1.61%
1972	Parsons, Anderson & Co	1.72	3	1.59%	0.69%

TABLE 4 (continued) Top ten audit firms (by fee revenue) across time and market percentage

Year	Audit Firm	Fee Revenue (\$Mill)	Number Clients	Percentage Fees	Percentage Clients
1977	Coopers & Lybrand	29.73	87	14.10%	9.89%
1977	Price Waterhouse	20.73	70	9.83%	7.96%
1977	Touche Ross & Co	20.14	43	9.55%	4.89%
1977	Peat Marwick Mitchell & Co	18.50	84	8.77%	9.55%
1977	Yarwood Vane & Co	13.86	40	6.57%	4.55%
1977	Arthur Young	11.15	38	5.29%	4.32%
1977	Hungerfords	7.70	18	3.65%	2.05%
1977	Fell & Starkey	4.97	19	2.36%	2.16%
1977	Arthur Andersen & Co	4.61	21	2.19%	2.39%
1977	Binder Hamlyn & Co	4.21	12	2.00%	1.36%
1982	KPMG	25.23	85	10.35%	9.82%
1982	Price Waterhouse	24.94	67	10.23%	7.74%
1982	Deloitte Touche Tohmatsu	24.37	68	9.99%	7.85%
1982	Coopers & Lybrand	24.00	84	9.84%	9.70%
1982	Touche Ross	20.70	42	8.49%	4.85%
1982	Arthur Young	13.19	54	5.41%	6.24%
1982	Hungerford Hancock & O	12.30	44	5.04%	5.08%
1982	Pannell Kerr Forster	6.73	24	2.76%	2.77%
1982	Binder Hamlyn & Co.	6.53	13	2.68%	1.50%
1982	Ernst & Whinney	6.36	24	2.61%	2.77%
1987	KPMG	62.32	139	19.88%	9.53%
1987	Coopers & Lybrand	39.27	122	12.53%	8.36%
1987	Price Waterhouse	29.69	115	9.47%	7.88%
1987	Touche Ross	27.13	103	8.66%	7.06%
1987	Deloitte Touche Tohmatsu	21.31	93	6.80%	6.37%
1987	KMG Hungerfords	13.65	55	4.36%	3.77%
1987	Arthur Young	13.45	86	4.29%	5.89%
1987	Arthur Andersen	12.18	108	3.88%	7.40%
1987	Thompson Douglass & Co	9.09	14	2.90%	0.96%
1987	Pannell Kerr Forster	9.03	40	2.88%	2.74%
1992	KPMG	75.19	154	28.59%	15.98%
1992	Coopers & Lybrand	37.47	94	14.25%	9.75%
1992	Deloitte Touche Tohmatsu	36.07	73	13.72%	7.57%
1992	Arthur Andersen	33.32	62	12.67%	6.43%
1992	Price Waterhouse	22.48	83	8.55%	8.61%
1992	Ernst & Young	11.93	116	4.54%	12.03%
1992	Duesburys	7.14	25	2.72%	2.59%
1992	Pannell Kerr Forster	2.97	37	1.13%	3.84%
1992	Horwath & Horwath	1.50	17	0.57%	1.76%
1992	Priestley & Morris	1.46	10	0.56%	1.04%

TABLE 4 (continued) Top ten audit firms (by fee revenue) across time and market percentage

Year	Audit Firm	Fee Revenue (\$Mill)	Number Clients	Percentage Fees	Percentage Clients
1997	KPMG	81.65	169	31.23%	15.56%
1997	Coopers & Lybrand	43.44	126	16.61%	11.60%
1997	Arthur Andersen	32.59	84	12.46%	7.74%
1997	Ernst & Young	27.26	142	10.43%	13.08%
1997	Deloitte Touche Tohmatsu	26.68	98	10.20%	9.02%
1997	PriceWaterhouseCoopers	18.72	56	7.16%	5.16%
1997	BDO	5.08	45	1.94%	4.14%
1997	Pannell Kerr Forster	3.52	44	1.35%	4.05%
1997	Price Waterhouse	2.00	33	0.77%	3.04%
1997	Grant Thornton	1.36	31	0.52%	2.86%
2002	Ernst & Young	130.38	262	38.53%	20.63%
2002	PriceWaterhouseCoopers	81.26	221	24.02%	17.40%
2002	KPMG	77.04	190	22.77%	14.96%
2002	Deloitte Touche Tohmatsu	25.78	118	7.62%	9.29%
2002	BDO	3.40	61	1.01%	4.80%
2002	Pannell Kerr Forster	2.79	58	0.83%	4.57%
2002	Grant Thornton	1.83	37	0.54%	2.91%
2002	WHK Horwath	1.71	25	0.51%	1.97%
2002	Pitcher Partners	1.34	11	0.40%	0.87%
2002	Hall Chadwick	0.87	22	0.26%	1.73%
2007	PriceWaterhouseCoopers	157.85	181	32.31%	11.82%
2007	KPMG	135.69	187	27.78%	12.21%
2007	Ernst & Young	98.50	244	20.16%	15.93%
2007	Deloitte Touche Tohmatsu	46.18	141	9.45%	9.20%
2007	Pannell Kerr Forster	8.05	99	1.65%	6.46%
2007	BDO	7.86	122	1.61%	7.96%
2007	Pitcher Partners	6.44	35	1.32%	2.29%
2007	Grant Thornton	3.68	51	0.75%	3.33%
2007	Moore Stephens	3.00	25	0.61%	1.63%
2007	Bentleys	2.20	36	0.45%	2.35%

TABLE 5
Distributional Properties of Audit Firm Size measured as the sum of audit fees (in 2007 dollars)

This table reports the number of auditors and descriptive statistics for the size of audit firms across time from 1962 to 2007. The size of an audit firm is measured each year as the sum of the auditor's audit fees. All figures are in 2007 real dollars. Large (small) companies are those companies above (below) the 65th percentile of total assets in each year.

Year	Obs	Mean	Median	Std	Coeff			Min	p25	p75	p95	p99	Max
					Var	Skew	Kurtosis						
Panel A		Small Companies											
1962 to 1965	105	39,760	26,972	44,556	1.12	2.42	6.76	700	10,560	50,266	132,657	225,663	257,166
1966 to 1970	122	55,974	32,394	74,345	1.33	3.63	19.38	783	13,733	69,033	197,595	362,358	747,747
1971 to 1975	118	125,934	55,611	223,214	1.77	4.81	30.7	892	25,679	128,571	496,764	1,262,197	2,241,652
1976 to 1980	158	203,012	56,717	486,919	2.40	4.78	25.68	606	22,676	145,101	1,017,180	3,210,394	3,719,815
1981 to 1985	134	207,923	46,234	512,966	2.47	4.29	19.82	616	20,021	127,865	1,065,564	2,838,317	3,796,120
1986 to 1990	127	260,081	43,409	722,879	2.78	5.04	33.54	768	16,875	111,647	1,776,342	3,216,381	8,166,864
1991 to 1995	107	233,640	40,663	652,712	2.79	4.4	21.21	149	14,410	106,859	1,684,795	3,525,054	5,069,857
1996 to 2000	98	348,293	49,774	970,108	2.79	4.23	18.97	2,228	19,344	155,287	2,044,636	5,393,399	6,775,029
2001 to 2005	93	455,577	49,028	1,359,742	2.98	4.38	20.3	2,229	20,031	146,752	3,031,551	7,406,114	10,604,921
2006 to 2007	82	719,778	71,488	1,859,145	2.58	3.71	14.45	2,020	27,163	272,458	5,824,593	10,783,841	11,273,554
Panel B		Large Companies											
1961 to 1965	88	353,810	153,069	477,809	1.35	3.22	14.21	7,350	67,736	456,616	1,068,791	2,832,200	3,541,584
1966 to 1970	100	526,958	186,581	972,155	1.84	5.08	35.46	7,113	88,792	596,176	1,630,256	5,225,771	10,708,281
1971 to 1975	97	1,078,775	292,061	2,296,433	2.13	4.65	25.08	3,616	139,729	1,084,821	3,937,409	13,615,791	19,801,331
1976 to 1980	79	2,127,631	483,783	4,349,289	2.04	3.34	11.34	2,423	211,169	1,802,791	14,082,100	21,239,663	27,223,620
1981 to 1985	60	3,410,249	428,153	6,516,522	1.91	2.51	5.89	9,247	139,221	3,205,479	20,107,948	29,855,157	34,994,466
1986 to 1990	67	4,109,747	240,413	10,886,598	2.65	4.47	25.92	2,847	98,341	1,691,314	25,240,368	59,375,975	99,442,427
1991 to 1995	50	4,737,684	200,305	12,938,809	2.73	3.81	16.1	3,120	84,082	836,903	31,932,022	76,240,264	77,651,363
1996 to 2000	38	6,200,910	205,092	15,753,592	2.54	2.94	8.23	3,645	90,606	770,466	43,017,246	78,211,936	78,251,146
2001 to 2005	35	8,668,962	192,306	25,139,390	2.90	3.15	8.9	11,446	89,693	719,967	83,201,671	112,414,221	123,285,371
2006 to 2007	34	12,197,526	179,000	34,357,888	2.82	2.95	7.55	5,280	87,450	1,336,474	114,991,832	149,424,709	149,424,709

TABLE 6
Number of Auditors, Herfindahl Index and Percent of Market audited by BIGN

This table reports the number of audit firms within each five-yearly interval and five alternate measures of auditor industry concentration. The *Herfindahl Index* is calculated for each year as the sum of the square of the each auditor's market share measured as the number (size) of companies audited as a percent of total number (size) of companies. *Percent of Companies* is the percent of the total number of companies audited by the BIG N. *Percent of Fees* is the sum of the audit fees charged by the BIGN as a percent of the total audit fees of all companies. *Percent of Total Assets* is the sum of the total assets of the companies audited by the BIGN as a percent of the total assets of all companies. The BIGN subsequent to 1980 is taken to be the conventional Big Eight, then the Big Six, Big Five and Big Four. Prior to 1980 the top 8 ranked audit firms measured by number of companies was taken to be the BIGN.

Year	Number of Auditors	Herfindahl Index		Big N Percent of Market		
		No. of Companies	Total Assets	No. of Companies	Fees	Total Assets
Panel A Small Companies						
1962 to 1965	122	0.0119	0.0155	0.15	0.18	0.17
1966 to 1970	122	0.0152	0.0185	0.25	0.28	0.28
1971 to 1975	118	0.0229	0.0300	0.35	0.40	0.40
1976 to 1980	158	0.0311	0.0380	0.43	0.49	0.47
1981 to 1985	134	0.0398	0.0490	0.50	0.56	0.54
1986 to 1990	127	0.0491	0.0585	0.55	0.59	0.60
1991 to 1995	107	0.0601	0.0749	0.53	0.63	0.62
1996 to 2000	98	0.0708	0.0867	0.54	0.62	0.62
2001 to 2005	93	0.0741	0.0905	0.47	0.60	0.55
2006 to 2007	82	0.0615	0.0780	0.36	0.53	0.45
Panel B Large Companies						
1962 to 1965	102	0.0171	0.0534	0.25	0.30	0.28
1966 to 1970	100	0.0239	0.0963	0.33	0.42	0.29
1971 to 1975	97	0.0345	0.1195	0.41	0.51	0.48
1976 to 1980	79	0.0575	0.1158	0.57	0.60	0.61
1981 to 1985	60	0.0704	0.1474	0.67	0.67	0.63
1986 to 1990	67	0.0778	0.1719	0.70	0.72	0.64
1991 to 1995	50	0.1206	0.2242	0.80	0.86	0.75
1996 to 2000	38	0.1478	0.2877	0.83	0.93	0.93
2001 to 2005	35	0.1859	0.3146	0.83	0.95	0.98
2006 to 2007	34	0.1779	0.3153	0.81	0.95	0.98

TABLE 7
Audit Fees/Total Assets

The Table reports descriptive statistics for the ratio of audit fees to total assets, presented in five-yearly intervals, for the 41,041 company-year observations across the period from 1962 to 2007. Large (small) companies are those companies above (below) the 65th percentile of total assets in each year. W-Mean is the mean winsorized at the 99th percentile

Year	Obs	Mean	W-Mean	Median	P25	P75	P95	P99	Max
Panel A All Companies									
1962 to 1965	1514	0.0012	0.0012	0.0009	0.0005	0.0015	0.0034	0.0054	0.0111
1966 to 1970	2122	0.0013	0.0013	0.0010	0.0006	0.0017	0.0035	0.0057	0.0106
1971 to 1975	2316	0.0016	0.0016	0.0013	0.0007	0.0020	0.0039	0.0060	0.0135
1976 to 1980	3860	0.0034	0.0027	0.0018	0.0010	0.0031	0.0078	0.0193	0.6944
1981 to 1985	4269	0.0031	0.0023	0.0015	0.0008	0.0027	0.0063	0.0173	0.9278
1986 to 1990	6500	0.0032	0.0026	0.0014	0.0007	0.0028	0.0077	0.0254	0.6667
1991 to 1995	5239	0.0047	0.0036	0.0017	0.0007	0.0036	0.0127	0.0439	0.8091
1996 to 2000	5789	0.0039	0.0027	0.0013	0.0006	0.0029	0.0089	0.0322	1.0333
2001 to 2005	6582	0.0088	0.0045	0.0019	0.0008	0.0044	0.0185	0.0736	8.7500
2006 to 2007	2850	0.0100	0.0048	0.0020	0.0008	0.0048	0.0198	0.0668	11.4000
Panel B Small Companies									
1962 to 1965	756	0.0016	0.0015	0.0012	0.0007	0.0019	0.0040	0.0061	0.0111
1966 to 1970	1060	0.0017	0.0017	0.0013	0.0007	0.0021	0.0043	0.0071	0.0106
1971 to 1975	1156	0.0020	0.0020	0.0016	0.0010	0.0025	0.0047	0.0075	0.0135
1976 to 1980	2454	0.0046	0.0035	0.0023	0.0013	0.0039	0.0099	0.0319	0.6944
1981 to 1985	2795	0.0041	0.0030	0.0020	0.0010	0.0034	0.0078	0.0222	0.9278
1986 to 1990	4256	0.0044	0.0035	0.0020	0.0010	0.0038	0.0102	0.0415	0.6667
1991 to 1995	3430	0.0068	0.0050	0.0027	0.0015	0.0050	0.0176	0.0648	0.8091
1996 to 2000	3792	0.0056	0.0038	0.0021	0.0012	0.0040	0.0118	0.0485	1.0333
2001 to 2005	4311	0.0129	0.0065	0.0032	0.0017	0.0067	0.0263	0.1058	8.7500
2006 to 2007	1867	0.0148	0.0069	0.0035	0.0018	0.0073	0.0286	0.1037	11.4000

TABLE 7 (continued) Audit Fees/Total Assets

Year	Obs	Mean	W-Mean	Median	P25	P75	P95	P99	Max
Panel C	Large Companies								
1962 to 1965	758	0.0008	0.0008	0.0007	0.0004	0.0012	0.0020	0.0028	0.0035
1966 to 1970	1062	0.0009	0.0009	0.0008	0.0004	0.0013	0.0022	0.0034	0.0041
1971 to 1975	1160	0.0012	0.0012	0.0010	0.0006	0.0016	0.0029	0.0038	0.0059
1976 to 1980	1406	0.0014	0.0014	0.0013	0.0007	0.0019	0.0033	0.0041	0.0197
1981 to 1985	1474	0.0012	0.0012	0.0009	0.0005	0.0016	0.0029	0.0041	0.0084
1986 to 1990	2244	0.0009	0.0009	0.0007	0.0003	0.0012	0.0025	0.0036	0.0098
1991 to 1995	1809	0.0008	0.0008	0.0007	0.0003	0.0012	0.0021	0.0035	0.0062
1996 to 2000	1997	0.0006	0.0006	0.0004	0.0002	0.0009	0.0017	0.0031	0.0289
2001 to 2005	2271	0.0008	0.0008	0.0006	0.0002	0.0011	0.0023	0.0040	0.0093
2006 to 2007	983	0.0008	0.0008	0.0005	0.0002	0.0011	0.0025	0.0040	0.0058

TABLE 8
Industry Composition of Sample (in percentage)

Panel A	Small Companies									
	1965	1970	1975	1980	1985	1986	1995	2000	2005	2007
Gold	1.32	1.42	1.21	10.00	20.90	24.26	25.55	23.05	22.81	27.50
Other Metals	1.59	1.79	1.47	11.14	12.54	8.59	9.84	10.25	11.00	8.27
Diversified Resources	0.00	0.00	0.00	0.00	0.14	0.02	0.06	0.24	0.14	0.00
Energy	4.23	4.53	4.07	8.57	10.29	5.98	6.83	7.45	8.00	10.42
Infrastructure/Utilities	0.53	0.47	0.43	0.24	0.43	0.45	0.67	0.77	1.02	0.43
Developers and Contractors	4.50	3.96	3.98	3.84	3.44	3.51	3.04	3.30	2.14	1.93
Building Materials	7.01	8.49	7.79	5.71	3.44	2.00	1.72	0.92	0.84	1.24
Alcohol & Tobacco	0.00	0.00	0.26	0.37	0.39	0.73	1.17	1.24	0.65	0.59
Food & Household	5.29	5.75	6.23	4.98	3.80	2.71	2.63	2.27	1.88	1.88
Chemicals	0.79	1.42	1.47	0.61	0.07	0.64	0.41	0.32	0.26	0.21
Engineering	9.39	7.83	9.78	7.14	5.27	3.67	3.45	2.88	1.65	1.45
Paper & Packaging	0.40	0.38	0.69	0.45	0.32	0.24	0.12	0.24	0.00	0.05
Retail	8.60	8.68	8.74	4.98	3.19	2.89	2.25	3.14	2.58	2.69
Transport	0.53	0.47	0.52	0.78	0.82	0.26	0.26	0.26	0.12	0.05
Media	6.08	6.32	5.80	5.27	4.12	1.86	2.34	2.98	2.98	2.26
Banks & Finance	0.53	0.47	0.69	0.69	0.32	0.28	0.26	0.32	0.42	0.16
Insurance	1.59	0.94	0.52	0.45	0.32	0.16	0.18	0.03	0.00	0.00
Telecommunications	0.00	0.00	0.00	0.00	0.18	1.15	2.01	2.72	3.77	3.33
Investment & Financial Services	16.40	17.17	15.31	11.35	10.25	15.69	12.76	10.83	10.05	9.24
Property Trusts	0.00	0.00	0.26	1.02	1.54	0.73	1.02	0.90	0.53	0.54
Healthcare	0.00	0.00	0.35	0.29	0.43	2.59	4.47	6.26	9.47	10.53
Miscellaneous Industrials	29.50	27.74	28.72	20.45	15.77	19.62	16.09	16.05	16.84	15.31
Diversified Industrials	1.19	1.32	0.87	1.10	1.25	1.01	0.85	0.71	0.33	0.16
Tourism & Leisure	0.53	0.85	0.87	0.57	0.75	0.96	2.04	2.88	2.53	1.77

TABLE 8 (continued) Industry Composition of Sample (in percentage)

Panel B	Large Companies									
	1965	1970	1975	1980	1985	1986	1995	2000	2005	2007
Gold	0.00	0.00	0.00	0.93	2.73	10.51	9.21	7.30	5.08	7.76
Other Metals	2.00	1.62	2.00	5.38	6.14	5.99	6.10	4.93	4.42	5.51
Diversified Resources	0.53	0.48	0.43	1.08	1.71	1.07	1.11	1.01	0.84	0.92
Energy	2.53	2.09	2.43	4.59	8.94	7.15	6.32	4.73	5.34	6.63
Infrastructure/Utilities	0.00	0.00	0.00	0.07	0.34	0.40	0.67	1.76	2.43	2.76
Developers and Contractors	2.67	2.76	3.22	3.73	5.39	7.02	5.21	5.28	5.25	4.59
Building Materials	11.60	11.12	11.04	9.12	9.35	5.86	4.44	3.77	3.31	2.96
Alcohol & Tobacco	3.73	3.52	3.04	2.44	1.84	1.12	2.00	1.96	1.68	0.51
Food & Household	11.33	11.60	11.57	9.91	7.44	3.71	3.66	3.67	2.69	2.04
Chemicals	2.67	2.85	2.78	2.44	1.98	1.56	1.61	1.41	0.75	0.61
Engineering	11.33	12.36	10.52	9.62	8.60	4.78	3.00	1.76	1.85	1.53
Paper & Packaging	4.27	3.99	4.09	3.37	2.18	1.25	1.39	1.61	1.85	1.33
Retail	8.00	8.17	7.22	6.82	3.82	4.20	5.27	4.63	5.39	4.80
Transport	1.07	0.95	1.13	1.15	0.82	0.45	0.72	0.50	0.22	0.20
Media	2.53	2.47	2.43	3.02	3.28	3.49	4.49	3.93	4.19	3.57
Banks & Finance	3.87	4.47	4.96	5.67	4.85	2.82	4.22	4.08	3.53	3.57
Insurance	1.87	2.38	2.52	2.58	2.53	1.43	1.77	2.26	1.41	1.43
Telecommunications	0.00	0.00	0.00	0.00	0.00	0.40	1.28	2.52	3.13	2.45
Investment & Financial Services	6.13	5.70	7.57	6.60	6.83	12.20	10.87	9.06	11.08	13.27
Property Trusts	0.53	0.48	0.43	0.86	2.12	4.60	6.54	11.58	7.59	7.96
Healthcare	0.40	0.48	0.09	0.07	0.27	1.30	1.89	2.92	3.89	3.88
Miscellaneous Industrials	17.73	18.54	18.61	16.51	15.22	13.54	11.04	11.78	16.60	15.71
Diversified Industrials	4.13	3.42	3.48	3.73	3.34	3.22	3.94	3.57	3.84	3.16
Tourism & Leisure	1.07	0.57	0.43	0.29	0.27	1.92	3.27	3.98	3.58	2.86

This Table report the percentage industry composition, presented in five-yearly intervals, for the 32,730 company-year observations across the period from 1962 to 2007.

TABLE 9
Descriptive Statistics for Profitability and Leverage

The table reports the descriptive statistics, presented in five-yearly intervals, for the ratios Net Profit/Total Assets (Panel A) and Long Term Debt/Total Assets (Panel B) for the 32,730 company-year observations across the period from 1962 to 2007. Large (small) companies are those companies above (below) the 65th percentile of total assets in each year

Panel A Descriptive Statistics for Net Profit/Total Assets

Year	Obs	Mean	Median	Std	Min	p25	p75	p99	Max	Percent Loss
Small Companies										
1962 to 1965	756	0.05	0.05	0.04	-0.21	0.03	0.07	0.17	0.32	0.05
1966 to 1970	1060	0.05	0.05	0.05	-0.67	0.04	0.08	0.17	0.26	0.05
1971 to 1975	1156	0.05	0.05	0.06	-0.88	0.03	0.08	0.21	0.42	0.08
1976 to 1980	2311	-0.05	0.05	0.18	-63.71	0.00	0.09	0.45	77.34	0.25
1981 to 1985	1973	-0.08	0.02	0.20	-24.17	-0.07	0.07	0.37	8.53	0.40
1986 to 1990	783	-0.42	-0.09	0.77	-26.53	-0.37	0.02	0.33	4.53	0.68
1991 to 1995	2541	-0.15	-0.05	0.78	-26.25	-0.24	0.04	0.71	391.90	0.62
1996 to 2000	3497	-0.32	-0.05	0.62	-105.89	-0.25	0.04	0.44	48.86	0.61
2001 to 2005	4249	-0.64	-0.13	0.90	-822.43	-0.46	0.01	0.60	1847.73	0.73
2006 to 2007	1860	-0.35	-0.11	0.78	-36.62	-0.40	0.03	0.57	44.39	0.70
Large Companies										
1962 to 1965	750	0.05	0.05	0.03	-0.27	0.03	0.07	0.12	0.18	0.02
1966 to 1970	1052	0.05	0.05	0.03	-0.20	0.03	0.06	0.12	0.41	0.02
1971 to 1975	1150	0.05	0.05	0.03	-0.11	0.03	0.06	0.14	0.19	0.03
1976 to 1980	1341	0.05	0.05	0.05	-0.92	0.03	0.07	0.19	0.52	0.05
1981 to 1985	1214	0.04	0.04	0.05	-0.48	0.02	0.07	0.16	0.36	0.10
1986 to 1990	502	0.03	0.05	0.14	-1.61	0.01	0.08	0.33	0.51	0.16
1991 to 1995	1454	0.03	0.04	0.12	-1.79	0.01	0.07	0.21	0.38	0.17
1996 to 2000	1904	0.03	0.04	0.18	-5.41	0.01	0.07	0.24	0.83	0.15
2001 to 2005	2197	0.03	0.04	0.17	-3.63	0.01	0.08	0.30	0.84	0.18
2006 to 2007	980	0.05	0.05	0.14	-2.41	0.01	0.09	0.38	1.22	0.17

TABLE 9 (continued) Descriptive Statistics for Profitability and Leverage**Panel B Descriptive Statistics for Leverage (Long-Term Debt/Total Assets)**

Year	Obs	Mean	Median	Minimum	p25	p75	p95	p99	Max
Small Companies									
1962 to 1965	756	0.0727	0.0344	0.0000	0.0000	0.1156	0.2685	0.3869	0.4460
1966 to 1970	1060	0.0786	0.0409	0.0000	0.0000	0.1198	0.2868	0.4850	0.7860
1971 to 1975	1156	0.0888	0.0494	0.0000	0.0000	0.1260	0.3183	0.6040	0.8250
1976 to 1980	2311	0.0883	0.0323	0.0000	0.0000	0.1271	0.3669	0.6296	1.5890
1981 to 1985	1973	0.0738	0.0112	0.0000	0.0000	0.1047	0.3273	0.5618	1.4800
1986 to 1990	783	0.0926	0.0092	0.0000	0.0000	0.1091	0.3990	0.8577	1.9850
1991 to 1995	2541	0.2420	0.0119	0.0000	0.0000	0.1338	0.4823	2.6894	115.6860
1996 to 2000	3497	0.1337	0.0163	0.0000	0.0000	0.1345	0.4489	0.9921	23.3800
2001 to 2005	4249	0.2876	0.0072	0.0000	0.0000	0.0807	0.4168	1.1357	667.3940
2006 to 2007	1860	0.0984	0.0077	-0.0056	0.0000	0.0860	0.4070	0.9233	15.5450
Large Companies									
1962 to 1965	750	0.1236	0.0896	0.0000	0.0119	0.1784	0.4374	0.5845	0.6820
1966 to 1970	1052	0.1289	0.1002	0.0000	0.0217	0.1802	0.4502	0.5905	0.6910
1971 to 1975	1150	0.1507	0.1270	0.0000	0.0526	0.2086	0.4220	0.6071	0.7930
1976 to 1980	1341	0.1623	0.1350	0.0000	0.0658	0.2116	0.4323	0.6834	1.1400
1981 to 1985	1214	0.1737	0.1461	0.0000	0.0591	0.2438	0.4617	0.6899	0.8840
1986 to 1990	502	0.1900	0.1434	0.0000	0.0273	0.3100	0.5454	0.8134	0.9030
1991 to 1995	1454	0.2049	0.1676	0.0000	0.0467	0.2962	0.5776	0.9196	1.6460
1996 to 2000	1904	0.2279	0.2044	0.0000	0.0896	0.3278	0.5120	0.7741	7.4280
2001 to 2005	2197	0.2187	0.1938	0.0000	0.0687	0.3293	0.5201	0.8150	1.3990
2006 to 2007	980	0.2556	0.2225	0.0000	0.0806	0.3604	0.6899	0.9734	1.6740

TABLE 10 (Continued) Audit Price Regressions

Panel B Large Companies

	1961 to 1965	1966 to 1970	1971to 1975	1976 to 1980	1981 to 1985	1986 to 1990	1991 to 1995	1996 to 2000	2001 to 2005	2006 to 2007
Intercept	-3.8754*** (0.8367)	-6.4556*** (0.5105)	-8.8446*** (0.5859)	-3.7941*** (0.5693)	-0.0211*** (0.5868)	3.7492*** (1.8096)	2.3472*** (0.6218)	0.9741 (0.6394)	-2.6356*** (0.4938)	3.1355** (1.3956)
BIGN	0.0331 (0.0378)	0.1015*** (0.0267)	0.0524 (0.0370)	0.0001 (0.0348)	-0.0079 (0.0427)	-0.0577 (0.1015)	-0.1017 (0.0790)	-0.0441 (0.0731)	0.2007*** (0.0563)	0.3442 (0.2182)
Size	0.8036*** (0.0514)	0.9731*** (0.0301)	1.0894*** (0.0331)	0.8336*** (0.0318)	0.6271*** (0.0315)	0.4201*** (0.0880)	0.4963*** (0.0314)	0.5787*** (0.0336)	0.6809*** (0.0244)	0.3709*** (0.0682)
Profit	-0.8673 (0.6091)	1.1673*** (0.4480)	0.6762 (0.5273)	-0.6340** (0.2582)	-0.7293*** (0.2576)	0.0142 (0.2776)	0.0265 (0.1023)	-0.1297* (0.0684)	-0.1709*** (0.0574)	-0.1722 (0.2047)
Leverage	-0.1836 (0.2132)	-0.0176 (0.1797)	0.3524* (0.1970)	-0.1756 (0.1732)	0.4170*** (0.1317)	0.3691 (0.2685)	0.3417*** (0.1017)	0.2815*** (0.1063)	-0.1902** (0.0946)	0.2052 (0.2206)
ARINV	0.4638*** (0.1648)	0.0251 (0.1400)	0.7834*** (0.1560)	0.3914*** (0.1226)	0.4009*** (0.1032)	0.4298* (0.2553)	0.5102*** (0.1478)	0.1933* (0.1127)	0.1007 (0.1353)	-0.2547 (0.4066)
Dummloss	0.1512** (0.0652)	0.1512** (0.0651)	0.3110*** (0.0616)	-0.0245 (0.0526)	0.0490 (0.0386)	0.0146 (0.0749)	0.0665* (0.0357)	0.0598 (0.0378)	-0.0018 (0.0300)	0.0834 (0.1015)
R-Squared	0.9693	0.9784	0.9585	0.9641	0.9732	0.984	0.968	0.9473	0.9622	0.9476
Observations	750	1052	1150	1341	1214	502	1454	1904	2197	980
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*, ** and *** indicates statistical significance at the 10%, 5% and 1% level respectively.