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ECONOMIC PERSPECTIVES

A review from the
Federal Reserve Bank
of Chicago

The temporary labor force

**Does business
development raise taxes?**

FEDERAL RESERVE BANK
OF CHICAGO

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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-

ices (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).

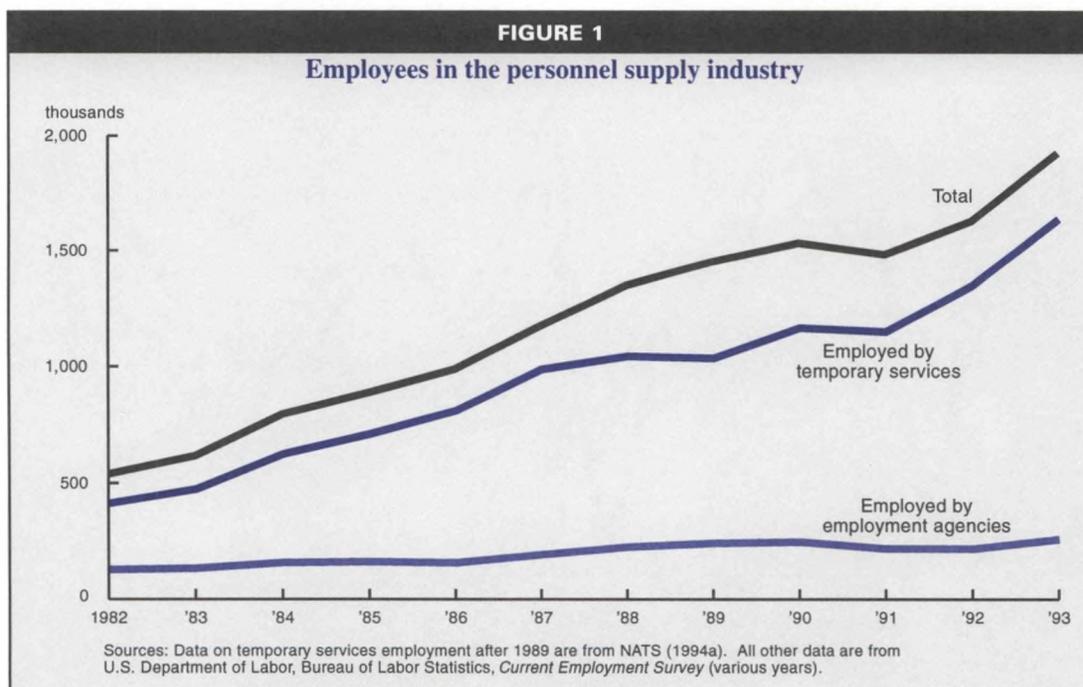
ing maintenance services) into a single category named “help supply services” (SIC 7363). This procedural change prompted NATSS to contract with private survey firms to gather comparable data on temporary help supply firms at a quarterly frequency.

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-



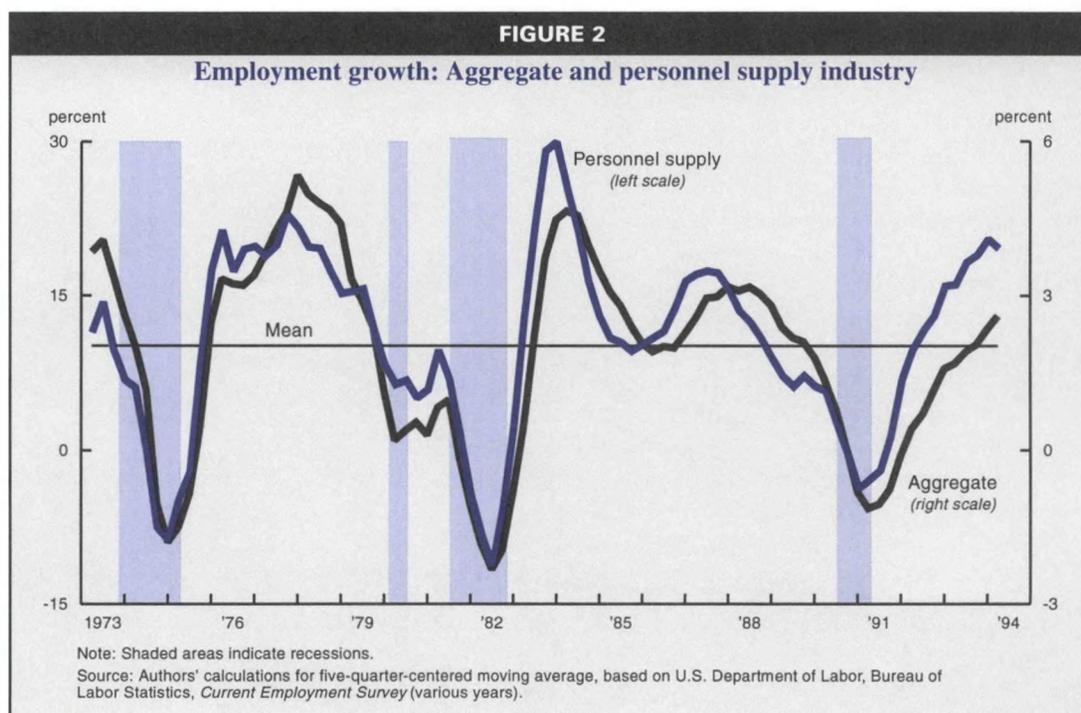
ing clerical workers.⁵ In fact, 30 percent of all help supply employment fell into the industrial categories of “operators, fabricators, and laborers,” and “precision, production, craft, and repair” occupations. Technical and related support occupations, including health and computer-related employment, 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)

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 ^a	Blue-collar ^a	Pink-collar ^a
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

^aDefined 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

TABLE 7

One-year wage change regression model

	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

^aDefined 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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The New Tool Set

ASSESSING INNOVATIONS IN BANKING

**The 31st Annual Conference
on Bank Structure and Competition
May 10-12, 1995**

On May 10-12, 1995, the Federal Reserve Bank of Chicago will hold its 31st annual Conference on Bank Structure and Competition at the Westin Hotel in Chicago. The major theme of the conference will be assessing recent changes or "innovations" that are affecting the financial services sector. At last year's conference, participants heatedly debated whether the role of commercial banks in the provision of financial services was declining. There was considerable disagreement on this question but universal agreement that, declining or not, the industry was changing significantly. It is that change, and the resulting public policy implications, that will be evaluated at this year's conference.

As examples of such change, the use of both exchange-traded and over-the-counter financial derivative products has increased dramatically as institutions have sought more efficient ways to manage their risk positions. Secondary markets have developed for various classes of loans, in some cases with the support of government intervention. Aided by favorable regulatory decisions, banks have become more deeply involved in mutual fund activities by introducing their own proprietary funds or by managing or selling third-party funds. Finally, as a result of recent legislation, banks will soon be able to diversify geographically in a more efficient manner than state laws previously allowed.

Do these innovations represent adaptations that banks must make to fulfill their traditional role of processing information and managing risk in the new financial environment? What impact will these innovations have on the institutions' ability to provide intermediary services? Do they make us better off as a society? While the new tools may allow for improved risk management, do they carry the potential for increased risk if used improperly? Are they being used improperly? Is government intervention needed in the development of secondary loan markets? Does unchecked geographic expansion carry with it the danger

of a significant increase in market concentration and the exploitation of market power? Is the recent liberalization of Glass-Steagall simply the dismantling of an archaic New Deal banking regulation, or does it eliminate a necessary defense that prevents systemic problems from infecting the entire financial system?

The 1995 conference will feature discussions of these and related questions by some of the industry's most prominent practitioners, regulators, and academics, including Alan Greenspan, Chairman of the Board of Governors of the Federal Reserve System, and Ricki Tigert Helfer, the newly appointed Chairman of the FDIC.

This year's theme panel will focus on an evaluation of the recent financial innovations. The panel will feature Warren Heller, VERIBANC, Inc.; Richard S. Carnell, U.S. Treasury; Frank L. Gentry, NationsBank; Cynthia A. Glassman, Furash & Company; and Edward J. Kane, Boston College.

The grand finale of the conference will be a luncheon panel discussing alternative strategies for utilizing the new tool set. The panel will feature chief executive officers of banking organizations that have adapted to the changing environment and effectively utilized the new tool set. They include Frank V. Cahouet, Mellon Bank Corporation; David W. Fox, Northern Trust Co.; and John F. Grundhofer, First Bank System, Inc.

The conference will also include sessions on the following topics:

- *Derivatives and Risk Management*
- *Evidence of Contagion in Financial Crises*
- *Mortgage Financing and Community Development*
- *Expanding Bank Product Powers*
- *Interstate Bank Activity*
- *Capital Regulation*
- *Assessing and Monitoring Risk*
- *Financial Intermediation and Bank Uniqueness*
- *Regulatory Accounting Issues*

The first day of the conference is intended primarily for an academic audience and will emphasize technical research papers. The Thursday and Friday sessions are addressed to a more general audience.

Invitations to the conference will be mailed in March. If you are not currently on the conference mailing list or have changed your address and would like to receive an invitation, please contact the Public Affairs Department of the Federal Reserve Bank of Chicago at 312-322-5114, or send your request to Public Affairs Department, 3rd Floor, Federal Reserve Bank of Chicago, P.O. Box 834, Chicago, Illinois 60690-0834.

Does business development raise taxes?

**William H. Oakland
and William A. Testa**



Many suburban communities experienced rapid business development and employment growth during the 1980s.

Community planners and development officials tended to encourage business development not only because it promised increased employment, but also because they believed it would increase the tax base, drawing new taxes from nonresident business owners to the benefit of community residents.¹

These beliefs have recently been challenged, however, by some urban planners and other analysts of the suburban growth process who maintain that business development brings along high costs in associated public services and infrastructure, and that intergovernmental aid to pay for these costs is too low.² Critics of urban land-use expansion further contend that job suburbanization isolates the urban poor from gainful employment, contributes to overdevelopment of land and spoilage of agricultural land at the urban fringe, and raises overall metropolitan-area public service costs by requiring new infrastructure that duplicates what already exists in the urban core. In contrast, others argue that the “not in my backyard” response by communities has unduly constrained economic growth and standards of living. This article assesses the local fiscal impact of business development by first reviewing previous studies and then investigating the statistical relationship between business development and residential property tax rates for 115 Chicago suburbs during the 1980s.

What do previous studies tell us?

Previous studies have assessed the fiscal impact of business development using two different methodologies. One approach generalizes from the outcomes of many different case studies that tabulate the fiscal costs and benefits of individual business developments. The other examines the statistical relationship between general business growth and community fiscal well-being. So far, both approaches have produced ambiguous or contradictory findings; studies can be found suggesting that business development brings a net fiscal benefit, and that it does not.

Fiscal impact studies

So many local officials have become concerned about the fiscal impact of land development that an entire methodology has been developed to address the question in specific circumstances. This methodology, known as fiscal impact analysis, compares the public service costs of land development in a particular use to the public revenues that the development is expected to generate.³

Although most recent fiscal impact studies share this general methodology, these studies vary widely in sophistication.⁴ Nonetheless, the findings of fiscal impact studies over the past four decades indicate a dichotomy between business and residential development with respect to fiscal impact. Generally

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speaking, and with important exceptions, commercial and industrial development (hereafter referred to as “business development”) appears to more than pay its way fiscally. Specifically, the public revenues generated from business development tend to exceed the costs of the public services they require. For example, some extensive studies of the impacts of individual developments, such as the Saturn plant, suggest that the local revenues generated by industrial development exceed the generated service costs by a factor of three.⁵ In contrast to most business development, most types of residential development, especially single-family detached housing, are found to be losing propositions. The households inhabiting such housing tend to pay property and other local taxes that fall short of the costs of public services consumed. Elementary and secondary education is commonly implicated as the major public service cost associated with such households.⁶ The divergence between the fiscal impact of residential development and that of business development can, in some instances, become irrelevant because people tend to follow jobs, and vice versa. Accordingly, for example, the fiscal benefits of business development can be subsequently negated as population in-migration responds to job growth. In other instances, however, communities act to exclude unrewarding types of development through zoning restrictions while admitting lucrative business development to the community.

While some studies conclude that business development showers community residents with fiscal benefits, others claim that those studies are flawed. They argue that cost-benefit methodologies do not fully account for the added costs of public infrastructure, and some important case studies find that when these costs are acknowledged, business development does not pay its own way.⁷ This may explain why some communities that experienced rapid employment growth in the 1980s also experienced rising property tax rates. In addition, fiscal impact studies may be turning up more negative findings because revenue assistance from state and federal government has become less responsive to community growth.⁸

Statistical studies of fiscal impact

The majority of studies from the economic and professional planning literature have concluded that business development tends to pay

its own way. However, statistical evidence of fiscal impact is sometimes ambiguous. Some look for associations between business development and changes in local property tax rates. From the standpoint of community residents, falling property tax rates are a fiscal benefit because lower property tax rates allow a greater proportion of personal income to be devoted to consumption (assuming that public service consumption does not decline). However, evidence that residential property tax rates are rising can be more difficult to interpret.⁹ Rising property tax rates imply either 1) that community residents have taken advantage of their enhanced ability to tax nonresident business property owners in order to increase public services, or to the contrary, 2) that business development has imposed higher costs on the community, which must now raise tax rates.

One recent statistical study examined 365 contiguous municipalities of northern New Jersey that gained 400,000 new jobs and 150,000 new residents during the 1980s.¹⁰ The study assessed whether growth in jobs and population affected several indices of fiscal and nonfiscal benefits. In general, the authors concluded that employment growth benefited local communities while population growth was largely detrimental. With specific regard to fiscal benefits, community employment growth significantly lowered property tax rates while raising local government revenues per capita.

While lower property tax rates strongly suggest fiscal benefit to community residents, evidence showing increased local government revenues and services is more ambiguous. New businesses may necessitate increased public expenditures for services such as police and fire protection, thereby offsetting increased revenues that derive from an augmented property tax base. Some ambiguity can be reduced by focusing on the growth of those public expenditures that more directly benefit community residents, such as local school spending. While an educated work force benefits the broader business sector to some degree, no individual business will draw its entire labor force from the immediate community, as table 4 below indicates. Accordingly, school spending at the community level largely benefits residents rather than community businesses.

Studying the educational spending decisions of communities in the Boston metro-

politan area, Ladd found that a greater proportion of commercial and industrial property signals local voters that they face a lower “tax price” for education.¹¹ That is, for every additional dollar that voters decide to spend, they behave as if part of the additional costs will be borne by out-of-community people associated with the business property.¹² A study of 56 Bergen County (New Jersey) communities found similar results.¹³ In a recent study of northern New Jersey, community employment growth was found to increase per pupil school spending significantly; in contrast, population growth tended to depress it.¹⁴

The Bergen County study looked at both the tax rate and local education expenditures. It found that 70 percent of commercial and 52 percent of industrial property tax payments benefited residents in the form of lower taxes and higher educational expenditures per household.¹⁵ In particular, a hypothetical \$1,000 extra of commercial property was estimated to have resulted in \$8.60 lower property tax payment per household, and an extra \$8.10 in educational expenditures per household.

Some empirical studies do not support the hypothesis that community pursuit of commercial and industrial property is advantageous. Margolis examined both the real effective property tax rate of municipalities in the San Francisco Bay area in 1953-54 and their total property value per resident.¹⁶ Margolis classified cities according to their intensity of commercial/industrial property land use, and then compared the distribution of property value and real tax rate by type of city. He found that “dormitory” cities (that is, those choosing to specialize in residential property) tended to display lower property tax rates than did “balanced” cities (those with substantial proportions of both nonresidential and residential property). However, the evidence for this conclusion is not compelling. First, the study entirely excluded the type of community—so-called industrial enclaves—that contains the largest proportion of commercial and industrial property. It is arguable whether such communities should have been excluded from the comparison sample, that is, whether there is any good reason to treat them as essentially nonresidential. In any case, as discussed earlier, higher property tax rates do not necessarily indicate fiscal benefits accruing to community residents.

More recently, a study by the staff of the DuPage County (Illinois) Development Department (1991) has received much public attention for its finding that the growth of nonresidential property has had a major negative impact on the fiscal situation of 133 communities. Specifically, the study finds that both residential and nonresidential land uses have significant impacts on property tax revenues and that the areas of the county that experienced the most rapid change from residential to nonresidential bore additional service provision costs that required higher tax levies. The DuPage study did not distinguish among types of property tax payers, but considered all residential and nonresidential property tax payments together. However, increased payments by nonresidential property owners are not likely to be a burden to local residents; in fact, they may compensate or benefit residents. Moreover, the study examined the growth of the tax levy in absolute dollar amounts (and not the “price” or “tax rate” effect of growth and development).

The empirical analysis

We begin the empirical analysis with an examination of the following question: Has business development been associated with reductions in tax burdens? We used correlation analysis to address this question. If the analysis indicates a relationship between business development and reduced tax burden, then the burden of proof for the claim that business development has either a negative or no fiscal impact would seem to rest with those who take such a position.

The study sample and period

We drew our sample communities from suburbs within a six-county Chicago area.¹⁷ The unit of observation was the municipality. We defined sample communities by municipal boundaries rather than, say, school districts, because significant control over land use is vested with municipal governments. Our sample included incorporated municipalities with populations of more than 10,000 in Cook County and the six counties that border it. We excluded the city of Chicago because of its size and economic maturity. The 115 suburbs we included account for just over two-thirds of the suburban population. Because the sample excluded the many smaller municipalities in the six-county region, our results may not apply to

TABLE 1

Trends in population, employment, and total equalized assessed value

Place name	Population		1990 population
	1970-80	1980-90	
	<i>(percent change)</i>		
Chicago	-10.7	-7.4	2,783,726
Cook County	-4.3	-2.9	5,105,067
Cook County suburbs	5.8	3.1	2,321,341
DuPage County	33.9	18.6	781,666
Kane County	10.9	14.0	317,471
Lake County	15.1	17.3	516,418
McHenry County	32.6	23.9	183,241
Will County	30.9	10.1	357,313
Suburbs	13.6	9.2	4,477,450
SMSA	1.8	2.2	7,261,176

Place name	Employment		1990 employment
	1972-81	1981-90	
	<i>(percent change)</i>		
Chicago	-9.1	-1.9	1,201,136
Cook County	1.6	8.2	2,247,098
Cook County suburbs	22.3	22.7	1,045,962
DuPage County	68.7	91.9	380,334
Kane County	17.3	30.8	120,331
Lake County	24.5	61.8	183,823
McHenry County	23.9	55.4	52,778
Will County	15.1	21.1	75,145
Suburbs	26.8	37.4	1,858,373
SMSA	6.8	18.7	3,059,509

Place name	Equalized assessed value	
	1980-90	1990 EAV
	<i>(percent change)</i>	
		<i>(billions)</i>
Chicago	90.9	\$23.1
Cook County	103.9	56.0
Cook County suburbs	114.2	32.9
DuPage County	145.0	13.6
Kane County	89.1	3.5
Lake County	127.9	8.7
McHenry County	107.1	2.4
Will County	112.1	4.6
Suburbs	119.7	65.7
SMSA	111.4	88.8

SOURCES: U.S. Department of Commerce, Bureau of the Census, *Census of Population and Housing*, various issues; Illinois Department of Employment Security, *Where Workers Work*, 1981 and 1990; and Illinois Department of Revenue, *Property Tax Statistics*, various issues.

such areas. The period of observation was roughly 1980-90. We say "roughly" because some data were available only for the Census years 1979 and 1989, or for the fiscal years 1981 and 1991.

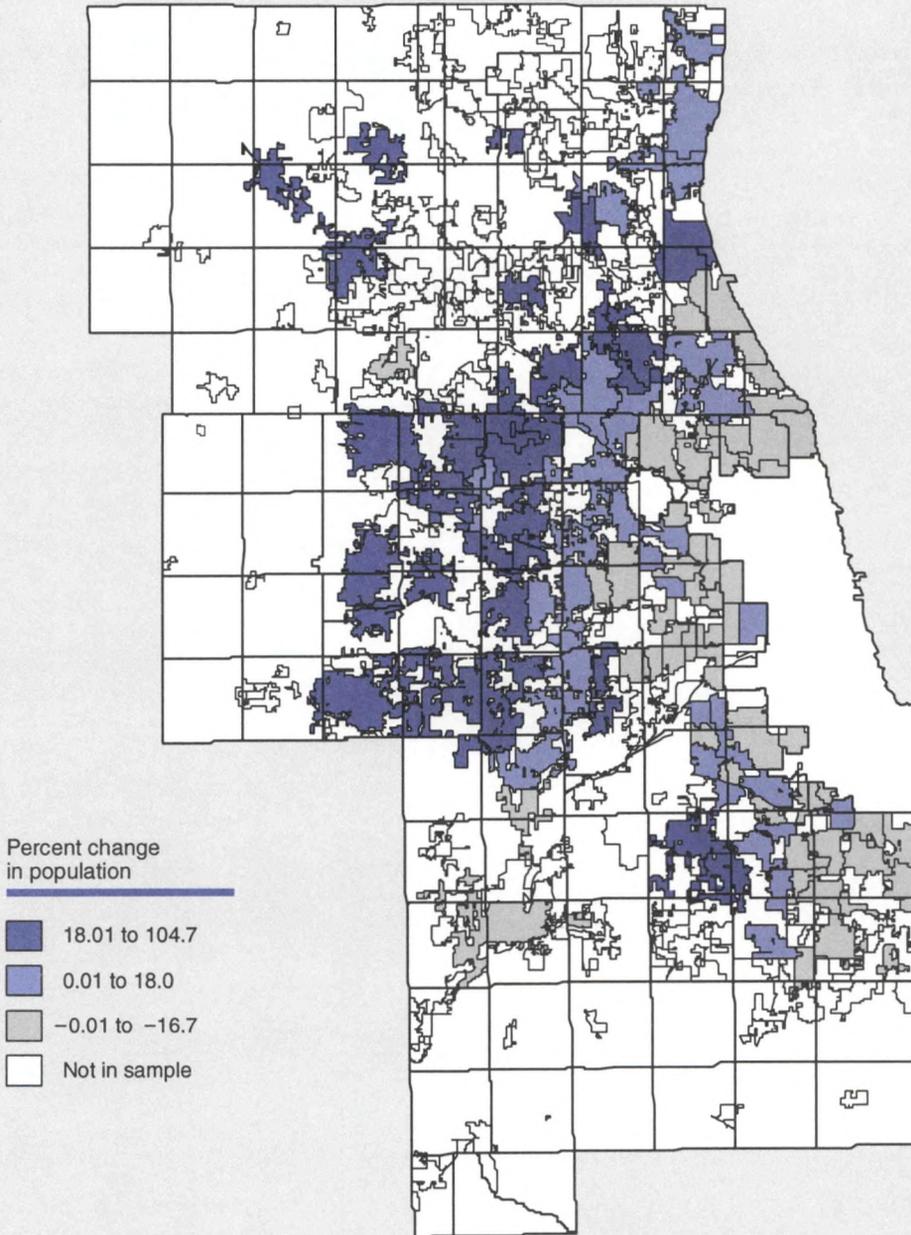
During the period under study, population in the overall suburban area surrounding the city of Chicago grew by a robust 9.2 percent, while the city's population fell by 7.4 percent (see table 1). All suburban counties experienced population growth, as did Cook County, in which Chicago is located. Population grew most rapidly in the farthest-outlying suburbs. It grew more slowly nearer the center of the six-county area and declined in the inner-ring suburbs immediately surrounding Chicago (see figure 1).

Consistent with the experience in much of the nation during this time, employment growth greatly exceeded population growth. Several noted demographic trends contributed to this development. Generally, the large baby-boom generation continued to enter the labor force during the decade, and labor force participation of females continued to rise. Consequently, many suburbs saw their commercial and industrial base expand, many experienced population growth, and many experienced both.

In most of the municipalities we sampled, numerous local taxing jurisdictions overlap. Therefore, we found it necessary to estimate an aggregate tax rate or tax burden for each municipality, reflecting the combined burden of all the levies imposed within the municipality's boundaries.¹⁸ We refined these aggregate tax burdens further to reflect differences in assessment practices and in the incidence of major tax exemptions, such as the homeowner's exemption.

FIGURE 1

Change in population, 1980-90
(Six-county Chicago area)



Source: U.S. Department of Commerce, Bureau of the Census, *Census of Population, 1980 and 1990*.

Measures of tax burden

We considered three measures of tax burden: 1) the statutory property tax rate,¹⁹ which is applied to equalized assessed value (EAV), and hereafter denoted as *trate*; 2) effective tax rate on owner-occupied housing, denoted as *rate*; and 3) effective tax rate in terms of income, denoted as *burden*. Each of these

measures is interesting in its own right. *Trate* is of interest because it is the measure set by local governing authorities; it is also the tax rate applied to commercial and industrial property. *Rate* is of interest because it reflects the degree to which residential property is taxed, and is relevant to decisions to build or improve residential property. It reflects residential tax

payment in relation to full market value. Finally, *burden* measures property tax payments by residential property owners in relation to their personal income and thus measures the average sacrifice required of homeowners within a community. Increases in this measure imply that fewer funds are available for private consumption.

Mathematically, these measures can be represented as follows:

$$trate = RPTAX / EAVRES$$

$$rate = RPTAX / FVRES$$

$$burden = RPTAX / INC,$$

where

RPTAX = aggregate residential property tax payments,

EAVRES = aggregate equalized assessed value of residential property,

FVRES = aggregate market value of residential property, and

INC = aggregate homeowner income.

Simple algebraic manipulation reveals the following relationships among these measures:

$$trate = rate * (EAVRES / FVRES)$$

$$burden = rate * (FVRES / INC).$$

The term *EAVRES / FVRES* is commonly known as the assessment ratio, while *FVRES / INC* is the average ratio of house value to income. The assessment ratio differs among

communities despite efforts by the State Board of Equalization to keep them uniform. The ratio of housing value to income will differ because of underlying differences in land values and the average age of housing stock.

Simple regression analysis

We began by testing for a simple correlation between business development and percentage change in tax burden. As our measure of business development (*chbus*) we used the change in the inflation-adjusted equalized assessed value of commercial and industrial property divided by total assessed value:

$$chbus = (EAVBUS91 - EAVBUS81) / EAV91,$$

where

EAVBUS = inflation-adjusted equalized assessed value of business property, and

EAV = inflation-adjusted total equalized assessed value.

This measure reflects the maximum potential reduction in *trate* afforded by the growth in taxable business property. The model tested then takes the form

$$(1) \text{ ch}(taxmeasure)_i = a + b * chbus_i + e_i,$$

where e_i is an error term, and the subscript i denotes the various sampled communities. The results displayed in table 2 indicate no significant relationship between *chbus* and *trate*, a marginal negative relationship with *rate*, and a

	Parameter estimate	Standard error	t-statistic	Prob > t	Adj. r^2
CHTRATE					
INTERCEPT	13.97	1.30	10.73	0.0001	
CHBUS	-0.05	0.32	-0.15	0.8786	-0.0086
CHRATE					
INTERCEPT	13.86	1.58	8.75	0.0001	
CHBUS	-1.22	20.39	-3.12	0.0023	0.0712
CHBURDEN					
INTERCEPT	21.03	2.05	10.23	0.0001	
CHBUS	-5.50	0.05	-10.59	0.0001	0.4940

strong negative relationship with *burden*. Whether business development is associated with a reduction in tax burden therefore depends on which measure of burden one adopts. If one is most interested in burden relative to housing value, assessed or otherwise, one must conclude that there is at best a weak negative association between business growth and tax burden. On the other hand, if one is more interested in tax sacrifice, there appears to be a much stronger negative association.

Multiple regression analysis

The lack of a strong relationship between business development and two of the three measures of tax burden may be due to intervening changes in other elements of the tax base. For example, business development may sometimes be accompanied by increases in residential investment. If such a pattern is uneven among communities, the true relationship between business investment and tax burden may not be revealed by simple correlation measures. Multiple regression can often overcome this difficulty, since it controls for the intervention of confounding factors.

Accordingly, we decomposed the change in residential EAV into a capital gain element (*capgain*) and a new housing component

(*chres*). Like changes in business EAV, these changes in residential EAV were expressed relative to total EAV. By construction, therefore, the three components exhaust the change in total EAV over the period.

We introduced these added variables into the relationship between *ch(taxmeasure)* and *chbus*, as follows:

$$(2) \quad ch(taxmeasure)_i = a + b * chbus_i + c * capgain_i + d * chres_i + e_i$$

Table 3 presents estimates of equation 2. A significant negative relationship now emerges for all three measures. Thus, if the effects of changes in residential EAV are taken into account, changes in business EAV have been associated with decreases in residential tax burdens. It is noteworthy that the capital gain component of the change in residential EAV also is significantly associated with tax burden changes. However, in the case of *chburden*, the correlation is positive. This might reflect the failure of taxing authorities to fully roll back property tax rates for increases in EAV caused by housing appreciation. Under such circumstances, tax bills would increase even though income did not, leading to greater tax sacrifice.

TABLE 3
Multiple regression of economic development on tax burden

	Parameter estimate	Standard error	t-statistic	Prob > t	Adj. <i>r</i> ²
CHTRATE					
INTERCEPT	19.82	1.30	15.2	0.0001	
CHBUS	-1.53	0.345	-4.4	0.0001	
CAPGAIN	-2.46	0.325	-7.5	0.0001	
CHRESNET	-0.18	0.433	-0.4	0.6683	0.36
CHRATE					
INTERCEPT	16.15	1.97	8.1	0.0001	
CHBUS	-1.83	0.52	-3.5	0.0006	
CAPGAIN	-1.00	0.49	-2.0	0.0439	
CHRESNET	-0.01	0.65	-0.02	0.9829	0.09
CHBURDEN					
INTERCEPT	14.37	2.32	6.1	0.0001	
CHBUS	-3.61	0.61	-5.8	0.0001	
CAPGAIN	2.89	0.58	4.9	0.0001	
CHRESNET	0.07	0.77	0.09	0.9233	0.59

It is further noteworthy that for *chtrate*, capital gain has a larger coefficient (in absolute value) than *chbus*. This might reflect the need for public services to accommodate economic development, whereas no expenditure needs may arise from housing appreciation. It might also reflect the tendency to spend some of the fiscal benefits of economic development by raising community consumption of public services. By contrast, housing appreciation per se seemingly provides no fiscal benefits.

Finally, it is noteworthy that new housing capital as measured by *chres* is not correlated with any of the burden measures. This dichotomy with business investment may well reflect the greater expenditure needs that added population places on local government relative to its contribution to government revenues. This finding is in harmony with the view that people "simply don't pay for themselves."

Discussion and conclusions

Simple correlation analysis indicates that business development and tax burden are, if anything, inversely associated in the suburban six-county area during the period under study. Although correlation does not necessarily imply causation, this finding would seem to ease the burden of proof from those who believe that business development is associated with fiscal benefits, unless it is shown that there are intervening forces that may be causing the observed correlation.

One such intervening force may be the growth of population and residential property that often accompanies business development. When we included residential growth in our correlation analysis, we found that the inverse relationship between residential property tax rates and nonresidential development was strengthened rather than diminished. Nonetheless, the observed relationship between business development and property tax rates may fail to tap some important indirect impacts of the former on the latter. For example, fiscal benefits of business development may be partly reflected and hence capitalized into the value of residential property. If so, the coefficient attributing lower tax rates to business development may actually understate that beneficial impact. We can begin to understand such complexities only by fully modeling and estimating the important interrelationships among land uses and other important factors.

Another important relationship may be that business development induces residential growth as people follow jobs so as to reduce the distance between home and work. Such migration has been observed in other studies that focus on the aggregate city versus suburban location of jobs and people.²⁰ Recently, such migration has been observed among suburban communities around Philadelphia.²¹ This behavioral relationship may be important for two reasons. First, population in-migration to a community in response to jobs may be accompanied by residential public service costs. In turn, those added public service costs may offset fiscal benefits derived from expanding the business property tax base. Perhaps more important, population in-migration can have spillover impacts on neighboring communities. As table 4 illustrates, in most suburban municipalities, employees tend to work outside

TABLE 4		
Percentage of employed residents who worked elsewhere, 1990		
Top ten		
Rank	Municipality	Percent
1	Justice	96.2
2	Country Club Hills	95.3
3	Sauk Village	94.3
4	Hanover Park	92.9
5	Riverdale	92.8
6	Palos Hills	92.4
7	Calumet Park	92.2
8	Woodridge	91.9
9	Glendale Heights	91.7
10	Hazel Crest	91.6
Bottom ten		
Rank	Municipality	Percent
106	Chicago Heights	68.3
107	Naperville	66.8
108	Crystal Lake	65.6
109	St. Charles	65.1
110	Waukegan	64.2
111	Elgin	61.4
112	Aurora	61.0
113	Evanston	57.4
114	Joliet	51.0
115	North Chicago	24.0
Average for suburban municipalities in the study		81.7
Source: U.S. Department of Commerce, Bureau of the Census, <i>Census of Population</i> , 1990.		

of their community of residence. Accordingly, a community that brings in business development may not bear the attendant population increase and residential fiscal burden of their actions. If all or many adjacent communities similarly follow their own self-interest in attracting business development, the resulting

area-wide impact may be to raise population pressures in a wider region, thereby lowering or negating the fiscal benefits attendant to business development. Such hypotheses can be tested only with a more complete model of community behavior.

NOTES

¹Fiscal benefit is defined from the perspective of a typical household in the home community. Broadly construed, fiscal benefit means an enhanced ability of a representative household to consume more publicly provided goods and services, such as education and parks, and private goods and services. A fiscal benefit can arise from an increase in the community's taxable resources or, on the expenditure side, from a reduced need for public services. For example, a new business development typically adds to a community's tax base—property or other. As the community levies taxes on this addition to the tax base, new revenues will be generated. If these revenues exceed the public service demands that accompany the new development, then the community household will be able to 1) lower its own tax rate, thereby enabling increased consumption of private sector goods, 2) consume more residential services as financed from the added tax base, or 3) both. Note also that the accrual of fiscal benefit does not necessarily imply greater overall levels of general welfare for community residents. Business development may cause congestion and environmental degradation that lower the quality of life for residents.

²See Gomez-Ibanez (1993), Ladd (1994), DuPage (1991), and White (1975).

³An extensive handbook details how to measure the fiscal impact associated with any particular property development; see Burchell and Listokin (1993).

⁴See Testa (1995), Gomez-Ibanez (1993), and Burchell and Listokin, *ibid.*

⁵Bartik (1991), citing Fox and Neel (1987) and Bartik *et al.* (1987).

⁶On average, and with much variation, education accounts for 40 percent of local government spending in the U.S. (Advisory Commission on Intergovernmental Relations 1993).

⁷See, for example, Gomez-Ibanez (1993).

⁸Gomez-Ibanez (1993); Ladd (1994).

⁹If a growing business property tax base tends to reduce residential property tax rates, this does not necessarily mean that a business development has paid its own way in the host community. Nonproperty taxes borne by community residents may increase at the same time that property tax rates decline and service demands by the business sector rise. In such a situation, the rising service

demands from business could crowd out the public services enjoyed by the community's households. Such crowding out is unlikely, however. The greatest demands on local governments are not usually for services to business but for education.

¹⁰Danielson and Wolpert (1991).

¹¹Ladd (1975). Commercial and industrial property is defined by most local governments as that land and building used (and assessed for tax purposes) in profit-making enterprises. Hence it is closely aligned with what we refer to in our empirical work as "business development." Of course, some job-creating businesses are not subject to the local property tax—for example, government operations and private colleges—and hence are not included in measurements of commercial and industrial property.

¹²Unlike the assumption of some statistical studies and most fiscal impact studies, Ladd's study suggests that local residents comprehend that part of local taxes imposed on businesses is shifted forward to local consumers or backward to local wage earners or landowners. Ladd found that in their selection of property tax rates, communities act as if 39 percent to 45 percent of the property taxes paid by industrial property are borne by that property rather than by local residents.

¹³Fischel (1975).

¹⁴Danielson and Wolpert (1992).

¹⁵Some studies, including Fischel (1975), posit that fiscal surplus attendant to business development represents an implicit price or compensation that businesses pay to gain entry into communities. Fiscal benefit compensates for environmental noxiousness (see Fischel 1975, McGuire 1987, and White 1975). Under some conditions of competitive bidding among communities to attain fiscal surpluses associated with business, the surplus itself may be bid down to zero; that is, an observed fiscal surplus may be exactly compensating a community for environmental noxiousness (White 1975).

¹⁶Margolis (1956b and 1957).

¹⁷This area is not identical to the present Metropolitan Statistical Area as defined by the U.S. Department of Commerce; rather, it is the former SMSA area that continues to be used by local government-related planning agencies.

¹⁸We did this by overlaying maps of each type of jurisdiction upon that of the municipality in question. The fraction of a municipality's tax base that was subject to the property tax levy of an overlapping jurisdiction of a particular type (for example, school district) was assumed to equal the fraction of municipal land area accounted for by that particular jurisdiction. A detailed description of the methodology and the data themselves will appear in a forthcoming working paper, "Does business development raise taxes? An empirical analysis of Chicago's suburbs," Federal Reserve Bank of Chicago, working paper, 1995.

¹⁹The statutory tax rate reflects all the property tax rates imposed by all overlapping governments on real property in the sample community. Equalized assessed value is the

taxable base against which the statutory rate is applied. After the assessor has assigned an "assessed value," the state of Illinois applies a county-wide multiplier factor to all assessed values within each county in order to bring the aggregate assessed value in each county to approximately one-third of fair market value. This process is called equalization. After this, certain exemptions are deducted to arrive at a taxable base against which all local property tax rates are applied.

²⁰For a recent review, see McDonald (1989) and Thurston and Yezer (1994).

²¹Luce (1994).

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