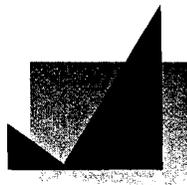


The temporary labor force

Lewis M. Segal and Daniel G. Sullivan



In this article we examine the characteristics of workers in the personnel supply industry, the great majority of whom are employed by temporary help supply firms.¹ We examine the changes that have occurred to the demographic and occupational composition of this industry's work force over the last decade. We also provide evidence on the labor force attachment and industrial mobility of temporary workers and examine how their wages compare to those of similar workers, as well as to their own wages on previous or subsequent "permanent" jobs.

Several factors motivate this undertaking. First, employment growth during the current economic expansion has been led by the service sector. One of the fastest-growing components of this sector has been the personnel supply industry, which supplies temporary and continuing workers to client firms (see table 1). Indeed, though the personnel supply industry currently comprises less than 2 percent of total employment, it accounted for over 15 percent of employment growth between 1992 and 1993, and many analysts predict continued rapid growth. Thus it is worth understanding the makeup of workers in this growingly significant sector.

Furthermore, the personnel supply industry has received attention because it is widely believed to be a leading indicator of employment conditions. As we confirm below, employment in the industry has led total employment during recent business cycles. Such lead-

ing indicators are useful to policymakers and others who need to base decisions on where the economy is headed rather than where it has been. However, there is evidence that the temporary help industry has undergone structural changes, including expansion into industrial settings. Assessing these structural changes can help us assess the implications of using employment growth in the temporary help industry as an indicator for the economy as a whole. Toward this end, in the pages that follow we examine micro data on workers.

The increasing use of temporary help in manufacturing has also been suggested as a possible explanation for the puzzlingly slow growth of manufacturing employment coming out of the recent recession. That is, it is possible that more workers were employed in manufacturing activities than the manufacturing employment totals would suggest, but that a sizable fraction of the workers were temporaries and so not counted in those totals. Examining occupational data on individual workers in the personnel supply industry helps us to evaluate this explanation.

Finally, there has been considerable controversy about the social desirability of temporary help. Some describe temporary workers as an underclass who, because of their contingent status, do not receive sufficient human capital investments to succeed in today's labor market.² Defenders of the temporary help

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TABLE 1
Payroll employment by industrial sector
Annual average
(thousands of workers)

Year	Total	Manufacturing	Services	Personnel supply (SIC 736)
1990	109,423	19,076	27,934	1,535
1991	108,262	18,408	28,336	1,485
1992	108,599	18,105	29,050	1,630
1993	110,525	18,005	30,276	1,926

Annual growth rate
(percent)

Year	Total	Manufacturing	Services	Personnel supply (SIC 736)
1990	1.4	-1.6	3.8	5.5
1991	-1.1	-3.5	1.4	-3.3
1992	0.3	-1.6	2.5	9.8
1993	1.8	-0.6	4.2	18.2

Source: U.S. Department of Labor, Bureau of Labor Statistics, *Current Employment Survey*, (various years).

industry point out that temporary employment provides workers with additional skills and serves a number of other important economic functions. They note that the industry has increasingly provided human resource services that were traditionally provided within client firms, and that the use of temporary workers has increased the efficiency and competitiveness of U.S. industry. While such controversies are beyond the immediate scope of this article, some relevant facts can be learned from the data on individual workers. For instance, from the micro data we can determine if temporary employment is a permanent condition, as implied by the "underclass" designation, or rather, a transitory state en route to permanent employment.

Most prior analyses of the personnel supply industry have drawn on data collected from temporary help firms. Such sources include the Bureau of Labor Statistics' Current Employment Survey (also known as the establishment survey or the payroll survey), surveys conducted by the National Association of Temporary and Staffing Services (NATSS), and special surveys of personnel supply firms conducted by the Bureau of Labor Statistics (BLS).³ Our analysis draws on these sources

as well as a new one constructed from the 1983 through 1993 Current Population Survey (CPS). The CPS data provide a perspective on individual workers in the personnel supply industry and the labor force as whole. These data can, moreover, be used to observe changes over time in individual workers' labor force status and earnings.

The remainder of this article has the following organization. First we describe the personnel supply industry in greater detail, sketching its recent growth and verifying its status as a leading indicator of employment conditions. Second, we review some of the reasons why client firms and workers turn to temporary supply services. Last, we examine the characteristics of the temporary labor force as viewed through CPS micro data, focusing on the questions raised above.

Overall, we find that the personnel supply industry is a leading indicator of aggregate economic growth as measured by aggregate employment. However, the industry is also undergoing substantial structural change in demographic and occupational composition, showing a long-term trend towards increased male participation and increased placement in blue-collar occupations. The increase in temporary blue-collar positions offsets up to one-half of the decline in manufacturing employment observed between 1991 and 1993. Workers in the personnel supply industry exhibit weaker attachment to the labor force than other workers, and yet a large fraction shift into permanent work within a year. Temporary workers earn lower wages than workers with similar demographic characteristics and educational attainment. Moreover, among workers who held both temporary and permanent jobs, wages were lower when they worked as temporaries. The wage differential for temporary work varies widely by occupational group, being largest for blue-collar workers and essentially zero for managerial and professional workers. Although temporary status often lowers workers' wage levels, it does not lower

their average wage growth; wage growth of those who remain temporaries does not differ significantly from that of workers who remain permanent employees.

Composition of the personnel supply industry

Our main interest is in analyzing the characteristics of temporary workers. Unfortunately, our primary source of data for this analysis, the CPS, does not identify workers' industries to this level of detail. All we can tell from the data is whether workers are in the broad industrial category called "personnel supply." Below, we will follow the fairly common practice of ignoring the distinction between the temporary help supply and personnel supply industries. In order to assess the impact of this imprecision on our results for temporary workers, we briefly discuss the composition of the personnel supply category.

The 1972 Standard Industrial Classification (SIC) scheme decomposed personnel supply services (SIC 736) into employment agencies (SIC 7361), temporary help supply serv-

es (SIC 7362), and a residual category of firms not elsewhere classified (SIC 7369). The BLS payroll survey estimated employment in these three industrial categories on a monthly basis through 1989. The first category, employment agencies, includes firms that match workers with other employers. As such, they provide an alternative hiring mechanism that aims to improve the speed and quality of the employer/employee matching process. In contrast, the second category, temporary help supply service firms, provide temporary workers to client firms, directly providing an alternative source of labor. While temporary workers are under the supervision of the client organization, they remain on the payroll of the supplying firm. The residual category includes firms that supply workers on a longer-term basis, including employee leasing services, firms providing facilities management, and continuing maintenance services. The 1987 revision of the Standard Industrial Classification scheme combined temporary services and the residual category (excluding facilities management and continu-

Terms used in this article

Personnel supply services (SIC 736)—establishments involved in supplying workers to firms. This aggregate category includes employment agencies, temporary help services, and other help supply services.

Employment agencies (SIC 7361)—establishments primarily engaged in providing employment services by assisting either employers or those seeking employment. Examples are chauffeur registries, employment agencies (excluding theatrical and motion pictures), executive placing services, labor contractors, maid registries, model registries, nurses' registries, ship crew registries, and teachers' registries.

Help supply services (SIC 7363)—establishments primarily engaged in supplying temporary or continuing help on a contract or fee basis. The help is always on the payroll of the supplying establishment, but is under the direct or general supervision of the business to whom the help is furnished.

Temporary help supply services—establishments primarily engaged in supplying temporary help on a contract basis to other businesses. The help is always on the payroll of the supplying establishment, but is under the direct or general supervision of the business to whom the help is furnished. Examples are office help supply services, model services, labor pools, manpower pools, and usher services. Prior to the 1987 revision to the Standard Industrial Classification scheme, these firms were classified as SIC 7362; they are currently part of SIC 7363.

Employee leasing services—establishments that take on the payroll of an existing work force, becoming the legal employer but having no role in the recruiting or screening of workers. Part of SIC 7363.

Contingent employment—a broad category of positions including part-time work, temporary work, employee leasing, self-employment, out-sourcing, and home-based work. Positions in this category are often associated with low job security, high variability, and considerable uncertainty.

Source: Adapted from Executive Office of the President, Office of Management and Budget (1987).

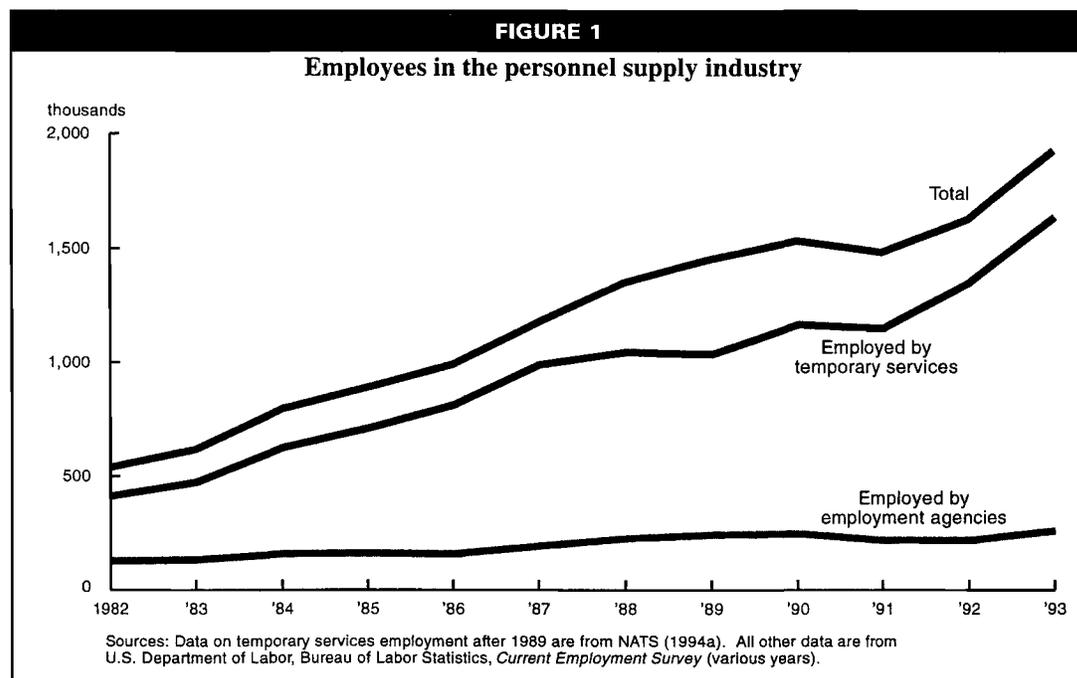
ing maintenance services) into a single category named "help supply services" (SIC 7363). This procedural change prompted NATSS to contract with private survey firms to gather comparable data on temporary help supply firms at a quarterly frequency.

Figure 1 shows total employment in the personnel supply industry and its principal components: employment agencies (SIC 7361) as tracked by the BLS, and temporary help supply firms as tracked by the BLS until 1989 and NATSS thereafter. (We omitted the small residual category which accounts for only about 2 percent of all workers in the industry.) As the figure illustrates, the temporary help supply sector accounts for the lion's share of employment in the personnel supply industry. For instance, of the approximately 1.9 million workers employed in the personnel supply industry in 1993, more than 1.6 million worked for temporary help supply services.⁴ The figure also illustrates that the explosive growth of the personnel supply industry has come mainly from growth in temporary help services.

Personnel supply workers employed outside the temporary industry are likely to resemble permanent workers in other industries. Thus differences between personnel supply workers and workers in other industries are likely to understate differences between tempo-

rary and permanent workers, but they are not likely to be of a different direction. Moreover, since temporary workers are such a large fraction of all personnel supply workers, the attenuation of differences between temporary and permanent workers is likely to be modest. Additionally, because most of the growth in personnel supply services has come from growth in temporary help services, our results on changes over time in industrial composition should mainly reflect changes in the temporary industry. Thus we feel that our inability to distinguish in the CPS between temporary and non-temporary personnel supply workers, while a drawback, is not a major limitation of our analysis. Nevertheless, the fact that some workers identified in the CPS as personnel supply industry workers are not temporary workers should be kept in mind as one interprets our results below.

For many, the term *temporary worker* evokes the image of a part-time, female, clerical worker. In actuality, temporary workers are involved in both full-time and part-time jobs, in a broad spectrum of activities. A 1989 BLS survey of wages in the help supply industry (that is, temporary services and employee leasing) found that only 45 percent of the workers supplied to client firms were placed in administrative and support occupations, includ-



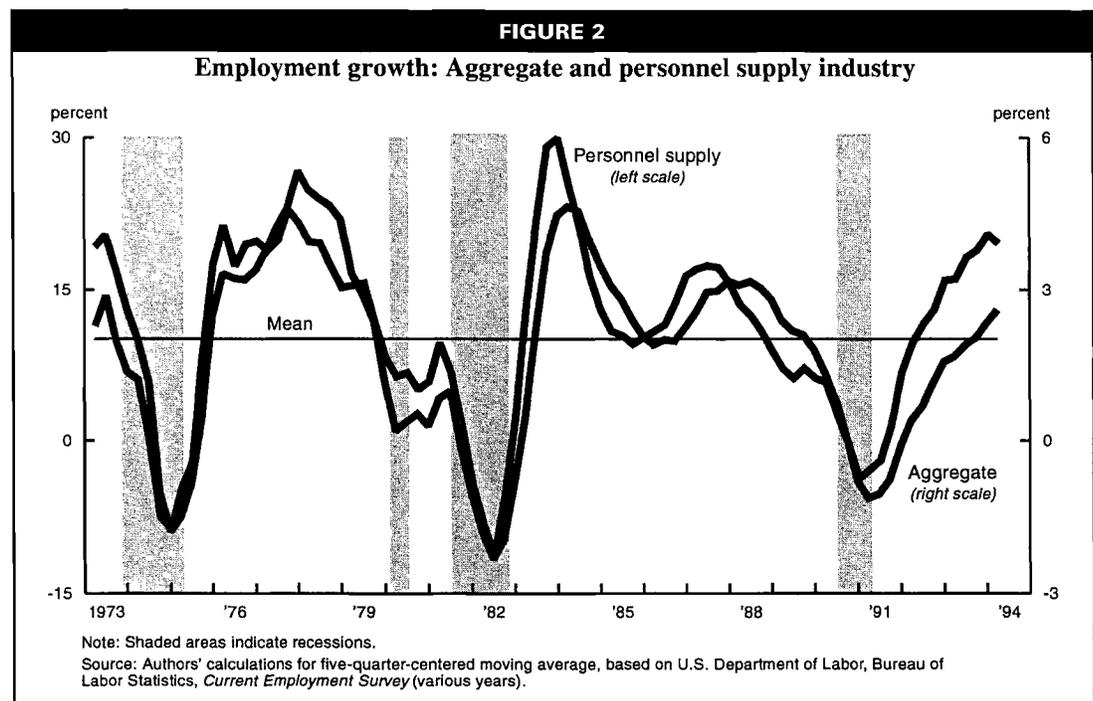
ing clerical workers.⁵ In fact, 30 percent of all help supply employment fell into the industrial categories of “operators, fabricators, and laborers,” and “precision, production, craft, and repair” occupations. Technical and related support occupations, including health and computer-related employment, comprised another 5 percent.⁶ Below we use the CPS micro data to provide more information on the occupational distribution of all personnel supply workers as well as how that distribution has shifted over time. But first we examine the relationship between the personnel supply industry and aggregate employment, and the forces that drive employment in the industry.

Growth in personnel supply services and aggregate employment

Figure 2 plots quarterly data on employment growth for the personnel supply industry and for the economy as a whole. Two features are obvious. First, the average growth rate of the personnel supply industry has been much higher than that of the economy as a whole, averaging 11 percent annualized growth per quarter since 1972 compared with 2 percent in the aggregate economy. Thus the pattern displayed in table 1 is not unique to the current business cycle. Second, personnel supply employment growth is much more volatile than

aggregate employment, falling more during economic contractions and rising more during expansions. When, as in figure 2, the data are smoothed and plotted on scales that make their swings comparable, another feature of the series emerges: Temporary help tends to lead aggregate employment by at least a quarter or two over the course of a business cycle.⁷ This relationship is most evident during the 1980s and 1990s.

Statistical analysis confirms the visual impressions of figure 2. Using quarterly data from 1973:Q2 through 1994:Q4, a four-lag bivariate autoregression of the quarterly growth rates reveals that growth in personnel supply employment Granger causes (statistically significant at the 0.01 level) aggregate employment growth but not vice versa. In other words, lagged data on temporary employment growth improves the forecast of aggregate employment growth over forecasts based solely on lagged values of aggregate growth.⁸ Within this bivariate model, an unexpected one percent increase in the growth rate of personnel supply employment would increase the one quarter ahead prediction for aggregate employment growth by approximately one-tenth of a percent and would increase the one year ahead forecast by nearly one-fourth of a percent.



The predictive power of this industry for the aggregate economy is particularly interesting in view of its small size.

For comparison, we repeated the bivariate analysis using employment growth in the entire service sector instead of growth in the help supply industry. We found that service sector employment growth does not Granger cause aggregate employment growth. Perhaps this is not surprising given that service employment is already one-quarter of total employment.

Why client firms use temporary workers

A number of reasons have been suggested for why firms sometimes use temporary workers. These include the possibility of lower hourly costs per worker, increased flexibility, the desire to maintain a dual internal labor market, economies of scale, and the desire to screen potential permanent employees.⁹

Lower hourly wage rates and benefit levels

Lower wage rates can make temporary workers attractive to firms. A widely cited statistic suggests that the average temporary worker earns only about three-fourths of what the average worker earns. For example, according to the Current Employment Survey, the average hourly earnings for all private workers in 1993 were \$10.83, but only \$8.27 for workers in personnel supply services.¹⁰ However, gross wage comparisons are misleading, as the average temporary worker may perform substantially different tasks and have substantially different levels of training and experience than the average for all workers. In later sections we use the data from the CPS to make comparisons of wages that take into account differences in the type of work and the characteristics of workers.

A full comparison of labor costs would require information on the markup charged by help supply firms as well as benefit costs (vacation, sick time, insurance) for permanent and temporary workers. While little information is publicly available on temporary firm markup rates, NATSS reports that total temporary supply firm receipts are approximately 50 percent more than their total payroll, suggesting that the average markup is approximately 50 percent.¹¹

On the benefits question, the 1989 BLS survey of help supply workers found that just over half of them worked for establishments that offered hospitalization, surgical, and medical insurance coverage to workers who had met a minimum service requirement. However, many non-permanent help supply workers elect out of this coverage. Overall, employers paid health insurance benefits for only one-fourth of all help supply workers. In comparison, in 1991 four-fifths of all full-time workers and slightly more than one-fourth of all part-time workers in private establishments employing 100 or more workers were covered for medical care.¹² For permanent manufacturing workers, benefit costs may account for as much as 40 percent of total payroll costs.¹³ Whether temporary or permanent workers cost firms more per hour is likely to vary significantly by firm and by job category, depending on the relative contribution of benefits to labor costs.

Increased flexibility and lower adjustment costs

Temporary workers may also be attractive to firms because they allow increased flexibility in meeting production schedules that vary over time or in dealing with short-term absences of permanent employees. Firms can of course adjust hours per permanent worker as well as the number of permanent workers. However, there are limits and costs to such adjustments. Overtime premiums are substantial, and valued workers might quit if their hours fall below a threshold. Hiring and firing permanent employees costs large amounts of time and money. Firms are often thought to “hoard” permanent workers during low production periods in order to reduce the costs associated with locating and hiring them at a later date. Compensating workers during periods of non-production is obviously a costly strategy.

Given the difficulties of adjusting a permanent work force, it may be cost-effective for a firm to respond to variations in production schedules by means of intermittent use of temporary workers even if the hourly rates are higher than for permanent workers. Costs of recruitment and, in many cases, training are borne by the temporary agency, which can spread the costs over a longer time period than the client firm since the temporary worker may work several assignments for the agency.

Hiring temporary workers to meet varying production schedules is likely to be most attractive to firms whose production schedules are especially variable, whose production processes are simple enough or common enough that temporary workers can easily substitute for permanent ones, and whose permanent workers cannot perform other tasks during periods of low production. For example, firms that can postpone maintenance tasks to slack periods when permanent workers are available would have less to gain from the use of temporary workers. In a study of the use of outside contractors by manufacturing firms, Abraham and Taylor (1993) found that firms in more cyclical industries are more likely to contract for accounting services but less likely to contract for janitorial and machine maintenance services. The latter two activities are more easily deferred to otherwise slow periods.

Support for dual internal labor markets

Many firms appear to use a combination of permanent employees and contingent workers, including temporary workers. This mixture might be termed a dual labor market within a single firm.¹⁴ Positions that require less firm-specific human capital and have little chance for advancement are filled on a contingent, as-needed basis. Positions that require significant matching of worker skills and firm needs, or that require a stable relationship, are filled on a permanent basis. The latter set of jobs might be described as embodying a firm's core competencies. Using external sources of personnel such as temporary workers may enhance a firm's ability to operate a two-tiered enterprise.

Having dual labor markets within one firm can be rationalized by theories of efficiency wages and worker equity. In the simplest theory of labor markets, workers need only be paid their opportunity wage, the value of their services elsewhere. Efficiency wage theory recognizes, however, that it may be profitable for the firm to pay more than the opportunity wage in order to promote a long-term relationship with the employee. For example, as mentioned earlier, given hiring and termination costs, firms may prefer to pay above the market wage in order to reduce worker turnover and avoid the expense of rehiring. Other formulations of the efficiency wage model argue that it is hard to assess workers' productivity before they are

hired, and that above-market wages attract workers with higher productivity. Yet another version suggests that since monitoring workers is costly, firms may decide to pay above-market wages to raise the cost to workers of being terminated if they are discovered to perform poorly.

There is, however, no reason why firms that find it efficient to pay above-market wages to some workers must find it efficient to pay them to all workers. Thus firms may decide to pay above-market wages for difficult-to-monitor jobs or jobs for which it is hard to judge the qualifications of applicants, while paying market wages for other jobs. Similarly, the firm might provide a promotion and wage growth path for some but not all workers. Under some circumstances, however, it may be in a firm's interest to maintain certain forms of equity across workers. This might be because of union contracts, equal employment opportunity concerns, or worker productivity effects. Indeed, there is some evidence that high-wage firms pay high wages to all workers, not just those in particular occupations. Hiring temporary workers to fill jobs that pay only market wages may be a useful way to implement a two-tiered wage structure while treating all permanent employees equitably. Such would be the case, for example, if valued permanent workers suffered lower productivity from working with lower-paid permanent employees but not with temporary workers, or if government regulations mandating uniform benefits policies for all employees did not extend to temporary help.¹⁵

Opportunity to preview workers

Firms may also use temporary workers in order to screen and evaluate potential permanent employees more thoroughly than they could otherwise. This is a reasonable choice if there are costs associated with hiring inappropriate permanent workers. For example, terminating an inappropriate permanent employee may require a great deal of administrative work, or a high turnover rate among permanent employees may be especially disruptive. Offering permanent employment to temporary workers who perform well appears to be relatively common. In a 1993 NATSS survey, more than one-third of temporary workers reported being offered full-time employment by a firm for which they had worked on assignment.¹⁶

Economies of scale and worker specialization

Imagine a firm that needs to perform a certain task only one day per month; imagine further that the task requires special training. The firm could hire a permanent employee and provide the necessary training, but it would obviously be attractive to pay the worker for only the one day of service per month. Using a temporary worker may make this possible. Indeed, the same worker could perform the task for many different firms each month. The use of temporaries for such reasons should be most prevalent among small companies, since large firms would be more likely to have sufficient demand for the specialized services to justify permanent hiring. Abraham and Taylor (1993) find that contracting out of machine maintenance, engineering and drafting, and accounting and computing services is indeed more common in small organizations. Location in a metropolitan area, a correlate of economies of scale, is also associated with increased contracting out for services.

Why workers work for temporary help supply firms

The previous section discussed firms' reasons for using temporary labor. However, the labor market involves both supply and demand forces. In this section, we sketch reasons why workers might prefer this type of employment. They include preferences for flexibility, compensating wage differentials, the ability to continue searching for permanent employment, and access to low-cost or free training and experience.

Flexibility

Many workers prefer relatively flexible schedules or have a taste for diversity, preferring to change tasks and surroundings frequently. Temporary help supply firms can accommodate such workers more readily than other firms. Since their work does not typically require firm-specific skills, temporary firms can build up lists of qualified workers on whose services they can draw. Thus they may more easily be able to find two or more workers to staff what might normally be a full-time position. Similarly, they may find it less disruptive to have workers decline assignments.

Compensating wage differentials

Temporary work need not imply low wages. Workers in certain occupations such as

professional nursing are paid more when they work as temporaries. Higher wages may compensate for the disadvantages of temporary employment such as uncertainty about work availability. In those occupations in which temporaries receive compensating differentials, workers who value the extra wage compensation more highly will be drawn to jobs as temporaries. Similarly, working as a temporary may be more attractive to those for whom benefits such as health insurance are less important—younger workers, for example—since the compensation packages of temporary firms usually are more heavily weighted towards wage income.

Support during an extended job search

Workers searching for permanent employment may find it advantageous to work for a time as temporaries while pursuing their job searches. Without an interim job, they may grow so short of cash that they need to accept a permanent job paying less well than a job they might ultimately find through a longer search. Working as a temporary may enable them to support themselves until they find a more appropriate job.¹⁷

Opportunity for training and experience

Many temporary help firms provide training to their workers prior to placement. NATSS reports that in 1993, 29 percent of the temporary work force received more than 20 hours of training from their temporary help company. Additionally, 66 percent reported that they gained new skills while working as temporaries.¹⁸ Such training and experience may increase the likelihood of moving into permanent employment and make temporary employment more attractive.

The temporary labor force

In this section we study the workers of the personnel supply industry using data from the CPS (also known as the household survey). This is a monthly survey of approximately 160,000 individuals in 60,000 households selected to represent the U.S. population 16 years of age and older. Households are interviewed during four successive months, ignored for eight months, and interviewed again during four months. Several questions on earnings are asked only during the fourth and eighth interviews, known as the "outgoing rotations." The resulting sample is too small to provide month-

ly information on an industry the size of the personnel supply industry. However, by combining all data from the outgoing rotations within a given year, we can construct useful annual information on temporary workers.¹⁹

Comparison of CPS and establishment survey employment estimates

The CPS micro data can be used to estimate total employment in the personnel supply industry. Table 2 contains such estimates along with the corresponding estimates from the BLS establishment survey. The differences are striking. Employment estimates based on the CPS are on the order of half those from the establishment survey. Moreover, the former suggest slower growth over time and also suggest that the industry's employment peaked in 1990.

These discrepancies are difficult to explain. Imprecision of the household estimates due to sampling error does not account for the consistent undercount, as the standard errors for the annual estimates are relatively small, less than 30,000 workers per year in 1993. Differences in survey methodology and design may explain some of the difference.²⁰ The establishment series are compiled from monthly payroll

records and count all jobs for which workers were paid. The resulting figures are adjusted to a comprehensive count of employment in an annual process known as the benchmark revision. The CPS series is constructed from a monthly survey of individuals asked about primary jobs. Thus these figures exclude individuals holding a second job in the personnel supply industry. However, the difference in the treatment of multiple job holding cannot account for much of the difference between the temporary employment estimates. Currently, approximately 6 percent of employed persons report that they hold multiple jobs. The May 1989 Current Population Survey, which included questions on multiple job holding, showed that less than one percent of the multiple job holders reported that their second job was in the personnel supply industry.²¹ One percent of 6 percent of the labor force is less than 75,000 workers, which is only a fraction of the difference to be explained.

Perhaps the most likely explanation is that many personnel supply workers in the CPS mistakenly report that their employer is the client firm to which they are temporarily assigned rather than their actual employer—the personnel supply firm. Despite this difficulty, we see no reason to discount the responses of temporary workers to other questions. In the following sections, we analyze those responses.

Occupational and demographic shift

The observed growth of the personnel supply industry raises questions about the nature of the workers and the tasks they perform. As noted earlier, the stereotypical image of a temporary worker portrays a woman in a clerical position. Table 3, which tabulates demographic and occupational statistics from the CPS data, shows that only a minority of temporary workers actually fit that description.

While temporary workers remain predominantly female, the portion who are male has grown significantly. In 1983 it was 25 percent and in 1993 it was 38 percent, with the bulk of the change occurring in the last four years. This observation becomes somewhat more remarkable given that over the same ten-year period, the male fraction of the total labor force fell slightly from 56 percent to 54 percent. Over the same period, the average age of temporary workers remained remarkably

Year	Establishment survey	Household survey
1983	619	390
1984	797	480
1985	891	607
1986	991	614
1987	1,177	628
1988	1,351	727
1989	1,455	790
1990	1,535	713
1991	1,485	655
1992	1,630	705
1993	1,926	689

Sources: Establishment survey—U.S. Department of Labor, Bureau of Labor Statistics, *Current Employment Survey* (various years). Household survey based on estimates from outgoing rotations of the Current Population Survey of the U.S. Department of Commerce, Bureau of the Census, 1983-93.

TABLE 3

Worker characteristics

Personnel supply workers

Year	Male	White	Average age	Paid hourly	Hourly wage ^a	Usual hours/week	Part-time	Part-time economic reasons	High school graduate	Started college	College graduate	Pink-collar ^b	Blue-collar ^c	White-collar ^d
1983	25%	81%	36.1	77%	5.89	34.3	30%	51%	34%	30%	25%	35%	9%	34%
1984	25	80	36.6	77	6.03	34.6	28	46	33	29	24	38	11	28
1985	23	81	36.0	76	6.34	34.3	32	49	34	31	23	35	10	29
1986	24	79	36.0	74	6.44	34.3	31	47	32	32	25	32	12	29
1987	27	79	36.7	78	6.92	35.1	29	48	32	33	23	34	14	27
1988	25	76	36.2	79	7.53	35.3	29	41	31	32	25	30	14	29
1989	25	76	36.6	79	7.74	36.0	31	42	34	31	24	35	11	28
1990	29	78	36.0	81	8.13	36.0	29	46	30	33	26	36	15	24
1991	33	78	37.1	81	8.19	35.1	33	49	28	33	28	34	17	26
1992	35	79	35.8	83	8.33	35.4	28	53	34	30	27	33	22	26
1993	38	79	36.6	82	8.47	35.8	29	56	31	32	28	34	23	27

All workers

Year	Male	White	Average age	Paid hourly	Hourly wage ^a	Usual hours/week	Part-time	Part-time economic reasons	High school graduate	Started college	College graduate	Pink-collar ^b	Blue-collar ^c	White-collar ^d
1983	56%	88%	37.4	59%	6.62	37.5	19%	33%	37%	23%	22%	16%	32%	23%
1984	56	88	37.2	59	6.84	37.9	18	30	37	24	22	16	32	24
1985	56	87	37.3	59	7.09	38.0	18	29	37	24	22	16	31	24
1986	56	87	37.3	59	7.29	38.0	18	29	37	24	22	16	31	24
1987	55	87	37.4	60	7.52	38.2	18	27	36	24	23	16	31	25
1988	55	87	37.5	60	7.78	38.3	18	26	36	24	23	16	30	25
1989	55	87	37.7	60	8.11	38.4	19	23	36	25	24	16	30	26
1990	55	87	38.0	60	8.49	38.5	19	24	36	25	24	16	29	26
1991	54	86	38.2	60	8.83	38.3	19	27	35	26	25	16	29	26
1992	54	86	38.4	60	9.06	38.3	19	28	35	27	25	16	28	26
1993	54	86	38.5	60	9.32	38.4	19	28	34	28	25	16	28	27

^aBased on hourly workers only.

^bPink-collar workers include administrative support occupations, including clerical (Standard Occupational Classification codes 303-389).

^cBlue-collar workers include farming, forestry, and fishing occupations (SOC 473-499); precision production, craft, and repair occupations (SOC 503-699); machine operators, assemblers, and inspectors (SOC 703-799); transportation and material moving equipment occupations (SOC 803-859); and handlers, equipment cleaners, helpers, and laborers (SOC 863-889).

^dWhite-collar workers include executive, administrative, and managerial occupations (SOC 003-037), and professional specialty occupations (SOC 043-199).

Source: Estimates from outgoing rotations of the Current Population Survey of the U.S. Department of Commerce, Bureau of the Census, 1983-93.

constant at around 36 years; educational attainment also remained relatively constant.

Another striking finding is the shift over time in the occupational distribution of temporary workers. Using the occupational information in the CPS, we identified three non-exhaustive categories of workers: blue-collar (industrial), white-collar (professional), and pink-collar (administrative support and clerical).²² The share of temporary work classified as blue-collar grew from 9 percent in 1983 to 23 percent in 1993. This increase occurred while the share of blue-collar workers in total employment fell from 32 percent to 28 percent. The increasing share of blue-collar workers did not come at the expense of the pink-collar share, which stayed relatively constant at about one-third. Rather, it came from a declining share of white-collar and other workers. While the share of white-collar workers fell, the actual number of such workers increased, according to CPS-based estimates, from 133,000 to 187,000. This 41 percent increase was, however, less than the 67 percent increase in pink-collar workers and 468 percent increase in blue-collar workers. The shift into blue-collar occupations may increase the cyclical sensitivity of the personnel supply employment, since blue-collar employment typically experiences greater fluctuations over the business cycle. In turn, this would increase the value of the industry as a leading indicator so long as proper allowance is made for its increased variance.

The great majority of workers whose primary job is in the personnel supply industry are paid hourly, and only about 30 percent work part-time. Indeed, their 1993 average usual weekly hours of 35.8 is not much less than the average 38.4 hours for all workers. Of all temporary workers who are working part-time, over half are doing so for economic reasons (or “involuntarily”), significantly higher than in the labor

force as a whole, where 70 percent of part-time workers indicate a preference for part-time work. The relatively high fraction of involuntarily part-time workers suggests at least two things. First, relatively few workers accept temporary jobs because they want a short work week. Second, the uncertainties of temporary employment are such that in any given month, at least 15 percent (half of 30 percent) of temporaries work fewer hours than they wish.

Implications for the interpretation of recent manufacturing employment

The standard measures of employment in the manufacturing sector continued to decline for several quarters after the official end of the recent recession, and even afterwards grew very slowly. As a result, from 1991 to 1993, manufacturing employment fell by more than 400,000 workers, a decrease of more than 2 percent.

The personnel supply industry has been shifting towards industrial occupations, as documented above. Yet these workers count as part of the service sector, resulting in a substantial underestimate of those working in manufacturing settings. Table 4 uses the estimated fraction of personnel supply (SIC 736)

TABLE 4

Manufacturing employment adjusted for use of temporary workers
(thousands)

Year	Manufacturing employment	SIC 736 employment	SIC 736 blue-collar ^a	Adjusted manufacturing employment ^b
1983	18,436	619	56	18,491
1984	19,375	797	88	19,463
1985	19,249	891	89	19,338
1986	18,947	991	119	19,066
1987	18,999	1,178	165	19,164
1988	19,314	1,351	189	19,503
1989	19,391	1,455	160	19,551
1990	19,076	1,535	230	19,306
1991	18,408	1,485	252	18,660
1992	18,105	1,630	359	18,464
1993	18,005	1,926	443	18,447

^aPercent blue-collar from table 3 multiplied by total SIC 736 employment.
^bSum of manufacturing employment and the blue-collar component of SIC 736 employment.
 Note: Totals may not match because of rounding error.
 Source: U.S. Department of Labor, Bureau of Labor Statistics, *Current Employment Survey*, 1983-93.

employment in industrial occupations to estimate its contribution to manufacturers' use of labor. If we assume that all personnel supply workers in industrial occupations were hired in the manufacturing sector, the manufacturing employment estimates for 1991-93 would increase by 252,000, by 359,000, and by 443,000 workers, respectively. Even with these adjustments, manufacturing employment fell annually during 1989-93, but the adjustments substantially reduce the decline. On an unadjusted basis, manufacturing employment declined by 403,000 workers from the end of the recession in 1991 until the end of 1993. On an adjusted basis, the decline was only 213,000. Thus half of the measured job loss in manufacturing may have been due to the increased use of temporary and leased workers. Employers' use of temporary workers is similarly likely to affect estimates of wage inflation and worker productivity within manufacturing, though we do not assess the magnitude of such mismeasurements.

Labor market attachment and industrial mobility

As we noted earlier, our CPS data are drawn from the fourth and eighth interviews, which occurred one year apart. When possible, we matched observations on individual workers for the two interviews to study changes in labor force attachment, wages, and temporary versus permanent status.²³

The first column of the upper panel of table 5 displays the percentages of workers who were working in personnel supply services at the time of their first interview and who were in various labor force states at the time of their second interview. These states are out of the labor force, employed (in either a temporary or permanent position), and unemployed. The second column displays the corresponding percentages for all workers employed at the time of their first interview. A number of points stand out. First, temporary workers were almost twice as likely to leave the labor force as the average worker (11.6 percent versus 6.8 percent). Second, table 5 also shows

At second interview	Status at time of first interview							
	Employed		Employed pink-collar		Employed blue-collar		Employed white-collar	
	SIC 736	All	SIC 736	All	SIC 736	All	SIC 736	All
Out of labor force	11.6	6.8	13.2	7.2	15.2	6.5	7.1	4.3
Employed	83.5	90.9	81.7	90.9	77.3	90.3	90.1	94.4
SIC 736	32.0		26.3		14.7		47.8	
Non-SIC 736	51.6		55.4		62.6		42.3	
Unemployed	4.9	2.3	5.0	1.9	7.5	3.2	2.8	1.2
At first interview	Status at time of second interview							
	Employed		Employed pink-collar		Employed blue-collar		Employed white-collar	
	SIC 736	All	SIC 736	All	SIC 736	All	SIC 736	All
Out of labor force	13.3	6.3	17.2	7.2	15.0	5.4	7.6	3.4
Employed	78.9	90.8	74.4	90.5	68.7	90.7	88.1	95.4
SIC 736	30.7		26.2		12.4		46.9	
Non-SIC 736	48.2		48.3		56.3		41.3	
Unemployed	7.8	2.9	8.4	2.5	16.2	3.9	4.2	1.3

Note: Columns may not total 100% because of rounding error.
Source: Outgoing rotations of the Current Population Survey of the U.S. Department of Commerce, Bureau of the Census, 1983-93.

that temporary workers were more than twice as likely as the average worker to be unemployed one year later (4.9 percent versus 2.3 percent). This is further evidence that working as a temporary decreases security, a factor that motivates much of the concern over the growth of the contingent labor force.

The higher probabilities of leaving the labor force and becoming unemployed appear within each of the occupational categories shown in table 5. There are, however, some notable differences among the categories. For instance, white-collar workers, whether temporary or permanent, are significantly more attached to the labor force. The chance that a worker will be out of the labor force one year later is significantly less for white-collar than for blue- or pink-collar workers, and the difference is especially pronounced among temporaries. The difference in strength of attachment between temporary and other workers is greatest among blue-collar workers. For instance, among all employed workers, the probability of leaving the labor force is higher for pink-collar than for blue-collar workers (7.2 percent versus 6.5 percent); the opposite is true of temporaries (13.2 percent versus 15.2 percent). Blue-collar temporaries also have a particularly high chance of falling into unemployment the next year (7.5 percent).

Another relevant finding from table 5 is that for most temporary workers, that status itself is temporary. Less than one-third of temporary workers were still temporaries one year later; more than half were in permanent positions.²⁴ These figures varied somewhat by occupational group. On the one hand, blue-collar temporaries were especially unlikely to remain temporaries. One year later, only about 15 percent were still temporaries, while 63 percent had permanent jobs. On the other hand, almost half of the white-collar temporary workers remained temporaries after one year, more than the fraction that moved into permanent positions. The estimates for pink-collar occupations lay between those of blue- and white-collar workers. The relatively high degree of industrial mobility suggests that a large underclass of temporary workers is unlikely to develop, since there are significant paths for moving out of temporary work.

The lower panel follows a similar format, except in reverse. That is, the first column

shows the distribution of the labor force states workers were in at the time of their first interview, given that they were employed as temporaries a year later. As can be seen, temporaries were more than twice as likely (13.3 percent versus 6.3 percent) to have been out of the labor force in the earlier year. This is further evidence of their weaker-than-average labor force attachment. It is also consistent with the view that temporary employment is a popular way to re-enter the labor force. Pink-collar temporary workers were especially likely to have been out of the labor force in the earlier period, which probably reflects the higher fraction of women who may have taken time out to raise children.²⁵

Table 5 also shows that temporaries were more than two and a half times as likely (7.8 percent versus 2.9 percent) to have been unemployed a year earlier, consistent with a below-average level of economic security. Blue-collar temporaries were especially likely to have experienced unemployment the previous year.

The picture of industrial mobility that emerges from the lower panel of table 5 is consistent with that of the upper panel. Less than a third of temporary workers had been temporary workers the previous year. Just under half (48.2 percent) had been employed in permanent positions the previous year, a bit less than the fraction (51.6 percent) observed in the upper panel who were permanent employees the following year. The breakdown by occupation is also consistent with the earlier tables. On the one hand, blue-collar workers were particularly unlikely (12.4 percent) to have been temporaries previously. On the other hand, white-collar temporaries were significantly more likely (46.9 percent) to have been temporaries a year before. Again, pink-collar temporaries fell in between (26.2 percent).

Wage comparisons

The labor market transitions described above are accompanied by wage rate adjustments. The CPS data are well suited to analyses of wage changes, as they include detailed demographic information on individuals. Our analysis begins by asking whether personnel supply workers are paid more, less, or the same as comparable workers outside of SIC 736. The aggregate comparison presented earlier (\$10.93 per hour for all private workers in

1993, compared to \$8.27 for SIC 736 workers) does not account for differences in worker abilities and activities. To address this criticism we estimated a log wage regression using the CPS outgoing rotation data for 1983-93. The regression controls for age, age squared, race, sex, and educational attainment, and allows for year-specific wage inflation rates. We estimated the model separately for blue-, white-, and pink-collar occupational groups, and limited the sample to full-time hourly workers. The results, shown in table 6, indicate that a pink-collar SIC 736 worker earns 10.2 percent less (standard error 0.7 percent) than a comparable worker outside that sector. While considerable, this differential is much smaller than the 25 percent often reported. The

wage differential for blue-collar workers operates in the same direction but is larger—a difference of 34.3 percent with a standard error of 1.2 percent. This gap exceeds the gross estimates. Finally, full-time hourly white-collar SIC 736 workers earn 2.4 percent (standard error 1.4 percent) *more* than their non-SIC 736 counterparts. Perhaps the controversial discussion about the desirability of the growth of contingent work, including SIC 736 employment, needs to be considered at a disaggregated level.

We also used the matched CPS samples to relate changes in wages to temporary status at the time of workers' two interviews. This is of interest for two reasons. First, temporary workers may differ from permanent workers in

ways not measured by the CPS. If such characteristics are also related to wages, then the results in table 6 may reflect those unobserved differences rather than temporary status per se. However, if the relevant unobserved characteristics are constant over time, then analyzing how wages vary with changes in temporary status may give a better indication of the effect of temporary status on wages.²⁶ Second, it may be that the relationship between wages and temporary status is more complex than is assumed in the statistical model underlying table 6. For instance, temporary workers may not only have higher or lower wages at a point in time, but also experience faster or slower wage growth. Observing how temporary and permanent workers' wages change between the two interviews allows us to check this possibility.

TABLE 6

Log hourly earnings regression for full-time hourly workers

	Pooled	White-collar*	Blue-collar*	Pink-collar*
Employed in SIC 736	-0.0787** (0.0054)	0.0239* (0.0143)	-0.3431** (0.0120)	-0.1020** (0.0066)
Age	0.0613** (0.0002)	0.0627** (0.0008)	0.0638** (0.0003)	0.0459** (0.0004)
Age ²	-0.0006** (0.0000)	-0.0006** (0.0000)	-0.0007** (0.0000)	-0.0005** (0.0000)
Started 9th grade	0.1278** (0.0022)	0.0121 (0.0190)	0.1567** (0.0025)	0.0621** (0.0093)
High school graduate	0.2645** (0.0019)	0.1415** (0.0175)	0.2868** (0.0022)	0.1663** (0.0087)
Started college	0.3601** (0.0020)	0.3012** (0.0175)	0.3575** (0.0025)	0.1994** (0.0088)
College graduate	0.5086** (0.0023)	0.4815** (0.0175)	0.3245** (0.0039)	0.2297** (0.0090)
Male	0.2837** (0.0009)	0.1668** (0.0028)	0.3396** (0.0015)	0.2150** (0.0020)
White	0.0759** (0.0012)	0.0355** (0.0040)	0.1111** (0.0017)	-0.0221** (0.0023)
Root mean squared error	0.3969	0.4063	0.3775	0.3223
Observations	872,916	89,233	403,004	161,918
Adjusted r ²	0.3025	0.2927	0.3143	0.2654

*Defined in notes to table 3.
 *t-statistic ≥ 1.64.
 **t-statistic ≥ 1.96.
 Note: Model includes a separate intercept for each year. Standard errors in parentheses.
 Source: Outgoing rotations of the Current Population Survey of the U.S. Department of Commerce, Bureau of the Census, 1983-93.

Workers employed at both interviews could have been temporary at both dates, changed from permanent to temporary status, changed from temporary to permanent status, or been permanent at both dates. Table 7 reports how average wage growth for workers in the other cases differed from that of the base case—workers who were permanent at both interviews. In addition, base case wage changes were allowed to vary by year and to depend on workers' ages.²⁷

For pink-collar workers, the results in table 7 are relatively consistent with those in table 6.

Wage growth of workers who were temporary at both dates did not differ significantly from that of workers who were permanent at both dates. However, moving from permanent to temporary status was associated with 4.7 percent (standard error 1.7 percent) less wage growth, and moving from temporary to permanent status was associated with 9.6 percent (standard error 1.5 percent) more wage growth than the base case. The latter figure is not very different from the 10.2 percent estimate of the gap between temporary and permanent workers' wages shown in table 6.

For blue-collar workers, the picture in table 7 differs dramatically from that of table 6. Changing from permanent to temporary status was associated with 12.2 percent (standard error 2.8 percent) less wage growth, and changing from temporary to permanent status was associated with 14.2 percent (standard error 2.6 percent) more wage growth than that of the base case workers who were permanent at both dates. Both of these figures are much less than the 34.3 percent estimate of the effect of temporary status shown in table 6. This suggests that some of the results of table 6 were due to temporary blue-collar workers' having different unobserved characteristics

	Pooled	White-collar^a	Blue-collar^a	Pink-collar^a
Age	-0.0014** (0.0000)	-0.0008** (0.0002)	-0.0015** (0.0001)	-0.0011** (0.0001)
SIC 736 in first year, not second year	0.0412** (0.0096)	0.0440 (0.0345)	0.1424** (0.0260)	0.0962** (0.0146)
SIC 736 in second year, not first year	0.0147 (0.0097)	0.0575* (0.0330)	-0.1219** (0.0282)	-0.0471** (0.0172)
SIC 736 in both years	0.0170 (0.0130)	0.0485 (0.0345)	-0.0643 (0.0464)	0.0023 (0.0169)
Root mean squared squared error	0.2904	0.2978	0.2822	0.2414
Observations	251,645	16,583	94,665	36,883
Adjusted r ²	0.0047	0.0023	0.0050	0.0052
*Defined in notes to table 3.				
**t-statistic ≥ 1.64.				
***t-statistic ≥ 1.96.				
Note: The dependent variable is the change in log average hourly earnings. The regression includes only people employed at both points in time, one year apart, and includes an intercept for each year.				
Source: Matched samples from outgoing rotations of the Current Population Survey of the U.S. Department of Commerce, Bureau of the Census, 1983-93.				

than permanent blue-collar workers. In addition, table 7 shows that the wage growth of those who were temporary at both dates averaged 6.4 percent less than that of base case workers, though this difference is not statistically significant.

In the case of white-collar workers, the differences in average wage growth associated with different transitions are generally small relative to their standard errors. This is consistent with table 6, which showed no statistically significant differences between temporary and permanent white-collar wage rates. However, table 7 suggests that among white-collar workers, transitions from permanent to temporary status are associated with higher than normal wage growth.

Conclusions

This article described the personnel supply industry, its relationship to aggregate employment, and the changes occurring in the industry over time. We presented evidence that the use of temporary workers is a leading indicator of aggregate economic conditions. We also found the industry to be undergoing fundamental change as well as rapid growth.

Over the last decade, the industry has become increasingly male and blue-collar. The latter development may further enhance the industry's value as a leading indicator. Moreover, the increased provision of temporary workers to the manufacturing sector suggests that the decline of manufacturing employment in 1992-93 may have been overstated by perhaps as much as 50 percent.

We also found that temporary workers have somewhat weaker than average attachments to the labor force and that they tend to have less economic security than the average worker, being more likely to become unemployed and to be involuntarily part-time. However, workers frequently move from temporary to permanent employment, suggesting that fears of a developing underclass are exaggerated.

After adjusting for characteristics such as age and educational attainment, we found that the wage differential associated with temporary employment varies widely by occupation, from 34 percent less for blue-collar workers to 10

percent less for pink-collar workers to 2 percent more for white-collar workers. Comparing temporary workers' wages to those on their previous and subsequent permanent jobs suggests more moderate wage changes, especially for blue-collar workers, for whom the estimated change was on the order of 12 percent to 14 percent. We also found little evidence that workers who remain temporary experience wage growth that is slower than normal, as they might be expected to do if they were accumulating less human capital.

Our analysis focused on the occupational decomposition of the personnel supply industry. We attribute much of the employment growth in the industry to its expansion into blue-collar occupations and document differences across occupational groups (blue-, white-, and pink-collar) in labor force transition rates, permanent/temporary wage differentials, and wage growth. Disaggregate analysis such as this will become increasingly important as the personnel supply industry continues to grow.

NOTES

¹The Bureau of Labor Statistics identifies the personnel supply industry as Standard Industrial Classification (SIC) 736.

²The term "contingent work force" has been used to describe temporary workers, part-time workers, the self-employed, and independent contractors, among others. See Belous (1989) and Polivka and Nardone (1989).

³A special Bureau of Labor Statistics survey of contingent work, including temporary work, has been scheduled for mid-1995. The 1994 National Longitudinal Survey of Youth (NLSY) also includes questions on this topic. Until this year, NATSS was known as the National Association of Temporary Services (NATS). For publications produced under the latter name, we refer to it that way.

⁴These counts include workers involved in recruiting and placing workers, as well as the workers themselves. A 1989 BLS survey of the help supply industry suggests that only about 6 percent of its employees are permanent staff.

⁵That survey estimates the total size of the help supply industry as substantially smaller than the does the BLS's payroll survey. The difference is largely due to differences in sampling methodology. See U.S. Department of Labor, BLS (1993b) for details.

⁶The estimates are largely compatible with the 1989 estimates for the entire personnel supply industry from the household employment survey (35 percent administrative and support, and 10 percent farm, craft, operators, transport, and handlers) and the 1992 estimates for all tempo-

rary workers from NATSS (46.6 percent clerical, 27.5 percent industrial, 10.2 percent technical, and 8.8 percent medical). (NATSS 1993).

⁷We seasonally adjusted the data before computing the growth rates, which we then smoothed by computing a five-quarter-centered moving average of the growth rates.

⁸The regression results are robust to a variety of specifications including different lag lengths, sample periods, and trend specifications.

⁹This section follows the analysis of Abraham and Taylor (1993) regarding the firm's decision to contract out for certain functions.

¹⁰A special wage survey of the help supply services industry conducted in October 1989 estimates the nationwide average earnings at \$7.59 per hour (BLS 1993b).

¹¹For instance, NATSS reports that total 1992 receipts of temporary supply firms were \$24.9 billion, or 49 percent greater than their payroll of \$16.7 billion. See NATS (1993).

¹²Bureau of Labor Statistics (1993a).

¹³U.S. Chamber of Commerce (1993).

¹⁴Mangum, Mayall, and Nelson (1985) suggest that the desire to implement dual internal labor markets motivates the use of contingent workers.

¹⁵Such considerations also suggest the value to firms of contracting out certain functions such as food service and janitorial work. Temporary firms are also taking over whole functions such as word processing and data entry, in which they may have more expertise than client firms, thus freeing the latter to concentrate on areas in which they have a competitive advantage.

¹⁶NATS (1994b).

¹⁷See Hotchkiss (1991).

¹⁸NATS (1994b).

¹⁹The National Bureau of Economic Research provided the micro data for the outgoing rotations used throughout this section. The resulting size of the sample of SIC 736 workers ranges from 1,122 workers in 1983 to 1,823 in 1993.

²⁰Green (1969) outlines the differences between the household and payroll surveys.

²¹Tabulations by authors. Precise estimation of the fraction is difficult because of the small number of people who have second jobs.

²²White-collar workers include executive, administrative, and managerial occupations (Standard Occupational Classification codes 003-037) and professional specialty occupations (SOC 043-199). Blue-collar workers include farming, forestry, and fishing occupations (SOC 473-499); precision production, craft, and repair occupations (SOC 503-699); machine operators, assemblers, and inspectors (SOC 703-799); transportation and material moving equipment occupations (SOC 803-859); and handlers, equipment cleaners, helpers, and laborers (SOC 863-889). Pink-collar workers include administrative support occupations, including clerical (SOC 303-389).

²³The BLS provides a household identifier in the monthly CPS data that allows us to match households across interviews. However, the CPS data do not provide an identifier to match individuals within the household. As a result, we used the available individual level demographic information (age, race, sex, and educational attainment) in conjunction with the household identifier to match individuals across interviews. Welch (1993) and Hirsch (1993) use similar matching procedures. Approximately 75 percent of the records are matched across years. However, the rate is lower in 1985 and 1986 because the 1995 survey tested new population weights and area identifiers. A portion of the unmatched data is attributable to mobility factors. Within the CPS methodology, individuals and households who relocate are dropped from the sample.

²⁴With the current data we are unable to address the interesting question of how many workers accepted permanent positions at the firms to which they were assigned as temporaries. Considerable anecdotal evidence suggests that such career paths are common. For example, Manpower Incorporated alone reports that approximately 150,000 temporary workers made a transition into permanent positions with client companies during 1993 (U.S. Department of Labor and U.S. Department of Commerce 1994).

²⁵In aggregate, during 1993 approximately 80 percent of the workers in our pink-collar category were women, compared with nearly 50 percent of our white-collar category and only 20 percent of our blue-collar category.

²⁶That is, the wage change regressions of table 7 allow for the existence of worker-specific fixed effects.

²⁷More specifically, the coefficients shown in table 7 were obtained by regressing the change in log hourly wage on year dummies, age, and dummies for the three remaining possible combinations of temporary statuses at the two interviews.

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