Pricing in the accountant labor market

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Abstract

This study examined pricing in the market for seasoned accountant labor. We investigated the value of employment experience, education, and professional certification on the starting salaries for over 1,000 seasoned accountant job placements. Our results indicated that the labor market paid a salary premium to accountants previously employed by a Big 4 firm. For other job candidates, salaries were discounted relative to those paid to Big 4 alumni, and the labor market utilized alternative metrics of quality to reduce uncertainty, such as Fortune 200 experience, education, and professional certification. The results of this study suggested the existence of a labor market partitioned into two tiers: one for accountants who had previously worked for a Big 4 firm, and one for job candidates with other types of experience.

Keywords: accountant labor market, compensation, 'Big 4', Fortune 200, masters of accounting.
Data Availability: Data utilized in this research are derived from a proprietary source.

INTRODUCTION

The objective of this research is to answer the question: What qualities or characteristics of experienced accountants create value in the labor market? We attempt to ascertain not only what attributes of job seekers are prized, but also how accountant labor is priced. Our focus is on the marketplace for seasoned accountant labor because it is more dynamic and populated with more heterogeneous participants than the market for new university graduates. Furthermore, the competition for experienced accountants provides a rich setting for examining the collective interplay between the demands of the job market and the career choices and human capital investments of the participants.

In this study, we investigated the value of experience, education, and professional credentials on the starting salaries for over 1,000 job placements in the accountant labor market during the period 2000 - 2003. Our data were gathered from the records of a national placement firm, and represented principally experienced accountants hired by publicly-held corporations and private entities. We evaluated empirically whether the accountant labor market pays a premium for: 1) Big 4 public accounting experience, 2) advanced degrees, 3) degrees awarded by top-tier academic institutions, and 4) professional certification.

Our analyses indicate that the value assigned by the labor market to Fortune 200 experience, bachelor's degrees, advanced degrees, and professional certification was dependent upon whether the accountant had Big 4 experience. A higher starting salary was paid to accountants with Big 4 experience, but the labor market was effectively indifferent regarding their educational background, paying a premium only for an advanced degree awarded by a university ranked in the highest quality tier, and for certification as a public accountant (CPA). In contrast, job candidates without a Big 4 background received premiums for an advanced degree from any institution, Fortune 200 experience, non-Big 4 public accounting experience, and both CPA and non-CPA professional certifications.

These results of this research suggest the existence of a labor market partitioned into two stratums: one for accountants who had previously worked for a Big 4 firm, and one for job candidates with other types of experience. A potential explanation for this two-tier market is that as the Big 4 are comparatively homogeneous firms with strong brand name reputations (Beatty 1989; Francis and Wilson 1988), selective in hiring, and provide high quality work experiences to their employees (Stevens 1981), the labor market has a relatively high degree of certainty regarding the productive capability of their alumni. Consequently, employment by a Big 4 firm may serve as a screening function in the accountant labor market (Arrow 1973), and investments in human capital prior to entry, such as obtaining an undergraduate degree from a high quality institution, do not provide incremental information regarding the quality of the job applicant.[1] For accountants lacking Big 4 credentials, the labor market has comparatively less information about previous employers and the quality of their work experience, and correspondingly greater uncertainty in predicting productivity. As a result, compensation is initially discounted relative to that awarded to former Big 4 accountants. The labor market then relies upon alternative

[1] We do not attempt to differentiate between human capital (Becker 1964; Mincer 1974) and signaling/screening (Arrow 1973; Spence 1973, 1981) explanations as to "why" the accountant labor market assigns value to various attributes. Both theories are utilized to provide support for our hypotheses, which focus on establishing "what" employee attributes are valued.

indicators of quality to reduce uncertainty, such as educational background or professional certification, and adjusts compensation appropriate to the expected level of productivity.

This study makes several contributions to the accounting research literature. First, the study provides important insights into how the seasoned accountant labor market functions, and identifies elements that convey a comparative advantage to the participants. By partially removing the penumbral veil previously shrouding the market for accountant labor, the results provide a roadmap to accounting students for career planning and to accounting educators who often provide career counsel. Second, as the first study to comprehensively investigate how the seasoned accountant labor market functions, the results both confirm and disconfirm some long-standing perceptions regarding the relationship between human capital investments and the valuation of accountant services. Third, this study constructs a foundation for future research on the accountant labor market. Finally, the results of our research have implications for both accountants and employers of accountants. For accountants, the results provide guidance for investments in their human capital and in assessing the relative market value of their qualifications. For employers, the results provide information that will enable them to set salary levels sufficient to attract appropriately qualified and credentialed accountants.

The remainder of this paper is structured in the following manner. In the next section, we discuss the relevant literature and present our hypotheses. The research methodology and the results of the statistical analyses are contained in the third section. Our summary and conclusions follow in the final section.

LITERATURE REVIEW AND HYPOTHESES

Big 4 Experience

The Big 4 firms dominate the public accounting industry in the United States, auditing almost all of the Fortune 500 and the great majority of publicly traded companies.[2] For fiscal year 2004, the total combined United States net revenue for the Big 4 exceeded the total combined net revenue of the next ninety-six largest public accounting firms (Lindy 2004). Research on the relationship between employer size and productivity suggests that Big 4 alumni may be perceived as higher quality by the accountant labor market. Employer size and wages are positively related (Dupray 2001; Oi 1990; Pearce 1990), creating a competitive advantage for Big 4 firms in attracting the most qualified workers. Large employers are also more diligent in screening potential employees, and tend to hire job applicants with greater educational achievement (Dupray 2001; Schmutte 2001). As educational achievement serves as an indicator of productive capability (Arrow 1973; Spence 1973), accountants hired by Big 4 firms may be perceived as higher quality than those hired by smaller firms. Employee productivity is also higher in larger companies, which Idson and Oi (1999) partially attribute to greater effort by their workers. Dupray (2001) found that employees first hired by large companies are more productive than those first hired by small companies. Therefore, the accountant labor market may consider former Big 4 employees as potentially more productive than other job candidates.

[2] The Government Accountability Office reported in 2003 that the Big 4 audited over 78 percent of all U.S. public companies (Guaalaplli 2005). Based on U.S. Compustat data, Francis et al. (2005) reported that the Big 5 firms audited approximately 85 percent of all U.S. companies in the period 2000-2001.

Big 4 firms collectively service a client base that includes the largest, most diversified, and complex national and international corporations, presenting work experiences that may not be readily duplicated elsewhere in the public accounting industry. As job assignments convey information about the quality of the worker to external labor markets (Mori 1991; Waldman 1983; 1990), the client base of the Big 4 may convey an advantage to their alumni in that employers will prefer to hire accountants with higher quality work experiences (Waldman 1990).

Service providers are ultimately dependent upon the skills, training, experience, and motivation of their personnel. Therefore, the reputation capital of a public accounting firm, or the value created by the perception the firm's critical characteristics compared to its rivals (Oswald 1996), may attach to alumni seeking employment (Erdem and Swait 1998; Hamori 2003; Kirmani and Rao 2000; Titman and Trueman 1986). Big 4 firms have invested more in reputational capital than non-Big 4 firms (Beatty 1989), and sustain their reputation through investments in their employees (Francis et al. 2005) and by providing higher quality audits in the United States (Colbert and Murray 1999; DeAngelo 1981; Francis 2004; Francis and Krishnan 1999; Khurana and Raman 2004; Palmrose 1988; Teoh and Wong 1993).[3] As the reputation capital of a job seeker's former organization informs the labor market of her productive capability (Spence 1974), Big 4 alumni may be perceived as higher quality by the accountant labor market.[4]

The preceding discussion suggests that experience with a Big 4 firm serves to proxy for quality in the accountant labor market. Employers who demand high quality accountants should be willing to pay higher wages (Rao and Monroe 1996; Spence 1973). Therefore, we expect that candidates in the accountant labor market with Big 4 experience will receive higher salaries than similarly qualified candidates without Big 4 experience.

H1: Participants in the accountant labor market with Big 4 experience will command a wage premium.

Big 4 Tenure

Big 4 work experience may mitigate adverse selection in the labor market by signaling productive potential. Employers, however, still confront the informational problem of shirking, or moral hazard, even by the most qualified workers. Employment in Big 4 firms is largely characterized by "up-or-out" contracts, under which workers are either promoted within a relatively fixed time interval or terminated (Stevens 1981). Working environments under up-or-out regimes may be utilized to overcome moral hazard problems because the firm does not retain workers of low productivity (Kahn and Huberman 1988). Although only the employing firm has private information regarding the productivity of an employee, under up-or-out contracts, retention serves as a signal of the worker's productivity to outside employers (Waldman 1990).

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[3] Some evidence suggests that the higher quality audit services of Big 4/5 firms in the U.S. enable them to command a price premium (Palmrose 1986; Simon and Francis 1988). Francis et al. (2005) reports an average audit price premium for U.S. Big 4 firms of approximately 20%, and provides evidence suggesting that firms earning higher fees provide higher quality audits.

[4] Hamori (2003) found reputation capital to be positively related to firm size in the financial services industry, as well as to the promotions and salary increases departing employees received when they changed employers.

Length of tenure with a Big 4 firm reduces information asymmetry by signaling productivity to potential employers in the accountant labor market.

Research in economics has indicated that tenure is positively related to output (Altonji and Shakotko 1987; Toppel 1991). Under human capital theory, investment in skills increase productivity, resulting in higher wages (Lazear 2000; Shaw 1984). Increases in wages due to tenure, as opposed to experience in general, are considered evidence of the acquisition of job–specific skills (Shaw and Lazear 2008). As larger clients require a more sophisticated skill set from their auditors, and responsibilities and job requirements increase with tenure in Big 4 firms, productivity should rise with the acquisition of more job-specific skills. To the extent that these skills are transferable, greater tenure in a Big 4 firm will result in higher wages in the accountant labor market (Shaw 1984; Toppel 1991).

H2: Length of tenure will positively affect the Big 4 premium in the accountant labor market.

Education

As suppliers of accounting labor are relatively numerous and infrequently participate in the market, they are unlikely to invest individually in acquiring reputations for quality (Spence 1973). Instead, membership in a group associated with high productivity serves as an indicator of quality. Educational achievement has been commonly modeled as a signal of an individual's productive capacity (Arrow 1973; Reeve 1983; Spence 1973; Stiglitz 1975). Under the signaling framework, the primary role of education in the labor market is to signal the most able candidates to prospective employers (Spence 1973, 1974; Stiglitz 1975).[5] High productivity workers choose higher levels of education than low productivity workers, and receive correspondingly higher wages (Chevalier et al. 2004; Mintz 2004). The minimum educational standard for employment in public accounting is the bachelor's degree, and most other employers will only hire accountants with at least an undergraduate degree. High quality accountants will signal their superiority, therefore, by attaining an advanced degree beyond the bachelor's (Reeve 1983).

Although the signaling model of Spence (1973) does not consider learning as an objective of education (Hvide 2003), the value of a worker's labor has been represented by human capital theorists as a function of the productivity enhancing information acquired from years of schooling and job experience (Becker 1964; Mincer 1974; Stevens 2003). Workers increase their productivity, and therefore their value in the labor market, by investments in human capital. In the framework of the human capital model, education results in information acquisition and skills that are valued in the labor market (Mincer 1974). In a competitive labor market, the gain from education in the form of increased productivity will accrue to the worker in the form of higher wages (Becker 1964; Moen 1999). Accountants with an advanced degree will therefore be perceived as more productive by prospective employers.

Signaling and human capital models offer alternative explanations for variations in wages due to education; however, the models are not mutually exclusive (Spence 1981; Weiss 1995), and both theories predict that workers with higher levels of education will command a salary premium (Arrow 1973; Becker 1964; Mincer 1974; Spence 1973). Therefore, we expect

[5] Arrow (1973) suggests that admission to college may serve as a screening function, as higher quality academic institutions admit correspondingly higher quality applicants.

the labor market will perceive accountants with an advanced degree to be of higher quality than accountants holding only the bachelor's degree, and will correspondingly pay a higher wage.

H3: Participants in the accountant labor market with a master's degree will command a wage premium.

CPA Certification

The professional certification body that an accountant affiliates with sends a signal regarding his or her quality (Dunmore and Falk 2001). Similar to the rationale presented for education, high quality accountants can signal their superiority by incurring the costs of obtaining CPA certification. Outside of the public accounting industry, which has a monopoly in providing audit services, certification as a CPA has limited professional application.[6] The importance of CPA certification in the accountant labor market, however, is suggested by the occupational membership of the AICPA. In the years 2000-2004, over 60% of AICPA members were not employed in the public accounting industry (AICPA 2004). It is likely that these individuals incurred the costs of maintaining CPA certification because it conveyed a comparative advantage, such as informing the labor market of their high quality (Dunmore and Falk 2001). We posit that CPA certification is associated with favorable employee characteristics in the accountant labor market, and therefore CPA's will receive higher salaries than similarly qualified accountants lacking CPA certification.

H4: Participants in the accountant labor market with CPA certification will command a wage premium.

METHODOLOGY AND RESULTS

Sample Selection

To test the hypotheses, the authors contacted a national accountant placement firm in the United States and received permission to access their client database for the period 2000-2003. Accountant placement firms align job seekers with positions commensurate to their qualifications, thereby reducing the friction of unorganized labor markets, and are commonly utilized by experienced accountants and employers. The firm specialized in placing experienced accounting professionals with jobs in both the private and corporate sectors of the accountant labor market. The database represented placement files from offices located in six major metropolitan areas in Western and Midwestern states.

We were provided with data on 1,071 placements made by the firm from January 2000 to October 2003, including placement date, office location, starting salary, and employing company. In addition to this information, the placement firm provided resumes for 1,023 of the placed job seekers. Personal information pertaining to the placed accountant, including name, age, and gender, was redacted from the resume copies by the placement firm. Five observations

[6] Although certifications such as the Certified Management Accountant (CMA) and Certified Internal Auditor (CIA) are available to accountants, the CPA is the only certification that grants a license to practice.

were determined to have erroneous salary information and were deleted from the sample. The records provided by the placement firm, combined with information from the resumes, provided the data set for our analyses and a final sample of 1,018.[7] For each of the 1,018 placements, information gathered from the firm's records and resumes was coded and classified under three categories: 1) prior employment data, 2) educational background, and 3) professional credentials.[8]

Professional experience was calculated for each placement by summing the number of months employed for all employers. To capture the potential impact of organizational size on salaries, we separately identified publicly traded corporations in the Fortune 1,000 (Fortune 2003). For new placements with a public accounting background, we classified their experience as either Big 4 (including any with the Big 8, Big 6, and Big 5) or non-Big 4.[9] Tenure with the firm was calculated as the number of months employed. For educational background, we determined whether the employee had earned a master's degree, a bachelor's degree, or an associates degree. For the professional credentials category, we ascertained whether the employee was certified as a CPA, or maintained other professional certification.[10]

We indexed salary data to a common base to facilitate comparability across time periods. Starting salaries for new hires during the years 2000, 2001, and 2002, were adjusted to 2003 dollars, based on the United States Department of Labor, Bureau of Labor Statistics, Consumer Price Index-Urban Wage Earners and Clerical Workers (http://www.bls.gov/cpi) for each metropolitan area. Salary and demographic data for the sample are presented in Table 1 (Appendix).

Placement Data

The mean annual starting salary (in 2003 dollars) for the 1,018 placements was approximately $60,000, with more than half the placements occurring at Fortune 1000 companies (58%). For the sample, the average professional work experience before placement was 6.9 years, and approximately 27% of the new hires had some type of professional certification. Over 90% (920) of the sample had attained the bachelor's degree, and 18% (184) had a master's degree. In addition, 45% (453) of the new hires had worked in public accounting, with almost 80% of this group (357) reporting Big 4 experience.[11] Of the placements with Big 4

[7] The 48 placements without a resume were not included in the final sample because these observations did not have sufficient data for analysis. The average starting salary for these placements was $47,800.

[8] We were not able to determine if the placed employee received compensation other than salary, such as bonuses and stock options. Additionally, we were unable to ascertain the amounts of perquisites and benefits received per placement.

[9] A relatively small number of accountants in the sample had experience in both Big 4 and non-Big 4 firms. These individuals were included only in the Big 4 experience category.

[10] The CPA classification was assigned to subjects whose resume indicated that he/she had passed the CPA exam. The other professional certification classification included new hires whose resume indicated that the individual had attained a professional designation, most frequently the CMA.

[11] Of the remaining 96 individuals with non-Big 4 public accounting experience, 23 had worked for one of the twelve largest firms, representing Moss Adams, BDO Siedman, Grant Thornton,

experience, 22% earned a masters degree and 49% were CPAs. Not surprisingly, individuals with no degree or an associate's degree earned the lowest average salaries. The high mean salary for the 247 CPAs appears to suggest that the labor market values certification; however, because of correlations between many of the variables, interpretation is limited.

Panel C of Table 1 presents industry classification for the 1,018 placements. The insurance and real estate industry and the services industry combined for 50% of all placements. Panel D presents job or position classifications for the sample. As expected, executive positions such as CFO or CEO generated the highest mean salaries. Approximately 30% of the placements were for senior positions, including senior managers, assistant controllers, controllers, CFOs and CEOs. See Table 2 in the Appendix.

To test the hypotheses, we estimated the following model using ordinary least squares regression:

$$\text{Salary} = \alpha_0 + \alpha_1\text{Experience} + \alpha_2\text{Fortune 200} + \alpha_3\text{Non-Big4} + \alpha_4\text{Big4} + \alpha_5\text{Master's} + \alpha_6\text{Bachelor's} + \alpha_7\text{Associate's} + \alpha_8\text{CPA} + \alpha_9\text{Cert} + \varepsilon \quad (1)$$

Table 3 presents the results of the regression model and definitions of the variables. See Table 3 in the Appendix.

The regression model was significant ($p<.0001$) with an adjusted R^2 of .49.[12] Coefficients for the variables in the model represented the average increase in annual starting salary attributable to the specified characteristic.[13] As a control for potential geographical differences in salary, we initially included in the regression model a variable representing the six metropolitan placement offices. No significant difference in salary was attributable to geographical area, and the variable was dropped from the model.

The model indicated a significant effect for professional experience, with each year adding approximately $2,000 to the starting salary. This variable represents the value of one year of professional employment, and does not differentiate by type of experience.

The Big 4 variable was significant in the model, supporting H1. The premium for Big 4 experience was approximately $12,700, representing the average increment in annual starting salary attributable to prior employment with a Big 4 firm. Although not hypothesized, a marginally significant premium exceeding $3,300 resulted for placed accountants with public accounting experience in non-Big 4 firms.

As discussed, prior research indicates that employer size and employee wages are positively related (Dupray 2001; Oi 1990; Pearce 1990). Therefore, an alternative explanation for the Big 4 premium is that employees with experience at large organizations receive higher

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and RSM McGladrey. We compared the average salary this sub-sample to that of other placements with non-Big 4 public accounting experience, and found no difference.

[12] The Durbin-Watson Test (a test for autocorrelated disturbances) statistic was 1.870 for the regression model, indicating a failure to reject the null hypothesis of nonautocorrelated residuals (Johnston & DiNardo 1997).

[13] The prototypical earnings function utilizes a natural logarithm transformation of wages (Mincer 1974). In this research, we employed ordinary least-squares regression with untransformed salary dollars because our interest was in the incremental monetary value added by the variables in the model. We also ran the models with a logarithm transformation of salary, producing effectively parallel results.

wages. To control for this possibility, we included a variable in the model for prior employment with a Fortune 200 company. This cutoff level was selected because by our estimate, each Big 4 firm has total revenues sufficient to be included in the Fortune 200. However, accountants with employment experience at a Fortune 200 company did not receive significantly higher starting salaries. To ascertain whether the Big 4 premium may have been attributable to a public accounting firm size effect, we ran additional models including variables for large, national firms that had previously employed accountants in the sample. No significant premiums were attributable to experience with any of the national firms. These analyses suggest that the significance of the Big 4 variable is not due to an organizational size effect or a public accounting firm size effect.

Accountants in the sample holding a master's degree received a starting salary significantly higher than those without an advanced degree, supporting H3.[14] The average salary increment for the master's degree amounted to approximately $7,500. As the sample consisted of seasoned accountants placed in at least their second professional position, the premium for an advanced degree would not apply to new graduates seeking their first accounting position. Although not hypothesized, the bachelor's degree added significantly to the average starting salary, as compared to accountants not holding a four-year undergraduate degree.

The CPA credential added an average premium of approximately $11,200 to the placed accountants' starting salary, supporting H4. No significant value was assigned by the labor market to professional certification other than the CPA.

In Table 4, we further stratified the sample by years of Big 4 experience and by quality of educational institution for both master's and bachelor's degrees. From the U.S. News and World Report Rankings of Institutions of Higher Education for 2003, each institution was assigned to their respective quality tier, where Tier 1 represented the top 25%; Tier 2 represented the second 25%, *etc*. Unranked schools were assigned to a fifth tier, creating a ranking variable with values from 1 to 5 for both bachelor's and master's degrees. See Table 4 in the Appendix.

Recall that the coefficient for the Big 4 variable in model 1 of approximately $12,700 represented the average premium for all accountants in the sample with Big 4 experience. As indicated by the coefficients for the Big 4 tenure variables in Table 4, this premium is much smaller for Big 4 alumni with less than three years of experience. The smallest premium ($5,300) was generated by former Big 4 employees with one-to-two years of experience. A possible explanation for the low premium earned by Big 4 alumni with less than three years of experience is that leaving an employer earlier than expected, especially in an up-or-out employment setting, can be interpreted by the labor market as an indicator of an inferior worker (Hamori 2003; Noldeke and Van Damme 1990). As a result, for Big 4 alumni with relatively less experience, and especially for those in the one-to-two year range, the labor market may have received mixed signals. Employment with a Big 4 firm is apparently interpreted in the labor market as an indicator of quality; however, employees who leave before attaining two years of experience may be viewed with suspicion, and their value discounted. For employees with less than one year of Big 4 experience, the labor market may have ascribed more benign or non-work related causes for their unusually short stay.

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[14] The Master's of Accounting was the most commonly held advanced degree, followed by the MBA. We did not attempt to differentiate among the types of masters' degrees. Individuals with an MBA, for example, may have had a concentration in accounting, resulting in a degree largely overlapping in coursework with the Master's of Accounting.

From three to six years of experience, a range generally encompassing the senior positional level, the premium approximated the average for the full sample of former Big 4 employees. The premium increased dramatically for Big 4 alumni with at least six years of experience, paralleling the general timeline for promotion to the position of manager. For new placements with nine or more years of Big 4 tenure, the average premium exceeded $45,000. Except for the premium decline experienced in the one-to-two year category, these results substantially support H2: the longer the Big 4 tenure, the greater the salary premium.

As indicated in Table 4, the labor market paid approximately an equivalent salary premium for bachelor's degrees from all ranked institutions (Tiers 1 - 4). No significant premium was assigned to holding a bachelor's degree from an unranked institution (Tier 5). A similar pattern occurred for master's degrees, except that no premium was assigned to Tier 2 institutions.

Additional Analyses

Big 4 Firm Differences

The results of our regression models indicated the existence of a salary premium in the accountant labor market for placements with Big 4 experience. To ascertain whether the accountant labor market differentially compensated Big 4 alumni by firm affiliation, we replaced the Big 4 variable in model 1 with dummy variables for each firm (Arthur Andersen, KPMG, Deloitte & Touche, Ernst & Young, and PriceWaterhouseCoopers[15]). Variables representing the Big 4/5 firms were individually significant; however, the 95% confidence intervals for each coefficient indicated overlap among all firms. This suggests that the accountant labor market does not differentiate among the Big 4/5 firms, assigning essentially equivalent premiums to experience with any of the Big 4/5 including Arthur Andersen, which was subject to negative publicity during the period of observation.

Fortune 200 Experience and Professional Certification

To investigate the lack of significance for the Fortune 200 variable and for certification other than the CPA, we partitioned the sample of placements holding a bachelor's degree into two groups: those with Big 4 experience and those without Big 4 experience. We eliminated placements without the bachelor's degree because it is unlikely that they would be targeting the same jobs as Big 4 alumni. Post hoc, we speculated that Fortune 200 experience and certification may be more heavily relied upon by potential employers as quality metrics for non-Big 4 job candidates. Table 5 presents the results of the regression models partitioned by Big 4 experience. See Table 5 in the Appendix.

The results of the models in Table 5 suggest that the accountant labor market differentiates between candidates with Big 4 experience versus those without Big 4 experience. Note that in the Big 4 model, the intercept term would substantially absorb the Big 4 premium. Although only the intercept term and four variables in the Big 4 model achieved statistical significance, the adjusted R^2 of .51 indicates that the model has substantial explanatory power.

[15] Employees of legacy firms were classified based on the surviving firm (e.g., Coopers & Lybrand as PWC; Peat, Marwick, Mitchell as KPMG; and Arthur Young as Ernst & Young).

This is likely due to the impact of Big 4 experience in reducing labor market uncertainty regarding the quality of job candidates. In contrast, all variables except the bachelor's degrees were significant in the non-Big 4 model, and the adjusted R^2 was .45.

Partitioning the sample by Big 4 experience produced a significant Fortune 200 variable for both sub-samples, but in opposite directions: positive for placements without Big 4 experience but unexpectedly negative for the Big 4 group. The lack of significance for the Fortune 200 variable in the full sample models (Tables 3 & 4) was apparently due to its opposing impact on the two sub-groups. Consistent with our post-hoc expectations, Fortune 200 experience and non-CPA certification contributed positively to the starting salaries for non-Big 4 accountants. A potential explanation for this result is that the labor market may discount the salaries of these job candidates because of uncertainty arising from their lack of Big 4 experience. Other indicators of quality, such as Fortune 200 experience and certification, reduce this uncertainty and decrease the discount.

Further analysis of the data was undertaken in order to shed light on the negative Fortune 200 coefficient for placements with Big 4 experience. Of the 56 accountants with both Big 4 and Fortune 200 backgrounds, the average Big 4 tenure was under 3 years, and less than 20 of these individuals had experience in excess of 3 years. It is likely that the majority of this group was at the staff level when they departed their Big 4 firm. Because of this short tenure, the labor market may have had greater uncertainty regarding the productive quality of these individuals, and the negative coefficient effectively reduces the premium attributable to Big 4 experience.

CPA certification was significant for both models, again supporting hypothesis H4. An examination of the 95% confidence intervals for the CPA variable in the Big 4 and non-Big 4 models indicates no difference in the coefficients. As CPA certification has no practical application outside the domain of public accounting, the significance of this variable suggests that accountants holding the CPA credential have a comparative advantage in the labor market, perhaps because it may be perceived as a signal of quality (Dunmore and Falk 2001).

Education

For individuals with Big 4 experience, only an advanced degree from a Tier 1 institution increased their starting salary. The quality of the institution from which they received their bachelor's degree did not significantly impact salary, nor did a master's degree from a university other than a Tier 1 school. The overall lack of significance for the education variables may be attributable to the Big 4 firms' selectivity in hiring (Stevens 1981). A potential outcome of this selectivity is that admission into a Big 4 firm may serve as a screening function in differentiating quality (Arrow 1973). As the bachelor's degree, and often the master's degree, is an entry-level requirement, education does not contain information that incrementally contributes to reducing uncertainty beyond that provided by Big 4 employment.[16]

[16] Both the Wald test and the Chow test were conducted on the placements to determine whether the independent variables represented in Table 5 had differential impacts on the Big 4 sub-sample compared to the non-Big 4 sub-sample (Greene, 2007). The Wald statistic for the difference in coefficients between Big4 (n=359) and non-Big 4 (n=664) placements was significant (152.67, $p < 0.001$). The Chow statistic for the difference between Big 4 and non-Big 4 placements was also significant (11.47, $p < 0.001$). These results indicate that the parameters

For job candidates lacking experience with a Big 4 firm, the quality of the bachelor's degree was not significant in the model. In a labor market consisting of seasoned professionals, the quality of a bachelor's degree, although potentially useful for assessing a candidate's qualifications for an entry-level position, likely looses much of its relevance. In contrast to the Big 4 sample, an advanced degree from either a ranked or unranked institution (Tier 5) significantly increased starting salary. A possible explanation for this result is that when the labor market cannot rely upon Big 4 employment as a quality signal, it relies upon substitute indicators, such as an advanced degree, previous employers, and certifications.

Although the salary models in Table 5 assigned no significance to the quality of the job candidate's undergraduate institution, this result should not be interpreted as evidence that the ranking of the bachelor's degree institution does not impact the starting salary of seasoned professionals. Rather, for experienced accountants, the quality of their undergraduate university likely has an indirect effect on starting salaries through its influence on their first professional placement. Support for the indirect effect of the bachelor's degree ranking is provided by a supplemental analysis for the full sample which resulted in a significant, positive relationship between university tier and Big 4 employment.

SUMMARY AND CONCLUSIONS

The objective of this research is to identify and quantify elements of value in the accountant labor market. Based on our analyses of over 1,000 placements, we found strong support for the hypothesis that alumni of Big 4 firms command a premium in the labor market. The amount of the premium, however, depended upon the accountant's tenure with the firm. Accountants with only one to two years of Big 4 experience received an average premium of $5,300, while alumni with more than eight years were compensated with a premium exceeding $45,000.

The results of our analyses indicate that the accountant labor market is effectively composed of two tiers: one for accountants previously employed by the Big 4 and one for accountants with other types of work experience. Because the Big 4 are selective in hiring and the work experience is considered to be of high quality (Stevens 1981; Toffler 2003), there is likely greater certainty in the labor market regarding the potential productivity of Big 4 alumni. Other indicators of productive ability may not be incrementally informative beyond the contribution of Big 4 employment. This is especially true if the individual had a relatively long tenure in a Big 4 firm. Education, with the exception of an advanced degree from a Tier 1 institution, may not serve to inform the labor market regarding the quality of a job applicant because admission into a Big 4 firm functions as a screening mechanism (Arrow 1973), and education is required as a condition of entry.

The labor market is likely less certain of the productive potential of job candidates who were not previously employed by a Big 4 firm because their work experiences were more heterogeneous and less well-known. Therefore, the market may seek alternative indicators of quality, such as educational background, professional certification, and work experience in a large corporation. For individuals without Big 4 experience, our results indicated that a master's degree from any institution and professional certification other than a CPA significantly

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for the model in Table 5 are significantly different for placements with Big 4 experience compared to placements without Big 4 experience.

increased their starting salaries. The labor market may utilize these variables as substitutes for Big 4 experience in assessing job candidate quality.

Although CPA certification has no apparent professional application outside of public accounting, new placements holding this designation commanded a salary premium. This result is consistent regardless of whether or not the individual had public accounting experience. The premium paid for CPA certification may partially explain why most members of the AICPA do not work in public accounting, and why they are willing to bear the costs of maintaining their certification.

The results of this study suggest that the labor market considers experience with a Big 4 firm as the 'gold standard' for accounting job candidates. This does not imply, however, that alumni of Big 4 firms will always receive greater compensation than similarly qualified accountants without Big 4 experience. A more accurate interpretation is that in the absence of Big 4 experience, the labor market will seek additional indicators of quality, such as the CPA or other certification and a graduate degree. For example, consider two hypothetical job candidates with the following credentials: five years of public accounting experience, a CPA, a CMA, a Tier 3 bachelor's degree, and a Tier 3 master's degree. Using the models from Table 5 to estimate starting salary, the job candidate whose public accounting experience was with a Big 4 firm would receive $72,445, with no significant value assigned to the education variables or the CMA. The candidate whose public accounting experience was with a non-Big 4 firm would receive a starting salary of $75,974, with almost $20,000 attributable to the master's degree and CMA combined. If the master's degree was awarded by a Tier 1 institution, the salary advantage would shift to the candidate with Big 4 experience.

There are several limitations of this study. First, we were not able to determine the ethnicity or gender of the participants. The absence of this data represents a weakness of the study as demographic characteristics may influence placement and salary (Gerhart 1990). Although our models explain a relatively portion of the variance in salaries, the effect of excluding gender and ethnicity in this study is difficult to assess. Prior research has indicated that women and minorities are often at a disadvantage in the overall labor market (Bielby 2000; Fernandez and Mors 2008); however, wage differences appear largely attributable to occupational sorting (Petersen and Morgan 1995). Penner (2008), for example, recently examined the impact of gender and race on salaries at a large financial company, and found that controlling for occupational differences reduced gender and race effects to insignificance.

We did not have data on the age of the placements in our sample. Age is generally correlated with experience and tenure, which were significant in the model, and may therefore represent an omitted variable related to wages. Research in labor economics, however, generally estimates wages as a function of tenure or experience, and not age (Shaw and Lazear 2008). We were also not able to measure physical attractiveness or personality traits, which may also influence placement (Han, Norton, and Stearns 2008).

Second, there are numerous employment search alternatives and recruitment mechanisms, other than placement firms, available to sellers of accounting services. The placements comprising our sample may not be representative of those generated through avenues other than professional placement firms.

Third, our data were gathered from placements in the Western and Midwestern regions of the United States. Our data did not include placements in other geographical areas, including the Eastern region which represents the largest market for accounting labor. Therefore, the results of this study may not be generalizable to areas outside the Western and Midwestern United States.

Fourth, our measure of compensation included only starting salaries. We were unable to determine the amounts of any benefits, perquisites, stock options, and bonuses that may have been included in the placements. Finally, we did not attempt to assess the underlying reason(s) why the attributes identified in this study are valued by the accountant labor market. Future research may attempt to determine, for example, whether the labor market pays a premium for Big 4 experience because it serves as a signal of quality (Spence 1973; Stiglitz 1975), or because the work experiences and skills acquired are superior to those provided by other workplaces, (Becker 1964; Weiss 1995).

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TABLE 1

PANEL A

Salary and Years of Experience for Placements

Variable	Mean	Std. Dev.
Starting salary for 1018 placements	$60,084	(22,895)
Years of Experience	6.87	(5.29)

PANEL B

Descriptive Statistics for Job Placements

Variable Name (N)	Mean	Std. Dev.	Median	Max. Min.
Fortune 200 Experience (219)	$64,489	21,478	$61,000	$159,477 27,560
CPA certificate (247)	$77,934	28,204	$72,252	$212,635 36,028
Other certification (31)	$61,528	21,420	$60,047	$121,592 34,063
Master's and bachelor's degree (184)	$72,721	25,340	$67,327	$212,635 35,863
Bachelor's degree (743)	$58,770	21,550	$54,000	$184,587 20,641
Associate's degree only (14)	$44,292	10,170	$44,308	$59,000 25,530
No degree (77)	$45,430	15,793	$41,487	$101,002 27,250
Big 4 public accounting experience (357)	$71,870	25,163	$65,599	$212,635 36,028
Non-Big 4 public accounting experience (96)	$61,732	24,614	$55,128	$174,684 34,937

TABLE 1, continued

PANEL C

Industry Classification for Placements

Variable Name (N)	Mean	Std. Dev.
Agriculture, Forestry and Fishing (6)	$65,006	20,834
Mining (21)	60,231	18,224
Construction (13)	44,385	10,494
Manufacturing (164)	62,147	26,866
Transportation, Communications, Electric, Gas and Sanitary Services (211)	61,198	21,499
Wholesale Trade (9)	57,220	23,845
Retail Trade (62)	58,777	19,383
Insurance and Real Estate (247)	56,576	20,182
Services (261)	62,446	25,111
CPA Firm Services (13)	58,054	18,420
Public Administration and Nonclassified Establishments (11)	58,340	18,666

TABLE 1, continued

PANEL D

Job Classifications for Placements

Variable Name (N)	Mean	Std. Dev.
Partner/CEO/Owner/President/Director (30)	$98,599	29,745
CFO/SVP/VP(20)	120,176	40,420
Controller (64)	85,630	27,048
Assistant Controller (26)	73,763	23,181
Senior Manager/Manager/Assistant Manager (159)	72,747	15,074
Supervisor/Assistant Supervisor (27)	52,959	12,215
Senior Analyst/Senior Associate/Senior Consultant (59)	64,491	10,566
Senior Accountant/Senior Auditor/ Lead Accountant/Coordinator (128)	52,807	9,475
Associate/Consultant(10)	46,730	20,453
Analyst (146)	55,331	11,713
Accountant/Auditor (295)	46,523	13,415
Clerk/Administrative (26)	36,421	7,386
Other (28)	58,136	18,398

TABLE 2
Adjusted Salary Means, Frequencies, and Correlations

		Masters	Bachelor	Associates or No Degree	CPA	Other Cert	Big 4	Non Big 4	Fortune 200
Degree	Salary Frequency	$72,721 (184)	$58,770 (743)	$42,255 (91)					
CPA	Salary Frequency Correlation p-value	$84,248 (55) 0.062 [0.049]	$76,125 (192) 0.061 [0.054]	$0 (0)	$77,934 (247)				
Other Cert	Salary Frequency Correlation p-value	$78,916 (6) 0.006 [0.851]	$61,474 (20) -0.034 [0.281]	$40,876 (5) 0.045 [0.154]	$0 (0)	$61,258 (31)			
Big 4	Salary Frequency Correlation p-value	$77,773 (80) 0.083 [0.008]	$70,166 (277) 0.076 [0.015]	$0 (0)	$80,171 (175) 0.424 [0.001]	$73,177 (4) -0.082 [0.009]	$71,870 (357)		
Non Big 4	Salary Frequency Correlation p-value	$67,848 (14) -0.029 [0.351]	$60,688 (82) 0.090 [0.004]	$0 (0)	$74,934 (37) 0.107 [0.001]	$68,236 (2) -0.018 [0.565]	$0 (0)	$61,732 (96)	
Fortune 200	Salary Frequency Correlation p-value	$75,193 (61) 0.133 [0.001]	$61,445 (144) -0.085 [0.006]	$49,166 (14) -0.047 [0.136]	$80,025 (44) -0.051 [0.104]	$70,014 (9) 0.032 [0.301]	$76,775 (56) -0.104 [0.001]	$63,111 (21) 0.003 [0.928]	$64,489 (219)

Items on the diagonal for CPA, Other Cert., Big 4, Non-Big 4 and Fortune 200 represent averages across all categories. The summation of cases for the educational degrees (masters, bachelors only, and associates or no degree) equals the total on the diagonal. The other characteristics are not mutually exclusive.
Spearman correlation p-values are two tailed. Where frequencies equal zero (0), no correlations are reported.

TABLE 3

Results of Estimation of the Effects of Total Experience, Fortune 200 Experience, Public Accounting Experience, Level of Education, and Certification on Annual Salary Earned

$$Salary = \alpha_0 + \alpha_1 Experience + \alpha_2 Fortune\ 200 + \alpha_3 Non\text{-}Big\ 4 + \alpha_4 Big\ 4 + \alpha_5 Master's + \alpha_6 Bachelor's + \alpha_7 Associates + \alpha_8 CPA + \alpha_9 Cert + \varepsilon$$

Variable Name	Predicted Sign	Coefficients	t-statistics
Intercept		26,540	12.626***
Employment Variables			
Experience	+	2,000	18.925***
Fortune 200	+	905	0.693
Non-Big 4	+	3,313	1.754*
Big 4	+	12,689	9.802***
Education Variables			
Master's	+	7,479	5.397***
Bachelor's	+	10,412	2.331**
Associate's		1,332	0.279
Professional Credential Variables			
CPA	+	11,200	7.956***
Other Certification	+	2,181	0.719
N		1,018	
Adjusted R^2		0.486	

* Significant at .10, ** Significant at .05, *** Significant at .01

TABLE 3a
Variable Definitions
Dependent Variable

Salary	The starting annual salary earned by the employee placed by the search firm, adjusted to 2003 dollars by the Consumer Price Index – Urban Wage Earners and Clerical Workers for each metropolitan area.
Employment Variables	
Experience	The amount of professional work experience, in years, for the placed employee.
Fortune 200	Dummy variable equal to 1 if placed employee's experience included working for a Fortune 200 company, 0 otherwise.
Non-Big 4	Dummy variable equal to 1 if placed employee's public accounting experience was working for a Non Big 4 accounting firm, 0 otherwise.
Big 4	Dummy variable equal to 1 if placed employee's public accounting experience included working for a Big 4 public accounting firm, 0 otherwise.
Big 4 Tenure	Dummy variable equal to 1 if Big 4 public accounting firm tenure was for the time period indicated, 0 otherwise.
Education Variables	
Master's	Dummy variable equal to 1 if a master's degree was earned, 0 otherwise
Bachelor's	Dummy variable equal to 1 if a bachelor's degree was earned, 0 otherwise.
Associate's	Dummy variable equal to 1 if an associate's degree or equivalent college credit was earned, 0 otherwise.
Other Skills Variables	
CPA	Dummy variable equal to 1 if CPA certification was earned, 0 otherwise.
Cert	Dummy variable equal to 1 if professional certification, other than CPA, was earned, 0 otherwise

TABLE 4

Results of Estimation of the Effects of Total Experience, Fortune 200 Experience, Public Accounting Experience, Level of Education, and Certification on Annual Salary Earned

$$Salary = \alpha_0 + \alpha_1 Experience + \alpha_2 Fortune\ 200 + \alpha_3 Non\ Big\ 4 + \alpha_{4i} Big4 + \alpha_5 Associates + \alpha_{6i} Bachelor's + \alpha_{7i} Master's + \alpha_8 Cert + \alpha_9 CPA + \varepsilon$$

Variable Name	Coefficients	t-statistics
Intercept	28,355	14.303***
Employment Variables		
Experience	1,791	17.359***
Fortune 200	1,415	1.139
Non-Big 4	4,869	2.734***
Big 4 Tenure: 0 – 1 yrs.	8,131	2.443**
Big 4 Tenure: 1 – 2 yrs.	5,290	2.608***
Big 4 Tenure: 2 – 3 yrs.	11,304	6.555***
Big 4 Tenure: 3 – 4 yrs.	15,884	7.280***
Big 4 Tenure: 4 – 5 yrs.	14,543	4.628***
Big 4 Tenure: 5 – 6 yrs.	14,191	4.260***
Big 4 Tenure: 6 – 7 yrs.	22,309	4.871***
Big 4 Tenure: 7 – 8 yrs.	31,227	4.882***
Big 4 Tenure: 8+ yrs.	45,828	12.372***
Education Variables		
Master's Tier 1	15,426	7.376***
Master's Tier 2	2,991	1.363
Master's Tier 3	7,816	2.820***
Master's Tier 4	10,769	2.477**
Master's Tier 5	4,811	1.342
Bachelor's Tier 1	8,599	2.220**
Bachelor's Tier 2	8,193	2.112**
Bachelor's Tier 3	6,076	1.525
Bachelor's Tier 4	8,690	2.127**
Bachelor's Tier 5	131	0.030
Associate's	3,406	0.827
Professional Credential Variables		
CPA	8,653	6.399***
Cert	3,275	1.152
N	1,018	
Adjusted R^2	0.551	

* Significant at .10, ** Significant at .05, *** Significant at .01

TABLE 5

Results of Estimation of the Effects of Total Experience, Fortune 200 Experience, Quality of Education, and Certification on Annual Salary Earned for Public Accounting Experience Versus No Public Accounting Experience

$$Salary = \alpha_0 + \alpha_1 Experience + \alpha_2 Fortune\ 200 + \alpha_3 Non\text{-}Big4 + \alpha_{4i} Bachelors + \alpha_{5i} Master's + \alpha_6 Cert + \alpha_7 CPA + \varepsilon$$

Variable Name	Big 4 Public Accounting	All Others[a]
Intercept	47,850***	33,355***
Employment Variables		
Experience	3,213***	1,637***
Fortune 200	-10,258***	4,003***
Non-Big 4 Experience		4,204**
Education Variables		
Master's Tier 1	19,695***	13,569***
Master's Tier 2	-3,523	8,173***
Master's Tier 3	7,593	9,879***
Master's Tier 4	1,289	12,589***
Master's Tier 5	-14,549	8,132**
Bachelor's Tier 1	121	5,543
Bachelor's Tier 2	-700	6,156
Bachelor's Tier 3	-5,523	5,982
Bachelor's Tier 4	-2,027	7,035
Bachelor's Tier 5	-11,572	-1,047
Professional Credential Variables		
CPA	8,530***	11,131***
Cert	-15,832	9,220***
N	357	569
Adjusted R^2	0.510	0.445

[a] For qualitative comparisons, placements that indicated either an Associates degree or no achievement of a degree from a higher educational institution were dropped from this supplemental analysis.

* Significant at .10, ** Significant at .05, *** Significant at .01