



Determinants of Employment Externalization: A Study of Temporary Workers and Independent Contractors

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Administrative Science Quarterly, Volume 38, Issue 2 (Jun., 1993), 195-223.

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Administrative Science Quarterly

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Externalization: A Study
of Temporary
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Independent Contractors

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This paper examines what determines the use of temporary workers and independent contractors in a variety of organizations. We hypothesize that four factors affect the use of externalized workers: employment costs, the external environment, organizational size and bureaucratization, and skill requirements. Data from a large sample of employers surveyed by the U.S. Department of Labor were used to test the hypotheses. Analyses showed that each factor affected the use of both temporary workers and independent contractors; however, the effects differed across the two types of workers. Firm-specific training, government oversight, bureaucratized employment practices, establishment size, and requirements for high levels of informational or technical skill had negative effects on organizations' use of temporary workers; variation in employment needs positively affected the use of temporary workers. Variation in employment needs, bureaucratized employment practices, establishment size, and being part of a multiple-site firm had positive effects on the use of independent contractors. We discuss the implications of these findings for the study of the employment relationship.*

During the past decade, organizations' use of external workers, such as temporary workers, leased workers, and independent contractors has increased tremendously. Belous (1989) reported that one quarter of all U.S. workers in 1988 were nonpermanent or part-time employees. The kind of work performed by external workers has also changed. Applebaum (1987) noted that the majority of externalized workers no longer perform unskilled clerical tasks; many are professionals, such as nurses or accountants. As the externalized workforce becomes more numerous and diverse, it is important to explore why firms employ these types of workers.

Studying the externalization of the workforce is also important because an organization's employment practices affect both individual attainment and the distribution of rewards in organizations. Temporary jobs typically lack the job security, fringe benefits, and possibilities for advancement that are available to incumbents of permanent jobs (Mangum, Mayall, and Nelson, 1985; Applebaum, 1987). Extensive reliance on temporary workers may create two classes of employees: permanent workers with relatively secure, high-paying employment and temporary workers who have only sporadic, low-paying work. Barnett and Miner's (1992) analysis of promotion patterns at a utility company demonstrated that hiring temporary workers increased mobility rates for the firm's core, permanent workers. Thus, externalization may actually increase inequality in the distribution of rewards, which can have many important consequences, including lowered productivity and increased conflict inside organizations (Dickens, Wholey, and Robinson, 1987; Harrison and Bluestone, 1990; Pfeffer and Davis-Blake, 1992) and increased conflict in society (Blau and Schwartz, 1984; Osterman, 1988). Because incumbents of temporary jobs are often members of groups that have little power in

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0001-8392/93/3802-0195/\$1.00.

• The authors' names are listed alphabetically; both authors contributed equally to this work. This manuscript was initially submitted to *Administrative Science Quarterly's* special issue on Process and Outcome: Perspectives on the Distribution of Rewards in Organizations. We gratefully acknowledge the advice and comments of Karen Cook, special issue editor. We would also like to thank Mark Granovetter, Carol Kulik, Dan Levinthal, Michael Schwartz, Judith Tanur, and three anonymous ASQ reviewers for their helpful comments on previous versions of this manuscript.

organizations (i.e., women, nonwhites, the very young), firms may experience little pressure to change the inequalities generated by externalization.

To date, empirical research on the use of external workers has been primarily descriptive (see Pfeffer and Baron, 1988, for a review), reporting statistics on the demographic characteristics of external workers (Howe, 1986; Cohen and Haberfeld, 1993), the kinds of jobs staffed by external workers (Sugarman, 1978; Mangum, Mayall, and Nelson, 1985; Howe, 1986), or the industries and regions in which they are employed (Gordon and Thal-Larsen, 1969; Mayall and Nelson, 1982; Mangum, Mayall, and Nelson, 1985). Other studies have gone beyond descriptive statistics in explaining the use of external workers, but several of these studies have significant limitations.

A few studies have attempted to predict the use of temporary workers. Using a survey of 882 firms, Mangum, Mayall, and Nelson (1985) found that use of three types of temporary workers (workers from temporary-help service agencies, limited duration hires, and call-ins) was affected by firm size, growth or decline in firm employment levels, firm benefit levels, industry, and the occupations in which the workers were employed. Their analyses focused on bivariate relationships between particular independent variables and the use of temporary workers, however, and it is not clear whether these relationships would hold in a more complex multivariate model. Using a survey of over 400 employers, Abraham (1988) found that use of temporary workers was affected by the level of unionization among the firm's nonexempt workforce and by the amount of variation in demand for the firm's products. Barry and Crant (1990), using a survey of 153 growing firms, found that use of temporary workers was affected by the proportion of female workers in the firm, the difficulty of recruiting employees, and a variety of human resource practices, such as flexible hours and promotion practices for supervisory personnel. But, because some previous research suggests that changes in firm employment levels may affect the use of temporary workers (Mangum, Mayall, and Nelson, 1985; Abraham and Taylor, 1990), it is difficult to know whether results obtained from a sample of growing firms are generalizable to firms whose employment levels are stable or declining.

There has also been a limited amount of research predicting the use of independent contractors. Abraham and Taylor (1990), who examined the extent to which establishments contracted out six different types of services, reported that the use of independent contractors was affected by average wage levels in the establishment, seasonality and cyclicity in industry employment levels, establishment size, and geographic location. Harrison and Kelley (1991), reporting the results of a survey of 1,015 metalworking and machinery manufacturing plants, found that use of independent contractors was affected by firm size, occupational and product diversity, average hourly wages, and labor management relationships. Because they examined firms engaged in only one type of manufacturing, however, the extent to which their results would generalize to other industries remains unclear.

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Although existing research on employment externalization has produced a few consistent findings across studies, research in this area has been hampered by the lack of a theoretical framework, which creates two difficulties for researchers interested in externalization. First, because past studies generally have not been based on a clearly articulated theory of externalization, potential similarities between externalization and other, more extensively studied aspects of the employment relationship, such as internal labor markets, have not been uncovered. Failure to understand the similarities and differences between diverse aspects of the employment relationship hampers progress toward developing a coherent theory of the employment relationship. Second, because existing studies have examined extremely different determinants of externalization, it is difficult to identify robust findings that are likely to generalize across industries, organizations, and jobs. In this paper, we present a theoretical framework and develop and test hypotheses about the conditions under which organizations externalize work arrangements. In many ways, externalization complements the more widely studied process of internalization—the employment of full-time, permanent workers. Externalization may allow a firm to circumvent some of the problems associated with internalization.

Most research on internalization has focused on internal labor markets (Doeringer and Piore, 1971). According to Althauser and Kalleberg (1981), internal labor markets (ILMs) have several key attributes: job ladders are located within a single employer, entry is limited to the bottom of the ladder, and movement up the ladder is associated with the development of knowledge or skills. There is considerable agreement that ILMs increase workforce stability and give the employing firm control over employees (Sorensen, 1983). Internal labor markets provide these benefits by selecting workers capable of following rules (Collins, 1979; Cohen and Pfeffer, 1986) and by embedding jobs in hierarchical structures that socialize workers (Edwards, 1979), monitor worker behavior (Williamson, 1981), and provide opportunities for mobility between jobs (Jacobs, 1981; Wholey, 1985; Baron, Davis-Blake, and Bielby, 1986; DiPrete, 1987).

Because internal labor markets are designed to provide stability and control, ILMs may make it difficult and expensive for employers to adjust to changing internal and external conditions. These adjustment difficulties may occur for three reasons. First, because jobs in an ILM are arranged in a clear hierarchy, adjustments to the wages of one job require adjustments to the wages of many related jobs (Osterman, 1982). Second, internalized work often comes with an implicit promise of long-term employment. Workforce reorganizations that eliminate jobs tarnish a firm's reputation (Osterman, 1988; Belous, 1989). Finally, powerful groups that influence the design of ILMs (e.g., unions, government) may require ILMs to include practices that do not fit organizational needs (e.g., seniority rights during downsizing). Thus, firms may derive the benefits of ILMs at a cost of reduced organizational flexibility (Bills, 1987; Belous, 1989).

In contrast to internalization, externalization may increase a firm's flexibility in dealing with changing market conditions and organizational requirements in three ways. First, externalization reduces many types of employment and administrative costs. Firms can hire externalized workers without increasing the cost of health insurance, employer-funded pension plans, or unemployment insurance (Casey, 1989; Christopherson, 1989). Also, some types of external employees (e.g., independent contractors) are responsible for planning and managing their own work (Belous, 1989). In these situations, firms need to invest few administrative resources in the day-to-day management of individuals. Second, externalized workers are hired without the expectation of long-term employment and therefore can be let go without tarnishing a firm's image (Osterman, 1988; Belous, 1989). Third, externalization may offer a firm a way to access highly specialized skills that are needed for only a short period of time, such as engineering skills that are needed only for a single project (Gordon and Thal-Larsen, 1969). Both Lazerson (1988) and Belous (1989) reported that using independent contractors allows a firm to offer a wide range of products without risking a large fixed investment in labor.

We argue that internalization and externalization serve different but complementary purposes. Internalization enhances organizational control and stability, while externalization increases organizational flexibility. When used together, these two arrangements give a firm a mechanism for developing stable yet adaptable work arrangements. Because internalized and externalized work arrangements complement one another, they are likely to have many of the same determinants (i.e., factors that create a need for stability will increase internalization and decrease externalization). Therefore, we use existing perspectives on internalization as a starting point for developing hypotheses about the determinants of externalization. Our purpose is not to determine which of these perspectives is correct but rather to understand how factors drawn from each of these views affect externalization.

Our hypotheses are drawn from four theoretical perspectives: (1) a costs perspective, which maintains that the costs of employment affect an organization's choice of employment practices; (2) an external control approach, which posits that employment practices are shaped by the interests of powerful external groups and by conditions in a firm's environment; (3) a bureaucratic control perspective, which maintains that an organization's size and level of bureaucratization create diverse and sometimes contradictory pressures that affect employment arrangements; and (4) a job complexity perspective, which posits that the skills required to perform a job affect a firm's choice of employment arrangements.

We also examine differences in determinants of the use of two types of external workers: temporary workers hired and managed by the employing firm rather than by an outside agency, and independent contractors, which correspond to two of Pfeffer and Baron's (1988) three types of externalization: externalization by reducing the duration of

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employment (temporary workers) and externalization of administrative control (independent contractors).¹ These two types of external workers are interesting and important for three reasons. First, using temporary workers to reduce the duration of employment and independent contractors to externalize administrative control appear to be the largest and most rapidly growing forms of externalization (Pfeffer and Baron, 1988). Second, temporary workers hired and managed by the employing firm represent the largest segment of the temporary workforce. Using the May 1985 Current Population Survey, Spitz and Pfeffer (1987) reported that more than fourteen out of fifteen temporary employees were hired and managed directly by the employing firm. Third, firms may select different types of external workers for different purposes—because firms are unlikely to exercise day-to-day administrative control over independent contractors, for example, they may not use contractors for tasks that are critical to the core business of the organization—but, to date, there is no research comparing the use of different types of external workers by the same organizations.

Due to data limitations, we examined the use of these two types of workers at different levels of analysis. We had information about specific temporary workers and their jobs and therefore examined the determinants of temporary worker use at both the job and establishment levels of analysis. We had only establishment-level data about independent contractors; therefore, we examined the determinants of independent contractor use only at the establishment level of analysis. Due to these differences in data availability, we develop hypotheses about the effects of environmental and organizational level variables on the use of both types of workers. We develop hypotheses about the effects of job-level variables only for the use of temporary workers. Thus, we address two specific questions in this paper: (1) Under what conditions will an establishment fill an open position with a temporary worker? and (2) Under what conditions will an establishment employ independent contractors?

Hypotheses

Costs perspective. Hiring and managing workers entails a variety of costs, which may bring a firm very limited benefits and may be viewed by the firm as unnecessary constraints on its use of resources. A firm may try to reduce these constraints through externalization. The firm may view other costs as investments that it desires to recoup, thus creating pressure toward internalization. We focus on two employment costs: fringe benefits and the costs of firm-specific training. Although these two costs do not represent all employment costs, they are important and are likely to affect the choice between internalization and externalization. Fringe benefits costs are currently about 40 percent of total compensation (Cascio, 1992); they are also the component of total compensation that is most likely to differ significantly between internal and external workers (Applebaum, 1985). Unlike expenditures on wages or salaries, spending on fringe benefits yields few tangible outputs for the firm, making fringe benefits an obvious

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We do not examine their third type, externalization of place (e.g., telecommuting).

target for employment-cost reduction (Casey, 1989; Christopherson, 1989). Firm-specific training costs are an investment in the skills of an individual employee. A firm's ability to recoup that investment depends on how the firm structures the employment relationship.

Because many external workers do not receive fringe benefits (Applebaum, 1985), firms may be able to gain employment-cost flexibility by using external workers. Pressure to gain cost flexibility is likely to be greatest where fringe benefits are high. Mangum, Mayall, and Nelson (1985) reported that firms with high fringe benefits used more call-ins and temporary-help service employees than firms with low fringes, although they found no effect of fringe benefit levels on the use of temporary workers hired and managed by the firm. Thus, we predict:

Hypothesis 1: The higher the level of fringe benefits in an organization, the more likely the organization will be to use temporary workers and independent contractors.

Employment costs are also affected by the cost of providing firm-specific training. By definition, firm-specific training in skills and procedures unique to the firm can be provided only by the firm. Firm-specific training involves investing time and other organizational resources in an employee. Firms can recoup firm-specific training costs by amortizing them over the time during which the trainee is employed (Williamson, 1981). Therefore, firms tend to ensure that employees with firm-specific skills remain with the firm. By providing an employee with mobility opportunities, internal labor markets encourage an employee to remain with the firm long enough for the firm to recoup its training costs (Pfeffer and Cohen, 1984; Wholey, 1985; Baron, Davis-Blake, and Bielby, 1986). Investing in firm-specific training creates an incentive for firms to ensure employment stability for the trainee. Because externalization reduces employment stability, we predict:

Hypothesis 2: Jobs requiring high levels of firm-specific training are less likely to be filled by temporary workers than jobs requiring low levels of firm-specific training.

External control perspective. From the external control perspective, firms attempt to gain flexibility by managing their dependence on external groups (Pfeffer and Salancik, 1978). Firms may use externalization or internalization as tools to manage their relationships with external constituents. Several researchers (Piore, 1980; Mangum, Mayall, and Nelson, 1985; Pfeffer and Baron, 1988) have argued that organizations with highly variable employment needs are likely to be dependent on a continual flow of new employees. Each time employment needs increase, the organization must hire new workers, who may then be let go when employment needs decrease. One method of managing this dependence on the available supply of new employees is to rely on external rather than permanent workers. Continual hiring and firing of workers who are hired as permanent may make it more difficult for the organization to recruit permanent employees in the future. Individuals who desire permanent employment may be unwilling to work for an organization that has a history of extremely unstable employment. Externalized workers are typically

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hired with the explicit understanding that their employment will be for a limited duration. Therefore, they can easily be added to or dropped from the workforce without jeopardizing the organization's ability to hire new employees in the future (Belous, 1989). Past research provides some evidence that unstable employment levels increase the use of temporary workers. Mangum, Mayall, and Nelson (1985) reported that both growing and declining firms were more likely to use temporary workers than firms with stable employment levels. Abraham and Taylor (1990) found that both seasonality and cyclicalities in industry employment levels affected the use of independent contractors. Gordon and Thal-Larsen (1969) reported that workload variations were the second most common reason, after staff emergencies, for using temporary workers. Because externalization provides a way of managing dependence on the supply of new employees, we predict:

Hypothesis 3: Variability in organizational employment levels has a positive effect on the use of temporary workers and independent contractors.

Firms may also use externalized workers to manage their relationships with unions and government. Although unions are likely to have a significant effect on the use of externalized workers, the direction of this effect is difficult to predict. Firms may use externalized workers to decrease a union's power over employees. Externalized workers may be used to remind permanent workers that alternative sources of labor are readily available to replace those who use unions or other means to express dissatisfaction with the workplace. The use of externalized workers to control existing union power implies a positive relationship between unionization and externalization: As the number of unionized workers increases, organizations are likely to resist this influence by employing more workers who are outside of the control of unions. This line of argument is consistent with one of Abraham and Taylor's (1990) findings on independent contractors. They reported that the presence of a union had a positive effect on the use of independent contractors for trucking services, although unionization had no effect on the use of independent contractors for five other types of services.

Although firms may try to use externalization to reduce union power, unions are likely to resist the employment of externalized workers, who are very difficult to organize and often have different objectives than permanent workers, making collective bargaining difficult (Pfeffer and Baron, 1988). Union attempts to resist externalization should be most successful when the influence of unions is high because a large percentage of an organization's labor force is unionized. The idea that unions resist externalization suggests a negative relationship between unionization and externalization. As the percentage of unionized workers increases, union attempts to resist externalization should be increasingly successful, lowering the probability that the organization will use externalized workers. The results of Abraham's (1988) study of temporary workers are consistent with this second line of argument. She reported that the percentage of unionized workers in an organization had a

negative effect on the organization's use of temporary workers. Based on the preceding discussion, we predict:

Hypothesis 4: The proportion of unionized workers in an establishment will be correlated with the establishment's use of temporary workers and independent contractors.

There is a growing body of evidence that organizational employment practices are responsive to the interests of government (Jacoby, 1985; Baron, Dobbin, and Jennings, 1986; Edelman, 1990). Firms that are highly dependent on the government are likely to manage that dependence by adopting employment practices that conform to the interests of government (Salancik, 1979). Recently, many government agencies have become concerned about abuse and exploitation of temporary workers and independent contractors (Belous, 1989; Waller, 1989). Organizations that experience substantial government inspection of their employment policies and procedures may be reluctant to employ externalized workers. The use of externalized workers may raise new governmental concerns, leading to further investigation and restrictions on employment practices. One major area of government oversight is affirmative action; firms with more than 100 employees are required to file affirmative action (EEO-1) reports. These firms must demonstrate that their employment practices in a variety of areas (e.g., hiring, promotion) meet government standards. Therefore, we predict:

Hypothesis 5: Firms with government oversight of affirmative action will be less likely to use temporary workers and independent contractors than firms without government oversight.

Bureaucratic control perspective. The bureaucratic control perspective has two components. First, bureaucratization affects employment practices. Second, although large firms also tend to be highly bureaucratized, organizational size creates pressures on employment practices that may differ from the pressures created by bureaucratization.

Part of the process of bureaucratization is the development of employment practices that ensure that competent, stable, and reliable people are hired and promoted (Weber, 1958; Edwards, 1975). These employment practices also make it easier to exercise control over employees (Bills, 1987). Although the level of bureaucratization in employment practices can be assessed at the establishment level of analysis, there is substantial within-establishment variation in the extent to which bureaucratic employment practices affect specific jobs. Baron, Davis-Blake, and Bielby (1986) reported that establishments could be grouped into those without internal labor markets and those with them. Within establishments that had ILMs, however, there was substantial variation in how many jobs were actually included in the ILM. Similarly, Cohen and Pfeffer (1986) found that although establishments appeared to have establishment-level hiring standards, there was still variation in hiring standards across jobs.

We expect that the development of establishment- and job-level bureaucratic employment practices has different effects on the use of temporary workers and independent contractors. We first consider temporary workers. The

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existence of bureaucratic employment practices creates pressure for workforce stability. Organizations with bureaucratic employment practices seek stable and committed employees who are capable of following rules and who are likely to be influenced by organizational socialization (Collins, 1979); these firms are unlikely to hire temporary workers. Temporary workers may be perceived as unstable and transient and sometimes lack extensive formal education, which may be useful for understanding and following rules (Spitz and Pfeffer, 1987). Both firm- and job-level bureaucratization are inconsistent with the use of temporary workers. Therefore, we predict:

Hypothesis 6a: There is a negative relationship between the level of bureaucratization in employment practices (at both the establishment and job levels) and the use of temporary workers.

Because independent contractors often plan and control their own work (Belous, 1989), they may operate outside of the normal administrative structure of the firm. Therefore, independent contractors may not be disruptive to an establishment with highly bureaucratized employment practices. It is possible that establishments with bureaucratic employment practices may use independent contractors as a way of gaining flexibility without disrupting the establishment's routine practices. Therefore, we predict:

Hypothesis 6b: There is a positive relationship between the level of bureaucratized employment practices in an establishment and the use of independent contractors.

A large body of evidence suggests that large firms have more bureaucratic employment practices than small firms (Edwards, 1975; Pfeffer and Cohen, 1984; Baron, Davis-Blake, and Bielby, 1986; Cohen and Pfeffer, 1986). We also believe that, net of the level of bureaucratization within a firm, organizational size should be negatively related to the use of temporary workers and positively related to the use of independent contractors.

Although externalization can give firms the flexibility to adjust employment levels to changes in demand, large firms are less likely than small ones to require the rapid growth and contraction of the workforce that can be provided by temporary workers. Because large firms have more employees and slack than small firms, they are likely to have employees available to meet temporary needs. Similarly, because large organizations proliferate job titles (Blau, 1955; Baron and Bielby, 1986), they are more likely than small organizations to have open positions to which employees could be reassigned in the event of a downturn in workload. The idea that large firms are less likely than small firms to use temporary workers is partially consistent with past research. Abraham (1988) reported that heavy users of temporary workers were smaller firms than light users, but this bivariate relationship was not significant in a multiple regression. Mangum, Mayall, and Nelson (1985), in contrast, reported that large organizations were more likely than small organizations to use temporary workers, while Gordon and Thal-Larsen (1969) reported that temporary worker use did not vary with firm size. Because large firms have less need than small firms for flexibility in numbers of employees, we predict:

Hypothesis 7a: The larger the size of the establishment, the less it will use temporary workers.

Although large firms are unlikely to need the kind of employment flexibility that temporary workers provide, they are likely to have a greater need than small firms for access to specialized worker capabilities on a short-term basis. The wide range of products or services typically produced by large firms requires that they have access to many specialized skills and services that are difficult or expensive to develop in-house (Harrison and Kelley, 1991). These specialized skills are often provided by independent contractors (Lazerson, 1988; Belous, 1989). To date, empirical evidence on how firm size affects the use of independent contractors has been mixed. Both Penn (1992) and Harrison and Kelley (1991) reported that firm size had a positive effect on independent contractor use, while Abraham and Taylor (1990) reported that large establishments were less likely than small establishments to use independent contractors. Based on the argument that the product and market diversity often found in large firms requires short-term access to specialized worker skills, we predict:

Hypothesis 7b: The larger the establishment, the more likely it is to use independent contractors.

There is some evidence that being part of a multiple-establishment firm affects employment practices, even after controlling for establishment size (Pfeffer and Cohen, 1984; Baron, Davis-Blake, and Bielby, 1986; Harrison and Kelley, 1991). The basic logic behind the effect of being part of a multiple-establishment firm parallels the logic behind the effects of firm size. Multiple-establishment firms are likely to have duplication of skills across establishments and are likely to be involved in more activities than single-site establishments (Harrison and Kelley, 1991). Because of skill duplication across establishments, multiple-establishment firms may be able to adjust to shifting workloads by moving workers across establishments. Therefore, multiple-site firms are less likely to require temporary workers in order to adjust to shifts in demand. Because of the diversity of activities that occur in a multiple-site firm, however, multiple-establishment firms are more likely than single-site firms to require the specialized skills and capabilities of independent contractors. Kelley and Harrison (1990) found that multiple-site manufacturing plants were more likely to use independent contractors than single-site plants. Thus, we hypothesize:

Hypothesis 8a: Establishments that are part of multiple-site organizations are less likely to employ temporary workers than single-site establishments.

Hypothesis 8b: Establishments that are part of multiple-site organizations are more likely to employ independent contractors than single-site establishments.

Job complexity perspective. The job complexity perspective holds that the types of skills required to perform a job influence the degree to which the job is externalized (Jacobs, 1981). We focus on the effects of three types of skills: interpersonal skills, the ability to work with complex information, and the need for multiple, complex technical

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skills. Because the development or assessment of each of these skills requires employees to spend a significant amount of time in an organization, the need for each of these skills is incompatible with the use of temporary workers.

Jobs that require high levels of interpersonal skill are typically interdependent with other jobs and involve high levels of interaction with incumbents of other jobs. The smooth and efficient management of the flow of work among interdependent jobs requires that job incumbents have similar perceptions of the nature and timing of tasks (March and Simon, 1958). These perceptions are gained through experience and interaction with others and are lost when an incumbent leaves a position. Externalized workers are ill-suited for highly interdependent tasks because they typically do not participate in the firm long enough to gain the shared perceptions and access to social networks necessary to perform these tasks effectively. Therefore, we predict:

Hypothesis 9a: Jobs high in interpersonal complexity are less likely to be performed by temporary workers than jobs low in interpersonal complexity.

Baron, Davis-Blake, and Bielby (1986) argued that performance in informationally complex jobs is difficult to monitor, making assessments of outputs difficult for the organization. In order to make reasonable judgments about performance, organizations may construct mobility paths in which informationally complex jobs are preceded by simpler jobs. This ensures that individuals who will eventually occupy informationally complex jobs are first accurately monitored and evaluated in less complex jobs. Baron, Davis-Blake, and Bielby (1986) reported that while informationally complex jobs were less likely to be in job ladders than other types of jobs, informationally complex jobs that were located in formal job ladders were likely to be near the top of those ladders, which is consistent with a long period of monitoring before occupying the jobs. Jacobs (1981) also argued that when it is difficult to evaluate individual performance, organizations will create elaborate career ladders that slow mobility between positions. These ladders allow the organization to monitor individual performance over an extended period of time. The need to monitor individuals for some period of time before allowing them to occupy informationally complex jobs suggests that informationally complex jobs are not well suited to temporary workers. Therefore, we expect:

Hypothesis 9b: Jobs high in informational complexity are less likely to be performed by temporary workers than jobs low in informational complexity.

Belous (1989) argued that firms seek multiskilled workers, who can be moved into a variety of jobs, among their core employees. Technically complex jobs often involve both high skill levels and multiple types of skill. Therefore, technically complex jobs are often embedded in job ladders that promote skill development and experience in a variety of other jobs. Baron, Davis-Blake, and Bielby (1986) reported that jobs high in technical complexity were more likely to be in job ladders than jobs low in technical complexity. Because

experience in a variety of other jobs in the firm is often a prerequisite for effective performance in technically complex jobs, temporary workers would be ill-suited to these types of jobs. Therefore, we predict:

Hypothesis 9c: Jobs high in technical complexity are less likely to be performed by temporary workers than jobs low in technical complexity.

METHOD

Data from the Department of Labor's Employment Opportunity Pilot Project (EOPP) employer surveys were used to test the hypotheses. The EOPP is a random sample of establishments in 28 Standard Metropolitan Statistical Areas. These data have been used in a variety of previous studies on the employment relationship (e.g., Bishop, 1987, 1990; Barron, Black, and Lowenstein, 1987). Five thousand eighty-nine establishments participated in the survey in 1980 and were asked about their activities in 1979. In 1982, all establishments were recontacted; 2,752 responded and answered questions about their activities in 1981. Most of the questions were not the same in 1980 and 1982. Company personnel familiar with the establishment's employment practices provided a variety of information about the establishment. Respondents to the 1982 survey also provided information about either one or two specific jobs. Respondents were asked to provide detailed information about two jobs and their incumbents, first about the last new employee hired prior to August 1981, whether or not that employee was still with the organization at the time of the survey, then about another employee hired within the past two years for the same or a similar position but who had a different level of vocational training. Two thousand eighteen establishments reported on one job, and 734 establishments reported on two jobs. We used data primarily from the 1982 survey, although we used 1980 data to look at changes in some of the independent variables over time.

Measures

Dependent variables. Use of temporary workers was examined at the job level of analysis, and use of independent contractors was examined at the establishment level. Respondents were asked if "the job was supposed to be temporary, seasonal, or permanent" at the time when the most recent incumbent was hired. Jobs were classified as temporary if they were either temporary or seasonal; 10 percent of jobs were temporary and 5 percent were seasonal. Temporary job is a binary variable, coded 1 if the job was temporary or seasonal and 0 if the job was permanent. Independent contractor is a binary variable, coded 1 if the establishment used independent contractors and 0 if it did not.

Independent variables. Benefit costs were not measured in the survey, so we used data on industry benefit levels as a proxy for firm benefit costs. Industry benefits, at the two-digit Standard Industry Classification (SIC) level, were measured as the ratio of total employee-benefit costs to payroll in 1980 (Chamber of Commerce, 1981). Firm-specific

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training was a job-level measure and was assessed as the sum of the number of hours of three types of training received by the typical job incumbent after hiring: (1) formal training, (2) informal training by managers, and (3) informal training by coworkers.

Variation in employment was measured as the coefficient of variation in establishment employment on six dates: July 1979, December 1979, July 1980, December 1980, July 1981, and December 1981. Unionization is the percentage of workers in the establishment covered by collective bargaining agreements in 1981. Government oversight of affirmative action was also measured at the industry (two-digit SIC) level as the percentage of workers in an industry employed in firms that must file EEO-1 reports (from Smith and Welch, 1984: 275). The greater the percentage of workers employed in firms required to file reports on affirmative action compliance, the higher the level of government scrutiny of employment practices in the industry.

We measured bureaucratization of employment practices at both the establishment and the job level. Our establishment-level measure was the extent to which the establishment had bureaucratic termination procedures, measured as the amount of paperwork needed to fire an employee (on a 1–4 scale). Our job-level measure was the number of weeks a job's probationary period lasted. Cohen and Pfeffer (1986) reported that use of probationary periods was strongly related to other bureaucratic hiring standards (e.g., the use of tests and educational credentials). While probationary periods may also index job skills, we included a number of other measures of skill and training in the model (i.e., firm-specific training and interpersonal, informational, and technical complexity). Establishment size is the number of employees on the date the survey was administered in 1982. Multiple-site establishments were identified by a binary variable, coded 1 if the firm had any other divisions or subsidiaries located outside of the SMSA and 0 otherwise.

Measures of informational (data), interpersonal (people), and technical (things) complexity are occupational level measures taken from the 4th edition of the *Dictionary of Occupational Titles (DOT)* (see Baron, Davis-Blake, and Bielby, 1986 for a similar use of the *DOT* measures). All complexity measures were reverse-coded so that higher complexity scores indicate more complex jobs.

To assess the extent to which the *DOT* measures of data, people, and things were associated with informational, interpersonal, and technical complexity, we conducted two analyses, reported in Appendix A. First, we examined the mean score of seven occupational groups on each of these three variables and found these means generally consistent with our interpretation of the variables. For example, sales occupations had high scores on interpersonal complexity and low scores on technical complexity. Similarly, managerial occupations had high scores on informational and interpersonal complexity and low scores on technical complexity. Craft occupations had high scores on technical complexity but not on the other two types.

Second, to determine whether our measures were merely surrogates for basic occupational categories, we examined all occupational titles that scored either at the highest or next-highest level on each of the three measures. A subset of these occupations is reported in Appendix A; a complete listing is available from the authors. The specific occupations listed in Appendix A indicate that jobs from a variety of occupations scored high on each measure. The most informationally complex jobs included jobs in managerial and professional occupations (e.g., lawyer, tax accountant), as well as jobs in sales and service occupations (e.g., sales agent, chef). The most interpersonally complex jobs were in either managerial or professional occupations. The most technically complex jobs included jobs in professional occupations (e.g., drafter, dental hygienist), jobs in service occupations (e.g., cook, cosmetologist), as well as jobs in a variety of craft and operative occupations (e.g., carpenter, mechanic). The diversity of occupations that had high scores on each complexity measure indicates that the three measures of complexity are not merely surrogates for basic occupational categories.

Control variables. Several variables were included to control for human capital, occupational, industrial, and geographic factors that are likely to affect the use of externalized workers. Our human capital measures typically apply to the incumbent most recently hired for the job. The most recently hired incumbent may have different demographic characteristics than other job incumbents. Given that jobs are often segregated by gender (Bielby and Baron, 1986) and that education and experience are commonly used hiring standards (Collins, 1974; Cohen and Pfeffer, 1986), however, it is likely that the most recently hired job incumbent is similar to other incumbents in gender, education, and experience. Because the limited amount of past research in this area has found that the incumbents of temporary jobs are likely to be young, female, and not highly educated or experienced (Mayall and Nelson, 1982; Howe, 1986; Spitz and Pfeffer, 1987; Cohen and Haberfeld, 1993), we wanted to control for these demographic effects.

To control for the effects of gender and age, measures of gender (a binary variable with female coded as 1), age in years, and age squared were added to the model. Although past research has suggested only that incumbents of temporary jobs are likely to be younger than incumbents of permanent jobs (Howe, 1986; Spitz and Pfeffer, 1987; Cohen and Haberfeld, 1993), we included both age and age squared to investigate the possibility that the relationship between age and temporary employment may be curvilinear.

The current hourly wage of the incumbent was added to control for the possibility that temporary workers may be paid less than permanent workers (Spitz and Pfeffer, 1987). Education and experience of the job incumbent may also affect temporary worker use (Spitz and Pfeffer, 1987). To control for these factors, we added to the model the last year in school completed by the job incumbent and the job incumbent's experience (in months) in similar jobs.

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Previous research (Mayall and Nelson, 1982; Mangum, Mayall, and Nelson, 1985; Abraham, 1988; Abraham and Taylor, 1990) has suggested that the use of external workers varies by occupation, industry, and region. Using one-digit 4th edition *DOT* codes, binary variables for eight occupational categories were created: managerial, professional/technical, sales, craft, clerical, service, operative (omitted category), and agricultural. Agricultural jobs (19 jobs) were excluded from the analysis. Binary variables for six industries were also created based on two-digit SIC codes: construction and mining, social-overhead capital, wholesale and retail trade, service, manufacturing (omitted category), and agriculture (five establishments that were excluded from the analysis). The social-overhead capital category includes firms in the transportation, communication, public utilities, and finance industries (Averitt, 1968). Three regional binary variables were also added to the model: west, south, and midwest (omitted category).

RESULTS

Table 1 reports the means, standard deviations, and correlations among the study variables; descriptive statistics for the control variables are reported in Appendices B and C. Fifteen percent of the jobs were either temporary or seasonal, and 41 percent of the establishments used independent contractors. Thus, there is variation in employment externalization across both jobs and establishments.

Temporary Workers

Table 2 presents the results of a series of logistic regressions on whether a job is temporary or permanent. The table begins by estimating the effects of the control variables without including any of the study variables, then the variables associated with each perspective are added to the model one step at a time. Before discussing the results for the specific coefficients, it is important to note two things about the overall pattern of results in Table 2. First, the signs and significance levels of the study-variable coefficients are quite robust across different specifications of the model; in general, signs and significance levels of study-variable coefficients do not change when new variables are added. Second, as noted near the bottom of the table, the addition of each group of variables improves the fit of the model.

Whether a job is temporary or permanent could affect the types of workers who occupy the job (i.e., externalization and worker characteristics are determined simultaneously). To test whether this possibility affected the results, we reestimated model 5 in Table 2 without the following variables: age, age squared, gender, education, experience, and current hourly wage. The results were the same as those reported in Table 2. We also wanted to assess whether the results were affected by the exclusion of cases with missing values. We therefore reestimated all models in Table 2 and replaced missing values of nonbinary variables with the variable mean ($N = 3153$ for all models). All results for the study variables were the same as those reported in

Table 1

Means, Standard Deviations, and Correlations among Study Variables				
Variable	1	2	3	4
1. Temporary job			-.05	-.10
2. Independent contractor*			.10	-
3. Benefits level				.05
4. Firm-specific training				
5. Variation in employment				
6. Government oversight				
7. Unionization				
8. Bureaucratized practices (establishment level)				
9. Bureaucratized practices (job level)				
10. Establishment size				
11. Multiple-site firm				
12. Informational complexity†				
13. Interpersonal complexity†				
14. Technical complexity†				
Mean	.15	.41	33.02	82.41
Standard deviation	.36	.49	2.94	110.41
Range	0-1	0-1	27.4-51.8	0-1260
N	3339	2710	3353	2941

* Because this is an establishment-level variable, correlations with job-level variables are not shown.

† These variables have been reverse-coded.

Table 2 except that the coefficient of unionization was statistically significant (it remained positive), and the coefficient of firm-level bureaucratized practices was not significant.

Contrary to our prediction, industry benefit levels were not a significant predictor of temporary worker use. This finding is consistent with the results reported by Mangum, Mayall, and Nelson (1985) and with Gordon and Thal-Larsen's (1969) finding that very few employers mentioned the need to reduce benefits costs as a reason for using temporary workers. It is also possible, however, that an industry-level benefits measure may be too noisy to reflect firm-level effects accurately. As predicted, firm-specific training had a significant negative effect on the use of temporary workers.

As predicted, variation in employment had a significant positive effect on temporary worker use. Because the coefficient of variation in employment may merely capture the effects of employment growth or decline, however, we added change in employment between July of 1979 and December of 1981 to the models estimated in Tables 2 and 4 (below). Change in employment had no effect on the use of temporary workers (Table 2), and all other coefficients remained the same as those reported in Table 2, but it had a positive effect on the use of independent contractors (Table 4, below). Otherwise, all coefficients remained the same as those reported in Table 4, below.

Government oversight of employment had a significant negative effect on the use of temporary workers. Unionization had a positive but nonsignificant effect on temporary worker use. Also, as expected, both establishment- and job-level bureaucratization had negative

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Table 1 (continued)

5	6	7	8	9	10	11	12	13	14
.15	-.10	.04	-.08	-.10	-.06	-.05	-.14	-.05	-.07
.06	.06	.12	.10	-	.06	.09	-	-	-
-.07	.51	.18	.20	.16	.23	.09	.03	-.07	.14
-.01	.07	-.05	.04	.12	.06	.04	.13	.03	.08
	-.08	.00	-.13	-.09	-.05	-.02	.02	.02	-.01
		.17	.23	.20	.18	.13	-.02	-.09	.11
			.23	.05	.16	.14	-.09	-.11	.05
				.22	.24	.33	-.02	.00	.03
					.10	.15	.07	.01	.10
						.20	.01	-.04	.03
							.04	.02	-.00
								.50	.17
									-.19
19.83	37.80	9.96	2.11	6.83	75.72	.29	2.39	1.42	2.68
19.24	16.33	27.24	1.02	8.36	278.87	.45	1.67	1.37	2.54
0-168.1	11.9-90.6	0-100	1-4	0-90	1-9012	0-1	0-6	0-8	0-7
3411	3479	3442	3316	3373	3442	3461	3432	3432	3432

effects on the use of temporary workers. Large establishments were less likely to use temporary workers than small establishments; however, the presence of multiple sites had no effect on temporary worker use. And, as predicted, a job's technical and informational complexity had negative effects on the use of temporary workers, but interpersonal complexity had no effect on temporary worker use.

The control variables generally had the expected signs, although not all of the effects were statistically significant. The relationship between age and temporary employment was curvilinear: Younger and older workers were significantly more likely than middle-aged workers to be employed in temporary positions. Also, employee experience had a negative effect on temporary employment. Although the coefficient of gender is positive, indicating that women were more likely to be employed in temporary jobs than men, it is not statistically significant. Similarly, the coefficient of current hourly wage was negative but nonsignificant. Occupation had no effect on use of temporary workers, and temporary workers were used more frequently in manufacturing than in all other industries. We also found that temporary workers were used less frequently in the south than in other regions.

To assess whether the results were robust, three additional analyses were conducted on model 5 in Table 2. First, the analysis was repeated excluding seasonal jobs. The results for the study variables were the same as those reported in Table 2 except that the effects of job-level bureaucratization and technical complexity were no longer significant (although their signs remained negative). Second, to determine if the results were affected by sample selection bias, because only

Table 2

Logistic Regressions on Temporary Worker Use (Job Level)*

Study variables	Model				
	1	2	3	4	5
Benefits level					-.01 (.04)
Firm-specific training					-.002*** (.001)
Variation in employment				.02**** (.003)	.02**** (.003)
Government oversight				-.02*** (.01)	-.02*** (.01)
Unionization				.004 (.003)	.004 (.003)
Bureaucratized practices (establishment level)			-.15** (.08)	-.11* (.08)	-.10* (.08)
Bureaucratized practices (job level)			-.03*** (.01)	-.02** (.01)	-.02** (.01)
Establishment size			-.004*** (.001)	-.004*** (.001)	-.004*** (.002)
Multiple-site firm			.18 (.17)	.08 (.17)	.07 (.17)
Informational complexity		-.11** (.06)	-.12** (.06)	-.13** (.06)	-.12** (.06)
Interpersonal complexity		.03 (.07)	.03 (.07)	.03 (.07)	.01 (.07)
Technical complexity		-.09*** (.03)	-.08*** (.03)	-.08** (.04)	-.07** (.04)
Control variables					
Employee age	-.14**** (.04)	-.13**** (.04)	-.12**** (.04)	-.11**** (.04)	-.11**** (.04)
Employee age squared	.002*** (.001)	.002*** (.001)	.001*** (.001)	.001** (.001)	.001** (.001)
Employee gender	.16 (.17)	.19 (.17)	.21 (.17)	.19 (.17)	.20 (.17)
Employee education	-.02 (.05)	-.01 (.05)	.01 (.05)	.0001 (.05)	.004 (.05)
Employee experience	-.004** (.002)	-.003 (.002)	-.004* (.002)	-.004** (.002)	-.004** (.002)
Current hourly wage	-.05 (.03)	-.03 (.03)	-.02 (.03)	-.03 (.03)	-.03 (.03)
Occupation					
Managerial	-.52 (.40)	-.40 (.46)	-.45 (.46)	-.61 (.48)	-.55 (.47)
Professional/technical	-.79* (.45)	-.48 (.47)	-.53 (.48)	-.49 (.48)	-.46 (.48)
Craft	.11 (.22)	.33 (.23)	.25 (.23)	.18 (.24)	.20 (.24)
Clerical	-.63*** (.25)	-.38 (.27)	-.34 (.27)	-.38 (.27)	-.37 (.27)
Sales	.09 (.20)	.05 (.27)	.02 (.27)	-.02 (.27)	.01 (.28)
Service	-.21 (.23)	.26 (.23)	-.25 (.24)	-.32 (.24)	-.34 (.24)
Operative (omitted category)					
Industry					
Construction	.84**** (.27)	.69*** (.28)	.31 (.29)	-.77* (.44)	-.74* (.45)
Service	-.01 (.25)	-.07 (.25)	-.36 (.26)	-.86*** (.33)	-.86*** (.34)
Social-overhead capital	-.20 (.32)	-.24 (.32)	-.46 (.32)	-.56* (.33)	-.55* (.34)
Trade	-.07 (.23)	-.12 (.23)	-.49** (.24)	-1.02** (.32)	-1.03*** (.35)
Manufacturing (omitted category)					

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Table 2 (continued)

Study variables	Model				
	1	2	3	4	5
Region					
South	-.34** (.15)	-.34** (.15)	-.39*** (.15)	-.34** (.16)	-.31** (.16)
West	.31* (.17)	.28* (.17)	.15 (.18)	.05 (.18)	.09 (.18)
Midwest (omitted category)					
Intercept	1.24	.28	.91	1.49	1.66
N	2076	2076	2076	2076	2076
Cases correctly classified	68%	68%	71%	73%	74%
-2 log likelihood	1598.64	1582.05	1544.24	1506.80	1499.97
G (chi-squared goodness-of-fit statistic for this model)	102.11****	118.71***	156.51****	193.96****	200.79****
Chi-squared (comparison of fit of this and previous model) (d.f. in parentheses)		16.59**** (3)	37.81**** (4)	37.44**** (3)	6.83** (2)

* $p < .10$; ** $p < .05$; *** $p < .01$; **** $p < .001$.

* Logistic regression coefficients are reported. Standard errors are in parentheses. All tests of study variables are one-tailed except for test of unionization coefficients, which are two-tailed. Tests of control variables are two-tailed.

a subset of the original random sample of firms participated in the second wave of data collection in 1981, we estimated the possible effects of sample selection bias, using the method described by Berk (1983). This procedure did not change the effects of any of the study variables reported in Table 2. Thus, the results do not appear to be significantly affected by sample selection bias. Finally, the analyses reported in Table 2 include two jobs from some establishments and one job from other establishments. When two jobs are in the same establishment, they are not independent. One solution to this problem would be to estimate a model using binary variables to control for establishment effects. Because of the large number of establishments relative to jobs, this approach was not feasible. We therefore estimated several models that contained only one job per establishment. These models included all jobs from establishments that reported on only one job and one job, randomly selected, from the two jobs in establishments that reported on two jobs. We reestimated model 5 in Table 2 several times, using different sets of jobs from the two-job establishments. The results of these analyses for the study variables were the same as those reported in Table 2 except that the effect of job-level bureaucratization was not significant.

To determine if any differences between the temporary-workers model and the independent-contractor model were due to differences in level of analysis, we reestimated the model in Table 2 at the establishment level of analysis. The results are reported in Table 3.

The independent variables in Table 3 are all of the establishment- and industry-level variables used in Table 2. Table 3 reports the results of two regressions that use two slightly different establishment-level measures of temporary

Table 3

Regressions on Temporary Worker Use (Establishment Level)*

Study variables	Temporary worker use (0–1 variable)†	Intensity of temporary worker use‡
Benefits level	–.01 (.03)	–.002 (.004)
Variation in employment	.01**** (.003)	.002**** (.0004)
Government oversight	–.02*** (.01)	–.003**** (.001)
Unionization	.004** (.002)	.001 (.0003)
Bureaucratized practices (establishment level)	–.06 (.07)	–.013* (.010)
Establishment size	–.003**** (.001)	–.0001** (.00005)
Multiple-site firm	–.10 (.14)	–.012 (.022)
Control variables		
Industry		
Construction	–.45 (.35)	–.015 (.053)
Service	–.78*** (.28)	–.114*** (.042)
Social-overhead capital	–.56** (.26)	–.079** (.038)
Trade	–.76*** (.28)	–.104*** (.043)
Manufacturing (omitted category)		
Region		
South	–.34*** (.13)	–.057*** (.020)
West	.08 (.15)	.033 (.025)
Midwest (omitted category)		
Intercept	.16	.432
N	2392	2392
Cases correctly classified	65%	
–2 log likelihood	2026.20	
G (chi-squared goodness-of-fit statistic)	110.95****	
R ²		.04

* $p < .10$; ** $p < .05$; *** $p < .01$; **** $p < .001$.

* Standard errors are in parentheses. All tests of study variables are one-tailed except for tests of unionization coefficients, which are two-tailed. Tests of control variables are two-tailed.

† Logistic regression coefficients are reported.

‡ OLS regression coefficients are reported. Dependent variable is intensity of temporary worker use (0–2).

worker use. In the first model, the dependent variable is a binary variable, coded 1 if any of the jobs reported on by the establishment were filled by temporary workers and 0 otherwise. In the second model, the dependent variable is the number of jobs filled by temporary workers. The effects reported in Table 3 are similar across the two models and are comparable to those reported in Table 2, with two exceptions: The effect of unionization is significant in the first model in Table 3, and the effect of bureaucratized practices at the firm level is not significant in either model in Table 3. Thus, the effects of the establishment- and

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industry-level independent variables are consistent across levels of analysis for the dependent variable.

Independent Contractors

Table 4 reports the results of a series of logistic regressions on independent contractor use. As in Table 2, the first set of regressions reports the effects of the control variables alone; groups of variables associated with each perspective were added one at a time. Again, the signs and significance levels of the study variables are quite robust across model

Table 4

Logistic Regression on Independent Contractor Use*

Study variables	Model			
	1	2	3	4
Benefits level				-.001 (.02)
Variation in employment			.01** (.002)	.01** (.002)
Government oversight			-.001 (.004)	-.001 (.004)
Unionization			.003 (.002)	.003 (.002)
Bureaucratized practices (establishment level)		.13*** (.05)	.14*** (.05)	.14*** (.05)
Establishment size		.001** (.0003)	.001** (.0003)	.001** (.0003)
Multiple site firm		.26*** (.11)	.24*** (.11)	.24*** (.11)
Control variables				
Industry				
Construction	.80*** (.19)	.96*** (.20)	.85*** (.26)	.85*** (.26)
Service	-.58*** (.14)	-.44*** (.15)	-.41** (.19)	-.41** (.20)
Social-overhead capital	-.23 (.17)	-.15 (.17)	-.10 (.18)	-.10 (.18)
Trade	-.89*** (.14)	-.74*** (.14)	-.71*** (.20)	-.71*** (.21)
Manufacturing (omitted category)				
Region				
South	.05 (.10)	.08 (.10)	.10 (.10)	.10 (.10)
West	-.06 (.12)	.03 (.12)	.001 (.13)	.001 (.13)
Midwest (omitted category)				
Intercept	.12	.14	.50	.46
N	2379	2379	2379	2379
Cases correctly classified	58%	65%	66%	66%
-2 log likelihood	3092.63	3061.80	3055.05	3055.04
G (chi-squared goodness-of-fit statistic for this model)	140.15***	170.98***	177.73***	177.73***
Chi-squared (comparison of fit of this and previous model) (d.f. in parentheses)		30.83*** (3)	6.75* (3)	.01 (3)

* $p < .10$; ** $p < .05$; *** $p < .01$; **** $p < .001$.

* Logistic regression coefficients are reported. Standard errors are in parentheses. All tests of study variables are one-tailed except for tests of unionization coefficients which are two-tailed. Tests of control variables are two-tailed.

specifications. Also, all models that involve the addition of significant variables are a better fit than previous models.

To assess whether the results were affected by the exclusion of cases with missing values, we reestimated all models in Table 4 and replaced missing values of nonbinary variables with the variable mean ($N = 2688$ for all models). All results for the study variables are the same as those reported in Table 4 except that the coefficient of establishment size is not statistically significant (it remains positive).

Contrary to our predictions, benefit costs had no effect on the use of independent contractors, although this may be due to the difficulties with the measure, mentioned earlier. As predicted, variation in employment had a positive effect on the use of independent contractors. Contrary to prediction, government involvement in monitoring affirmative action practices had no effect on the use of independent contractors, nor did unionization. As predicted, establishment-level bureaucratization of employment practices, firm size, and being part of a multiple-site firm had a positive effect on independent contractor use. Also, as expected, the use of independent contractors was affected by industry, with firms in construction being more likely than manufacturing firms to use independent contractors and firms in services or trade being less likely than firms in manufacturing to use independent contractors, a pattern of findings similar to that reported by Gordon and Thal-Larsen (1969).

To determine if the results were affected by sample selection bias, because only a subset of the original random sample of firms participated in the second wave of data collection in 1981, we estimated the possible effects of sample selection bias, using the method described by Berk (1983). This procedure changed the effect of only one of the study variables reported in Table 4: The effect of establishment size was no longer significant (although the sign remained positive). All other effects of the study variables were the same as those reported in Table 4. Thus, the results do not appear to be significantly affected by sample selection bias.

DISCUSSION

Three major conclusions can be drawn from the overall pattern of results. First, our results are consistent with the idea that externalization arises alongside the stabilizing process of internalization as a way to increase organizational flexibility. Factors associated with the need for increased flexibility (e.g., the need for flexibility in the number of employees in small firms and access to specialized skills in large firms) increased externalization. By contrast, when the nature of the job (e.g., the job required informationally complex or firm-specific skills) or the firm (e.g., the firm was bureaucratized) required employment stability, externalization was less likely to occur. Our results also show that externalization can be used to manage relationships with external constituents. Specifically, organizations appear to limit their use of externalization in response to governmental concerns.

Second, like other aspects of the employment relationship (e.g., internal labor markets, hiring standards), the use of externalized workers is determined by multiple factors and is

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affected by the costs and feasibility of externalization, by the structure of the organization, and by the interests of external groups. Some of the effects we found are quite consistent with those reported in the literature on internal labor markets. Our finding that jobs requiring firm-specific or complex technical skills are unlikely to be temporary is quite consistent with the findings that these types of jobs are likely to be located in internal labor markets (Wholey, 1985; Baron, Davis-Blake, and Bielby, 1986). Similarly, our finding that firms facing unstable employment patterns are likely to use externalized workers is consistent with the notion that internal labor markets are likely to be found in the economic core, where firms typically face relatively captive markets and stable demand (Edwards, 1975; Piore, 1980; Pfeffer and Cohen, 1984; Baron, Davis-Blake, and Bielby, 1986). This consistency between our findings and the research on internalization reinforces the idea that internalization and externalization are potentially complementary arrangements. Externalization provides a firm with flexible work arrangements that can be reorganized in ways that internalized work arrangements cannot. Our findings are also consistent with work in the "new structuralist" tradition, which suggests that differences between high-paying, secure jobs and low-paying, unstable jobs are associated with firm- and job-level attributes, not merely with industry-level attributes (Baron and Bielby, 1980).

Third, externalization can occur in multiple ways, and different kinds of externalization appear to be influenced by different factors. While variation in employment had a positive effect on the use of both temporary workers and independent contractors, other factors had different effects on temporaries and independent contractors. Specifically, bureaucratization had a negative effect on the use of temporary workers and a positive effect on the use of independent contractors, perhaps because independent contractors are more likely to be administratively and physically separate from the firm than temporary workers. Therefore, hiring an independent contractor may be less disruptive to a bureaucratic organization than hiring a temporary worker.

Large organizations were also more likely to use independent contractors and less likely to use temporary workers than small firms. This may be because large firms can have flexibility in the number of employees with their existing workforces. But large firms are also engaged in more and diverse activities that require skills that will not be used frequently inside the firm. It is also possible that large firms simply may be able to afford more expensive forms of externalization than small firms, so the negative effect of establishment size on use of temporary workers may merely reflect the fact that larger establishments use temporaries from agencies and do not try to manage the problem of temporary employment themselves. This idea is consistent with Mangum, Mayall, and Nelson's (1985) finding that large firms were more likely than small firms to use temporary workers from agencies.

The interests of external groups also had somewhat different effects on the use of temporaries and independent

contractors. While government oversight of employment reduced temporary worker use, it had no impact on the probability of using independent contractors. Perhaps firms whose employment practices are under scrutiny may reduce their use of only those types of externalized workers that are likely to be perceived negatively by the government (i.e., temporary workers whose low wages and lack of health benefits have created concern among policymakers). Firms may retain other types of external workers that are perceived by the government to be more highly paid and protected.

The finding that occupation had no effect on the use of temporary workers is somewhat surprising, given that past research has found differences in temporary worker use across occupations, but the research that has examined occupational differences has not controlled for differences in skills. It may be that the occupational differences reported in past research are primarily skill differences. Thus, when skills are controlled, there is no net effect of occupation on the use of temporary workers.

The finding that temporary workers were used more frequently in manufacturing than in other industries is only partially consistent with past research. Mayall and Nelson (1982) reported that firms in manufacturing, services, and finance were the heaviest users of the temporary help services industry, while Mangum, Mayall, and Nelson (1985) reported that use of temporary workers was highest in trade and lowest in service and manufacturing industries.

While our results suggest some interesting relationships between internalization and externalization and between various types of externalization, our conclusions must remain tentative, due to the limitations of our data. Our data included a large sample of establishments from diverse regions of the United States, but the measures of both temporary worker and independent contractor use were somewhat limited. Neither measure assessed how heavily the establishment used external workers. The impact of external workers on an establishment is likely to depend not only on whether externalized workers are used but also on how extensively they are used. Also, we did not have information about the types of work performed by the independent contractors. Collecting this information in future research may pinpoint the specific reasons for using external workers and establish whether independent contractors are actually hired because of their unique skills.

The consequences of increased reliance on externalized workers require further exploration. We have argued that externalization adds needed flexibility to work arrangements and complements the stability provided by the internalized workforce. It is possible that heavy use of externalized workers destabilizes the core workforce. The presence of a large externalized workforce may lead internalized workers to question whether the firm is committed to their continued employment and, consequently, lead them to reduce their commitment to the firm. The reward inequality associated with externalization may also create conflict between internalized and externalized workers, particularly if the two groups need to work interdependently. Unfortunately, it is

precisely when the two groups must work interdependently that conflict between them is most harmful to the firm. The rapid expansion of the externalized workforce warrants an increase in research devoted to understanding the full range of benefits and costs associated with externalization.

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APPENDIX A: Occupational Group Means for Informational, Interpersonal, and Technical Complexity*

Informational		Interpersonal		Technical	
Managerial:	5.94	Managerial:	3.69	Craft:	5.46
Professional/technical:	4.82	Sales:	3.39	Clerical:	4.92
Sales:	3.81	Professional/technical:	3.10	Professional/technical:	4.55
Clerical:	3.69	Clerical:	2.53	Operative:	3.63
Craft:	3.40	Service:	2.21	Service:	2.94
Service:	2.41	Craft:	1.80	Sales:	1.47
Operative:	2.25	Operative:	1.54	Managerial:	1.12

Examples of occupations that scored at either the highest or next-highest level in each category:

Informational	Interpersonal	Technical
Graphic designer	Lawyer	Machinist
Underwriter	Controller	Mechanic (various types)
Mechanical engineer	Instructor, vocational training	Toolmaker
Controller	Manager (various types)	Cabinetmaker
Funeral director		Lithographer
Lawyer		Drafter
Tax accountant		Dental hygienist
Sales agent, securities		Floral designer
Auditor		Interior designer
Chef		Carpenter
Field contractor		Plumber
Manager (various types)		Orthopedic assistant
		Electrician
		Cook
		Cosmetologist

* All variables have been reverse-coded so that higher values of these variables represent more complex skills.

APPENDIX B: Means, Standard Deviations, and Correlations among Control Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Temporary job independent contractor*																			
2. Employee age	-.09																		
3. Employee gender	.03	.41																	
4. Employee education	.02	.58	.03																
5. Employee experience (months)	.02	.07	.02	.03															
6. Current hourly wage	.03	.26	.15	.18	.06														
7. Occupational/managerial/technical	.32	.10	.03	.08	.01	.07													
8. Craft	.25	.17	.17	.14	.07	.07	.05												
9. Clerical	-.06	-.10	-.15	-.11	-.13	-.02	.01	.06											
10. Sales	-.09	-.13	-.09	-.16	-.22	-.11	-.13	-.05	.09										
11. Service industry	-.21	-.16	-.18	-.30	-.05	.06	.26	-.26	.26	.06									
12. Construction	-.09	-.13	-.09	-.16	-.22	-.11	-.13	-.05	.09	.01	.01								
13. Service	-.09	-.13	-.09	-.16	-.22	-.11	-.13	-.05	.09	.01	.01	.01							
14. Social-overhead capital	-.09	-.13	-.09	-.16	-.22	-.11	-.13	-.05	.09	.01	.01	.01	.01						
15. Trade	-.09	-.13	-.09	-.16	-.22	-.11	-.13	-.05	.09	.01	.01	.01	.01	.01					
16. Region	-.09	-.13	-.09	-.16	-.22	-.11	-.13	-.05	.09	.01	.01	.01	.01	.01	.01				
17. South	-.09	-.13	-.09	-.16	-.22	-.11	-.13	-.05	.09	.01	.01	.01	.01	.01	.01	.01			
18. West	-.09	-.13	-.09	-.16	-.22	-.11	-.13	-.05	.09	.01	.01	.01	.01	.01	.01	.01	.01		
19. Mean	.15	.41	.27	.26	.45	12.20	29.68	5.95	.07	.05	.13	.23	.14	.18	.09	.26	.12	.41	.46
Standard deviation	.36	.49	9.57	.50	2.55	56.02	3.25	.25	.22	.34	.42	.35	.35	.39	.28	.44	.32	.49	.50
Range	0-1	0-1	16-69	0-1	0-24	0-480	2.0-48.8	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
N	3339	2710	3253	3369	3215	3078	3148	3432	3432	3432	3432	3432	3432	3432	3479	3479	3479	3479	3484

* Because this is an establishment-level variable, correlations with job-level variables are not shown.

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APPENDIX C: Correlations among Study and Control Variables

Variable	Ben- efits	Train- ing	Var. employ- ment	Gvt. over- sight	Union	Bur. estab.	Bur. job	Size	Multi- site	Info. complex	Interpers. complex	Tech. complex
Employee age	-.02	-.05	.07	.01	.06	-.03	.00	.02	-.04	.10	.07	.01
Employee gender	.04	-.01	-.04	-.04	-.13	.02	.02	-.04	.04	.08	.09	.03
Employee education	.03	.09	-.00	.01	-.03	.02	.09	.01	.03	.23	.17	-.02
Employee experience (months)	-.02	-.03	.09	-.01	.07	-.02	-.01	-.01	-.02	.18	.09	.09
Current: hourly wage	.08	.06	.09	.13	.27	.05	.08	.07	.06	.25	.10	.09
Occupation												
Managerial	-.01	.05	.03	-.03	-.04	-.02	-.02	.00	.01	.41	.25	.27
Professional/technical	.03	.05	.02	.09	-.02	.01	.03	.02	.01	.27	.15	.08
Craft	-.03	.05	.06	-.11	.06	-.06	.01	-.04	-.09	-.01	-.17	.29
Clerical	.17	.02	-.04	.05	-.04	.05	.08	.01	.06	.10	.04	.27
Sales	-.13	.03	-.00	-.11	-.06	-.04	-.02	-.03	.03	.10	.29	-.35
Service	-.17	-.11	-.07	-.19	-.08	-.00	-.09	-.02	-.01	-.27	-.07	-.14
Industry												
Construction	-.06	-.02	.16	-.27	.20	-.05	-.07	-.02	-.04	-.08	-.08	.08
Service	-.12	-.01	-.02	-.13	-.13	-.02	.01	-.04	-.07	.03	.07	.04
Social-overhead capital	.41	.05	-.04	.31	-.01	.08	.13	.03	.05	.07	.06	.06
Trade	-.41	-.04	-.04	-.35	-.17	-.11	-.12	-.05	-.01	.03	.06	-.21
Region												
South	-.01	.05	-.02	.00	-.12	-.04	.01	-.01	.03	.04	-.00	.02
West	-.03	.02	.08	-.05	.06	-.09	-.01	-.05	-.08	-.01	.01	-.03