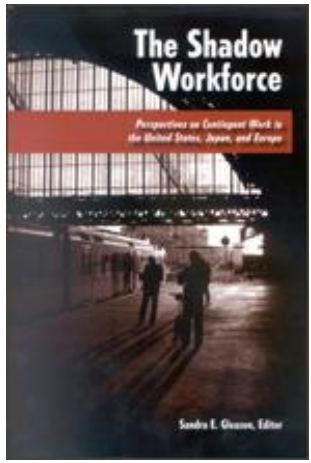
W.E. UPJOHN INSTITUTE
FOR EMPLOYMENT RESEARCH

Upjohn Institute Press

Employer Perspectives: Competing through a Flexible Workforce



Douglas J. Miller
University of Illinois at Urbana-Champaign

Jay B. Barney
Ohio State University

Chapter 3 (pp. 65-98) in:
The Shadow Workforce: Perspectives on Contingent Work in the United States, Japan, and Europe
Sandra E. Gleason, ed.
Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 2006
DOI: 10.17848/9781429454889.ch3

3
Employer Perspectives

Competing through a Flexible Workforce

Douglas J. Miller
University of Illinois, Urbana–Champaign

Jay B. Barney
Ohio State University

More than 4 percent of workers in the United States are in some form of alternative employment arrangement. Most large businesses now have a permanent budget category for temporary workers (*CPA Journal* 1998).

Evidence suggests that employer demand—not labor supply—is driving contingent work. Firms apparently want the cost savings and flexibility of hiring workers with no expectation of permanent employment (Golden 1996; Golden and Applebaum 1992). Companies hired more temporary workers as the last two decades progressed, although there was not a corresponding increase in workers willing to take contingent jobs (e.g., young people, married women, and older workers).

In this chapter we explain how forces external to a company operate to increase the demand for a flexible workforce and summarize evidence on how employers use contingent workers to manage labor and related costs. We then argue that, in many situations, creating a flexible workforce through investment in permanent employees may be a feasible alternative to the use of contingent workers and can be expected to lead more readily to a sustainable competitive advantage. This argument employs the concept of "real options" to link labor and related costs with decision making under uncertain conditions. It then combines the real options approach with the resource-based view of the firm to provide additional insights into the use of flexible permanent employees as a competitive strategy for organizations. This resource-

based view contends that competitive advantage results from appropriately managing resources that are valuable, rare, difficult to imitate, and combined uniquely within an organization. We also provide suggestions for future research.

WHY DO EMPLOYERS USE CONTINGENT WORKERS?

An employer wishing to determine the economic value of any employee's contribution compares the costs associated with hiring and employing a worker relative to the additional production expected (labor productivity).[1] Firms also need to consider how to plan to achieve the flexibility desired to manage variable and uncertain future economic conditions. Distinguishing between ongoing costs and transaction costs is important when explaining why employers use contingent workers.

Ongoing Costs: Wages and Benefits

Firms may wish to use contingent workers to lower wages or benefits. According to the 1999 Current Population Survey (CPS) by the U.S. Census Bureau, the median weekly earnings for a full-time, adult male contingent worker were only 80 percent of earnings for a comparable noncontingent worker. Women in contingent work earned less than 72 percent of comparable noncontingent workers. The discrepancy holds across all levels of education, age, and race (von Hippel et al. 1997). Contingent workers are eligible for employer-sponsored health insurance or pension coverage less than half as often as noncontingent workers (pp. 20–23). Efforts by temporary employees to demand better pay and benefits—such as lawsuits filed by oil field workers against ARCO and by independent contractors against Microsoft—highlight the differential compensation offered to contingent workers (Eisenberg 1999; *Training* 1999).

On average, contingent workers receive lower wages than equivalent, noncontingent employees. Workers employed through temporary service agencies (TSAs) make approximately 7.7 percent lower wages than long-term employees in similar jobs (Segal and Sullivan 1997).

However, according to the 1999 CPS supplemental survey, full-time contingent workers in some occupations, such as "precision production, craft, and repair" and "construction," earn nearly the same or higher median weekly earnings than noncontingent workers. However, wage comparisons may be deceiving because employers pay other costs, such as a markup to the TSA or the expenses of a self-employed consultant. On the other hand, a TSA could substitute for the employer's internal human resources personnel, so not all of the markup should be attributed to wages.

Several published studies support the claim that firms use temporary workers to save on fringe benefits.[2] The growth of the temporary help supply industry is positively related to the ratio of quasi-fixed labor costs to variable costs (Golden 1996). Quasi-fixed labor costs, such as health insurance and pension contributions, are associated with a particular worker rather than with hours worked. At the firm level, a higher level of benefits as a percentage of total payroll is correlated with increased use of temporary agency or call-in employees (Mangum, Mayall, and Nelson 1985). Firms may contract out for services to skirt the need to pay all workers the same high rate because of union pay scales or because workers believe equal pay is fair.[3]

Transaction Costs

Unlike wages and benefits, many costs associated with employees are not ongoing. Costs that are incurred each time an agreement is formed between two parties are called *transaction costs*, such as time spent interviewing job candidates and processing paperwork, the expense of training new employees in firm-specific skills, the loss of goodwill during negotiations, and strategies to protect core workers.

Using temporary employees generally would be expected to increase transaction costs since temporary employees come and go more often than permanent workers. Some costs are borne by the human resources budget, such as advertising, conducting interviews, or paying for travel. Time spent interviewing applicants can be a substantial investment for firms with high turnover. Another important transaction cost is the time and money spent on training new workers, especially when a job requires idiosyncratic skills or knowledge. Consequently, hiring new workers frequently entails high transaction costs.

Also, a less obvious transaction cost is that of continuing to employ the same workers under short-term contracts. Most employees develop some experience and information that is of more value to the current employer than to anyone else. This stock of knowledge, skills, and abilities (called firm-specific human capital) develops over time.

Because there is usually some uncertainty surrounding the particular tasks the worker should do, human capital often develops in ways that are not specified in the original employment contract. Thus, at the end of a short-term contract, the employee may wish to renegotiate the terms of employment to reflect his or her new perceived value to the firm. Likewise, the employer may argue that the worker cannot transfer that firm-specific human capital to another company and should be satisfied with remuneration that only reflects what the market will pay for generic skills, regardless of the fact that the employee truly can add value to the current firm. Even if the employer and worker agree to split the value created, reflected in some small raise at the time of renegotiation, the time spent in the negotiation process and the potential for hard feelings and loss of goodwill impose real costs on both parties. Consequently, rather than renegotiate every time the situation changes, an employer often will prefer to sign the worker to a long-term employment contract. The long-term contract gives the employer the right to alter the worker's use of the knowledge or skill as necessary to respond to unanticipated changes; it also protects the worker from an employer using bargaining power to renegotiate rewards downward. Particularly when a job requires substantial firm-specific training, the employer will prefer to hire permanent workers, even if it has to keep them on during slack periods when productivity is low (Williamson 1985).

The amount of firm-specific training may be decreasing as standard tools such as computer software make firms' processes more similar (Szabo and Negyesi 2005). If so, temporary and contract agencies may have an economy of scale in training workers. For example, Manpower Inc. introduced a Web-based learning center (www.manpowernet.com), which allows its employees and applicants access to technical training material. The free information technology training is particularly attractive to people trying to enter computer fields, precisely the level of workers Manpower typically places, but it also benefits Manpower's own full-time employees. Manpower's knowledge of clients and work-

ers allows it to track which skills are most in demand. Delivery of training over the Internet is ideal for technology workers (Cole-Gomolski 1999). Even in professions with more stable skill requirements, temporary employment agencies may have the opportunity to train more workers in a given profession than most businesses. Client firms may be willing to give up some of their firm-specific training preferences to hire temps with strong generic skills. (See Cappelli and Crocker-Hefter [1996]. The authors cite examples of how flexible business strategies match well with outside development of employee competencies.)

On the other hand, if workers receive minimal training, the key transaction cost surrounding employment may be the bureaucratic system of the employer. For a firm using generic labor in a seasonal business, the administrative and legal costs of hiring and firing temporary workers can be prohibitive. Furthermore, the legal doctrine of "employment-at-will," which allows an employer to dismiss an employee for almost any reason, has been weakened by federal regulation, thereby increasing the cost of firing a permanent worker (Lee 1996).[4] In this case, the transaction costs associated with contingent workers are less than those associated with permanent workers. Moreover, a temporary agency has an economy of scale in processing workers. John Bowmer, CEO of TSA Adecco, cites the firm's move to acquire Olsten's staffing unit as a response to the importance of information technology, which makes size important (Studer and Stern 1999). Larger TSAs can spread the costs of central computers and software over more placements. Adecco pioneered interactive "Job Shop" kiosks in public areas, linked to the Internet via Monster.com (Sunoo 1999). Such efforts reduce the transaction costs related to contingent workers.

Another kind of transaction cost relates to the firm's reputation with its core workers. The more frequent the layoffs, the more workers that the firm hopes to keep will look elsewhere for employment. By clearly identifying some jobs as temporary, firms can buffer their core workers from layoffs. The resulting loyalty of key employees can offset minor productivity losses that come from using day laborers or other contingent workers.[5] Respondents to a minisurvey from *Compensation and Benefits Review* noted that temporary workers allow the respondents' companies to cover the work performed by full-time workers when they take time off or to complete special projects (Jefferson and Bohl 1998).

The alternatives—requiring other employees to work overtime when someone goes on sick leave, or hiring extra programmers with no promise to recognize seniority after the project is over—would be more detrimental to the firm's core workers. For example, Bell Atlantic used an interim marketing staff for its move into the long-distance marketplace. If the venture failed, no long-term Bell Atlantic Corp. employees would be affected. If the market opened up, the company could transfer or hire permanent employees to handle the increased work (Keenan 1999).

EMPIRICAL RESEARCH ON TRANSACTION COSTS

Empirical research supports the importance of transaction costs in the management of hiring decisions. Research has investigated how firms respond to temporary increases in workload, the role of firm-specific training, and the impact of bureaucracy and firm size.

A nationwide survey of employers in the early 1980s, as well as archival and interview data, showed how different kinds of employers respond to temporary increases in workload (Mangum, Mayall, and Nelson 1985). In general, the researchers conclude that the use of temporary agencies lowered transaction costs related to temporary workers by eliminating various employer costs for a fixed fee paid to the agency, fulfilling an economic role similar to the union hiring hall. The study finds that the use of temporary employees from an agency, "call-ins" (occasional workers on a list maintained by the company itself), or "limited duration hires" (day workers or others whose employment is for a brief, specific time) is more likely when

- a firm has a high level of benefits (not true for call-ins),
- the firm's employment level is changing,
- the firm is large, or
- the skills involved are less specialized.

Another study using employer survey responses defines transaction costs primarily in terms of firm-specific training (Davis-Blake and Uzzi 1993). In general, the findings support the hypotheses that, in addition to employment costs and external economic forces, skill requirements,

organizational size, and bureaucratization affect the use of temporary workers, leased workers, and independent contractors. When a job requires training, the position is less likely, albeit slightly, to be "externalized" (filled by someone not on the permanent payroll). The effect is statistically significant but extremely modest. A job that involved over seven months of training was only one-half of 1 percent less likely to be externalized than a job that required no firm-specific training. This result argues against transaction costs being the driving factor in the decision. On the other hand, this measure actually includes all hours of formal training, informal training by managers, and informal training by co-workers for the typical incumbent in that job. It reflects at least some industry-specific training and possibly occupational training as well. Only some of this training is truly firm-specific, so this measure may underestimate the true impact of this type of training. Also, since the survey asked managers to consider the last position they filled, there is a selection bias toward hard-to-fill jobs. In order to fill a difficult position, firms may be more likely to hire a worker who lacks prior training.

In the same study, the authors measure the amount of paperwork necessary to fire an employee at each firm. The assumption is that some firms are more bureaucratic than others. Based on the argument in the previous section, one might predict that the administrative costs in a bureaucratic organization would create more demand for temporary workers. However, the hypothesis here is that workers undergo a particular kind of firm-specific training in a highly bureaucratic firm: the orientation to the bureaucratic system. Since temporary workers may be less able to follow rules without direct management, bureaucratic firms should use fewer temporary workers.

Firms with more employees tend to have more bureaucracy and can avoid layoffs in any business unit more easily by spreading jobs around. Therefore, the hypothesis is that firm size should vary inversely with the use of temporary workers. In contrast, contract workers generally manage themselves apart from the rules of the host firm. Since the diversified firm may need access to specialized skills occasionally, it should be more likely to use contract workers. As predicted, larger firms and those with higher levels of bureaucracy are less likely to hire temporary workers and more likely to use contract workers. Apparently,

the transaction costs of actually hiring and firing are outweighed by the transaction costs of orienting an employee to a bureaucratic organization.

The disadvantage of having temporary employees on site who have difficulty following rules is a cost of integration, even though the integration is only temporary. The same dynamic can work with contract workers in certain settings. For example, contract employees in the petrochemical industry have less safety training than permanent workers (Kochan et al. 1994). Since the contract company supervises their employees, the host firm reduces its transaction costs. However, the host firm and its employees may be harmed if the safety problems caused by contract workers go beyond accidents that injure contract employees. Thus, it may be in the best interest of the host company to offer further safety training and oversight to contract employees to avoid accidents. This effectively increases the transaction costs associated with contract employees, which may still be outweighed by the transaction costs associated with hiring and firing permanent employees.

PRODUCTIVITY

From the employer's perspective, the decision to define a task as contingent work or noncontingent work employs a standard cost-benefit analysis. The value of the expected contribution from either type of employee is productivity minus costs. Thus, if contingent workers are just as productive at a certain task as permanent employees, firms will hire contingent workers if the total cost is less. The total cost includes both ongoing and transaction costs. That is,

Value created = Productivity – Total cost

Total cost = Ongoing costs + Transaction costs.

In the same job over the same duration, contingent workers may be slightly more or less productive than noncontingent workers. Most academic research on direct productivity comparisons has studied en-

try-level employees because their tasks are generally the same across firms and settings. For instance, two case studies of data entry operators found that the productivity of part-time contingent workers was at least 7 percent below that of core workers. Considering the relative wages, benefits, and training costs, the use of contingent employees did not seem to be cost effective, but the use of agency-provided temporaries did provide savings. The biggest difference between the two categories of contingent workers was that the agency temps required much less training (Nollen and Axel 1996). Contingent workers in professional and technical fields, such as independent contractors of engineering services, may be at least as productive as a firm's own workers (see Jarmon, Paulson, and Rebne [1998]. A survey of managers in six high-technology settings found that the perceived performance of contractors was similar to employees).

Thus, the relative productivity of contingent and permanent employees depends on the circumstances. If an organization implements a new data entry system using off-the-shelf software, agency temps who have used the package at other establishments may be more efficient and accurate than the company's own workers who are just learning the system. Regarding professional workers, hiring an attorney who specializes in the particular legal issues currently facing the firm may be preferable to keeping one attorney on retainer who is a generalist. It may be impossible to hire permanent workers who are able to handle every contingency or to pay them full time when the work is seasonal.

Returning to the Bell Atlantic example, another reason the company decided to outsource may have been to access marketing people with skills related to the specific market or project. Many self-employed, independent contractors offer specialized expertise that employers need only on occasion. An extreme example is the U.S. Census Bureau, which hires thousands of workers for each decennial census (Potok and Holdrege 1999). The contingent work arrangement can provide an employer with flexibility to maintain high productivity, even when circumstances change.

USING "REAL OPTIONS" TO EXPLAIN FLEXIBILITY PLANNING

A flexible workforce is one that can create value under various conditions of production. There are two ways to achieve a workforce that can adapt over time to perform different tasks. One way is to hire different workers over time through contingent arrangements, including hiring into the firm with no long-term commitment. The other way is to hire and develop flexible permanent employees with either a broad range of skills or the ability and willingness to learn and adapt with the organization over time. In terms of the value equation above, a simple approach is:

Productivity = (Productivity under one condition × Probability of that condition)
+ (Productivity under another condition × Probability of that other condition).

If there are only a few possible conditions, and if an employer can anticipate their probabilities accurately, then it is possible to write those expectations into an employment contract. However, as the variety of potential tasks increases or the business environment becomes more unpredictable, it becomes impossible to work out every possible scenario ahead of time. Then, flexibility is helpful not only because productivity is increased under various conditions, but also because negotiations are simplified. Uncertainty, not just variability, makes flexibility valuable. But how does one estimate the value of flexibility?

Mathematically, the employer can estimate probabilities and conduct a more complete cost-benefit analysis than discussed above. Theoretically, one could even generate expected cash flows resulting from the worker's contribution. Standard financial analysis would use those cash flows discounted appropriately over time to produce a measure of net present value (NPV). Of course, realized cash flows may differ substantially from the expectation. Thus, a financial analyst will usually check to be sure conclusions do not change substantially if assumptions (e.g., the interest rate) change slightly. This "sensitivity analysis" considers not only the mean of the distribution of potential returns, but also the variation around the mean. For example, one can use a mathemati-

cal formula to estimate the value of mineral rights based not only on the expected price of the mineral and the costs of extraction, but also the possible drift in price in the future (Copeland, Koller, and Murrin 1995, Chapter 15). The right to drill for oil can be worth much more than might be revealed through a simple NPV analysis, because the owner only has to invest in extraction if the price of oil is high.

Similar logic underlies the large market for financial options. A call option, for instance, gives the investor the right to buy a stock at a specified price at a future date. If the stock price drops, the investor loses only the initial purchase price of the option, which is usually a few dollars for each share of stock. But if the stock price rises, the investor's gain is potentially huge. The investor can buy the stock at a preset, low price and sell at a high price. If the stock price is certain, options do not matter much; but if a stock price varies widely, an option is highly valuable.[6] The value of the option comes from the fact that the investor will only exercise the right to buy the stock if circumstances are favorable.[7]

The prevalence of financial options has led financial analysts to apply the term "option" to other kinds of investment under uncertainty. For example, the right to drill for oil is considered a "real option." The term "real" comes from the fact that this option involves investment in a real asset such as real estate rather than a financial asset such as stock. Also, the additional value not captured in the simple NPV calculation is sometimes called the "option value."

A real option usually will be reflected in a series of small, staged investments rather than a single, large investment, which is aimed at the same goal but is less flexible.[8] For example, firms entering highly uncertain new markets appear to invest in joint ventures rather than wholly owned subsidiaries because a joint venture embodies an option (Chi and McGuire 1996; Kogut 1991). For a relatively small investment, the firm can 1) learn more about the market and its potential partners, 2) wait to see if the market develops in some unpredictable manner, and 3) get out of the deal if necessary without damaging its reputation. The essential characteristic of a real option is that it allows the owner to make a claim when conditions are favorable, with limited downside risk. When change is likely but its direction is unpredictable, the firm may have different requirements than if the current environment is expected to continue.

Hiring temporary workers is a type of real option because the employer can switch labor inputs as conditions fluctuate (Foote and Folta 2002). While this arrangement does not have a written purchase price or exercise period, there are parallels to financial options. The purchase price of the real option may be lower productivity, higher transaction costs, or even higher wages. The option may only be good for a certain period, either because temporary workers can be expected to move on to other employers more likely to offer permanent positions, or because government regulation prevents keeping workers contingent forever. Transaction costs incurred in switching from one set of contingent workers to another, such as the cost of firm-specific training, represent a price paid when the option is exercised. Using real options logic in the employment context does not negate the importance of costs, but it allows consideration of flexibility as well. Therefore, under high uncertainty, the option value may flip the decision from hiring inflexible permanent workers to hiring contingent workers.

On the other hand, investing in full-time employees can create a different real option in which the firm secures the right to ask the employee to vary activities. The purchase price is the cost of inducing the employee to develop firm-specific human capital, perhaps through a company-sponsored training program. The exercise period depends on the outside job market as well as the person's age and ability to learn. There may be some further cost to exercise the right. For example, the manager may have to give some attention to restructuring work relationships, and the employee may not be at optimal productivity in the new setting right away. Both of these real options hedge against the same kinds of risks, and the value of both increases with higher uncertainty. Of course, just as there are different kinds of transaction costs, there also are many kinds of uncertainty to consider.

Factors Creating Uncertainty

There are three important categories of uncertainty: demand, technological, and measurement. Any change in demand can increase or reduce the number of labor hours (and therefore workers) a firm requires. These changes can result from shifts in buying power, consumer preferences, competition, or other factors. Moreover, cyclicality of consumer

demand can lead to increased demand for temporary workers, even if that cyclicality is perfectly predictable, as in the case of the decennial census of the United States. Given uncertainty about demand, a firm would prefer to collect more information and wait before hiring permanent employees. The greater the degree of the uncertainty, the more tenuous the desired commitments to employees become. If it were costless to hire and fire permanent employees, dishonest managers might offer "permanent" jobs when needed, and simply lay off people to match fluctuating demand. However, the costs of such actions include the loss of company reputation and the breakdown of the internal labor market (e.g., people performing their best to get a promotion).

In fact, the specific type of job influences the response to demand uncertainty, according to a study of contract services (Abraham and Taylor 1996, pp. 411–412). Organizations in industries with seasonal or cyclical workloads contract out significantly less of their janitorial and machine maintenance work. Cyclical firms also seem to contract out fewer engineering and drafting services, but more of their accounting work. The researchers offer a caveat that they had to construct seasonality and cyclicality measures from employment data at the industry level since they did not have access to that information for each establishment. A different study used establishment-level data to construct a measure of employment variability over a two-year span prior to the survey. This measure, which blends seasonality, cyclicality, and trend effects, is positively related to the use of temporary workers, as expected, confirming the value of flexibility under variability in demand (Davis-Blake and Uzzi 1993, p. 207).[9]

Similarly, if a firm is uncertain about what technology will be the most efficient, it will be difficult to specify what tasks employees will do in the future. The greater the degree of technological uncertainty, the more problematic it is to commit to a group of employees with set skills. Any change that affects the labor supply—equipment purchases, worker education, job process reengineering, or other factors that change the productivity of labor or the specific skills required to best implement production—can impact not only what tasks a worker performs, but also what that worker must be able to learn. A computer software designer can probably learn another programming tool. However, a company that moves from a business plan based on lean production to

one based on customer service may desire employee competencies that were not required previously.

Measurement uncertainty arises because an employee's productivity in any specific task is never fully verifiable. The resulting possibility of shirking work or other opportunistic behavior creates agency costs. Either the employer has to pay for someone to monitor the employee, the employee has to pay (perhaps in the form of self-financed education) to give assurance he can do the job, or the employer has to be willing to live with the potential losses. These agency costs are primarily characteristic of the task, not the employee. Some jobs are more difficult to monitor. Therefore, it is difficult to predict the impact of measurement uncertainty on the use of contingent workers. A permanent, internal employee may be more trusted, and can be rewarded based on long-term performance. On the other hand, using a contract worker or leased worker may allow a firm to share some of the agency risk with the contracting firm. A temporary employment agency might have an economy of scale or develop a particular skill in monitoring its employees or training them to a minimal degree of productivity. Also, externalized workers may have less opportunity to shirk duties if their assignments are more specific. To the extent that employers believe workers differ in their propensity to be opportunistic (and vice versa), temporary employment can be an effective screening device prior to a permanent hire.

To summarize, real option theory generally would propose that, under high uncertainty, companies should desire a more flexible workforce than required under low uncertainty. Flexibility can be achieved in two ways. One way is to employ more flexible permanent employees. In the face of demand uncertainty, companies will want to hire workers who will accept overtime hours and pay. If technological uncertainty makes it impossible to fully define the skills required in an employee, companies should aim to recruit employees with multiple competencies. The increased value of the flexible permanent workers would then require higher overall compensation. Moreover, the transaction costs and agency costs associated with flexible employees would likely be higher than for focused employees, but the value of their productivity under various scenarios will outweigh the increased costs as uncertainty increases. The firm will only invest in such human capital if it can re-

tain the right to exercise the option at its discretion. Thus, these flexible employees should be bound with contractual agreements that protect the firm's options, such as long-term contracts and "do not compete" clauses.

Alternatively, firms could achieve flexibility through the structure of the workforce: outsourcing work, or using leased or temporary employees (Foote and Folta 2002). In the case of demand uncertainty, the firm can hire temporary employees as needed. When technological uncertainty is high, the firm can hire contingent workers with different skill sets, and hire permanently only those it needs. Or, the firm can hire the workers it needs today and replace them in the future with workers with other skills. As technological uncertainty increases to very high levels, it would be impossible to hire permanent workers with the ability or desire to learn every possible skill required. The flexibility inherent in any one person is limited. When measurement uncertainty is present, firms may use temporary employment as a screening device. Firms can learn about specific employees and reduce the uncertainty involved in offers of permanent employment.[10] For example, the company could put temporary workers through a brief training program to see which are best suited to the company. Furthermore, certain firms may be able to hire these workers permanently at wages lower than for employees who did not temp first, because the temporary relationship convinced the worker that the company is a good place to work. The permanent hiring of temporary workers depends on the uncertainty being resolvable. In the extreme, hypercompetitive environment, a firm will desire to maintain the contingent relationship so it can swap skill sets as needed.

EVIDENCE FROM THE CURRENT POPULATION SURVEY

Existing research has tested for the importance of various determinants of demand for contingent labor. Unfortunately, studies to date have typically focused on one type of contingent work, or have measured only whether a form of contingent work is used at all, not the extent to which it is used. Gathering data on wages, benefits, transaction costs, and productivity for the same set of workers has been difficult.

However, to distinguish the economic importance of the various factors, they must all be included in the same statistical model.[11] The biennial supplements to the Current Population Survey (CPS) on contingent work offer an initial approach to these issues using a large sample of workers. We offer the following analysis of these data to confirm general facts and to point to issues deserving more rigorous research.

The February 1995 supplement to the CPS was the first to focus on contingent workers, whom Polivka and Nardone (1989) define as "workers who have no implicit or explicit contract for ongoing employment." The survey pertained to the worker's length of expected service as well as work arrangement. Respondents are categorized as contingent according to three definitions and their associated employment estimates. Estimate 1 includes wage and salary workers who have been in their jobs for up to one year and expect their jobs to last no more than an additional year. Estimate 2 includes those workers plus self-employed or independent contractors whose length of service matches definition 1. Estimate 3 includes wage and salary workers who believe their jobs to be temporary, without a specific time frame, plus all self-employed and independent contractors.[12] Thus, a worker is not defined as contingent simply because he or she works for a temporary agency, for example. Temporary agencies have permanent employees, and some firms that hire from temporary agencies also maintain their own pools of on-call workers. Using definition 3, 66.5 percent of workers paid by temporary help agencies in 1995 were contingent workers, and 3.6 percent of workers in traditional arrangements were contingent workers (Cohany 1996).

Each estimate reflects worker responses rather than a formal description by a human resources person at the company. It captures all employment arrangements in which contingency is understood even if not recorded in a written contract. Moreover, it reflects all different kinds of contingent relationships, which is important since these relationships can be substitutes for each other. The percentages of each estimate have remained similar in subsequent surveys.[13] Thus, 400,000 workers employed by temporary agencies see their positions lasting as long as they wish, while nearly 4 million workers employed directly by a firm consider their jobs more or less temporary.

Our analysis of data on 2,568 workers answering the 1995 CPS supplement reveals several important determinants in the choice of the relative importance of contingent and noncontingent jobs in the employment structure.[14] The model presented here assumes managers go to the labor market and identify prospective employees who are willing to accept a given level of compensation for their skills, experience, and education. Managers then choose whether to offer a contingent or noncontingent position based on the costs and benefits associated with those workers available to fill each kind of position.[15] This is a model of labor demand, not supply, so no conclusions should be drawn regarding workers' choices of positions. Furthermore, this model contains no information on worker productivity. The implicit assumption is that contingent workers and noncontingent workers perform the same. These simplifying assumptions are clearly unrealistic to some extent, and make the results given in this section exploratory. However, clarifying the assumptions also can help identify what kind of data would better untangle the interrelationships between factors.

All data in the discussion that follows are based on Estimate 1. Results are similar for the other definitions of contingency, except the impact of fringe benefits decreases when self-employed workers are included in the contingent ranks. The evidence shows the importance of ongoing costs, transaction costs, and flexibility in the decision to make a position contingent.

The current legal and cultural environment allows firms to offer, on average, lower wages and fewer benefits to contingent workers than to permanent workers. Our evidence confirms previous findings that employers hire contingent workers to reduce ongoing costs. The higher the level of weekly pay, the less likely a worker is contingent. Furthermore, if the employer provides health insurance or a pension in conjunction with the job, the worker is less likely to be contingent.

The CPS supplement did not ask about hours of training or other indicators of transaction costs. No information is given on the employer, other than the industry. However, if temporary agencies and contracting firms reduce transaction costs through economies of scale in processing and training workers, then firms should hire more contingent workers when these agencies are available and can achieve economies of scale. Thus, jobs in metropolitan areas should be more likely to be filled by

contingent workers. The CPS identifies the worker by census tract into three categories: central city, nonmetropolitan, and other (e.g., suburban). Indeed, we find that workers in nonmetropolitan areas are 2.59 percent less likely to be contingent than workers in other areas.

Firms can achieve workforce flexibility either through more flexible permanent employees or through the use of specialized, contingent workers. More flexible workers will therefore be less likely to be contingent employees. Age, education, and willingness to work nontraditional hours may all relate to worker flexibility. First, older workers have had more time to acquire a range of knowledge, skills, and abilities, including human capital specific to the firm. From the supply side, older workers also should be less willing to enter some contingent arrangements (such as temporary work) because their expected return on additional investments in human capital, such as learning new skills or acquiring new firm-specific knowledge, is limited by the time period available to benefit from the return. On the other hand, older workers may be more willing to be self-employed to take full advantage of their experience or take part-time jobs to enjoy more leisure. Second, a worker with more schooling should be more capable of learning new tasks, so we control for education level. Third, workers who work more than 40 hours a week provide a buffer against demand variation and uncertainty. However, part-time workers may be a substitute for contingent workers as defined in the CPS supplement. Firms may use workers for fewer hours each week on a permanent basis, rather than hiring full-time workers for short durations.

Including age in the model lessens the effect of pay, which makes sense since a worker's earnings usually increase throughout his or her career. A change in age from 30 to 40 reduces the probability that a worker is contingent by 5.7 percent. However, education does not seem to make a difference. Considering raw correlation statistics, having a bachelor's or graduate degree appears to be negatively related to contingent status. However, in a full model including the other factors, education has no effect.[16] The more overtime hours a person works, the more likely he or she is to be a permanent employee of the firm. Part-time status has no effect after controlling for wage and other variables.

Finally, firms facing higher uncertainty or variability should be more likely to hire contingent employees than firms facing lower uncer-

tainty. Since firm-level data are not available due to privacy concerns, an industry-level measure is used. This measure is the mean variation in stock returns over a two-year period for each three-digit SIC code, matched to the industry codes used in the CPS. Only industries with at least five actively traded firms were included. Aggregating over the industry creates a proxy for changes that affect total demand and the technology shared by the members of that industry.[17] We find that industry-level variability has no bearing on the use of contingent workers. It may be that the option value is more closely tied to firm-level uncertainty, or that achieving flexibility through investment in permanent workers is a close substitute for hiring temporary workers.

Overall, contingent positions pay less in wages, offer health insurance and pension coverage less often, and are more likely to be located in a city and not in a rural area. Contingent positions are less likely to be filled by older workers and those who worked overtime hours in the previous week. These broad correlations reinforce the tabulated results released by the U.S. Bureau of Labor Statistics.

COMPETITIVE ADVANTAGE THROUGH A FLEXIBLE WORKFORCE

As explained above, employees add value to an organization, and this value varies according to different conditions. We have argued that firms desire a workforce that can adapt quickly and effectively, especially as the pace of change in technology, international competition, and other dynamic environmental forces require increased flexibility. Furthermore, the employer can adjust the mix of contingent work arrangements and flexible permanent employees to address demand, technological, and measurement uncertainties. These two means of achieving flexibility can often substitute for each other. The key to gaining a competitive advantage is whether one firm can achieve flexibility that competitors cannot. Employers pursue strategic human resource management (SHRM) to compete effectively in these uncertain conditions. The primary theoretical perspective being used in studies of SHRM is the resource-based view of the firm.[18] In this approach, an organization

gains competitive advantage from managing resources that are valuable, rare, difficult to imitate, and organizationally implemented (Barney 1991; 1997, Chapter 5).

A resource or capability has *value* to the extent that it enables the firm to cut costs, increase price, or otherwise allow the firm to pursue a strategy in product markets. A resource or capability is *rare* when only one or a few competitors employ it in their strategies. Standard microeconomic approaches usually assume that competitors all have access to the same resources and will adjust prices or quantities until the earnings from the resource are just enough to cover the risk involved in its purchase. However, this "perfect competition" rarely, if ever, occurs. Some industries or geographic markets have only a few participating companies and, in emerging markets, a first mover may be able to gain high returns on its product while competitors try to catch up. Therefore, ongoing rarity is a function of how difficult a resource or capability is to *imitate*.

One reason a competitor may not be able to imitate a resource is that it was acquired at a unique point in history that cannot be repeated. For example, pharmaceutical companies that already valued basic science research in the 1970s were able to adopt new "science-driven" drug discovery procedures that led to highly profitable blockbuster drugs, whereas those companies that had relied on more random testing of existing chemicals to solve medical problems were unable to hire the scientists and create the culture needed to imitate them (Cockburn, Henderson, and Stern 2000).

A second obstacle to imitation is that someone outside the organization may not be able to distinguish the resource that is making the difference. Even if the competitor knows which capability to imitate, it may be hard to achieve since value is often created by teams of people working together in ways that are difficult to manage. Of course, those same management struggles affect the firm that already has the resource, so creating and maintaining an organization to get the best out of the resources is the final condition for competitive advantage. We now apply these concepts to the case of a flexible permanent workforce, with an emphasis on the issue of imitation.

The Flexible Permanent Workforce

For several reasons, a flexible permanent workforce built from training and rewarding permanent employees will be more difficult to imitate than a flexible workforce using contingent workers. First, creating a flexible permanent workforce takes time, whereas creating a flexible contingent workforce can be done more quickly, particularly with the aid of large-scale temporary service agencies. A permanent worker's flexibility may increase naturally over time as the employee changes jobs within the organization, encounters different customers, or communicates with other workers about their jobs. Also, an employee's long tenure often includes times when the employee sacrifices for the benefit of the firm, and other times when the company rewards that service by giving the employee extra consideration. The repeated reciprocity builds trust and encourages the worker to be flexible again in the future. Since knowledge and trust are rooted in a particular history, it would be difficult for a competitor to quickly reproduce that kind of relationship. When a change in demand or technology occurs, the capabilities must be already in place to be effective. In contrast, adjusting the workforce with contingent workers happens at the time of the change. A competitor can implement the same plan from scratch, assuming the purpose of the plan is apparent and does not rely on either reconfiguring the physical assets the contingent workers will use or redesigning jobs.

The second argument for a flexible permanent workforce is that employment policies focused within the firm are less transparent to observers than are relationships with external parties. Temporary service agencies, contract agencies, or independent contractors may reveal the parameters and proposed benefits of their relationship with one firm to entice another firm to use their services. Competitors can even ask contingent workers how their previous employers used them. The flow of information makes the market for contingent workers fairly efficient: any employer should have to pay about the same amount to contract for similar services. However, matching cost is not the only aspect of benchmarking. Even more important is the issue of whether the resource or policy under consideration is central to the firm's success. With a relatively minor investment, a competitor can investigate an employer's contingent work practices and determine whether they are the

source of the firm's competitive advantage or merely a convenient way to staff a firm that really gains its superiority from other factors besides human resources (e.g., its well-known brand name). On the other hand, an employer's relationship with its permanent employees is harder to benchmark. A large organization follows complicated selection procedures, conducts numerous training programs, transfers employees between departments, and offers various incentives.

Part of what makes human resource systems so hard to understand is that they are very complex, involving informal communication and relationships. This complexity also makes it difficult to duplicate such systems, even when the key components are well understood. Competitors thus find it difficult to determine which policies and practices have the desired effect. It is possible that an employer uses an outside consultant to determine salaries or off-the-shelf software to train personnel. In that case, a competitor could use the same methods. However, if the key aspect of firm-specific human capital is something less obvious, such as the personal commitments of team members to one another, implementing all the standard solutions will be ineffective in matching the successful firm. For example, HR practices that target employee development can speed organizational learning, increase quality, and enhance the flexibility of manufacturing systems.[19] So, does a firm's manufacturing quality come from its proprietary machinery, used by merely competent line workers, or from highly involved workers who make constant suggestions for ongoing improvement to the machinery? The answer to this question could lead a competitor to invest in new equipment, new HR policies, or both.

The third explanation for why it can be more difficult to imitate a flexible permanent workforce than one created through contingent workers is that the imitator firm's own history and capabilities impede transfer of best practices from elsewhere. A small misunderstanding can have a large impact on employees' loyalty and productivity. Firms must select, train, compensate, and commit to employees to create learning synergies—just one of those aspects probably is not enough. The difficult nature of implementing such systems may explain why many firms do not adopt "high-performance" work systems, and why many of these systems die off quickly (Pfeffer 1994). An important aspect of the complexity in workforce flexibility is the relationship between a plant or di-

vision and company headquarters. Employees will only welcome some practices (e.g., merit pay) if they are universally applied. Likewise, staff may establish uniform policies in order to simplify record keeping and avoid mistakes. Both pressures will work against the manager of a particular plant trying to benchmark to a competitor whose practices differ from the policies of his parent corporation. However, the harder a strategy is to implement, the more likely the successful firms will have a source of sustainable advantage. A workforce that creates value through flexibility will remain rare only if there exist barriers to imitation. The challenge for managers is to create an organizational structure and culture that is consistent with the strategy, but not so formal or simple as to allow for easy benchmarking.

Combining the Resource-Based and Real Options Frameworks

We have presented two frameworks for understanding flexible employment. Real options help managers know under what conditions flexibility is important for any organization. The real option approach also explains why contingent workers and flexible permanent employees are substitute methods of creating value under uncertainty. The resource-based view clarifies that gaining flexibility through permanent employees is more likely to sustain that value in the face of competition. Bringing the two frameworks together can generate some additional insights into how managers can use real options to gain competitive advantage. The resource-based descriptions of markets, uncertainty, and competitive advantage fit well with the type of economic framework represented by financial options and real options. Three keys to the use of financial options are information, complementarity, and efficiency, and the same aspects exist for the real option of a flexible workforce.

Financial investors trade stocks based on *information* about the magnitude, timing, and direction of profits and price movements. Financial options can be a less expensive way to profit from stock price movement. For the price of one share of stock, an investor could purchase dozens of options that will also appreciate if the stock goes up. It is even possible to make money on financial options solely by having superior information about the amount of variability a stock's price will exhibit over time. For example, a certain combination of call options

and put options may gain value if the stock price begins to move more erratically over time. An investor does not need to know whether the stock is going up or down, just whether world events or other factors will cause the company's cash flows to be less predictable in the future. Likewise, purchasing and exercising real options can lead to competitive advantage if a firm has superior information.

Certain kinds of superior information may enable a firm to hire employees at an advantage. Suppose a firm has superior information about which knowledge and skills will be in greatest demand in the near future. Competitors may be recruiting workers with broad skills, perhaps paying a premium for intelligence and industry experience. But the firm with superior information is able to select relatively inflexible workers with just the right skills. While other firms are paying higher transaction costs for churning through contingent workers, this firm can hire once.

Also, the *complementarity* between financial options and the underlying assets determines the value for each investor. The value of financial options depends on the other assets in the investor's portfolio, often because investors use financial options to hedge against exposure to specific risks. For example, an American company doing business in Europe will earn revenues in euros, and will want to hedge against changes in the exchange rate of the euro versus the dollar. A purely domestic U.S.-based company would have no need to hedge against currency risk. Even though traders and companies have sometimes been hurt by speculative investment in options, the market for them continues to be strong because they are a low-cost way to hedge against specific risks. On the individual level, an investor who already owns shares of stock can sell call options on those shares to lock in a limited profit; the call option thus serves as a form of insurance. Similarly, different real options will be worth more to some companies than others because of the uncertainty each faces and the resources under its control.

A firm with a particular resource may find investment in a flexible permanent workforce to be more valuable to it than a similar investment would be to its competitor. For instance, a firm with a distinctive culture, brand name, managerial know-how, or location may be able to leverage that resource into greater profits by hiring more flexible permanent employees at lower cost or with greater productivity than their competitors. Consider an organization with superior proprietary tech-

nology that allows a single worker to coordinate production of multiple items. For competitors, the same production requires multiple workers supervising multiple machines. The firm with the advantage can afford to bid more than its competitors for the workers with the best learning ability, and still be able to make an abnormal profit from their efforts. The reverse is also possible. A firm may use distributed manufacturing to meet demand as it arises. Because machines and systems are simple or standardized, the company can hire temporary workers for a relatively low cost. A competitor committed to one large production facility may have expensive overhead even during downtimes.

Finally, the U.S. stock market is still highly efficient in the sense that the mechanisms of trade are not costly (e.g., stocks trading in penny increments) and do not automatically bias prices one way or the other. The *efficiency* occurs despite the fact that the information available to investors is sometimes clouded by corporate misinformation (e.g., Enron's off-balance-sheet accounting), and some risks cannot be anticipated (e.g., a terrorist attack). On the other hand, the markets for resources that create real options are not necessarily efficient. Firms do not frequently trade or sell real options, and managers may discount the value of flexibility if it means trying something new.

Any input for sale in an efficient market will not be a likely source of competitive advantage. Competing firms should bid up the price of the resource to its fair market value. The market for contingent workers, at least in large metropolitan areas, is fairly efficient. Temporary service agencies, contract agencies, and independent contractors generally provide their services at the same price to each employer. Likewise, if every potential employer knows that certain potential employees are more flexible, the cost of engaging those workers on a permanent basis should rise to a level that equals their value contribution. Many seemingly different job abilities are highly correlated, at least as commonly measured (Campion 1989). Entering the market for flexible employees, an organization may find that everyone is its competitor, not just the other firms in its industry. Thus, although a flexible permanent workforce can be achieved through the structure of work and the selection of workers, such processes are likely to cost a firm the full price of the flexibility. Structure and selection can bring the average firm to competitive parity, but not competitive advantage.

On the other hand, in order to gain or extend a competitive advantage through investment in permanent employees, a company must only have superior information relative to its employees. Companies typically have a better understanding of what a job requires than does the prospective employee. The difference in information allows the firm to hire the worker at a fair market price, but less than the full value the individual will create within the firm over time. Then, continued investment in firm-specific human capital can create more value to be shared between the employer and an employee. The employee is willing to learn from the employer because of the employer's superior information and resources. Even skilled workers who know more about their tasks than any manager will find it easier to prove their value to the organization by listening to how their tasks fit within the overall strategy, rather than trying on their own to unpack complex interactions among other workers. The agreement between the employer and employee is not an efficient market, but rather a negotiation, even if it takes place within the structure of a union contract.

This is not to argue that all firms would do equally well to invest in permanent employees. Managerial skill, teamwork, distinctive reward systems, partnerships with universities, or other resources could create a superior environment for developing the right kind of employee flexibility. An optimal strategy for any given firm may be to invest in real options through some permanent employees and some contingent workers. Periodically integrating outsiders can invigorate organizational learning and facilitate change, even in businesses relying primarily on core workers.[20] Similarly, firms with good reason to employ many contingent workers may need to invest in a few key employees who can coordinate the constant flow of workers. Nevertheless, the resource-based view clarifies that a flexible permanent workforce may be a more sustainable source of competitive advantage than a contingent workforce, and the real options logic highlights the importance of information about industry conditions, firm-specific risks, and how an employee can become part of a complex system to create value.

CONCLUSION AND DIRECTIONS FOR FURTHER RESEARCH

Current research suggests that increasing rates of change in the economic environment and uncertainty have driven demand for contingent workers. Temporary supply agencies, independent contractors, and other organizational forms have arisen to take advantage of economies of scale and reduce transaction costs related to hiring workers with a particular, identifiable skill. Contingent work situations are diverse and they are designed to address different costs and benefits. A multivariate regression analysis using CPS data confirmed that employers are likely to hire contingent workers to save on wages, health insurance, and pension contributions, and to take advantage of the availability of large-scale agencies located in metropolitan areas. However, more flexible workers, such as those who have had more experience or are willing to work overtime, are less likely to be in contingent positions, which implies that employers also recognize the possibility of gaining a flexible workforce through hiring and training permanent employees. The resource-based view of the firm and the real options approach to valuing flexibility clarify that a company relying on multiskilled permanent employees to adapt to change may be in a better position to gain and sustain a competitive advantage than a company using contingent workers to handle uncertain labor demand.

Future research should shed light on two main areas. First, what are the most important factors driving demand for contingent workers? Second, under what circumstances is it preferable to invest in flexible permanent employees rather than using contingent workers? To answer both questions, there is a need for research designs that will measure all relevant costs and employee productivity. These studies would do well to move beyond studies of low-skilled temporary workers to consideration of the kind of high-skilled and professional occupations that are more central to value creation in a business. The measurement of particular risks in each firm's environment is necessary to test whether firms create the right real options.

An appropriate case study to address both questions might compare two firms that face ongoing technology changes, the timing of which

is unpredictable. One firm might make a commitment to its existing full-time workers, promising to train them in any new skill required. The other firm might cut back to a core of full-time employees and fill the other positions with temporary workers. When the change occurs (e.g., when a new time-saving computer technology is released), the first company pays to train its employees and may have to fire or offer early retirement to some who cannot make the adjustment, but it retains people with years of firm-specific experience. The second firm can move more quickly to hire temps with the newly required skills, assuming they are available in the labor market, or rely on the agency to train workers. The company using temporary workers ramps up to full productivity more quickly and inexpensively, but perhaps the eventual peak productivity is less than at the firm using its own employees. After the fact, one could assess which firm had higher overall productivity. But such examples are hard to find. Managers facing the same uncertainty often follow similar strategies, and estimating costs of training, turnover, and benefits is difficult.

Such research would require detailed personnel data, as well as integrated theories. The worker's own assessment of knowledge, skills, abilities, and motivation is relevant, as well as the employer's evaluation of the environment, the firm's strategy, and the worker's productivity and costs. Transaction costs are important, but theories also accounting for firm-specific resources and the need for flexibility must be tailored to specific industry and occupational contexts.

Finally, economy-wide evaluations of supply and demand for contingent work should be replicated at the level of the industry and firm. The CPS supplements have helped to define contingent work and its impact for the overall economy. However, new data sets at a more detailed level would allow tests of models considering worker and employer motivations. An understanding of both labor supply and demand is necessary to untangle the multiple factors driving contingent work.

Notes

1. This discussion builds on a review of workforce practices that concludes organizations use temporary employees to cut costs, avoid restrictions/consequences, and increase flexibility. See von Hippel et al. (1997).
2. The exception is a major study of employment externalization finding no relation between likelihood of a job being temporary and the level of fringe benefits. However, data on fringe benefits were only available at the industry level (2-digit SIC code), whereas the dependent variable is at the job level. This acknowledged mismatch might have diluted the statistical and economic impact of the benefits factor (Davis-Blake and Uzzi 1993).
3. This argument relies on empirical research that questions whether the dual internal labor market exists. Full-time employees may not believe managers who claim temporary workers are not competing for the same jobs (Abraham and Taylor 1996).
4. The major exception is dismissal based on discrimination such as gender or race discrimination.
5. While the distinction between core and periphery workers is intuitive, some empirical evidence questions whether employing contingent workers actually provides any buffer against involuntary turnover among permanent workers (Capelli and Neumark 2004). Further research is needed on the effects of employing both contingent and permanent workers under different conditions.
6. The Black-Scholes model is the most famous example of a mathematical formula to estimate the value of a financial option. The formula takes into account the option's purchase price, exercise date or period, and exercise price. The formula also considers the amount of uncertainty about the price of the stock.
7. This is why many executives who received stock options as compensation during the Internet stock boom of the late 1990s made so much money.
8. For a helpful categorization of real options, see Trigeorgis (1996).
9. Also, Abraham (1998) finds differences in mean use of staffing arrangements between firms with and without seasonality and cyclicality.
10. The first published paper to apply real options logic to employment decisions was Malos and Campion (1995). The authors explain the up-or-out promotional systems in professional service firms as creating a real option that mitigates uncertainty about employee productivity.
11. We use logistic regression analysis, which allows us to investigate the impact of independent variables on the probability that a position is contingent. Logistic regression is an extension of standard ordinary least squares analysis that is appropriate when the dependent variable is of a yes/no nature. Technical details and tables of results can be obtained from the first author.
12. See Chapter 2 of this volume for a more detailed discussion of these three estimates and the CPS definition of "alternative work arrangements" as distinct from contingent work.

13. By 1999, the numbers had changed slightly to 60.7 percent and 2.9 percent, respectively (DiNatale 2001, Table 6).
14. We report results from our analysis of the 1995 data because little has changed over time in the CPS variables employed in this study.
15. Managers and employees make decisions about the duration of a position, the compensation for the position, and the attributes of the workers simultaneously. To appropriately estimate all the relationships between these variables would require a system of equations. However, if employers can choose to save money on wages and benefits by hiring contingent workers, this choice implies that the employers are price takers.
16. Using Estimate 3 of contingent work, with self-employed and independent contractors included and the time frame restriction removed, those workers with some graduate work are 12 percent more likely than other workers to be contingent. Well-educated people are apparently more likely to start their own businesses.
17. In fact, Dixit and Pindyck (1994) argue that aggregate measures are superior to firm-level data at capturing technological risk because shocks should affect all industry users of the same technology.
18. Articles discussing theoretical approaches to strategic human resource management include Barney and Wright (1998); Gerhart, Trevor, and Graham (1996); and Snell, Youndt, and Wright (1996).
19. Several researchers have considered whether bundles of human resources practices are more effective than individual practices at creating value through people. Influential papers include Youndt et al. (1996); MacDuffie (1995); Becker and Huselid (1998); and Arthur (1992). An interesting and readable study is Upton (1995), in which the author finds that flexible manufacturing requires flexible employees.
20. Case studies show that the benefits of using contingent-knowledge workers can outweigh the costs (MacDougall and Hurst 2005). For a thorough discussion of how to use contingent workers to accumulate and disseminate knowledge, see Matusik and Hill (1998).

References

Abraham, K. 1998. "Flexible Staffing Arrangements and Employers' Short-Term Adjustment Strategies." In *Employment, Unemployment, and Labor Utilization*, R.A. Hart, ed. Winchester, MA: Unwin Hyman, pp. 288–311.

Abraham, K., and S. Taylor. 1996. "Firms' Use of Outside Contractors: Theory and Evidence." *Journal of Labor Economics* 14(3): 394–424.

Arthur, J.B. 1992. "Effects of Human Resource Systems on Manufacturing Performance and Turnover." *Academy of Management Journal* 37(3): 670–687.

Barney, J.B. 1991. "Firm Resources and Sustainable Competitive Advantage." *Journal of Management* 17(1): 155–171.

———. 1997. *Gaining and Sustaining Competitive Advantage*. Reading, MA: Addison-Wesley.

Barney, J.B., and P. Wright. 1998. "On Becoming a Strategic Partner: The Role of Human Resources in Gaining Competitive Advantage." *Human Resource Management* 37(1): 31–46.

Becker, B.E., and M.A. Huselid. 1998. "High Performance Work Systems and Firm Performance: A Synthesis of Research and Managerial Implications." In *Research in Personnel and Human Resources Management*, G.R. Ferris, ed. Greenwich, CT: JAI Press, pp. 53–101.

Campion, M.A. 1989. "Ability Requirement Implications of Job Design: An Interdisciplinary Perspective." *Personnel Psychology* 42: 1–24.

Cappelli, P., and A. Crocker-Hefter. 1996. "Distinctive Human Resources are Firms' Core Competencies." *Organizational Dynamics* 24(3): 7–22.

Cappelli, P., and D. Neumark. 2004. "External Churning and Internal Flexibility: Evidence on the Functional Flexibility and Core-Periphery Hypotheses." *Industrial Relations* 43(1): 148–182.

Chi, T., and D.J. McGuire. 1996. "Collaborative Ventures and Value of Learning: Integrating the Transaction Cost and Strategic Option Perspectives on the Choice of Market Entry Modes." *Journal of International Business Studies* 27: 285–307.

Cockburn, I.M., R.M. Henderson, and S. Stern. 2000. "Untangling the Origins of Competitive Advantage." *Strategic Management Journal* 21(10–11): 1123–1145.

Cohany, S. 1996. "Workers in Alternative Employment Arrangements." *Monthly Labor Review* 119(10): 31–45.

Cole-Gomolski, B. 1999. "Recruiters Lure Temps with Free IT Training." *Computerworld*, August 2, 10.

Copeland, T., T. Koller, and J. Murrin. 1995. *Valuation: Measuring and Man-*

aging the Value of Companies. New York: John Wiley & Sons, Inc.
CPA Journal. 1998. "Temps Have Permanent Place in Staffing Budgets." January, 11.
Davis-Blake, A., and B. Uzzi. 1993. "Determinants of Employment Externalization: A Study of Temporary Workers and Independent Contractors." *Administrative Science Quarterly* 38: 195–223.
DiNatale, M. 2001. "Characteristics of and Preference for Alternative Work Arrangements, 1999." *Monthly Labor Review* 124(3): 28–49.
Dixit, A.K., and R.S. Pindyck. 1994. *Investment under Uncertainty*. Princeton, NJ: Princeton University Press.
Eisenberg, D. 1999. "Rise of the Permatemp." *Time* 154(2): 48.
Foote, D.A., and T.B. Folta. 2002. "Temporary Workers as Real Options." *Human Resource Management Review* 12: 579–597.
Gerhart, B., C. Trevor, and M. Graham. 1996. "New Directions in Employee Compensation Research." In *Research in Personnel and Human Resources Management*, G.R. Ferris, ed. Greenwich, CT: JAI Press, pp. 143–203.
Golden, L. 1996. "The Expansion of Temporary Help Employment in the U.S., 1982–1992: A Test of Alternative Economic Explanations." *Applied Economics* 28: 1127–1141.
Golden, L., and E. Applebaum. 1992. "What Was Driving the 1982–88 Boom in Temporary Employment? Preference of Workers or Decisions and Power of Employers." *American Journal of Economics and Sociology* 51(4): 473–493.
Jarmon, R., A. Paulson, and D. Rebne. 1998. "Contractor Performance: How Good are Contingent Workers at the Professional Level?" IEEE *Transactions on Engineering Management* 45(1): 11–19.
Jefferson, F., and D. Bohl. 1998. "CBR Minisurvey: Part-Time and Temporary Employees Demand Better Pay and More Benefits." *Compensation and Benefits Review* 30(6): 20–24.
Keenan W. Jr. 1999. "Can You Use a Temporary Marketing Manager?" *Industry Week*, May 17, 18.
Kochan, T., M. Smith, J. Wells, and J. Rebitzer. 1994. "Human Resource Strategies and Contingent Workers: The Case of Safety and Health in the Petrochemical Industry." *Human Resource Management* 33(1): 55–77.
Kogut, B. 1991. "Joint Ventures and the Option to Expand and Acquire." *Management Science* 37: 19–33.
Lee, D.R. 1996. "Why Is Flexible Employment Increasing?" *Journal of Labor Research* 17(4): 543–553.
MacDougall, S.L., and D. Hurst. 2005. "Identifying Tangible Costs, Benefits, and Risks of an Investment in Intellectual Capital." *Journal of Intellectual Capital* 6(1): 53–71.

MacDuffie, J.P. 1995. "Human Resource Bundles and Manufacturing Performance: Organizational Logic and Production Systems in the World Auto Industry." *Industrial and Labor Relations Review* 48: 197–221.

Malos, S., and M. Campion. 1995. "An Options-Based Model of Career Mobility in Professional Service Firms." *Academy of Management Review* 20(3): 611–644.

Mangum, G., D. Mayall, and K. Nelson. 1985. "The Temporary Help Industry: A Response to the Dual Internal Labor Market." *Industrial and Labor Relations Review* 38(4): 599–611.

Matusik, S., and C.W.L. Hill. 1998. "The Utilization of Contingent Work, Knowledge Creation, and Competitive Advantage." *Academy of Management Review* 23(4): 680–697.

Nollen, S.D., and H.A. Axel. 1996. *Managing Contingent Workers*. New York: ANACOM.

Pfeffer, J. 1994. *Competitive Advantage through People: Unleashing the Power of the Work Force*. Boston: Harvard Business School Press.

Polivka, A., and T. Nardone. 1989. "On the Definition of 'Contingent Work.'" *Monthly Labor Review* 112(12): 9–16.

Potok, N.F., and M.A. Holdrege. 1999. "Contingent Staffing: Lessons from Census." *Public Manager,* Spring, 23–26.

Segal, L.M., and D.G. Sullivan. 1997. "The Growth of Temporary Services Work." *Journal of Economic Perspectives* 11(2): 117–136.

Snell, S.A., M.A. Youndt, and P.M. Wright. 1996. "Establishing a Framework for Research in Strategic Human Resource Management: Merging Resource Theory and Organizational Learning." In *Research in Personnel and Human Resources Management*, G.R. Ferris, ed. Greenwich, CT: JAI Press, pp. 61–90.

Studer, Margaret, and Gabriella Stern. 1999. "Swiss Temp Firm Shoots to No. 1 Spot in U.S.—Adecco Agrees to Acquire Olsten's Staffing Unit in a $840 Million Deal." *Wall Street Journal*, August 19, A:10.

Sunoo, B.K. 1999. "Temp Firms Turn up the Heat on Hiring." *Workforce* 78(4): 50–54.

Szabo, K., and A. Negyesi. 2005. "The Spread of Contingent Work in the Knowledge-Based Economy." *Human Resource Development Review* 4(1): 63–85.

Training. 1999. "Court Rules against Microsoft in Temp Worker Case." 36(8): 18.

Trigeorgis, L. 1996. *Real Options*: *Managerial Flexibility in Strategy and Resource Allocation*. Cambridge, MA: MIT Press.

Upton, D.M. 1995. "What Really Makes Factories Flexible?" *Harvard Business Review* 73(July/August): 74–84.

von Hippel, C., S. Mangum, D. Greenberger, R. Heneman, and J. Skoglind. 1997. "Temporary Employment: Can Organizations and Employees Both Win?" *Academy of Management Executive* 11(1): 93–104.

Williamson, O. 1985. *The Economic Institutions of Capitalism*. New York: The Free Press.

Youndt, M.A., S.A. Snell, J.E. Dean, and D.P. Lepak. 1996. "Human Resource Management, Manufacturing Strategy, and Firm Performance." *Academy of Management Journal* 39(August): 836–866.

The Shadow Workforce

Perspectives on Contingent Work in the United States, Japan, and Europe

Sandra E. Gleason
Editor

2006

W.E. Upjohn Institute for Employment Research
Kalamazoo, Michigan

Library of Congress Cataloging-in-Publication Data

The shadow workforce : perspectives on contingent work in the United States, Japan, and Europe / Sandra E. Gleason, editor.
p. cm.
Includes bibligraphical references and index.
ISBN-13: 978-0-88099-288-6 (pbk. : alk. paper)
ISBN-10: 0-88099-288-3 (pbk. : alk. paper)
ISBN-13: 978-0-88099-289-3 (hardcover : alk. paper)
ISBN-10: 0-88099-289-1 (hardcover : alk. paper)
1. Temporary employment—United States. 2. Temporary employment—Japan. 3. Temporary employment—Europe. 4. Part-time employment—United States. 5. Part-time employment—Japan. 6. Part-time employment—Europe. 7. Contracting out—United States. 8. Contracting out—Japan. 9. Contracting out—Europe. I. Gleason, Sandra E.
HD5854.2.U6S53 2006
331.25'729—dc22

W.E. Upjohn Institute for Employment Research
300 S. Westnedge Avenue
Kalamazoo, Michigan 49007-4686

Cover design by Alcorn Publication Design.
Index prepared by Diane Worden.
Printed in the United States of America.
Printed on recycled paper.