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INSTITUTIONAL DETERMINANTS OF INDIVIDUAL MOBILITY: BRINGING THE PROFESSIONS BACK IN

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In this research, we developed and tested a theory of institutional effects on the timing of resignation in accounting. The institutional effects examined are credentialing processes. We found that the interaction of certification requirements and job duties affected early-career resignation rates of accounting firm employees. Auditors in all certification jurisdictions studied and nonauditors in jurisdictions with broadly focused experience requirements postponed resignation until after the completion of the requirement.

A significant development in organization theory since the mid-1970s has been the realization that organizations are embedded in institutional arrangements (Scott, 1994a). A substantial amount of research has begun to show how social institutions condition organizational structures. Beliefs about individual rights, for example, affect the presence of organizational structures protecting individual rights (Sutton, Dobbin, Meyer, & Scott, 1994). Cognitive structures guide people's symbolic representations, conceptualization of what constitutes an actor, and beliefs about the normative appropriateness of alternative actions (Meyer & Rowan, 1977; Scott, 1994b). Sometimes these representational, constitutive, and normative rules unconsciously guide behavior. Zucker (1977), for example, showed how defining behavior as occurring in a bureaucracy made the behavior more resistant to change. At other times, people act on institutional rules more consciously.

Researchers have often examined institutional theory taking a structural approach. Organizations are argued to adopt normatively appropriate or taken-for-granted structures because they are organizational building blocks. A correlation between institutional structures and organizational structures is then interpreted as supporting evidence for institutional effects. However, taking a structural approach means neglecting a micro-level mechanism un-

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derlying institutional effects. A complementary explanation for institutional effects is that institutions provide individuals with the basis for action. For example, equal opportunity laws and beliefs about individual rights may lead individuals to aggressively seek their newfound rights. In doing so, they can cause significant financial penalties to be levied against organizations. This potential penalty can motivate organizations to adopt institutionally appropriate structures. This micro-level explanation differs from the structural approach in its emphasis on individual action. Changes in social institutions may not be directly associated with changes in organizational structure; intervening individual action may be necessary. Social institutions affect individual behavior, which affects organizational structures.[1]

This micro-level argument has two important components. First, the relationship between institutions and individual behavior needs to be established. Second, the relationship between the resulting individual behavior and organizational structures needs to be established. Although Zucker's (1977) research demonstrated that institutions affect individual behavior, her research was in an experimental setting. Our goal in this article is to extend institutional theory by examining the former point: How do institutions for certification and credentialing relate to individual action, such as professional resignation?

We studied accountants because they are embedded in strong institutional environments, as are many professionals. The long training and socialization periods many professions require cause individuals within a given profession to have similar norms (Wilensky, 1964), similar beliefs about what constitutes a professional of a given type, and similar ways of representing the world. One significant component of most professional institutions is certification requirements, which in part define what constitutes a professional. We develop and test hypotheses about the effects of these certification requirements on individual resignation from public accounting firms.

INSTITUTIONS AND PROFESSIONAL EXIT

Institutions associated with certification play a particularly important role in professional mobility decisions. Individuals seeking to leave firms often do so after searching for new jobs. In the search process, individuals signal their future productivity and quality using experience and certification (Spence, 1981). As a signal, certification has value beyond the actual knowledge—the human capital—gained in obtaining it. In order to obtain certification, employees may be willing to stay in situations in which their needs and their employers' do not match. The employers may be motivated to retain these employees so long as they "pay" for the credentials by receiving lower wages and fewer promotion opportunities than they could obtain elsewhere. The employees may stay because the lack of certification makes them

[1] The micro-level explanation is consistent with the approaches to institutional theory that emphasize individual cognition and beliefs (e.g., Meyer & Rowan, 1977; Scott, 1994a, 1994b).

unqualified for other jobs or because they value the certification credential. These arguments suggest that credentialing processes affect resignation rates.

Individuals may or may not be conscious of credentialing institutional effects. A professional may, for example, consciously pursue certification as a means to obtain new job. But a professional who receives an inquiry about a new job may not stop to consider the role that certification played in the inquiry. In either case, though, certification processes can influence the probability that the person will resign from his or her current firm.

Institutional Determinants of Mobility in Large Public Accounting Firms

We examined the effects of the certification process on resignation from public accounting firms. The largest national public accounting firms provide three general types of services: auditing and accounting services, tax services, and management consulting (Emerson, 1986). Auditing, usually the largest area of work in an accounting firm, involves independently reviewing and attesting to the financial condition of corporate clients (Montagna, 1974). Accountants in the tax area advise and represent client firms about tax issues, and those in management consulting provide clients with expertise on information and management systems.

An accounting firm staff can be described as a vertical stack of pools of different types of employees, with the pools nearer the bottom being largest. An accountant starts his or her employment as a "junior accountant." After two or three years, the staff member may be promoted to "senior accountant" (*New Accountant,* 1992), and in another two or three years to "manager." At some time during this process, many accountants complete applicable certification requirements and take their certified public accountant (CPA) exam. Firms typically make partnership decisions about accountants who are CPAs after they have been employed 10 or 12 years.

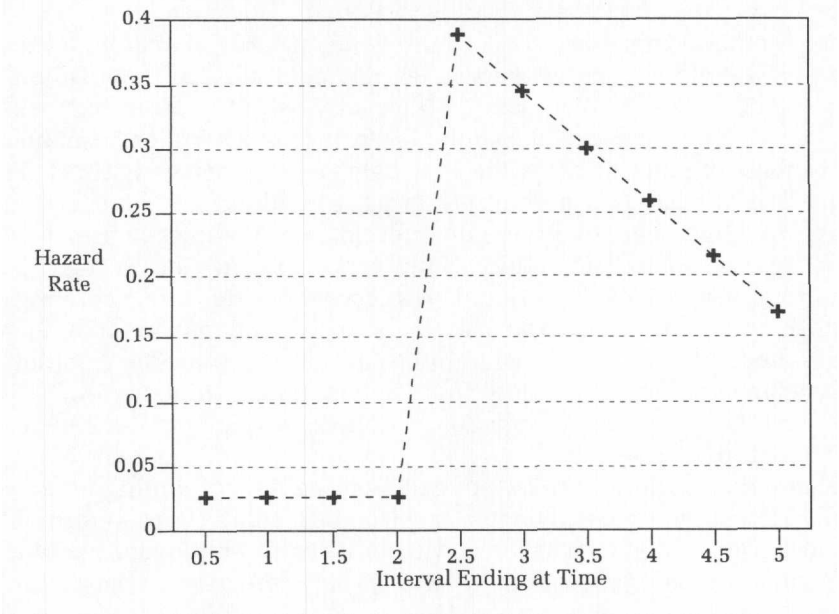
As in other occupations, in accounting organizational exit often occurs during an individual's early years of employment (Capin, 1969; Dillard & Ferris, 1989; Istvan & Wollman, 1976; Leathers, 1971; Montagna, 1974; Tyra, 1980). Exit rates are substantial, with half of all junior accountants leaving their original firms in the first four years (Montagna, 1974). This exit pattern is costly for accounting firms (Sheridan, 1992) but can also be seen as functional for firms and individuals. It allows a firm to use inexpensive personnel on routine audit tasks and provides a large pool of potential seniors, managers, and partners whom the firm can observe, socialize, and select from. The pattern is also functional for individuals because they receive professional training and socialization after completing their academic careers, experience that can help them complete certification requirements, locate jobs as private or corporate accountants, and learn what constitutes an accountant.

There are a variety of causes of exit from public accounting firms (see Bluedorn [1982] for a general review of exit). They include traits of the public accounting professional, personal characteristics of employees, employee satisfaction, person-organization fit, conflicts between professional and orga-

nizational commitments, and organizational culture (Aranya, Lachman, & Amernic, 1982; Aranya & Wheeler, 1986; Bullen & Flamholtz, 1985; Capin, 1969; Chatman, 1991; Dillard & Ferris, 1979; O'Reilly, Chatman, & Caldwell, 1991; Rhode, Sorensen, & Lawler, 1976, 1977; Sheridan, 1992; Sheridan & Abelson, 1983; White & Hellriegel, 1973). Although researchers have examined a wide variety of exit causes, no one has examined the relationship between certification and exit.

Signaling arguments suggest that since becoming a CPA is a valued signal, certification requirements will influence individual exit behavior. For some, certification is a prerequisite to establishing their own practices. For others, it is a requirement for advancing in a firm's hierarchy to partnership. For all, it is an important signal of their qualifications. Individuals are thus motivated to seek certification, causing the experience requirement to influence resignation in public accounting. Employees who take public accounting positions solely to achieve certification plan their resignations soon after fulfilling the experience requirement. Employees who lose their desire for public accounting careers prior to fulfilling the experience requirement may remain for the rest of the experience requirement period to enhance their value in the external labor market. Thus, exit rates may decrease immediately before individuals fulfill the experience requirement and increase immediately after. We refer to these shifts as *hazard shifts* (Figure 1). They are sudden changes in hazard rates, the instantaneous probability of exiting (Carroll, 1984; Tuma & Hannan, 1984: 58).

FIGURE 1
Illustration of a Hazard Shift at Time 2



The general argument for a credentialing effect, however, does not describe the exact relationship between credential requirements and resignation hazard shifts. Credentialing requirements often mandate both the duration of an accountant's experience and the types of work he or she performs, which we call the length and focus requirements. *Length* is the time that an accountant must be employed to fulfill the requirements. *Focus* is the type of accounting tasks that must be performed to fulfill the experience requirement. Tasks range from those that are unique to auditing to those that most accountants execute. We expected requirement length to position the hazard shift at different times and focus to affect the hazard shift's magnitude. We also expected that the effects of certification requirements would be contingent on the type of work an accountant did (e.g., audit, tax, or consulting) since some focus requirements require primarily auditing experience.

Length. The length requirement is the time an individual must be employed in a public accounting firm to receive certification. It is usually one or two years. We expected a one-year experience requirement to shift resignations that might have occurred during the first year to after the first year. A two-year experience requirement should shift resignations that might have occurred in the first two years to after the second year. Hence, resignation rates decrease before and increase after individuals fulfill the experience requirement.

The magnitude of the downward shift in resignation rates preceding the end of the length requirement may vary with the time left before employees complete the requirement. The closer they are to fulfilling it, the fewer costs they have to incur to obtain certification, and the more willing they may be to defer resignation. Employees in a one-year experience requirement jurisdiction have to "tolerate" public accounting for at least one year.[2] Employees in a two-year experience requirement jurisdiction must tolerate public accounting for at least two years. If the closeness of obtaining certification influences individuals, resignation rates will be lower during the first year in a one-year jurisdiction than in a two-year jurisdiction. This causes a hazard shift after the end of first year. It follows that employees with a two-year requirement have a hazard shift after completing the second year.[3]

> *Hypothesis 1: The hazard shift for auditor resignation in a jurisdiction with a one-year experience requirement occurs before the hazard shift for auditor resignation in a jurisdiction with a two-year experience requirement.*

Focus. Focus refers to the types of experience recognized as fulfilling the experience requirement. Some jurisdictions require public accounting

[2] A jurisdiction is a geographical area with uniform certification requirements for professionals. For accountants, jurisdiction and state are generally the same.

[3] Movement to other public accounting firms does not restrict the experience fulfillment and is controlled for as right-censored data.

audit experience only, even specifying the performance of specific tasks. Others require employment in public accounting without specifying the type of work. Some jurisdictions allow equivalent corporate and government experience as substitutions. These different breadths of focus affect the magnitude of the hazard shift.

Broadly focused experience requirements allow a wide range of experience to be used for certification. Accountants can use employment in firms outside the public accounting industry as a substitute for the public accounting experience. And time spent performing nonaudit tasks is more readily accepted in broadly focused jurisdictions. A narrowly focused experience requirement demands a restrictive set of audit experiences. Individuals desiring certification in a narrowly focused jurisdiction must be employed on the audit staff of a public accounting firm for the required period.[4] Movement to other employment prior to fulfillment of the experience requirement makes fulfilling it more difficult. Thus, a narrowly focused certification requirement increases the hazard shift more than a broad focus does.

> *Hypothesis 2: Auditors in a jurisdiction with a narrowly focused experience requirement have a larger hazard shift than auditors in a jurisdiction with a broadly focused experience requirement.*

Breadth requirements also affect hazard shift differences between auditors and nonauditors. Accountants engaged in tax, consulting, and other nonaudit activities receive different credit for their experiences under different breadths of focus. Under broadly focused experience requirements, employees can substitute much of their nonaudit public accounting experience to fulfill the experience requirement and may postpone their resignations to fulfill certification experience, much like auditors. Under narrowly focused experience requirements, nonauditors receive little or no credit toward fulfillment of their experience requirements and have little incentive to postpone their resignations.

> *Hypothesis 3: Nonauditors in a jurisdiction with a narrowly focused experience requirement have a smaller hazard shift than nonauditors in a jurisdiction with a broadly focused experience requirement.*

In a jurisdiction with a narrowly focused experience requirement, neither auditors nor nonauditors can substitute experience that is not public accounting experience to fulfill the experience requirement. Nor can the nonauditors substitute nonaudit public accounting experience. The auditors fulfill the experience requirement by not resigning before completing the

[4] The experience requirement may not explicitly require public accounting, but since few opportunities for experience in external auditing exist outside of public accounting, nonpublic accounting is implicitly excluded.

experience requirement. The nonauditors do not seek fulfillment of the experience requirement because their experience is irrelevant.[5]

Hypothesis 4: Auditors in jurisdictions with a narrowly focused experience requirement have a larger resignation hazard shift than nonauditors in those jurisdictions.

DATA AND METHODS

Employment information came from the personnel records of three "Big Six" (Big Eight at the time of the study) accounting firms located in jurisdictions with different certification requirements: Arizona, California, and New Mexico.[6] There were several reasons for using only Big Six firms. First, prior research shows that large firms have the highest exit rates (Tyra, 1980). Second, Big Six firms have similar organizational structures and processes so determinants of exit, such as hiring policies, promotion policies, and contracts, are similar; Sheridan similarly assumed in his study of six international accounting firms that "performance standards were consistent across them" (1992: 1041). Recruiting material from the firms in the study and discussions with their recruiters and partners suggested that these firms all conducted the first major evaluation of a new employee at two years. This equivalence reduced the likelihood that personnel practices peculiar to one national firm would cause results.[7] Third, using large firms is efficient because they provide a large amount of data. Fourth, accountants in small public accounting firms devote more of their time to tasks other than auditing than do accountants who are auditors in large firms. Using small firms would thus potentially confound the analysis.

Having only one firm in one market in each state is a potential problem, as differences in firms, markets, or certification requirements could therefore cause differences between states. Firm size and market size are the likely factors confounding the analysis because of their potential effect on exit. Tyra (1980) argued that accountants are likely to leave accounting firms in large markets earlier than those in small markets because the former contain more job opportunities and also that accountants are likely to leave large accounting firms earlier than small firms. These higher early resignation rates lead to lower hazard shifts over time because many accountants who would

[5] This argument implies that nonauditors are not assigned periodic audit tasks to help them become certified. Reassignment is commonly practiced to ensure certification for the managers of firms. However, this practice works against Hypothesis 3.

In jurisdictions with broadly focused experience requirements, both auditors and nonauditors receive credit for their experience toward fulfillment of the experience requirement, so there is no reason for a difference in breadth effects between the two groups.

[6] The Big Six accounting firms are Arthur Andersen, Coopers & Lybrand, Deloitte & Touche, Ernst & Young, KPMG Peat-Marwick, and Price Waterhouse. Confidentiality prevents us from offering more information about individual firms.

[7] A firm effect was not expected since office differences within a firm are as large as firm differences, as various firm partners and academics have suggested in discussions of the potential problem.

leave because of certification requirements have left earlier because of firm size. This association between firm and market size effects and certification effects would occur if the largest firm in our study were in the largest market and in a state in which certification requirements predict high early exit. In such case, a high early exit rate would be attributable to large firm size, large market size, or certification requirements. This bias worked against us because the largest firm in our analysis was in the largest market and in the state in which we predicted lower early resignations, the largest hazard shift, and the longest tenure for the hazard shift.

We studied firms in California, Arizona, and New Mexico because the three states had different experience requirements.[8] These jurisdictions also have different experience requirements for individuals with different educational and prior experience backgrounds. In Arizona, for example, the length requirement is shorter for employees with master's degrees than for those with baccalaureate degrees. Because the number of employees who do not have just a baccalaureate is small, the sample used to test the hypotheses included only individuals who had a baccalaureate accounting degree. We included employees in California subject to a two-year experience requirement with a relatively narrow focus. An accountant must gain experience in many specific audit functions. Since it is not possible to obtain experience for all the tasks in most positions outside of public accounting, public accounting is almost the exclusive source of experience fulfillment in California. We included employees in Arizona subject to a two-year, broad experience requirement. Arizona's focus requirement is broader than California's, with either experience in public accounting or equivalent industry or government experience allowed. Arizona also does not itemize the types of experience required. We included employees in New Mexico subject to a requirement of one year of moderately broad experience in public accounting firms. New Mexico is moderately focused because it allows individuals to use some nonaudit experience to help fulfill the experience requirement.

Sample

The data come from employees hired between January 1, 1974, and December 31, 1984, who started at their firms after graduation from college. This sampling procedure avoids many of the analytic problems associated with cross-sectional studies of exit (Peters & Sheridan, 1988; Singer & Willett, 1991). We collected these data in the late fall of 1988 and winter of 1989. Therefore, the sample consists of employees who had opportunities to be employed for at least three years. The firms provided access to the personnel records. The accounting firms placed no restrictions on any information except that for partners, for whom accounting firm personnel provided data. The data include such information as entrance dates, exit dates, and types

[8] Experience requirements range from zero to nine years, with two years being the most common.

of exit. Using the firms' personnel records provides reliable data unbiased by employees' interpretations. We did not expect systematic bias to result from our coding the data since dates and amounts are not open to interpretation.

The coding yielded 885 personnel records. Incomplete data and confounding effects, such as prior accounting experience, eliminated 81 employees. We eliminated 25 employees in California who were without baccalaureate degrees and had a three-year experience requirement. Twenty-five employees in Arizona who had master's degrees and a one-year experience requirement were also eliminated, as well as 4 employees in New Mexico who had a three-year requirement. We also eliminated 36 nonaudit employees in New Mexico because they were not involved in any comparisons. Table 1 presents cell frequencies for the remaining 714 data points. All employees in the analysis had baccalaureate degrees and accounting majors.

Of the 714 subjects, 183 (25.6%) survived until the end of the study. Of those that exited, 405 (56.7%) voluntarily resigned, 74 (10.3%) were terminated, 8 (1.1%) were placed in other firms, 30 (4.3%) moved to other accounting firms, and others transferred to other offices or were unknown mortalities. The median lengths of service for the three firms were 3.08 years, 2.95 years, and 2.97 years.

Modeling Procedure

The dependent variable is the instantaneous transition rate for employee resignation (Tuma & Hannan, 1984; Singer & Willett, 1991):

$$r(\tau) = \lim_{\Delta\tau \to 0} \frac{(Exit\ at\ \tau + \Delta\tau \mid Employed\ at\ \tau)}{\Delta\tau}.$$

It is the product of the hazard rate and the probability that an individual moves from one state to another at a particular time (Tuma & Hannan, 1984). The instantaneous transition rate is also interpreted as the transition rate—the number of individuals who exit in a period divided by the number of individuals who were employed at the start of a period—calculated for an infinitesimal period. Since the transition rate necessarily implies the hazard rate, changes in the transition rate capture hazard shifts.

Estimating these rates requires information about the timing, duration, and type of exit. Combining entrance and exit dates gives the duration of

TABLE 1
Breakdown of Sample

Variables	Arizona	California	New Mexico	Total
Focus	Broad	Narrow	Narrow	
Years experience required	2	2	1	
Nonauditors	16	133		149
Auditors	109	302	154	565
Total	125	435	154	714

employment. Exit takes three forms (Istvan & Wollman, 1976): termination, resignation, and placement. We analyzed resignation because it is employee driven (see Sheridan [1992] for a similar study of voluntary retention).[9]

The transition rate theoretically has a lower bound of zero and no upper bound. We modeled the instantaneous transition rate as $r(\tau) = \exp(\beta X)$, where β is a vector of coefficients and X is a vector of independent variables. The exponential form constrains the rate to be positive. We used event history analysis to estimate the parameter values and to test different models.[10] The statistical package RATE (Tuma, 1979) estimates the models.

There are two broad options in modeling resignation rates. One is a using a continuous function that specifies resignation as a continuous function of experience with a clock beginning at the time an employee begins at a firm. Hazard shifts are then tested for by including a dummy variable set to one after the experience requirement is completed and possibly including another clock, which begins at zero when that employee completes the experience requirement. The dummy variable allows for an upward shift in the hazard rate, and the second clock moves the hazard rate back to the baseline hazard rate. The second approach is to use discrete categories for various time periods. We adopted a discrete parameterization approach for empirical reasons.

We adopted a discrete model because graphs of hazard rates suggest that they shift at various time boundaries. Figure 2 plots product limit estimates of the semiannual resignation hazard rate for auditors generated with the SAS procedure LIFETEST. Resignation rates for auditors in the one-year jurisdiction shift upward after one year of experience. Resignation rates in all three jurisdictions shift upward after two years of experience.

Similar patterns hold for nonauditors, for whom Figure 3 plots resignation hazard rates. The data for all states are pooled because nonauditors are less likely to be affected by experience requirements and because the number of nonauditors in two of the jurisdictions results in small risk sets and unstable estimates. Even though nonauditors are less likely to be affected by experience requirement than auditors, the pattern of nonauditors' and auditors' resignation rates are similar over the first few years.

Other research has shown similar patterns for auditors and nonauditors. Graphs of hazard rates for accountants generated by Summers (1992) show similar patterns. For accountants in Georgia, a state with requirements similar to California's (two years, narrow focus), she reported very low exit rates through two years, followed by a large jump in exit rates between years two

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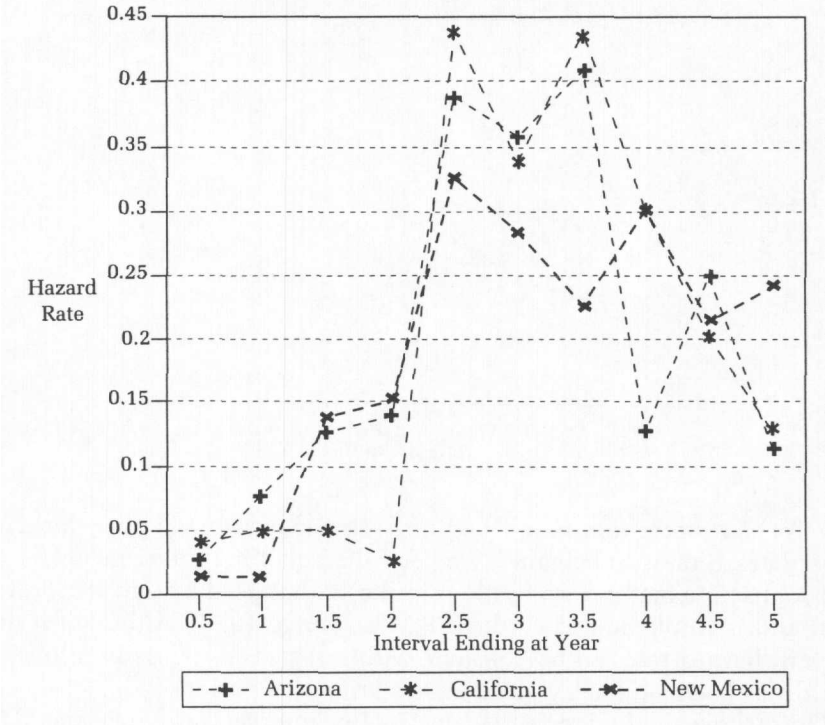
[9] See Robson (1990) for models of termination and placement.

[10] Event history models are potentially biased when data are either left- or right-censored. Left-censoring occurs when the starting date of employment is unknown, a problem that did not occur in this study. Right-censoring occurs when a subject leaves a sample before the end of the data collection period or ends the period without having left the firm. Right-censoring is corrected for with maximum likelihood procedures that produce asymptotically unbiased estimates.

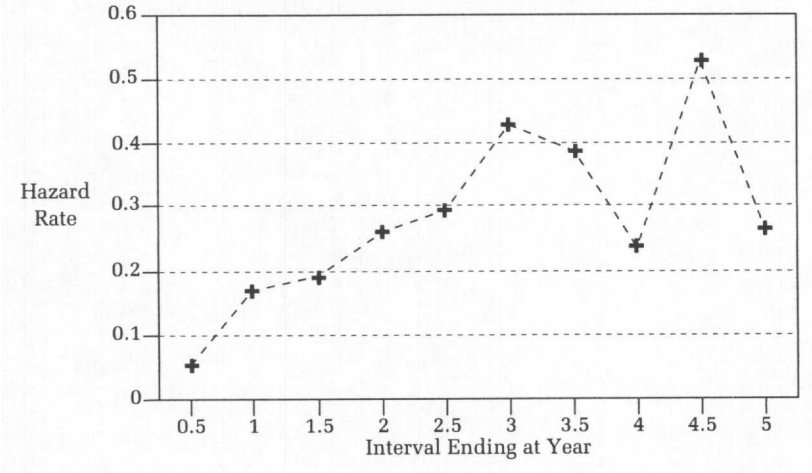
FIGURE 2
Resignation Hazard Rates for Auditors by State



and three. Her graphs of exit patterns in Florida, a state with no length-of-experience requirement, are similar to the graphs of hazard rates for nonauditors. In all five states, accountant exit increases over the first two years, peaks during the third year, and declines thereafter.

We also adopted a discrete method because a continuous model can introduce inappropriate constraints. A hazard shift difference resulting from employees' completing certification requirements could occur in a variety of ways: (1) hazard rates prior to completing certification requirements in two jurisdictions can be equal, with the hazard shift manifested by a jump in hazard rates after completion, (2) hazard rates can be substantially lower in some jurisdictions immediately prior to requirement completion and then jump back to the higher hazard rate afterward, or (3) hazard shifts could occur because hazard rates decrease somewhat before requirement completion and increase somewhat afterward. It should be noted that condition 1 implies that the hazard rates prior to certification should be constrained to be equal, condition 2 implies that the hazard rate after certification should be constrained to be equal, and condition 3 implies that neither the before-completion nor the after-completion hazard rates should be constrained to be equal.

FIGURE 3
Resignation Hazard Rates for Nonauditors



Since use of a continuous model could require constraining either the before or after hazard rates to be equal, we used discrete time intervals.

The discrete method we used is similar to that used by Carroll and Huo (1988) and is implemented through RATE (Tuma, 1979). Although it does constrain hazard rates to be constant within a period, it easily allows for inequalities between hazard rates across firms and periods.

The discrete method required constructing intervals so that we could test the hypotheses. We examined hazard shifts under a one-year experience requirement by comparing the 7–12 month exit rate to the 13–18 month exit rate and examined shifts under a two-year requirement by comparing the 19–24 month exit rate to the 25–27 month exit rate. We chose intervals long enough to ensure that enough events occurred in each period to yield precise and stable estimates but short enough that resignation rates would not be smoothed over several intervals. We used SAS survival analyses (LIFETEST) with each of the three jurisdictions' data separately to examine monthly, quarterly, semiannual, and annual intervals. Almost all quarterly intervals gave stable rates, but we used semiannual intervals to be conservative and because some tests split the jurisdictions by specialization. Using the interval endings necessary for our hypothesis tests and the hazard plots, we used RATE with the pooled data to incrementally evaluate the significance of various intervals' additions to the overall model. The three months following the 24th month contained sufficient exits and provided a significant improvement to the overall model. Other intervals during the early years of interest were at least 6 months. We analyzed the first five years of each employee's firm tenure because most exits occur in this period and because the periods of interest are in this interval. Time intervals after three years are longer since they were not directly involved in the analyses and had fewer survivors at risk.

Models contrasting jurisdictions within periods test the hypotheses. The jurisdiction effect in each period captures the difference between the contrasted jurisdictions. Comparing the transition rate for the period prior to the expected shift to the transition rate for the period immediately after the expected shift measures the hazard shift. A lower transition rate prior to and a higher rate after employees' fulfillment of the experience requirement demonstrates a hazard shift; a greater difference between the two periods shows a larger hazard shift. Significance tests are directional because the hypotheses are directional.

We used two levels each of length, focus, and specialization, contrasting a one-year experience requirement with a two-year experience requirement and a broadly focused requirement with a narrowly focused one. The third dichotomy, specialization, separates audit from nonaudit experience. Although there were three variables with two levels, we could not use a two-by-two-by-two factorial design (length by focus by specialization) because of data limitations.

Contrasting auditors in a two-year jurisdiction and a one-year jurisdiction, both with similar breadths of focus, tests Hypothesis 1.[11] The two-year jurisdiction takes a value of 1, and the one-year jurisdiction takes a value of 0. The sign of the indicator variable shows whether the two-year jurisdiction has a higher or lower transition rate than the one-year jurisdiction. Hypothesis 1 predicts that the two-year jurisdiction will have a significantly lower hazard rate than the one-year jurisdiction during year 2 and a significantly higher hazard rate in the period following year 2.

Hypotheses 2 and 3 compare the narrowly focused, two-year experience requirement and the broadly focused, two-year experience requirement. The indicator variable captures the narrowly focused effect. Hypothesis 2 deals with auditors, and Hypothesis 3 examines nonauditors' resignation behavior. Hypothesis 2 predicts lower resignation rates prior to and higher resignation rates after the end of the second year for auditors in the narrowly focused jurisdiction. Hypothesis 3 reverses these predictions and predicts coefficients of lower magnitude for nonauditors in the narrowly focused jurisdiction.

The narrowly focused, two-year jurisdiction data test Hypothesis 4. The indicator variable measures type of employee, with a value of 1 assigned to auditors. Hypothesis 4 predicts negative coefficients for the auditors during the second year, showing lower resignation rates for them than for nonauditors, and a significantly greater coefficient for auditors immediately after two years, showing higher resignation rates for the auditors than for the nonauditors.

We used results from two tests as evidence of differences in hazard shifts as specified by the hypotheses. First, we tested for expected differences between comparison groups during time periods before and after the expected

[11] Only the jurisdictions relevant to a hypothesis were included in the sample. We tested Hypothesis 1, for example, with only California and New Mexico data.

hazard shifts, as indicated in the discussions. These provide an indirect test of the differences in hazard shifts hypothesized; lower rates prior and higher rates after an event imply larger hazard shifts. We tested for the significance of individual periods using a *t*-statistic for an independent variable of the event-history regression analysis.[12]

Second, we provided a direct test of differences in hazard shifts by comparing constrained models, with the difference in the hazard shifts held equal, to unconstrained models. A constrained model forces the hazard shift of one comparison group to be of the same magnitude as the hazard shift for the other comparison group. The unconstrained model places no restrictions on the magnitudes of either comparison group's hazard shift. If there is no difference in hazard shifts, then a model constraining these estimates to be equal fits as well as a model in which the estimates are not constrained to be equal, and no difference would be found between the models. We compared the logarithmic likelihood of the constrained model to the log likelihood of the unconstrained model to determine the improvement of the unconstrained model. Twice the absolute value of the difference in log likelihoods is compared using the chi-square distribution with the degress of freedom equal to the number of additional parameters of the unconstrained model over the constrained model.

Where the hypotheses deal with differences in overall model fit, the chi-square tests for complete model fit are the most appropriate for testing them. We could find, for example, that although many of the individual effects are not significantly different from zero, that the hazard shift—the difference between hazard rates for two adjacent periods—may differ for two states (for example, adjacent hazard rates of 0 and 0 compared with adjacent hazard rates of 0 and .4).

Controls

Our focus on resignation behavior made it important to distinguish resignations from terminations and placements. We did not use employee- or supervisor-stated reasons for exit that were not confirmed by evaluation and compensation patterns consistent with the stated reasons. We treated unclear classifications as right-censored items.[13]

Similarly, identification of a second employer determines whether a resigning employee stayed in public accounting, where he or she could

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[12] We test for the significance of individual periods using a *t*-statistic, although the tests are technically chi-square tests, for a number of reasons. First, *t* is equivalent to the chi-square test in large to moderate samples (Allison, 1984). Since most of our tests are based on relatively large samples, using *t*-statistics is reasonable. Second, a *t* can be used for directional tests, which our hypotheses are. Finally, we note that the only result in which any discrepancy may arise from using a *t* rather than a chi-square test is for period 25–27 in the test of Hypothesis 1. This particular contrast has a relatively large sample.

[13] There were no ambiguous classifications. Alternative types of exit can be treated as a competing risks specification.

continue to work toward satisfying the experience requirement. We treated such an exit as a right-censored data item.

Employee attributes can affect resignation. We examined the effects of age and gender by including them as independent variables in survival analyses. These analyses resulted in certification requirement period effects having the same signs, levels of significance, and relative magnitudes as those reported. Age and gender, though affecting resignation, do not alter our inferences. We leave them out of the reported analyses because including them reduces the sample size through missing data.

RESULTS

Tables 2 through 4 present the tests of Hypotheses 1 through 4. The statistics for the different periods are in the columns. The first two estimates in each column are the constant's coefficient and its standard error. Below these are the unstandardized contrast coefficients and their standard errors. Estimates of the baseline instantaneous rates of exit for the constant term are the exponential of the constant since the estimated model is in exponential form. An estimate of the instantaneous rate for the contrasting jurisdiction in a period is the exponential of the sum of the estimates for the constant term and the indicator variable. These exponentials are the transition rates in the period because all other effects are 1 (the dummy variables for all other periods are necessarily 0, resulting in multipliers of 1 [exp(0)]).

Length Attribute

Hypothesis 1 contrasts audit staff hazard rates for the narrowly focused, two-year jurisdiction and the one-year jurisdiction (Table 2). We expected lower resignation rates for the two-year jurisdiction during year 2 and a higher rate for the two-year jurisdiction in the period following year 2. Focusing on the value assigned to the indicator variable (two-year) in Table 2, we note

TABLE 2
Results for the Length Attribute for Auditors[a,b]

Experience Requirement[c]	Months 1–6	7–12	13–18	19–24	25–27	28–36	37–48	49–60
Constant	−4.34*	−4.32*	−1.93*	−1.88*	−1.36*	−1.11*	−1.35*	−1.50*
	(1.00)	(1.00)	(0.32)	(0.33)	(0.38)	(0.21)	(0.24)	(0.32)
Two-year	0.70	1.42	−1.21*	−1.37*	0.70*	−0.01	0.39	−0.34
	(1.12)	(1.06)	(0.49)	(0.56)	(0.42)	(0.26)	(0.28)	(0.41)

[a] Unstandardized estimates are shown; standard errors are in parentheses.

[b] For time-periods-only model, $\chi^2 = 258.44$ ($p < .01$, 8 *df*). For model with two-year and constant compared to a model with time periods only, $\chi^2 = 37.16$ ($p < .001$, 8 *df*). For unconstrained model compared to a model constraining two-year and one-year hazard rate shifts between months 7–12 and months 13–18 to be equal and between months 19–24 and months 25–27 to be equal, $\chi^2 = 20.70$ ($p < .01$, 2 *df*).

[c] The one-year state (constant) is New Mexico, the two-year state is California.

* $p < .05$, one-tailed test.

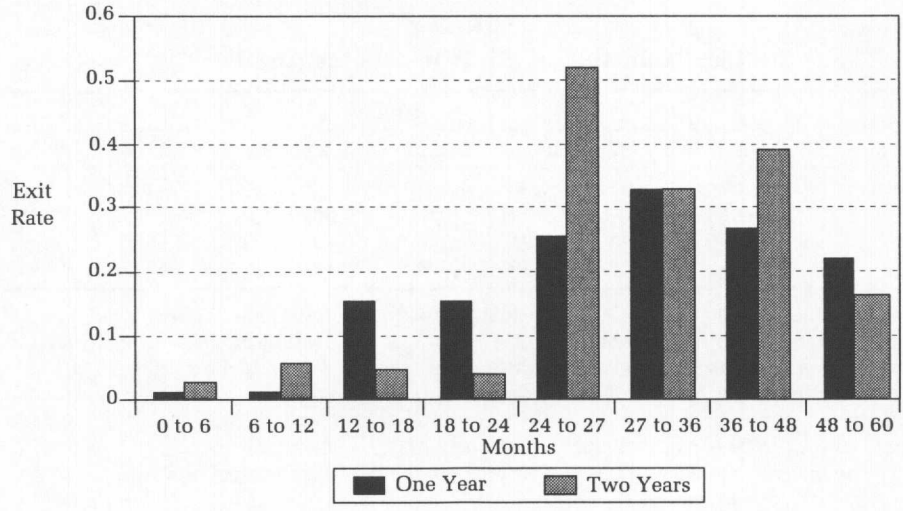
negative and significant values of −1.21 and −1.37 for months 13–18 and 19–24 followed by a positive and significant value of 0.70 in months 25–27. The two-year coefficients in year 1 are positive but not significant. There is strong evidence for lower resignation rates for the two-year jurisdiction in year 2 and strong evidence for higher resignation rates for the two-year jurisdiction in the three months following the completion of year 2. These results are consistent with Hypothesis 1.

The hazard shifts' magnitudes are substantial (Figure 4). The constant exit rate, which incorporates the one-year jurisdiction but not the two-year jurisdiction, is .0132 for the first year (exp[−4.32]). In year 2, this rate jumps to .145 (exp[−1.93]). Auditors in the one-year jurisdiction are 11 times more likely to resign in year 2 than in year 1. The shift for the two-year jurisdiction at the end of year 2 has a similar magnitude. It increases from .039 (exp[−1.88−1.37]) to .517 (exp[−1.36+.70]). Auditors in the two-year jurisdiction are 13 times more likely to resign after completing their experience requirement. These effects are statistically significant, as demonstrated by the chi-square (χ^2 = 20.70, 2 *df*) for the improvement in comparing the unconstrained models to the constrained models. The pattern of effects is also important. Employees' exit rates plunge in the year immediately preceding their completion of the certification requirement.

Focus Attribute

Tables 3 and 4 present the models for the breadth-of-focus effects. The first analysis contrasts jurisdictions with broad and narrow focuses, and the second analysis contrasts auditors and nonauditors within jurisdictions. These contrasts test Hypotheses 2 through 4.

FIGURE 4
Length Requirements and Exit Rates



Between jurisdictions. Table 3 and Figure 5 present the test for the effects of the focus attribute between jurisdictions using a narrowly focused, two-year jurisdiction and a broadly focused, two-year jurisdiction as contrasts. We expected the hazard shift—the difference in hazard rates in the period following year 2 and the period preceding completing year 2—to be greater in the narrowly focused jurisdiction than in the broadly focused jurisdiction. In months 13–18 and 19–24 in the audit staff panel of Table 3, the narrowly focused jurisdiction indicator variable is negative and significant in both cases. In the period following year 2, the variable is positive but not significant.

In the contrast of the broadly focused jurisdiction hazard shift and the narrowly focused jurisdiction hazard shift for auditors, the chi-square for the difference between the unconstrained and constrained models is 5.56 (1 *df*). The estimates support Hypothesis 2, suggesting that breadth requirements affect the behavior of auditors in states with similar experience length requirements.

The nonauditor panel of Table 3 and Figure 6 present the test of Hypothesis 3. The indicator variable's coefficients for months 1–6 and months 7–12 are not significant and are the opposite sign from that expected. The resignation rates in months 13–18 and months 19–24 are in the expected direction; however, they are also not significant. The coefficient for months 25–27 is

TABLE 3
Results for the Focus Attribute[a,b]

Breadth of Focus[c]	Months							
	1–6	7–12	13–18	19–24	25–27	28–36	37–48	49–60
Auditors								
Constant	−4.01*	−2.61*	−2.14*	−2.05*	−0.87*	−1.03*	−1.26*	−1.68*
	(1.00)	(0.50)	(0.41)	(0.41)	(0.33)	(0.23)	(0.27)	(0.38)
Narrow	0.37	−0.29	−1.00*	−1.20*	0.21	−0.09	0.30	−0.16
	(1.12)	(0.61)	(0.58)	(0.61)	(0.38)	(0.27)	(0.30)	(0.46)
Nonauditors								
Constant	−2.05*	−1.20*	−8.12	−8.12	0.06	−1.90*	−1.20*	−1.66*
	(1.00)	(0.71)	(23.67)	(23.67)	(0.58)	(1.00)	(0.71)	(1.00)
Narrow	−1.56	−0.62	6.08	6.86	−1.44*	0.92	0.16	1.07
	(1.23)	(0.77)	(23.68)	(23.67)	(0.71)	(1.02)	(0.74)	(1.03)

[a] Unstandardized estimates are shown; standard errors are in parentheses.

[b] For the time-periods-only auditors' model, $\chi^2 = 235.48$ ($p < .01$, 8 *df*). For the time-periods-only nonauditors' model, $\chi^2 = 127.72$ ($p < .01$, 8 *df*). For the model with narrow and constant compared to a model with time periods only, $\chi^2 = 216.78$ for auditors ($p < .01$, 8 *df*) and 87.05 for nonauditors ($p < .01$, 8 *df*). For the auditors' unconstrained model compared to a constrained model for the hazard rate shifts between months 18–24 and months 24–27, $\chi^2 = 5.56$ ($p < .01$, 1 *df*). For the nonauditors' unconstrained model compared to a constrained model for the hazard rate shifts between months 18–24 and months 24–27, $\chi^2 = 6.46$ ($p < .01$, 1 *df*).

[c] The broad focus (constant) state is Arizona; the narrow focus state is California.

* $p < .05$, one-tailed test.

FIGURE 5
Focus Requirements and Exit Rates for Auditors

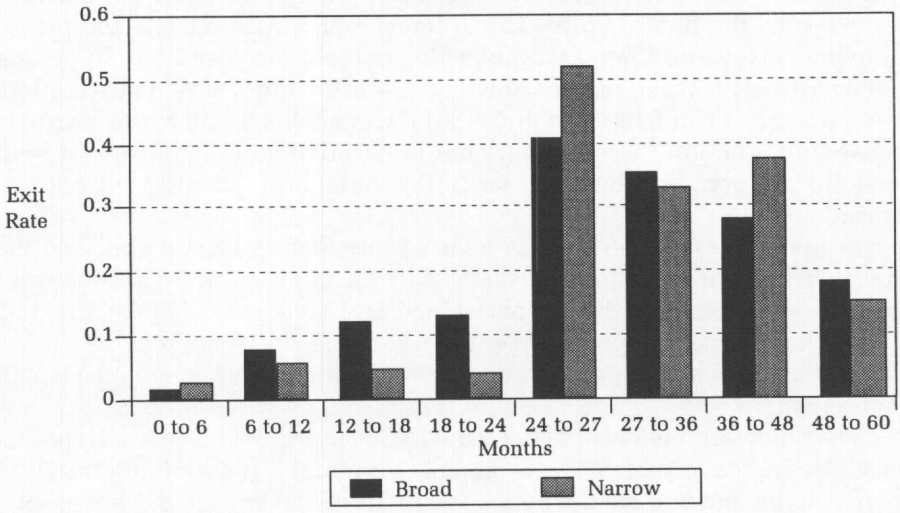
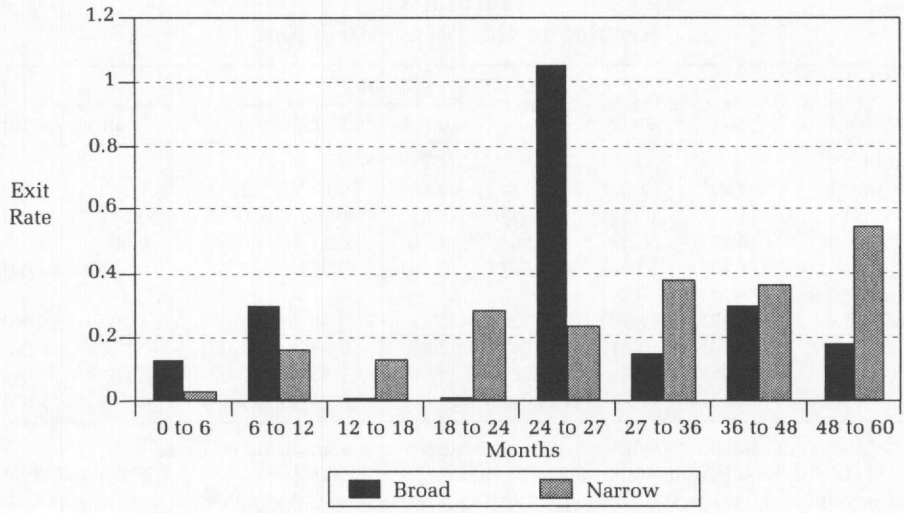


FIGURE 6
Focus Requirements and Exit Rates for Nonauditors



negative and significant, demonstrating a moderately larger hazard shift for the broadly focused jurisdiction than for the narrowly focused jurisdiction, as hypothesized. The difference in hazard shifts between nonauditors in the narrowly focused jurisdiction and the broadly focused jurisdiction is significant at the .05 level, with the chi-square for the difference between uncon-

strained and constrained models 6.46 (1 *df*). Nonauditors in a broadly focused jurisdiction are more likely to wait until they have completed the certification requirement. In contrast, nonauditors in a narrowly focused jurisdiction have less to gain by completing the two years.

Within jurisdictions. Table 4 and Figure 7 present results for the comparison of the focus attribute across specialties within single jurisdictions. For the narrowly focused, two-year jurisdiction, the coefficients for the audit variable are negative in months 1–6, months 7–12, months 13–18, and months 19–24. The four coefficients increase in magnitude and significance over time. Months' 1–6 coefficient (−0.04) is not significant, but those for months 7–12 (−1.08), 13–18 (−1.10), and 19–24 (−2.00) are all significant. Auditors show lower resignation rates as they approach the certification requirement. Furthermore, the hazard shift is substantial. Upon their completion of the requirement, auditors' resignation rates jump from less than one-seventh of the nonauditors' rate to twice the nonauditors' rate. The difference between constrained and unconstrained models is also significant beyond the .05 level ($\chi^2 = 23.07$, $df = 1$). The results strongly support Hypothesis 4. Breadth of focus and type of activity condition the experience requirement effect. With a narrowly focused experience requirement, auditors' exits differ considerably from nonauditors' exits.

DISCUSSION

We have extended institutional research by demonstrating a relationship between institutions and individual behavior. In doing so, we suggest that a micro-level, individual process underlies organizational conformance to institutional structures. The social institution of certification provides accountants with a valued resource that increases exit rates. Accounting firms may be forced to adopt similar structures because of the need to deal with

TABLE 4
Comparison of Auditors and Nonauditors in a Two-Year Narrow Focus Jurisdiction[a, b]

	Months							
Variable[c]	1–6	7–12	13–18	19–24	25–27	28–36	37–48	49–60
Constant	−3.61*	−1.82*	−2.04*	−1.26*	−1.38*	−0.98*	−1.04*	−5.97*
	(0.71)	(0.30)	(0.35)	(0.26)	(0.41)	(0.21)	(0.23)	(0.23)
Auditors	−0.04	−1.08*	−1.10*	−2.00*	0.72	−0.14	0.08	−1.24*
	(0.87)	(0.46)	(0.54)	(0.52)	(0.45)	(0.26)	(0.27)	(0.35)

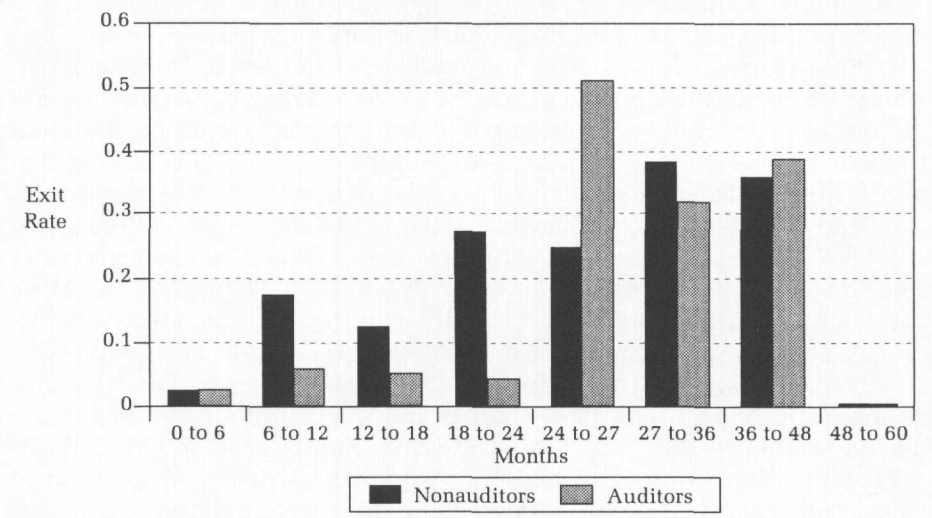
[a] Unstandardized estimates are shown; standard errors are in parentheses.

[b] For the time-periods-only model, $\chi^2 = 242.50$ ($p < .01$, 8 *df*). For the model with auditors and constant compared to a model with time periods only, $\chi^2 = 136.45$ ($p < .01$, 8 *df*). For the unconstrained model compared to a model constraining the auditors' hazard rate shift to equal the nonauditors' hazard rate shift between months 18–24 and months 24–27, $\chi^2 = 23.07$ ($p < .01$, 1 *df*).

[c] All data are for California. The constant is nonauditors.

* $p < .05$, one-tailed test.

FIGURE 7
Focus Requirements and Exit Rates for Auditors and Nonauditors



employee exit brought about by certification institutions. This latter point needs to be tested with further research.

We also demonstrated that institutions interact with individual activities to affect individual behavior. The effect of certification on individual exit is contingent on the types of activities in which an individual is engaged. Auditors defer resigning until they have completed experience length requirements, but nonauditors defer resigning in locations where their work activities fulfill broader breadth requirements.

Finally, we demonstrated that institutional effects offer an alternative to other explanations of individual behavior, such as person-organization fit. When professionals from only one institutional environment are studied, variation due to differences between institutional environments is held constant. This may lead to inappropriate or incomplete inferences. Sheridan (1992), for example, showed that an accounting firm's culture, particularly its emphasis on interpersonal relations, is associated with lower individual exit rates and longer individual tenures. And Chatman (1991) found that accountants with low person-organization fit are more likely to exit after completing two years. Missing from these various studies, however, is an examination of the effects of professional certification requirements on individual mobility.

When institutional differences are held constant, organizational differences may appear to be the most significant correlate of exit. Or bursts of exit occurring shortly after employees' completing two years of experience may be attributed to poor person-organization fit but actually may be in part the result of their completing experience requirements for certification. Since there is a relationship between institutional environments and individual

exit, further research is required to estimate the relative magnitude of each effect on exit and to control for systematic bias due to institutional environments.

One criticism of our study is that we have identified only firm or market effects because we studied only one firm in each jurisdiction. We do not feel this to be the case for a number of reasons. First, we collected data from major accounting firms in relatively large markets. Doing so controlled for some interfirm differences, because major accounting firms tend to have similar personnel policies, and also controlled for the fact that accountants in small firms spend a disproportionate amount of their time on nonaudit tasks.

Second, Summers (1992) reported evidence consistent with the differences being due to state, rather than firm, differences. She examined accountant exit patterns in Georgia, a two-year, narrow-experience-requirement state, and in Florida, which has no length requirement. Her sample included two branches from different parent firms in Georgia and a branch in Florida that had the same parent as one of the Georgia firms. She found that the two accounting firms in Georgia, representing different parent firms, had similar exit patterns, which were both different from the Florida firm's. Thus, she had between-states differences for branches of the same firm. As we argued earlier, the large firm and large market effects work against our hypotheses. Further, any reasonable criticism has to include an argument about how some firm or market characteristic systematically varied over the 15-year period we studied (1974 to 1989, when the data were gathered) in a way that generates the findings we report.

Third, results for Hypothesis 4 cannot be attributed to between-firms effects as the analysis was within-firm. Fourth, Hypothesis 2 predicts higher shift rates for auditors, and Hypothesis 3 predicts the opposite effect for nonauditors. If there is an unspecified firm effect that is consistent across firms, then it cannot have these opposing effects. Fifth, when we tested Hypothesis 1, we found a significant difference in hazard shift timing for auditors, yet when the same firms were compared for nonauditors, no differences were found (results are available from the first author). Any firm effect should be consistent for auditors and nonauditors.

Our analyses show certification effects are time-dependent. A variety of other time-dependent processes also affect individuals early in their careers, including evaluations and reviews (Sheridan, 1992). Since these processes can introduce significant spikes in hazard rates, early career analysts should take care in specifying the functional form for time-dependent effects.

As well as introducing a time-dependent discontinuous shift in hazard rates, completion of certification requirements may also affect the impact of other variables on exit rates. Perhaps, as would follow from the logic of Sheridan and Abelson (1983), the effect of commitment or job tension on exit behavior is conditional on completing certification. Once certification requirements are completed, commitment and job tension effects on exit may be heightened.

An important extension would be incorporating organizational and individual effects in the baseline model. Do certification hazard shifts vary across individuals? For example, individuals who had relatives who were independent accountants or entrepreneurs might be more likely to value a career independent of a large firm. Or members of minorities might see a lower probability of moving upward in an accounting firm and be more likely to use certification as an avenue to an independent, high-status occupation. How does person-organization fit (Chatman, 1991) affect the certification hazard shift? Do accountants with low person-organization fit have a higher certification hazard shift?

Finally, what are the consequences of certification-requirement-induced mobility for accountants and accounting firms (Sheridan, 1992, Staw, 1980)? At the individual level, who pays for certification? Certification is equivalent to investing in general skills, skills that are useful to a wide variety of employers (Becker, 1975; Wholey, 1990). Certification is a general credential because it provides accountants access to the market of firms and individuals requiring an accountant's services. Economic theory suggests that since a firm is not guaranteed a return from a given professional's credential and the professional is, professionals in states with more restrictive credentialing requirements will pay more for certification, possibly by accepting lower wages or longer working hours (ceteris paribus). At the organizational level, do restrictive certification requirements provide accounting firms with relatively poorly paid accountants to perform routine tasks? Do restrictive certification requirements improve the quality of the personnel available for promotion? Are accounting firms in states with more restrictive certification requirements linked more tightly with client corporations or linked to more client corporations because of the large number of accountants who move through the firm to client corporations? Many of these hypotheses are testable; however, they require researchers to be sensitive to the effects of different institutional regimes.

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