The Effects of Firm-Wide and Office-Level Industry Expertise on Audit Pricing

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ABSTRACT: This study examines the role of auditor industry expertise in the pricing of Big 5 audits in Australia. We test if the audit market prices an auditor’s firm-wide industry expertise, or alternatively if the audit market only prices office-level expertise in those specific cities where the auditor is the industry leader. We document that there is an average premium of 24 percent associated with industry expertise when the auditor is both the city-specific industry leader and one of the top two firms nationally in the industry. However, the top two firms nationally do not earn a premium in cities where they are not city leaders. We further document that national leadership rankings are, in fact, driven by the specific offices where accounting firms are city leaders. Thus, the overall evidence supports that the market perception and pricing of industry expertise in Australia is primarily based on office-level industry leadership in city-specific audit markets.

Keywords: audit fees; industry expertise; Big 5 accounting firms.

Data Availability: Data are publicly available.

I. INTRODUCTION

This study investigates the effect of industry expertise on audit fees of Big 5 accounting firms and is motivated by recent findings in Ferguson and Stokes (2002), who document a decline in audit fee premia for industry specialists during the 1990s. Specifically, they report evidence that the audit fee premia documented in Craswell et al. (1995) and based on 1987 data no longer existed by 1998. In light of this result, we re-examine the data in Ferguson and Stokes (2002) using a new research design to determine

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if there is still a credible basis for differentiation among Big 5 accounting firms, based on their industry clienteles.\footnote{One explanation for result in Ferguson and Stokes (2002) is that the accounting firm mergers in the late 1980s and 1990s which reduced the Big 8 to the Big 5 have equalized market shares to the point where no meaningful differentiation exists among Big 5 auditors based on clienteles and that they are all now viewed as experts in all industries.}

We begin the analysis by considering two contrasting ways of conceptualizing the operations of Big 5 accounting firms. The “firm-wide” perspective considers an accounting firm’s practice in aggregate, typically at the country-level of analysis. The firm is the focal point and no differentiation is presumed to exist across the individual practice offices of the firm. Firm-wide studies using country-level data have documented that Big 5 audit fees are higher than the fees of non-Big 5 accounting firms (Francis 1984; Francis and Stokes 1986; Francis and Simon 1987; Chan et al. 1993; Craswell et al. 1995; DeFond et al. 2000).

An alternative, which we term the “office-level” perspective, views each individual practice office in the Big 5 network as a unique and relevant unit of analysis in its own right because audit contracting is conducted through local offices, audit engagements are administered by an audit team typically located in an office in the same city as the client’s headquarters, and audit reports are issued on office-specific letterhead of the Big 5 engagement office administering the audit (Wallman 1996; Penno and Walther 1996; Francis et al. 1999; Reynolds and Francis 2000).

The implication of each perspective for audit pricing is as follows. Under the firm-wide perspective, industry expertise is a firm-wide phenomenon and therefore a firm-wide measure of industry expertise is relevant for the study of audit pricing. Under the office-level perspective, industry expertise resides in the unique human capital and experience of professionals in each office, therefore an office-level measure of industry expertise is relevant for the study of audit pricing. In both the firm-wide and office-level perspectives, the assumption is that some clients demand a higher level of industry expertise from their auditor and are willing to pay a premium for the expertise. The difference in the two perspectives is whether industry expertise is viewed as a firm-wide or office-specific phenomenon.\footnote{Evidence of higher quality audits by industry specialists is supported by recent evidence that industry specialists constrain earnings management (Zhou and Elder 2002; Krishnan 2003), and result in a higher market valuation of earnings (Balsam et al. 2002). Another viewpoint is that specialization creates production economies that will reduce audit fees if efficiencies are passed on to clients (Craswell et al. 1995, 301). While plausible, there is no evidence in the research literature of lower fees for Big 5 firms that are industry specialists.}

Like other empirical studies, we assume that Big 5 industry expertise can be inferred from a firm’s market share of industry audit fees. The firm-wide perspective views national market share as the relevant basis for determining Big 5 industry expertise, while the office-level perspective views city-specific (local office) industry market share as the relevant basis for determining industry expertise. The firm-wide analysis in our study uses country-level data in Australia to determine national market shares of Big 5 firms, and the office-level analysis determines industry market shares of Big 5 firms for each unique city-industry combination in the study (Adelaide, Brisbane, Melbourne, Perth, and Sydney). In both cases a larger market share implies greater industry expertise, \textit{ceteris paribus}. The two approaches can result in quite different market share measures and rankings. For the Australian data in our study, the nationally top-ranked accounting firm in an industry is the city-specific industry leader in only 44 percent of city-industry combinations, and Francis et al. (1999) report similar results using U.S. data.

Prior studies use arbitrary market share thresholds (typically 10–20 percent) and apply these percentages across all industries to denote industry experts (e.g., Pearson and
Trompeter 1994; Craswell et al. 1995; Hogan and Jeter 1999; DeFond et al. 2000; Ferguson and Stokes 2002). Our study takes a different approach and uses Big 5 industry rankings based on market shares within each industry to denote industry experts. Ferguson and Stokes (2002) use this approach and find no evidence of a premium for the top-ranked auditor in each industry based on national market share data. However, we do not know a priori if the market perceives only the top-ranked auditor as having differential industry expertise relative to other Big 5 firms. For example, if the second-ranked firm is also perceived by the market to be an industry expert, then a model testing only the top-ranked firm would be misspecified.

Since we have no theoretical or empirical basis for knowing how many auditors are viewed as industry experts, we approach the problem as an empirical one and undertake the following series of tests. We begin by comparing the top-ranked firm in the industry with all other Big 5 auditors. The test is conducted using both firm-wide (national) data and city-specific (office) data to denote industry leaders. We then repeat the above analysis and test if each of the top two auditors in an industry (national and city) has a premium relative to other Big 5 auditors. We extend this logic and test each of the top three firms in the industry (national and city) relative to the other Big 5 auditors. We did not proceed with further testing because it was clear that, on average, only the top two firms (at most) are perceived by the market to be industry experts as evidenced by higher audit fees.

Our firm-wide analysis indicates that on average each of the top two auditors nationally has a fee premium relative to other Big 5 auditors, but the third-ranked firm does not have a premium. Our city-specific analysis indicates that, on average, only the top-ranked Big 5 auditor in an industry has a fee premium, with no premium for the second- or third-ranked firms.

In an attempt to reconcile the firm-wide and office-level results, we test the joint effect of firm-wide industry expertise and office-specific industry expertise on audit fees. These results indicate that Big 5 auditors earn an average fee premium of 24 percent when they are one of the top two firms nationally and are also the city-specific industry leader. We further document that the top two firms nationally do not earn a fee premium if they are not also the city leader. Thus, the evidence shows that an auditor must be a city-level industry leader to earn a premium for industry expertise, and our study supports the office-level perspective in the pricing of Big 5 industry expertise.

The remainder of the study is organized as follows. The next section develops in more detail the firm-wide and office-level perspectives on the operations of Big 5 accounting firms and the development of industry expertise. Section III describes the data and research design. Primary results are reported in Section IV and sensitivity analyses and robustness checks are reported in Section V. Results of the study and implications for future research are discussed in the concluding section.

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3 Our reasoning draws on research in marketing and economics that market share is a signal of quality, and industry leadership provides the strongest signal of quality with respect to the accounting firm's industry expertise (Smallwood and Conlisk 1979; Caminal and Vives 1996; Hellos and Jacobson 1999).

4 At the country level, the average market shares across the 24 industries in the study are 50 percent for the top-ranked firm, 20 percent for the second-ranked firm, and 12 percent for the third-ranked firm. At the city level, the top-ranked Big 5 auditor in each city-industry combination has an average market share of 66 percent, the second-ranked firm 18 percent, and the third-ranked firm 7 percent. For both national- and city-specific measures, the differences in market shares are statistically significant between the first- and second-ranked firms, and between the second- and third-ranked firms.
II. TWO VIEWS OF BIG 5 ACCOUNTING FIRMS

The Big 5 accounting firms are organized as country-level partnerships, and have also created international organizations that bring all of the country-level partnerships together under one administrative structure. Andersen Worldwide was the prototype for these international umbrella organizations. However, while the Big 5 firms have country-level and international organizational structures, they operate through a decentralized network of semi-autonomous practice offices (Narayanan 1995; Wallman 1996; Francis et al. 1999; Chan et al. 2002). National offices are small and serve as an administrative unit for the firm. Individual engagement partners in practice offices contract for audits (in the name of the firm) with clients that are generally headquartered in the same locale, and administer the audit engagement even though other offices may be involved. The final audit report is signed by the engagement partner on the letterhead of the local office of the Big 5 accounting firm administering the engagement. Descriptively, then, audit contracting and audit reporting occurs at the office-level of each Big 5 accounting firm even though the firms have national and international organizational structures.

In predicting audit pricing the central question is the degree to which positive network externalities exist across individual offices of Big 5 accounting firms. Positive network externalities will exist if an accounting firm develops a firm-wide reputation and if individual offices within a Big 5 firm’s network capture the benefit of the firm-wide reputation. Craswell et al. (1995) argue that Big 5 firms have developed brand name reputations. Positive network externalities are likely for brand name reputations, and all offices of a Big 5 firm should benefit from the firm’s reputation. Some of the factors that contribute to this are firm-wide quality control procedures (e.g., standardized audit programs, peer reviews) and uniform firm-wide personnel practices with respect to hiring, training, and promotions. The finding of a Big 5 premium in many countries is consistent with positive network externalities across individual offices for a Big 5 accounting firm’s brand name reputation.

With industry expertise, it is less clear if there are positive firm-wide externalities. We now develop in greater detail the underlying assumptions about industry expertise based on the firm-wide and office-level views of the operations of Big 5 accounting firms.

Reasons Why Industry Expertise Is Firm-Wide

The firm-wide view assumes that industry expertise is captured by the firm as whole and therefore exists at the firm level. Expertise in individual offices is assumed to be uniform across offices and the national office facilitates the transfer of expertise across offices so that clients can have seamless access to the firm-wide expertise they demand. In this view, all offices of a particular firm are suppliers of homogenous expertise. Uniform industry expertise is provided across individual offices through standardized national training programs, standardized audit programs, travel by industry experts between offices and, with advances in technology through knowledge management systems, video-conferencing and other contact between local office partners and industry experts in other offices.

This view is supported by the fact that the Big 5 firms hold themselves out through the media and their web sites as having firm-wide operations organized along industry lines,

Francis et al. (1999) report that 97 percent of U.S. audit reports of Big 5 firms are issued by offices located in the same geographic locale as the client’s headquarters. In our Australian sample, all companies are headquartered in the same city as the local office of the Big 5 accounting firm administering the audit and issuing the audit report.

Katz and Shapiro (1985) and Bental and Spigal (1995) for a general discussion and economic analysis of network externalities.
standardized national training, and standardized audit programs. If the firm-wide view is descriptive of how accounting firms operate—one in which there are strong positive network externalities—then national (firm-wide) industry expertise is all that will matter in the pricing of audits, and clients that demand a higher level of industry expertise will pay more to the Big 5 firms that are perceived to have such expertise. Under this view we assume clients use an auditor’s industry ranking based on national market share as the basis for determining auditor industry expertise.

Reasons Why Industry Expertise Is Office-Specific

Accounting is a knowledge-based professional service, and under the office-level perspective industry expertise is seen to reside in the unique personnel of the firm and is acquired through experience working with individual clients in specific industries (Solomon et al. 1999). This argument is also consistent with Carcello et al. (1992) and Behn et al. (1997) who find that controllers of Fortune 1000 companies value highly the industry experience of the primary audit engagement team. Under the office-level perspective it is unlikely there are strong positive network externalities related to industry expertise. The reason is that the accounting firm’s investment in industry expertise is really an investment in the human capital of its professional staff, and the expertise derived from these human capital investments tends to be both client- and office-specific and, therefore, is not readily captured by the firm as a whole (which the firm-wide view assumes is possible). Gilson and Mnookin (1985) make similar arguments with respect to human capital in large law firms. Some aspects of industry expertise can be captured by Big 5 firms and distributed to local offices, for example, industry-tailored audit programs and databases with best industry practices. But deep industry knowledge resides in the firm’s individual experts and is limited to the specific engagements on which these individuals work, and most auditors continue to service clients predominantly in one locale. Under this view we assume clients use an auditor’s industry ranking based on their office-level (city-specific) market share as the basis for determining auditor industry expertise.

In sum, a local office of a Big 5 accounting firm will have a more credible claim of industry expertise to their clients (or prospective clients) if they are a leading firm in that industry for that particular city. The fact that an accounting firm has a “large” national market share counts for relatively little in city-specific audit markets if the national market share statistics are driven by clients located primarily in other cities. It turns out that this is the typical case. Francis et al. (1999) document that the national industry leader is the city-specific industry leader in only 25 percent of cities in the United States; in our Australian sample, the national industry leader is the city-specific industry leader in only 44 percent of city-industry combinations. If the local-office view is correct—one in which positive network externalities do not exist—then local-office industry expertise is what will be priced in audits for those clients demanding industry expertise.7

7 Empirically we know that industries are not randomly distributed. For U.S. data from 1990, Francis et al. (1999) find that the four-city concentration ratio is 37 percent for 27 industry sectors. This means that 37 percent of companies in an industry are located in the four cities with the most companies. Similarly, for Big 5 industry leaders, over half of their industry clientele is located in the four offices of the firm having the most clients in the industry. Thus, industries tend to cluster in certain cities, and auditor market shares also cluster in these same cities, which suggest that a small set of offices can drive the firm’s national market share. However, the question remains whether a firm can achieve positive firm-wide externalities for industry expertise across all of its offices.
III. DATA AND MODEL SPECIFICATION

Sample

We start with the sample of 1,084 Australian publicly listed companies in Ferguson and Stokes (2002). Their sample represents nearly all Australian publicly listed companies for fiscal 1998 and is collected from the following sources: Huntleys Datanalysis, Huntleys Datanalysis (Delisted Companies), the Australian Stock Exchange Library, the Australian Stock Exchange Microfiche Collection in the State Library of New South Wales, Connect 4, and Reuters Beacon.

Audit fees are examined for companies headquartered in the five largest Australian cities: Adelaide, Brisbane, Melbourne, Perth, and Sydney. These five cities contain the headquarters of 1,046 out of 1,084 companies in the Ferguson and Stokes (2002) sample, and are audited by offices of accounting firms located in the same city (based on information in the audit report). The other 38 publicly listed companies are located in several smaller regional cities, are audited by offices in these locales, and are thus excluded from the study.

The sample of 1,046 companies is distributed as follows: Adelaide has 43 observations, Brisbane has 93 observations, Melbourne has 223 observations, Perth has 290 observations, and Sydney has 397 observations. As in Craswell et al. (1995) and Ferguson and Stokes (2002), to avoid the confounding effect of Big 5 brand name on audit fees, the regression models are estimated for the 681 companies in the sample having Big 5 auditors, though industry market share calculations and rankings are based on the total sample of 1,046 companies.8

Audit fees measure industry output and can be used to calculate Big 5 market shares in Australia because fees are publicly disclosed in corporate annual reports.9 For convenience, the names of the Big 5 accounting firms are abbreviated as follows: Arthur Andersen (AA), Deloitte Touche (DT), Ernst & Young (EY), KPMG (KPMG), and PricewaterhouseCoopers (PWC). Industry rankings are based on an accounting firm’s share of total audit fees, measured nationally for the firm-wide perspective and measured for each industry per specific city for the office-level perspective. The industry groupings used in Craswell et al. (1995) and Ferguson and Stokes (2002) are also used in this study and are based on the 24 categories used by the Australian Stock Exchange.

Table 1 provides market shares of each Big 5 firm. Panel A of Table 1 shows the total national market share of each Big 5 firm and the total city-level market share of each Big 5 firm. Nationally, the two dominant firms are KPMG with 28 percent of total audit fees followed closely by PWC with 24 percent, a difference of only 4 percent. Panel A shows that national market shares are more evenly distributed among the Big 5 firms than city market shares. National data show a relatively narrow range from 28 percent for the top-ranked firm to 10 percent for the fifth-ranked Big 5 firm, a difference of only 18 percent. By contrast, three different firms are city leaders and fees average 38 percent for the city leader compared to 26 percent for the second-ranked firm. In addition, the range from top

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8 National industry rankings of auditors are unaffected if using the full sample of 1,084 observations (which includes the 38 observations in smaller regional cities and represents less than 1 percent of total audit fees for the full sample of 1,084 observations).

9 As in prior studies, all audit fees are attributed to the city-specific office that contracts for the audit and issues the audit report signed on the local office letterhead of the Big 5 firm (Francis et al. 1999; Reynolds and Francis 2000). We recognize this introduces two potential sources of error in measuring city-level audit market shares. First, it ignores fees from private companies, though these fees are unlikely to be large relative to publicly listed companies. Second, it potentially overstates local office fees to the extent other offices participate in engagements, although, the primary reputation effect is most likely to accrue to the engagement office that administers the audit and issues the final audit report. Therefore, while we believe it is reasonable to attribute all fees to the office administrating the audit, we recognize the potential for measurement error.
### TABLE 1
City and National Market Shares Based on 1998 Australian Audit Fees
(percentages of audit fees in parenthesis)

#### Panel A: Overall City-Level and National-Level Market Shares

<table>
<thead>
<tr>
<th>Perth</th>
<th>Sydney</th>
<th>Melbourne</th>
<th>Brisbane</th>
<th>Adelaide</th>
<th>National</th>
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<td>n = 290</td>
<td>n = 397</td>
<td>n = 223</td>
<td>n = 93</td>
<td>n = 43</td>
<td>n = 1084</td>
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<tr>
<td>EY (33)</td>
<td>EY (25)</td>
<td>KP (41)</td>
<td>PW (45)</td>
<td>KP (45)</td>
<td>KP (28)</td>
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<td>PW (21)</td>
<td>PW (21)</td>
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<td>KP (26)</td>
<td>DT (33)</td>
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<td>KP (18)</td>
<td>AA (13)</td>
<td>AA (08)</td>
<td>PW (09)</td>
<td>EY (16)</td>
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<td>AA (14)</td>
<td>DT (09)</td>
<td>EY (08)</td>
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<td>DT (04)</td>
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<tr>
<td>NB5 (14)</td>
<td>NB5 (11)</td>
<td>NB5 (06)</td>
<td>NB5 (09)</td>
<td>NB5 (08)</td>
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#### Panel B: City-Level and National-Level Industry Leaders

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<th>Brisbane</th>
<th>Adelaide</th>
<th>National #1</th>
<th>National #2</th>
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<td>PW (47)</td>
<td>PK (34)</td>
<td>EY (27)</td>
<td>DT (99)</td>
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<td>PW (40)</td>
<td>EY (52)</td>
<td>PW (96)</td>
<td>DT (100)</td>
<td>PW (57)</td>
<td>KP (19)</td>
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<td></td>
<td>AA (47)</td>
<td></td>
<td></td>
<td>AA (47)</td>
<td>PW (45)</td>
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<td>04 Energy</td>
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<td>KP (36)</td>
<td>PW (58)</td>
<td>PW (47)</td>
<td>KP (100)</td>
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<td>PW (18)</td>
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<td>KP (50)</td>
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<td>PI (100)</td>
<td>EY (100)</td>
<td>KP (100)</td>
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<td>PW (81)</td>
<td>PW (67)</td>
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<td>BD (03)</td>
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<td>KP (71)</td>
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<td>HC (100)</td>
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<th>Melbourne</th>
<th>Brisbane</th>
<th>Adelaide</th>
<th>National #1</th>
<th>National #2</th>
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<td>KP (83)</td>
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<td>KP (81)</td>
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<td>13 Retail</td>
<td>EY (94)</td>
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<td>AA (54)</td>
<td>PW (71)</td>
<td>PW (44)</td>
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<td>18 Telecommunications</td>
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<td>DT (17)</td>
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<td>20 Property Trusts</td>
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<td>EY (40)</td>
<td>MS (23)</td>
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<td>PW (27)</td>
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<td>21 Healthcare and Biotechnology</td>
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<td>KP (73)</td>
<td>JR (74)</td>
<td>DT (100)</td>
<td>KP (48)</td>
<td>DT (17)</td>
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<td>22 Miscellaneous Industrials</td>
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<td>DT (46)</td>
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<td>23 Diversified Industrials</td>
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<td>PW (12)</td>
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<td>24 Tourism and Leisure</td>
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<td>PW (35)</td>
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<td>AA (40)</td>
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AA—Arthur Andersen  
BD—BD Nelson Parkhill  
DT—Deloitte Touche  
EM—Edwards Marshall  
EY—Ernst & Young  
FJ—FA Jones  
HC—Hall Chadwick  
KP—KPMG  
JR—Johnston Rorke  
MS—Moore Stephens  
NB5—a non-Big 5 Auditor  
PI—Pitcher Partners

PK—Pannell Kerr Foster  
PW—PricewaterhouseCoopers
to bottom at the city level averages 33 percent (compared to 18 percent at the national level).

Panel B of Table 1 reports industry market shares by the top two firms nationally, and the city-specific leaders for each of the 24 industry categories of the Australian Stock Exchange. Even though KPMG and PWC are the two leading firms in overall market share and earn 52 percent of total fees in the sample, national-level industry leadership is quite diverse. KPMG or PWC are the top-ranked firm in only 13 of 24 industries, and are the second-ranked firm in 15 of 24 industries. Thus, another firm is one of the top two firms in an industry in 20 of 48 instances.

There are a potential of 120 city-specific industry leaders in Panel B (24 industries times 5 cities). However, for 17 city-industry combinations there are no observations and therefore no industry leaders. For these 103 city-industry combinations in the study the Big 5 national leader is the city-level industry leader in only 45 cases (44 percent). In addition, for 13 of the city-industry combinations a non-Big 5 accounting firm is the industry leader. This leaves 90 city-industry combinations for which a Big 5 firm is the industry leader and these are distributed as follows: AA has 8 industries in which it is the city-specific market leader, DT has 12 industries, EY has 17 industries, KPMG has 27 industries, and PWC has 26 industries. Again, even though KPMG and PWC are the two dominate firms nationally, they are city-level leaders in only 53 of the 90 city-industry combinations having a Big 5 firm as city leader.

In sum, the national industry leader is the city-level industry leader in less than half of the industry-city combinations in Panel B (45 of 103 cases). No industries have the same accounting firm as the industry leader for all five cities, and 16 of the 24 industries have three (or more) different accounting firms as market leaders for the five cities. Thus, there is no general pattern in which individual accounting firms dominate industries across all cities.

Model Specification

A cross-sectional audit fee regression model similar to that used in prior audit fee research is used to estimate the effects of industry expertise on audit fees (Francis 1984; Francis and Stokes 1986; Craswell et al. 1995; Ferguson and Stokes 2002). Audit fee regression models use a set of variables to control for cross-sectional differences in factors that affect fees such as client size, audit complexity, and auditor-client risk sharing. These models have good explanatory power (adjusted $R^2$s of 0.70 and higher) and have been robust across different samples, time periods, countries, and sensitivity analyses for model misspecification (Francis and Simon 1987; Chan et al. 1993).

Two auditor variables are specified to test the effect of industry expertise on audit pricing: the first variable, AUDITOR#1, indicates if the observation is audited by the specific Big 5 firm that is industry leader for that particular observation's industry. The second variable, AUDITOR#2, indicates if the observation is audited by second-ranked Big 5 firm in that particular industry. The default comparison group consists of observations audited by all other Big 5 auditors. This is similar to the research design in prior audit fee research in which an indicator variable is used to test if Big 5 auditors earn a fee premium over non-Big 5 auditors. The design tests for differential audit fees through a cross-sectional comparison of audit fees of the top two industry leaders with other firms, after controlling for other factors affecting fees. Formally, the test determines if there is a significant positive

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10 These 13 city-industry combinations with a non-Big 5 market leader represent only 27 of the 1,046 companies in the study, and only 0.8 percent of total audit fees for the full sample of 1,046 companies.
intercept shift (higher fees) in the fitted regression model for observations audited by either of the two top-ranked accounting firms in the industry.\footnote{As explained in the introduction, we undertook a series of tests at the national- and city-level of analysis to determine if the top-ranked firm has a premium, if each of the two top-ranked firms has a premium, and if each of the three top-ranked firms has a premium, relative to other Big 5 auditors. On the basis of these analyses it appears that only the top two ranked firms (nationally) have a premium, and the models reported in our study are based on this analysis. The models testing only the top-ranked firm, and the models testing each of the three top-ranked firms, are available upon request.}

An OLS regression model is estimated pooling observations with Big 5 auditors and company headquarters in Adelaide, Brisbane, Melbourne, Perth, and Sydney. Observations are pooled across cities to increase statistical power, though a sensitivity analysis of individual cities is reported later. The model is specified in two ways: the first estimation defines the top two accounting firms based on national-level market share data, and the second estimation defines the top two accounting firms using city-level market share data, which means that an industry can have different auditors as industry experts in different cities depending on auditor industry rankings in each city.

The OLS regression model is specified as follows:

$$LAF = b_0 + b_1 LTA + b_2 LSUB + b_3 CATA + b_4 QUICK + b_5 DE + b_6 ROI + b_7 FOREIGN + b_8 OPINION + b_9 YE + b_{10} LOSS + b_{11} AUDITOR\#1 + b_{12} AUDITOR\#2 + e$$

where:

- \(LAF\) = natural log of audit fees;
- \(LTA\) = natural log of total assets;
- \(LSUB\) = natural log of the number of subsidiaries;
- \(CATA\) = ratio of current assets to total assets;
- \(QUICK\) = ratio of current assets (less inventories) to current liabilities;
- \(DE\) = ratio of long-term debt to total assets;
- \(ROI\) = ratio of earnings before interest and tax to total assets;
- \(FOREIGN\) = proportion of subsidiaries that represent foreign operations;
- \(OPINION\) = indicator variable, 1 for qualified audit report;
- \(YE\) = indicator variable, 1 for non-June 30th year-end;
- \(LOSS\) = indicator variable, 1 for loss in any of the past three years;
- \(AUDITOR\#1\) = indicator variable, 1 for top-ranked auditor in the industry;
- \(AUDITOR\#2\) = indicator variable, 1 for second-ranked auditor in the industry; and
- \(e\) = error term assumed to have normal OLS regression properties.

As in prior studies transformations are made to linearize certain variables (\(LAF, LTA, LSUB\)). Observations having a zero value for \(LSUB\) are re-coded to a small positive value (.00001) to enable a logarithmic transformation. Three additional variables, \(QUICK, DE,\) and \(ROI\) are winsorized to a maximum value of \(\pm 3\) standard deviations to control for extreme values.

With respect to the ten control variables in the model, higher fees are expected (positive signs) for larger clients (\(LTA\)), for greater audit complexity (\(LSUBs\) and \(FOREIGN\)), and for greater audit risk (\(DE\) and \(CATA\)). A positive sign is also expected for \(OPINION\) as
prior studies document higher fees associated with modified opinions, possibly due to more investigative efforts in such circumstances. Negative signs are expected for the variables QUICK, ROI, LOSS, and YE. QUICK is an audit risk variable and clients with a smaller quick ratio are riskier (less liquid) and therefore are expected to have higher audit fees. Prior studies find that clients with higher ROI have lower fees, which is consistent with auditor-client risk sharing, i.e., more profitable clients pose less risk to the auditor resulting in lower fees. However, prior studies also show that clients with operating losses (LOSS) have lower fees, possibly due to an inability to pay higher fees. Finally, clients with off peak non-June 30th fiscal year-ends (YE) are expected to have lower fees.

Descriptive Statistics

Descriptive statistics are reported in Table 2 for the full sample of 1,046 observations, and for the 681 observations audited by Big 5 accounting firms in 1998. The 681 observations with Big 5 auditors represent 65 percent of the 1,046 observations and 91 percent of total audit fees. At 65 percent, the Big 5 share of clients in Australia is somewhat smaller than the U.S., and this may be due to the smaller average size of companies in Australia.

| TABLE 2 |
| 1998 Australian Sample Descriptive Statistics |
| (June 30, 1998 exchange rate $1 AUD = .6135 USD) |

<table>
<thead>
<tr>
<th>Variables</th>
<th>Full Sample (n = 1,046)</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Big 5 Sample (n = 681)</th>
<th>Mean</th>
<th>Std. Dev.</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAF</td>
<td>3.82</td>
<td>1.43</td>
<td></td>
<td>4.16</td>
<td>1.47</td>
<td></td>
</tr>
<tr>
<td>LTA</td>
<td>10.56</td>
<td>2.30</td>
<td></td>
<td>11.08</td>
<td>2.39</td>
<td></td>
</tr>
<tr>
<td>LSUB</td>
<td>-0.66</td>
<td>5.39</td>
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<td>-0.37</td>
<td>5.43</td>
<td></td>
</tr>
<tr>
<td>CATA</td>
<td>0.36</td>
<td>0.27</td>
<td></td>
<td>0.35</td>
<td>0.27</td>
<td></td>
</tr>
<tr>
<td>Quick</td>
<td>3.75</td>
<td>5.83</td>
<td></td>
<td>3.20</td>
<td>5.30</td>
<td></td>
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<tr>
<td>DE</td>
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<td>0.15</td>
<td></td>
<td>0.12</td>
<td>0.15</td>
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<tr>
<td>ROI</td>
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<td>0.32</td>
<td></td>
<td>-0.08</td>
<td>0.31</td>
<td></td>
</tr>
<tr>
<td>Foreign</td>
<td>0.17</td>
<td>0.27</td>
<td></td>
<td>0.18</td>
<td>0.26</td>
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</tr>
<tr>
<td>Opinion</td>
<td>13%</td>
<td></td>
<td></td>
<td>11%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>YE</td>
<td>20%</td>
<td></td>
<td></td>
<td>23%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss</td>
<td>61%</td>
<td></td>
<td></td>
<td>56%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Big 5</td>
<td>65%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>City IL</td>
<td></td>
<td></td>
<td></td>
<td>36%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

LAF = natural log of total audit fees;  
LTA = natural log of total assets ($000);  
LSUB = natural log of the number of subsidiaries;  
CATA = ratio of current assets to total assets;  
Quick = ratio of current assets (less inventories) to current liabilities;  
DE = ratio of long-term debt to total assets;  
ROI = ratio of earnings before interest and tax to total assets;  
Foreign = proportion of subsidiaries that are foreign;  
Opinion = 1 if qualified audit opinion;  
YE = 1 if non-30th June balance date;  
Loss = 1 if reported loss in any of the last three years;  
Big 5 = 1 if Big 5 auditor; and  
City IL = 1 if auditor is the Big 5 City Industry Leader.
However, the Big 5 firms do earn over 90 percent of total audit fees. The Big 5 percentages of clients (fees) for the five cities are as follows: Adelaide, 70 percent (92 percent); Brisbane, 69 percent (91 percent); Melbourne, 62 percent (94 percent); Perth, 69 percent (86 percent); and Sydney, 66 percent (89 percent).

IV. RESULTS

The study’s primary results are presented in Table 3. Model (1) is the estimation using national-level data to determine the top two accounting firms in each industry, and Model (2) is the estimation using city-level data to determine the top two accounting firms in each unique city-industry combination. Both models are significant at $p < .01$ and have adjusted $R^2$s of 0.80, which are consistent with prior research and indicate good explanatory power for the models. The control variables are significant in the expected direction with the exception of OPINION, LOSS, and YE, which are not significant in any of the models.

Model (1) shows that both the national industry leader and the second-ranked firm in the industry have a premium over other auditors. The coefficient on the industry leader is significant at $p = .069$, and the second-ranked firm is significant at $p = .03$. An F-test cannot reject the null hypothesis of no difference in these two parameter estimates. We conclude from Model (1) that both of the top two nationally ranked firms in an industry ($n = 351$) have a comparable premium over the audit fees of other Big 5 auditors ($n = 330$). This result differs from Ferguson and Stokes (2002) who found no fee premia based on national market shares. However, they used a different model specification and conducted tests using market share threshold percentages to define industry experts (10, 15, and 20 percent) or tested the top-ranked firm alone.

Model (2) shows that the city-level industry leader has a fee premium over other auditors, but the second-ranked firm does not have a premium. The coefficient on the city-level industry leader is significant at $p = .01$. We conclude from Model (2) that the city-level industry leader ($n = 247$) has a fee premium relative to other Big 5 auditors ($n = 434$).

The results in Model (1) provide support for the firm-wide view of industry expertise, while the results in Model (2) provide support for the office-level view. We now attempt to reconcile these results by examining the potential joint effects of firm-wide and office-level industry expertise on the pricing of audits. Model (3) in Table 3 creates three test variables: (1) an indicator variable if the auditor is one of the two top-ranked accounting firms in an industry nationally, and is also the city-specific industry leader ($n = 169$); (2) an indicator variable if the auditor is one of the two top-ranked firms in an industry nationally, but is not the city-specific industry leader ($n = 182$); and (3) an indicator variable if the auditor is the city-specific industry leader, but is not one of the two top-ranked firms in an industry nationally ($n = 78$). The default comparison group is companies whose Big 5 auditor is neither the city-level industry leader nor one of the two top-ranked firms nationally ($n = 252$).

Model (3) shows that auditors have significantly higher fees when they are both the city-specific leader and one of the top two firms nationally ($p = .001$). The coefficient on the auditor variable is 0.213, and using the procedure described in Craswell et al. (1995, 307), this parameter value represents an average audit fee premium of 24 percent.\footnote{The procedure calculates the percentage effect of the intercept shift on the dependent variable (natural log of audit fees), and is defined as $e^z - 1$, where $z$ is the parameter value for auditors who are market leaders.} The other two auditor indicator variables in Model (3) are not significant at conventional levels.
<table>
<thead>
<tr>
<th>Control Variables</th>
<th>Exp. Sign</th>
<th>National #1 and #2 Firms</th>
<th>City #1 and #2 Firms</th>
<th>Combined Model</th>
<th>Model 3 excluding Adelaide, Brisbane</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
<td>Model 3</td>
<td>Model 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Estimate</td>
<td>t-value</td>
<td>Prob*</td>
<td>Estimate</td>
</tr>
<tr>
<td>Intercept</td>
<td></td>
<td>-1.54</td>
<td>-8.05</td>
<td>0.001</td>
<td>-1.52</td>
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<tr>
<td>LITA</td>
<td>+</td>
<td>0.47</td>
<td>31.20</td>
<td>0.001</td>
<td>0.46</td>
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<tr>
<td>LSUB</td>
<td>+</td>
<td>0.05</td>
<td>9.20</td>
<td>0.001</td>
<td>0.05</td>
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<td>8.77</td>
<td>0.001</td>
<td>0.94</td>
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<td>Quick</td>
<td>-</td>
<td>-0.03</td>
<td>-5.06</td>
<td>0.001</td>
<td>-0.03</td>
</tr>
<tr>
<td>DE</td>
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<td>0.76</td>
<td>4.21</td>
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<td>0.75</td>
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<tr>
<td>ROI</td>
<td>-</td>
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<td>0.001</td>
<td>-0.45</td>
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<tr>
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<td>0.69</td>
<td>6.60</td>
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<td>Opinion</td>
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<td>0.04</td>
<td>0.968</td>
<td>0.01</td>
</tr>
<tr>
<td>YE</td>
<td>-</td>
<td>0.03</td>
<td>0.44</td>
<td>0.663</td>
<td>0.03</td>
</tr>
<tr>
<td>Loss</td>
<td>-</td>
<td>-0.01</td>
<td>-0.15</td>
<td>0.881</td>
<td>-0.01</td>
</tr>
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</table>

(continued on next page)
### TABLE 3 (continued)

<table>
<thead>
<tr>
<th>Experimental Variables</th>
<th>Exp. Sign</th>
<th>National #1 and #2 Firms</th>
<th>City #1 and #2 Firms</th>
<th>Combined Model</th>
<th>Model 3 excluding Adelaide, Brisbane</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Model 1</strong></td>
<td><strong>Model 2</strong></td>
<td><strong>Model 3</strong></td>
<td><strong>Model 1</strong></td>
<td><strong>Model 2</strong></td>
</tr>
<tr>
<td>Industry Leader</td>
<td></td>
<td>0.094</td>
<td>1.48</td>
<td>0.069</td>
<td>0.143</td>
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<td>Second Largest Firm</td>
<td></td>
<td>0.117</td>
<td>1.88</td>
<td>0.030</td>
<td>0.050</td>
</tr>
<tr>
<td>National #1 or #2, and city #1</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>National #1 or #2, not city #1</td>
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<td></td>
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</tr>
<tr>
<td>City #1, not National #1 or #2</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>F-statistic (p-value)</td>
<td></td>
<td>227</td>
<td>(&lt;.001)</td>
<td>227</td>
<td>(&lt;.001)</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td></td>
<td>0.80</td>
<td></td>
<td>0.80</td>
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<tr>
<td>Sample Size</td>
<td></td>
<td>n = 681</td>
<td></td>
<td>n = 681</td>
<td></td>
</tr>
</tbody>
</table>

*All p-values are two-tailed, except the experimental auditor market share variables, which are one-tailed.

- **LTA** = natural log of total assets;
- **LSUB** = natural log in the number of subsidiaries;
- **CATA** = ratio of current assets to total assets;
- **Quick** = ratio of current assets (less inventories) to current liabilities;
- **DE** = ratio of long-term debt to total assets;
- **ROI** = ratio of earnings before interest and tax to total assets;
- **Foreign** = proportion of subsidiaries that represent foreign operation;
- **Opinion** = indicator variable, 1 = qualified audit report;
- **YE** = indicator variable, 1 = non-June 30th year end;
- **Loss** = indicator variable, 1 = loss in any of the past three years.
Model (3) is re-estimated dropping those observations in Adelaide and Brisbane, the two smallest cities in the sample. This result is reported as Model (4) in Table 3 and is qualitatively the same as Model (3), indicating that the results in Model (3) are not driven by potentially smaller industry sizes and auditor clienteles in Adelaide or Brisbane. The auditor coefficient is slightly larger (.24) equating to an average premium of 27 percent for auditors that are both city leaders and one of the top two firms nationally. As a further sensitivity analysis, Model (3) is also re-estimated dropping each of the five cities one at a time. Despite the loss of observations, these additional results are qualitatively the same as Model (3) and auditors that are both the local industry leader and one of the top two firms nationally have a significant fee premium (p < .05) in all cases, and the other two auditor indicator variables are insignificant. To be sure that individual industries do not drive the results, Model (3) is re-estimated deleting each of the 24 industries one at a time. The fee premium for auditors that are one of the two top-ranked firms nationally and also the city-specific industry leader is robust to dropping individual industries, and the one-tail p-values range from .001 to .034 and average .005.

At face value the results in Models (3) and (4) imply that both firm-wide and office-level expertise affects audit pricing and that neither view alone is correct or sufficient to explain a fee premium for industry expertise. However, further analysis shows that in fact the results are driven by office-level industry leadership. We begin by comparing the city-level market shares of the two top-ranked firms nationally when they are also the city industry leader (n = 169) vs. when they are not the city industry leader (n = 182). The purpose is to see if relative market share data help to explain why a premium is earned by national leaders only when they are also city leaders. When the two top-ranked firms nationally are also the city-industry leader, they have an average market share of 66 percent, which is significantly greater than the average market share of 17 percent for the second-ranked firm in the city (t-statistic 32.5, p < .001). However, when the two top-ranked firms nationally are not the city-industry leader, their average market share is only 17 percent, which is significantly less than the average market share of 48 percent for the city-industry leader in those cities (t-statistic −30.1, p < .001). If expertise is inferred by having a leading local-office market share, then the two top-ranked firms nationally clearly have significantly smaller market shares than the city leader in those cities where they are not the city leader. These market share comparisons help to better understand why an audit premium is earned only when the firm is also the city-level industry leader.\(^{13}\)

Next we show that national industry leadership itself is a statistical artifact of the city-specific offices where the firm is the industry leader. The nationally top-ranked Big 5 firm in each industry is the city leader in 45 of 103 city-industry combinations in the study (recall from Table 1, Panel B there are 120 possible city-industry combinations in the study, less 17 that have no observations). In aggregate, the national Big 5 industry leaders’ audit fees for these 45 city-industry combinations in which the national leader is also the city leader represent 95 percent of the national leaders’ total industry audit fees. Importantly, the same Big 5 firm would still be the nationally top-ranked firm in 21 of 24 industries in the study if the top-ranked accounting firm’s fees were based solely on those offices where it is also the city-specific industry leader. This analysis illustrates why the national market share data for the top-ranked firm is a statistical artifact of the city-specific practice offices in which these firms are industry leaders. In other words, national market share data for

\(^{13}\) The results are comparable when dropping those city-industry combinations in which the city leader has only one or two clients. This is important because it rules out that the market share differences are not driven by small industries or small auditor clienteles.
the top firm nationally is driven almost exclusively by the individual offices where the firm is also the city leader.\textsuperscript{14}

In sum the top two firms nationally earn a premium \textit{only} in those specific offices where they are also the city-industry leader, and it turns out that national-industry leadership data are really driven by the individual offices where the firm is the city leader. We conclude that the evidence does not support the existence of positive firm-wide externalities for industry expertise beyond those offices where the firm is the city-specific industry leader, and that the pricing of expertise appears to be limited to those individual offices where the auditor is the city leader.\textsuperscript{15}

There is one anomaly in our results, however. Model (3) in Table 3 show that the city-level industry leader does \textit{not} earn a premium if they are not also one of the top two firms nationally. This is the case for 78 observations representing 24 of the 90 city-industry combinations having a Big 5 firm as city-level industry leader. An additional analysis of these 78 observations is now undertaken to better understand why there is no fee premium. One explanation is that despite being the top-ranked firm in the city, these auditors do not have a significantly different market share from the second-ranked firm. These 78 city-industry leaders have an average market share of 63 percent, which is significantly greater than the average market share of 18 percent for the second-ranked firm in the city (t-statistic 5.19, p < .001). However, in eight of the 24 city-industry combinations (representing ten of 78 observations) the city leaders have a 100 percent market share. This potentially exaggerates the market share differences as there are only ten observations in these eight city-industry combinations.\textsuperscript{16} For the remaining 16 city-industry combinations (representing 68 of the 78 observations) the city leaders’ average market share is 44 percent, compared to an average market share of 28 percent for the second-ranked firm. In other words, for 68 of the 78 observations, the city-leader’s market share is much closer to the second-ranked firm in the city, with an average difference of 16 percent (vs. a much larger difference of 39 percent in the 66 city-industry combinations where the city leader earns a premium). So it is possible that despite being the nominal city-level industry leader, in these 16 city-industry combinations the city leader does not stand out as being qualitatively different from the second-ranked firm, in which case there would be no perceived difference in expertise and no basis for a differential audit fee.

Finally, in terms of overall materiality, these 24 city-industry combinations in which the city leader does not earn a fee premium represent only 10 percent of total audit fees in the sample, and 29 percent of companies. By contrast the 66 city-industry combinations in which the Big 5 city leader earns a fee premium represent 90 percent of total audit fees in the sample, and 71 percent of companies. Median total assets are $87.9 million (Australian dollars) for observations in the 66 city-industry combinations, compared to only

\textsuperscript{14} A similar though less dramatic effect occurs for the second-ranked firm nationally. The second-ranked Big 5 firm in each industry is the Big 5 city leader in 21 of 103 possible city-industry combinations, and representing 14 of the 24 industry categories in the study. These second-ranked firms would still be the nationally second-ranked in eight of the 14 industries where they are a city leader if the firms’ industry fees were based solely on these offices.

\textsuperscript{15} As a further sensitivity analysis, we test if auditors that are industry leaders in two or more cities earn higher fees than auditors that are the city-leader in only one city. The tests indicate that audit firms do not earn a relatively higher fee premium if they are the industry leader in multiple cities compared to audit firms with only one city, which means there is no evidence of positive externalities arising from multiple city leadership. This finding reinforces the importance of individual office-level industry leadership in the perception and pricing of Big 5 industry expertise.

\textsuperscript{16} In addition, in seven of these eight city-industry combinations, the city leader has only one audit client, and this may limit the firm’s ability to credibly claim expertise due to lack of multiple clients.
$22.0 million for observations in the 24 city-industry combinations. Thus, both clients and fees are much smaller in the 24 city-industry combinations where the city-leader does not earn a fee premium. This is consistent with prior evidence that an industry premium is more likely for larger companies (Craswell et al. 1995; Ferguson and Stokes 2002). It is possible these smaller firms are either unable or unwilling to pay a premium to the city-level leader for its industry expertise.

In conclusion, the empirical results in Table 3 provide evidence of a Big 5 audit fee premium for industry expertise, and this result is explained primarily by office-level industry leadership in city-specific locales that represent 90 percent of total audit fees in the sample. Further implications are discussed in the concluding section but it appears that the traditional firm-wide view is not adequate to fully describe the operations of Big 5 accounting firms, at least in terms of explaining the audit market’s perception and pricing of auditor industry expertise.

V. SENSITIVITY ANALYSIS AND ROBUSTNESS CHECKS

Additional sensitivity analyses are reported in this section. All tests are based on Model (3) in Table 3. The analyses demonstrate the robustness of Model (3) to a wide range of sample selection and model specification issues.

Individual Big 5 Firms

Model (3) is re-estimated dropping each Big 5 firm one at a time to be sure individual Big 5 firms do not drive the results. Despite considerably reduced sample sizes in each of these five estimations, the results are qualitatively the same as Model (3). The auditor indicator variable for observations in which the auditor is one of the national top two firms and also the city leader is significant in all cases at p < .07, with no evidence of a significant fee premium for the other two auditor variables.

Industry Sensitivity

An analysis is undertaken to assure that small industries do not drive the statistical results. Industry expertise is not necessarily a meaningful concept if there are only a few firms in an industry in a particular city. Model (3) in Table 3 is re-estimated dropping all industries in each city that have fewer than five observations. For this reduced sample (n = 584) the results are comparable to Model (3) for the full sample.

Table 1, Panel B shows that city-level industry leaders have market shares of 90 percent or more in 29 of the industry-city combinations in the study. If the premium for industry expertise is driven by this set of observations, then it could be argued that the audit fee premium represents an economic rent arising from the auditor’s monopoly power rather than a premium for industry expertise. We re-estimate Model (3) in Table 3, dropping observations in these 29 industry-city combinations, and the result for this reduced sample (n = 644) is consistent with Model (3) for the full sample. Therefore, the audit fee premium is not driven by the auditor’s potential monopoly power. We also dropped 42 observations that are city-industry leaders with only one client, to further rule out that small industries

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17 Other than being smaller in size, the observations in these 24 city-industry combinations are not unusual in terms of industry or auditor relative to the 66 city-industry combinations where the city leader earns a fee premium. The distributions across broad industry sectors (mining, manufacturing/distribution, services) are comparable, and the two dominant auditors are KPMG and PricewaterhouseCoopers in both groups. The 78 observations are more heavily distributed in Perth for the 24 city-industry combinations (59 percent compared to 11 percent), but we do not know why this might affect the fee premium, particularly since the industry and auditor distributions are comparable.
/clients do not drive the statistical results. Model (3) is unchanged when estimated without these 42 observations.

Finally, Model (3) is re-estimated dropping all observations in the mining sector (industries 01–04) to assure that this large sector of the Australian economy does not drive the statistical results. For this reduced sample (n = 456) the results are comparable to Model (3) for the full sample.

**Effect of Client Size on Industry Premium**

Client size is controlled by including total assets (LTA) in the fee model. However, it is still possible that the magnitude of the fee premium in Model (3) is sensitive to size. For example, larger clients might have greater bargaining power with auditors and therefore may pay a lower premium for industry expertise. To determine if the premium in Model (3) in Table 3 is sensitive to client size, an additional variable is added for the interaction of company size (LTA) with the auditor indicator variable for those observations in which the auditor is one of the top two firms nationally and also the city leader. The interaction term is positive and significant (p < .001). Therefore the premium in Model (3) does increase as client size increases, which is consistent with both Craswell et al. (1995) and Ferguson and Stokes (2002).\(^{18}\) Craswell et al. (1995) speculate that larger companies are more likely to benefit from hiring an industry expert, and are also more capable of paying higher audit fees. This finding may also help to explain the lack of a fee premium for the 78 smaller than average companies in the sample that were audited by city industry leaders who were not also national leaders.

**VI. DISCUSSION**

The purpose of this study was to re-examine the effects of industry expertise on Big 5 audit fees using a new research design based on industry rankings to denote industry audit experts, and testing the effect of auditor industry expertise at both firm-wide view and office-level of analysis. Our results provide support for the office-level but not the firm-wide view of auditor industry expertise. Specifically, our tests show that being one of the top two firms nationally does not translate to a fee premium unless the auditor is also the city-specific industry leader. The national top two firms do not earn a premium in those cities where they are not the city leader. We also document that national industry leadership in 21 of the 24 industries in the study is driven almost exclusively by the individual offices in which the accounting firm is also the city-level industry leader. We further document that being the industry leader in multiple cities does not increase the fee premium relative to those cases where the Big 5 firm is the city leader in only one city.

In sum, the evidence does not support the existence of positive network externalities across offices, which is assumed to be the case in the firm-wide view of industry expertise. Rather, our tests show the opposite, namely, the industry expertise that is priced by the audit market is city-specific and a function of local-office industry leadership. The firm-wide and international views of Big 5 accounting firms are important in understanding their organization structures and operations. However, our findings provide evidence that the office-level perspective and city-specific audit markets are also important to fully understanding the operations of Big 5 accounting firms, and recent research has begun to investigate office-level behavior of Big 5 firms (e.g., Craswell et al. 2002; Reynolds and Francis

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\(^{18}\) The effect of the interaction term on the premium in Model (3) in Table 3 is estimated by calculating the fee premium for ±1 standard deviation of LTA, holding all other factors constant. In our sample the premium ranges from close to zero for an observation with minus 1 standard deviation of LTA, to a premium of 30 percent for an observation with plus 1 standard deviation of LTA.
2000). As a caveat, we do note that for 78 observations in 24 city-industry combinations, which represent 10 percent of total audit fees in the sample, the city-level industry leader does not earn a premium for industry expertise and this may be related to the relatively smaller size of companies in these particular city-industry combinations.

The empirical results in the study are necessarily limited to the Australian audit market, and with only five major cities it may be difficult to perfectly isolate firm-wide vs. office-level measures of auditor industry expertise. However, there are reasons to believe similar results would be found in the U.S. audit market. The reason is that the U.S. audit market is far more geographically dispersed than the Australian market. In our sample, 84 percent of Australian publicly listed companies are concentrated in just three cities: Melbourne, Perth, and Sydney. By contrast, Francis et al. (1999, 194) report that the 10 largest U.S. cities have only 50 percent of U.S. publicly listed companies. Big 5 practices are also more widely dispersed in the U.S. Francis et al. (1999, 195) document that among the Big 5 firms' 10 largest offices, there are only five common cities. This means there is greater geographical dispersion in the U.S. than in Australia of both clients and auditors, which means that it may be more difficult for Big 5 firms to create uniform firm-wide reputations for industry expertise and to achieve positive network externalities across all offices. In other words, with greater dispersion there is a greater potential for variations in Big 5 reputations and clientele across cities, and thus it is possible that one would observe a significant local-office effect on the perception and pricing of industry expertise in the United States.

On the other hand, it may be easier for Big 5 accounting firms in Australia to develop unique office-specific reputations since there are only five primary cities in the country. In contrast, the fact that Big 5 firms have many more practice offices in the United States may make it more difficult for individual offices to develop unique reputations that differ markedly from the firm's overall national reputation. Because the U.S. offers a richer multi-office setting than Australia, an obvious direction for future research is to use the new U.S. fee disclosures to further examine the interplay of firm-wide and office-level characteristics of accounting firms, and the audit market's perception and pricing of auditor industry expertise.

REFERENCES


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