The Evolution of the Demand for Temporary Help Supply Employment in the United States

Marcello Estevão and Saul Lach*

October 1999

ABSTRACT

The level of temporary help supply (THS) employment surged during the late 1980s and the 1990s. However, we know little about where these workers were placed and, thus, there is a gap in our understanding of cyclical and trend industry employment in the U.S.. To close this gap, we estimate the proportion of THS employees in each major U.S. industry during 1977-97 using information from input-output tables and from the Contingent Worker Supplements to the CPS surveys of February 1995 and February 1997. Our estimates indicate that almost all of the growth in THS employment is attributed to a change in the hiring behavior of firms, rather than to a disproportional increase in the size of more THS-intensive industries. In fact, the proportion of THS employees in each major American industry, except the public sector, increased during our sample period. These increases were particularly large in services and in manufacturing where by 1997 close to 4 percent of all employees were THS workers. The public sector, which had demanded almost 40 percent of all THS workers in 1982, hired a negligibly small number of THS workers in 1997.

JEL codes: E2, J20, J40, D21

* Board of Governors of the Federal Reserve System and The Hebrew University and NBER. We would like to thank Carol Corrado, Ellen Dykes, Marianne A. Ferber, Lonnie Golden and Beth Anne Wilson for their comments. Saul Lach acknowledges financial support from the Employment Policies Institute. This paper presents the authors' own view and not those of the Federal Reserve System or of any members of its staff.

The Evolution of the Demand for Temporary Help Supply Employment in the United States

ABSTRACT

The level of temporary help supply (THS) employment surged during the late 1980s and the 1990s. However, we know little about where these workers were placed and, thus, there is a gap in our understanding of cyclical and trend industry employment in the U.S.. To close this gap, we estimate the proportion of THS employees in each major U.S. industry during 1977-97 using information from input-output tables and from the Contingent Worker Supplements to the CPS surveys of February 1995 and February 1997. Our estimates indicate that almost all of the growth in THS employment is attributed to a change in the hiring behavior of firms, rather than to a disproportional increase in the size of more THS-intensive industries. In fact, the proportion of THS employees in each major American industry, except the public sector, increased during our sample period. These increases were particularly large in services and in manufacturing where by 1997 close to 4 percent of all employees were THS workers. The public sector, which had demanded almost 40 percent of all THS workers in 1982, hired a negligibly small number of THS workers in 1997.

JEL codes: E2, J20, J40, D21

1 Introduction

In the last ten years or so, employment in the temporary help supply (THS) industry has more than tripled in the United States.[1] The increased use of individuals hired from THS firms is evident in the payroll data published by the Bureau of Labor Statistics (BLS). Although employment in the THS industry represented only about 2 percent of total nonfarm employment in 1997, it accounted for 10 percent of the net increase between 1991 and 1997. Since 1972, employment in the THS industry has risen at an annual rate of more than 11 percent while total nonfarm employment expanded only 2 percent per year (Figure 1). In addition, the variability and cyclical sensitivity of THS jobs have been extraordinarily high (Golden, 1996). If we wish to understand the reasons for the timing and magnitude of the changes in employment in the THS industry, we need to know more about the changing demand for this type of nonstandard worker. Knowledge of precisely where THS employees actually work is a first step towards this goal. Furthermore, this information is essential to assess the impact of the rapid growth in the THS industry on the performance of the sectors that hire such workers (Segal and Sullivan, 1995; Estevão and Lach, 1999).

There is, however, very scant direct evidence concerning the industry of assignment of THS workers. Because the BLS classifies employees by the industry of the employing firm rather than by the industry where they are actually working, THS workers are not included in the regularly reported measures of employment in those industries. This paper aims to remedy this problem by combining different sources of information about the THS industry to generate estimates of the flow of these workers going to major U.S. industries from 1977 to 1997.

In the next section, we define the measurement problem in more detail and discuss the different data sources that can be used to analyze the recent developments in the THS industry. In Section 3, we provide estimates for the proportion of THS employees working in each major sector of the U.S. economy. These estimates are based on the analysis of input-output tables published by the Bureau of Economic Analysis (BEA) for 1977, 1982, 1987 and 1992, and on the Contingent Worker Supplement to the

CPS of February 1995 and February 1997. These two supplements constitute the only direct evidence on where THS employees actually work. Section 4 decomposes the recent increase in THS employment into the contribution of two different sources of growth: changes in the size and changes in the THS-intensity of eight major sectors of the U.S. economy. Conclusions are presented in Section 5.

2 The Measurement Problem and Data Sources

The inherent measurement difficulty stems from the fact that BLS establishment surveys classify THS agency workers as employed in SIC 7363 (Help Supply Services), rather than being included in the measured employment of the industries actually using their labor. This occurs because THS workers are not on the payroll of the *using* firm.

Let $y_t = 1$ denote the event that an individual is a THS worker in period t. The time subscript is hereafter omitted for notational convenience. The parameters of interest are the probability that an individual working in industry i (e.g., manufacturing or services) is a THS, denoted by $\theta_i \equiv P(y=1|i)$, and the probability that a THS employee works in industry i, denoted by $\alpha_i \equiv P(i|y=1)$.

The two parameters are related by Bayes theorem as shown below:

$$(1) \qquad \theta_i \equiv P(y=1|i) = P(i\,|\,y=1)\frac{P(y=1)}{P(i)} = \alpha_i\,\frac{P(y=1)}{P(i)}$$

The expression for θ_i means, for example, that if a THS worker has a 30 percent chance of working in manufacturing (α_i = 0.30) then the number of THS workers employed in manufacturing relative to total employment is 0.30 times $P(y=1)$ which, given that the THS industry comprised about 2 percent of the workforce in 1997, equals 0.006. Using 0.15 as the value for $P(i)$ in 1997, the proportion of THS workers relative to manufacturing employment, θ_i, would be 4 percent.

In order to estimate θ_i we need to estimate $P(y=1)$, $P(i)$, and the assignment probability $\alpha_i = P(i|y=1)$. The first two probabilities are readily estimated from available

[1] The use of temporary workers also grew rapidly in most OECD countries (International Herald Tribune, September 1997).

data by the observed proportions of THS and industry *i* workers in every year. The last probability, however, is problematic because there is no systematic information about the distribution of THS workers by the industry of where they work (the "industry of use"). Nevertheless, under certain assumptions, estimates of the assignment probability can be extracted from selected data sources for particular years.

Note that the number of workers in industry *i*—the denominator in the estimate of θ_i—should be the *true* number of workers; that is, the reported number plus the THS employees working in the industry. Under these conditions, the probability of finding a THS worker in industry *i* is estimated by

$$\text{(2)} \qquad \hat{\theta}_i = \hat{P}(y=1|i) = \frac{\overbrace{\hat{P}(i\,|\,y=1)N_{y=1}}^{N_{y=1,i}}}{N_{y=0,i} + \underbrace{\hat{P}(i\,|\,y=1)N_{y=1}}_{N_{y=1,i}}}$$

where $\hat{P}(i\,|\,y=1)$ is some estimate of the assignment probability, and $N_{y=1}$ and $N_{y=0,i}$ are the observed number of THS and industry *i* workers, respectively. The numerator in (2) is the number of THS workers in industry *i* while the denominator is the total number of workers in industry *i* including THS workers.

Several data sets provide both direct and indirect information that can be used to calculate the conditional probabilities in (2). Table 1 summarizes these data sources. The Current Employment Survey (CES) of the BLS is an establishment based survey providing information on the number of workers on the payroll of firms belonging to SIC 7363—Help Supply Services. This is a slightly broader category than purely THS firms, but nonetheless almost identical to data collected by the National Association of Temporary and Staffing Services (NATSS) on THS firms (upper chart of Figure 2).[2] In other words, the residual category that explains the difference between the NATSS and the CES series for THS employment of employment is of trivial size. The number of

[2] Prior to the 1987 revision of the Standard Industrial Classification (SIC) scheme, THS firms were classified as SIC 7362 and were part of SIC 736 which also included Employment Agencies (7361) and a residual category. The 1987 revision combined the THS firms and the residual category (excluding facilities and continuing maintenance services) into a single category named "Help Supply Services" classified as SIC 7363.

THS workers, $N_{y=1}$, appearing in equation (2) is from the NATSS. The number of industry workers, $N_{y=0,\, i}$, appearing in equation (2) is from the CES.

The Current Population Survey (CPS) is a household-based survey providing information on households' and individuals' characteristics. It assigns workers to the industry in which they are employed, broadly equivalent to a 3-digit SIC industry. Therefore, individuals are not identified as employed in the Temporary Help Supply industry as such, but in the 3-digit industry (SIC 736) that contains THS, i.e., the Personal Supply Services (PSS) industry. However, the share of THS firms in total PSS employment was about 90 percent in 1997 and, as shown in the lower chart of Figure 2, changes over time in manufacturers' use of PSS workers mainly reflect changes in the use of THS workers. Unfortunately, the regular CPS does not include a question about the industry to which PSS employees are assigned.[3]

The Contingent Worker Supplements to the CPS of February 1995 and of February 1997 are other sources of data on the THS industry. In these supplements respondents were asked directly if they were paid by a Temporary Help Supply agency. Furthermore, the supplements recorded the respondents' industry of assignment. Thus, these surveys constitute the only *direct* evidence on the distribution of THS workers by industry of use.

Finally, under certain assumptions, input-output tables from the BEA provide estimates of the distribution of PSS workers among different industries. The commodities-use tables measure the dollar amount of output from one sector that is used as input to another sector. These transactions are registered at approximately a three-digit level of aggregation; therefore input-output tables do not provide information on THS firms but on PSS firms (SIC 736). When wages of PSS workers and other fees are largely independent of their industry of assignment, the proportion of the PSS industry's output that goes to industry *i* (the input–output coefficient) is equivalent to the proportion of PSS hours used by in industry *i*.

Formally, the nominal output in the PSS sector can be written as $Y = w_m H_m N_m + w_r H_r N_r$, where the subscript indicates the industry of assignment (*m* =

industry under study and r = remaining industries), w = hourly wage plus hourly overhead fees (including the profit-per-hour of the THS agency), H =average hours of work and N = number of workers assigned to industry m or r. If w_m is approximately equal to w_r, then the proportion of PSS output going to industry m (the input-output coefficient) is approximately equal to the share of total hours of PSS work going to industry m. In addition, if H_m is approximately equal to H_r, then the input-output coefficient is also a reasonable approximation for the share of employment directed to industry m. For instance, because manufacturing wages per worker ($w_{mfg}H_{mfg}$) are larger than the average wage in other industries, input-output coefficients will tend to overestimate a bit the proportion of THS employment directed to manufacturing. Anyway, input-output tables with the relevant information on the PSS industry are available for 1977, 1982, 1987 and 1992.

3 The Sectoral Evolution of THS Employment

Under the assumptions discussed above, input-output coefficients could be used as estimates of the assignment probability, α_i, for 1977, 1982, 1987 and 1992. Direct estimates of α_i can also be obtained for 1995 and 1997 using the Contingent Worker Supplement to the February CPS for each of these years.

In principle, these sources of data provide information at the three-digit level of aggregation. Because the statistical noise and potential biases of the estimators decrease with the level of aggregation, we conduct our analysis at the level of eight major industries: (1) construction; (2) manufacturing; (3) transportation, communication and utilities; (4) retail and wholesale trade; (5) finance, insurance and real estate (FIRE); (6) services; (7) public sector; and (8) other industries (mining, agriculture, forestry and fisheries).

Figure 3 reports the assignment probabilities. A few points are worth mentioning here. During 1982-87, the service and public sectors accounted for the lion's share of

[3] Using a non-parametric approach, Estevão and Lach (1999) use workers' individual characteristics from the March CPS tapes to provide a tight range of possible values for the probability of finding a THS worker in manufacturing from 1972 to 1997.

THS workers. After the 1982 peak of 40 percent, the proportion of THS workers employed in the public sector (includes federal, state and local administration, and public enterprises) declined dramatically—to almost zero in 1997. In contrast, the share in manufacturing increased no less dramatically—it tripled between 1987 and 1997—and accounted for about 30 percent of the THS workers in 1997. The demand for THS work from the service sector also increased substantially. Together, manufacturing and services firms accounted for about 75 percent of all THS employees in 1997.

The radical changes in the assignment distribution of THS workers must have been accompanied by changes in the characteristics of THS workers. In particular, the shift from the public sector to manufacturing suggests that there must also have been a shift in the direction of more male, blue-collar workers in the 1990s.

Using data from the March CPS files, Table 2 displays the changes in the average characteristics of individuals working in personnel supply services. While blue-collar workers comprised 14 percent of the workforce hired by PSS firms in 1977, and only 6 percent in 1985, they accounted for about 25 percent by the mid-90s. The particularly rapid increase in the proportion of blue-collar workers in the 1990s is consistent with the evidence from the input-output-tables and the contingent worker supplements pointing to a surge in the demand for THS employment from manufacturing firms. Most of this increase was matched by reductions in the proportion of white-collar workers, while the proportion of clerical workers (pink-collars) edged down.[4]

Table 2 presents additional evidence suggesting structural changes in the demand for THS workers. The average proportion of male workers in the PSS industry in 1992-1997 was more than 10 percentage points higher than in 1977-1987. The share of PSS employees working part-time (less than 35 hours of work per week) declined although it remained well above the average for the whole labor force. The increase in the proportion of male workers, the reduction in the proportion of employees working part-time and the slight rise in their usual weekly hours of work are also consistent with larger flows of THS employees to manufacturing firms.[5] As an aside, the average PSS worker

[4] Segal and Sullivan (1995) had already pointed out that the observed rise in the proportion of blue-collar workers among THS employees in the early 1990s was evidence of increased demand from manufacturers.
[5] The proportion of male workers in manufacturing (67 percent in 1997) is substantially larger than in the rest of the economy (48 percent in 1997). Also, manufacturing employees tend to work longer hours: 41.5

seems to have acquired only a bit more education over time: The proportion of individuals with at least some college increased from 52.5 percent between 1977 and 1987 to about 55 percent between 1992 and 1997, while the proportion of PSS workers without a high school diploma declined.

4 Composition Effects or Structural Changes?

As shown in Figure 1, the proportion of THS workers in total nonfarm employment increased from 1 percent in 1990 to about 2 percent in 1997. According to the National Association of Temporary and Staffing Services (NATSS), in 1990 the THS industry comprised about 1.2 million workers; in 1997 it reached more than 2.5 million workers.

The aggregate data, however, masks distinct sectoral trends. Our estimates of θ for different industries over time (as per equation (2)) are shown in Figure 4. We used payroll employment data from the CES to compute $N_{y=0,i}$ for seven of our eight industry groups. Data from the monthly Employment Situation BLS release for farms, fisheries and forestry were combined with payroll data from the CES for mining to form the "other industries" category. In addition, for the sake of presentation, we used a linear interpolation of the assignment probabilities shown in Figure 3 to estimate the missing observations when computing θ_i.[6]

What stands out is the rapid and sharp increase in manufacturing use of THS workers, from 1 percent of the sector's workforce in 1992 to about 4 percent in 1997, about the same level of THS-intensity as in service industries. Finance, insurance, and real estate (FIRE) and transportation, communications, and utilities have also shown significantly larger THS-intensity in the 1990s. But in contrast to manufacturing, services, FIRE and TCU arrived at this level of THS intensity through steady growth since the early 1980s. The proportion of THS workers in construction increased substantially between 1982 and 1987 but has remained roughly constant since then.

---

hours per week, on average, in 1997 as opposed to an average of 36.8 hours per week outside manufacturing.

[6] In Estevão and Lach (1999) we use workers' individual characteristics from the March CPS tapes to estimate assignment probabilities for the manufacturing sector in the missing years. Although those estimates provide a more precise picture of the annual variations in the assignment probabilities, they do not affect the longer-term trends discussed here.

Within manufacturing, THS-intensity increased a bit more in durable goods industries (Figure 5). In addition, the increase was somewhat more noticeable in high-tech industries—here defined as office and computing equipment (SIC 357) and electrical machinery, related equipment and supplies, excluding household appliances (SIC 36 excluding SIC 363).[7]

The proportion of the THS industry in total civilian employment, $\theta_t = \frac{T_t}{E_t}$ where *T* is the number of THS workers and *E* is total nonfarm employment, is equal to a weighted average of the θ_{it}*'s* in different industries with weights given by the employment share of each industry. Thus, the changes over time in the aggregate proportion θ_t depend on changes in the proportion of THS workers used by each industry, θ_{it}, and on the size of the various industries. More precisely,

$$\theta_t = \frac{T_t}{E_t} = \frac{\sum_{i=1}^{I} T_{it}}{E_t} = \sum_{i=1}^{I} \frac{E_{it}}{E_t}\frac{T_{it}}{E_{it}} = \sum_{i=1}^{I} s_{it}\theta_{it} \tag{3}$$

where $s_{it} = \frac{E_{it}}{E_t}$ is the employment share of industry *i*.

The change in θ over τ years is therefore

$$\begin{aligned} \Delta\theta_t = \theta_t - \theta_{t-\tau} &= \sum_{i=1}^{I} (s_{it} - s_{it-\tau})\bar{\theta}_{it} + \sum_{i=1}^{I} (\theta_{it} - \theta_{it-\tau})\bar{s}_{it} \\ &= \sum_{i=1}^{I} \Delta s_{it}\bar{\theta}_{it} + \sum_{i=1}^{I} \Delta\theta_{it}\bar{s}_{it} \end{aligned} \tag{4}$$

where a bar over the variable indicates the time mean of that variable, e.g., $\bar{s}_{it} = \frac{s_{it} + s_{it-\tau}}{2}$.

Equation (4) can be used to compute the contribution of individual sectors to aggregate growth. For example, the employment share of the manufacturing sector declined from 0.25 percent in 1977 to 0.15 percent in 1997. Thus $\bar{s}_{it} = 0.20$ and

---

[7] Given the breakdown provided by the CPS we defined "high-tech industries" as the lowest aggregate that captures developments in office and computing equipment (SIC 357), semiconductors and related products (SIC 3674) and communications equipment (SIC 366).

$\Delta s_{it} = -0.10$. However, the proportion of THS workers increased from 0.00001 to almost 0.04 during the same period. Thus, $\bar{\theta}_{it} \cong 0.02$ and $\Delta\theta_{it} \cong 0.04$. Putting all this information together, we get that the contribution of the manufacturing sector to the change in aggregate θ between 1977 and 1997 is (-0.10*0.02+0.04*0.2) = 0.006, which taking into account rounding errors in this back-of-the envelope calculation, is close to the 0.5 percentage point shown in Table 4.

The decomposition in (4) is also useful for identifying the sources of growth. At one extreme, growth in the aggregate proportion of THS workers can occur even when no industry increased its THS-intensity, i.e., when $\Delta\theta_{it} = 0$ for all *i*, as a consequence of the more THS-intensive industries having increased their size over time. In this case, aggregate growth is due to a purely *compositional component*.

On the other hand, all industries may be growing at the same pace, $\Delta s_{it} = 0$ for all *i*, so that changes in the aggregate θ are directly related to changes in industry-specific θ_{it}*'s*, their THS-intensity. This indicates changes in the hiring pattern within individual industries. This is the *within component* of aggregate growth.

Table 3 contrasts the contribution of the compositional and the within components with the growth in the ratio of THS workers to total civilian employment. The data clearly show that most of the growth in this ratio can be attributed to increases in the latter. In fact, in the most recent period, between 1992 and 1997, this component accounted for more than 96 percent of the increase in the proportion of THS workers among all civilian employees.

Table 4 presents a breakdown of the within and the compositional components by different sectors. As the third row shows, the public sector was the only industry making a negative contribution to the growth of aggregate θ. More than 90 percent of the public sector's negative contribution came from a change in hiring behavior (within component) and not from the observed relative shrinking of public sector employment (compositional effect). The service sector accounted for about half of the increase in THS use in the U.S. since 1977 (0.86 percentage point of the 1.67 percentage point increase in the aggregate θ), while manufacturing accounted for about a third of the increase (0.50 percentage point).

Virtually all of the contribution from manufacturing between 1987-1997 is originated from the within component suggesting a dramatic structural change in manufacturers' hiring behavior during this period. This structural change is all the more remarkable because it coincided with a significant decline in the share of manufacturing employment and, therefore, a negative contribution of this sector to the compositional component.[8]

Within manufacturing, as shown in Table 5, the change in THS intensity in durable goods industries (the within component shown in the second row) accounts for about 62 percent of the 3.4 percentage points increase during 1977-97. Compositional effects are insignificant. High-tech industries explain about 17 percent of the total variation in manufacturing THS-intensity during 1977-97 even though they comprise only 10 percent of manufacturing employment.

Using the estimates of industry-specific THS employment and shares we adjust upward the observed employment levels in each industry. Figure 6 plots the evolution of annual employment levels from 1977 to 1997 after taking into account the employment of THS workers.[9] As noted above, while employment other than THS has been going up in most industries it declined in manufacturing, so that at the end of 1997, manufacturing employment remained significantly below the peak reached in 1989. However, after correcting for THS hires (the dots in Figure 6), manufacturing employment in 1997 was only slightly lower than the level observed in 1989.

5 Concluding Remarks

This paper focuses on estimating the distribution of THS workers across eight major sectors of the U.S. economy using input-output data and information from the 1995 and 1997 Contingent Worker Supplement to the CPS. In 1997, about 75 percent of all THS employees worked in manufacturing or service sector firms, compared to 40 percent in 1982. This reallocation of THS workers has occurred at the expense of the public sector. It was accompanied by changing characteristics of the THS employees in the

[8] The combination of the two effects suggests that manufacturers may have substituted temporary workers hired from THS firms for directly hired temporary workers.

[9] In order to add up regular and THS employees we must assume that THS workers are full-time equivalents and are not merely replacing temporary absent regular employees. The general perception is that THS workers are regarded as fully substitutable for regular employees.

direction of significantly more males and blue-collar individuals who are, on average, a bit more educated now than they had been in the 1980s.

Our results show that the recent large increase in the proportion of THS workers in the economy is due to a change in the hiring behavior of firms in the private sector. It is not due to a reallocation of workers from the less to the more THS-intensive industries. This suggests that the reasons for the dramatic growth in THS employment should be traced to the forces underlying changes in firms' hiring patterns.

Many reasons have been advanced to explain the rapid spread of THS arrangements. These include the potential for employers to implement a new, lower-wage rate in a two-tier wage structure by contracting with intermediaries that pay less for similar work, realize scale economies due to specialization in the provision of specific tasks, increase productivity given that THS may be better screened or trained than temporary workers hired directly by the firm (Autor, 1998; Polivka, 1996), and facilitate more rapid changes in firms' level of employment in response to temporary and/or unpredictable changes in demand (Abraham and Taylor, 1996; Golden, 1996).

The estimates of temporary employment by sector discussed in this paper should provide guidance for future research aimed at testing some of these potential explanations. In particular, researchers must account for the observed differences in the timing of the changes in firms' hiring behavior in manufacturing and service sector industries.

References

Abraham, Katherine G. and Susan K. Taylor, "Firms' Use of Outside Contractors: Theory and Evidence", *Journal of Labor Economics* 1996, 14,3, pp.394-424.

Autor, David, "Why Do Temporary Help Firms Provide Free General Skills Training?", *mimeo*, JFK School of Government, Harvard University, October 1998.

Estevao, Marcello and Saul Lach "Measuring Labor Outsourcing in U.S. Manufacturing", mimeograph, Federal Reserve Board, September 1999.

Golden, Lonnie "The expansion of Temporary Help Employment in the U.S., 1982-1992: A Test of Alternative Economic Explanations", *Applied Economics*, 28, 1127-1141, 1996.

National Association of Temporary and Staffing Services, various press releases.

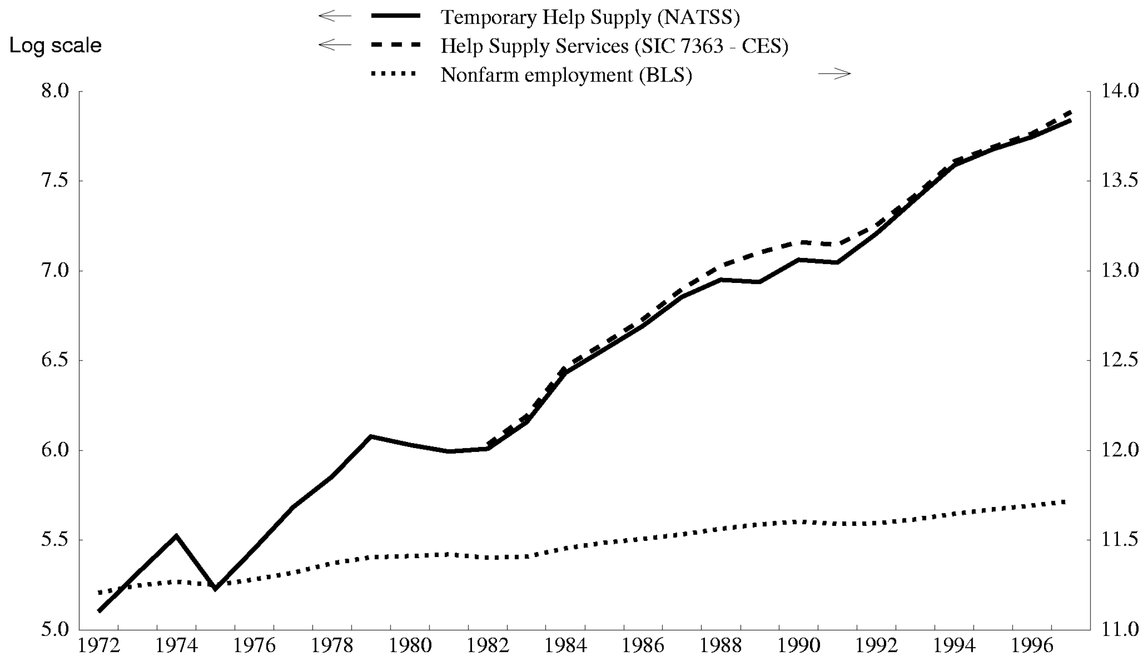
Polivka, Anne E., "Are Temporary Help Agency Workers Substitutes for Direct Hire Temps? Searching for an Alternative Explanation of Growth in the Temporary Help Industry", mimeograph, BLS, 1996.

Segal, Lewis M. and Daniel G. Sullivan, "The Temporary Labor Force", *Economic Perspectives*, 19, 1995, 2-19.

Segal, Lewis M. and Daniel G. Sullivan, "The Growth of Temporary Services Work", *Journal of Economic Perspectives*, Spring 1997, 11, 117-136.

Figure 1

Employment



Share of THS (NATSS) in nonfarm employment

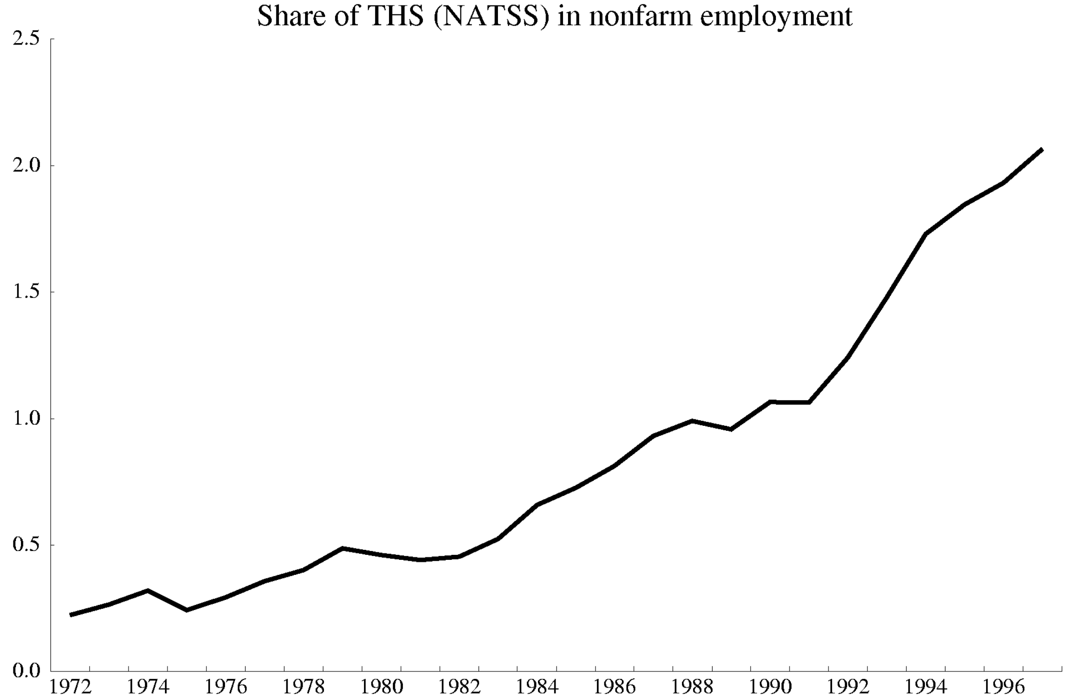
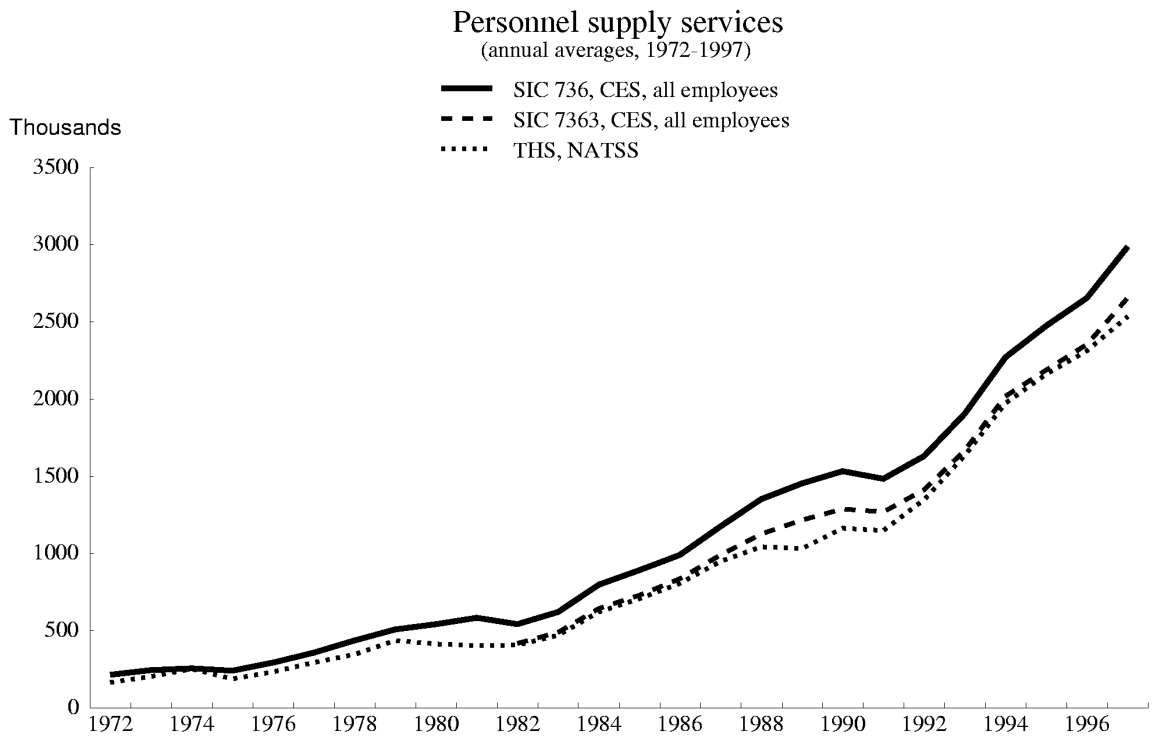


Figure 2


Personnel supply services
(annual averages, 1972-1997)
SIC 736, CES, all employees
SIC 7363, CES, all employees
THS, NATSS
Thousands
3500
3000
2500
2000
1500
1000
500
0
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996

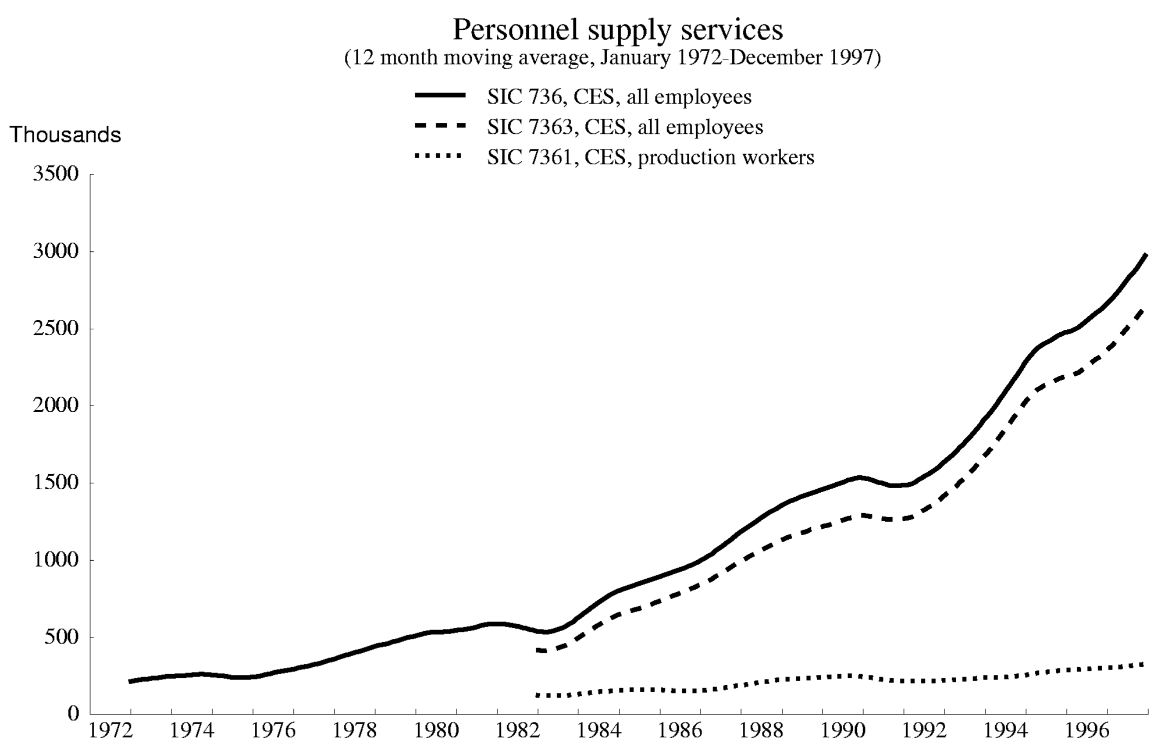

Personnel supply services
(12 month moving average, January 1972-December 1997)
SIC 736, CES, all employees
SIC 7363, CES, all employees
SIC 7361, CES, production workers
Thousands
3500
3000
2500
2000
1500
1000
500
0
1972
1974
1976
1978
1980
1982
1984
1986
1988
1990
1992
1994
1996

Figure 3
Assignment probabilities (%)

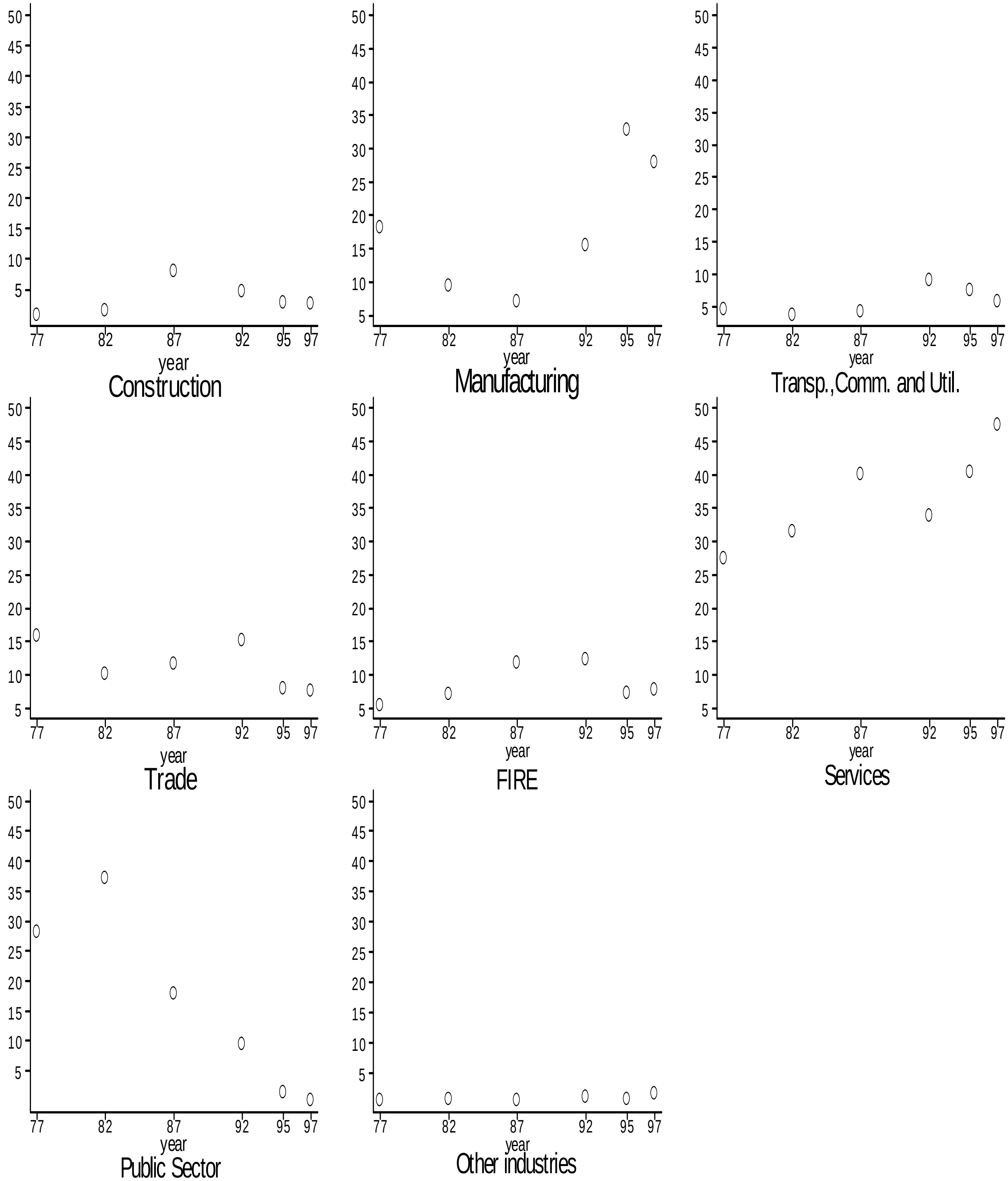


Figure 4
Proportion (%) of THS in each sector's employment

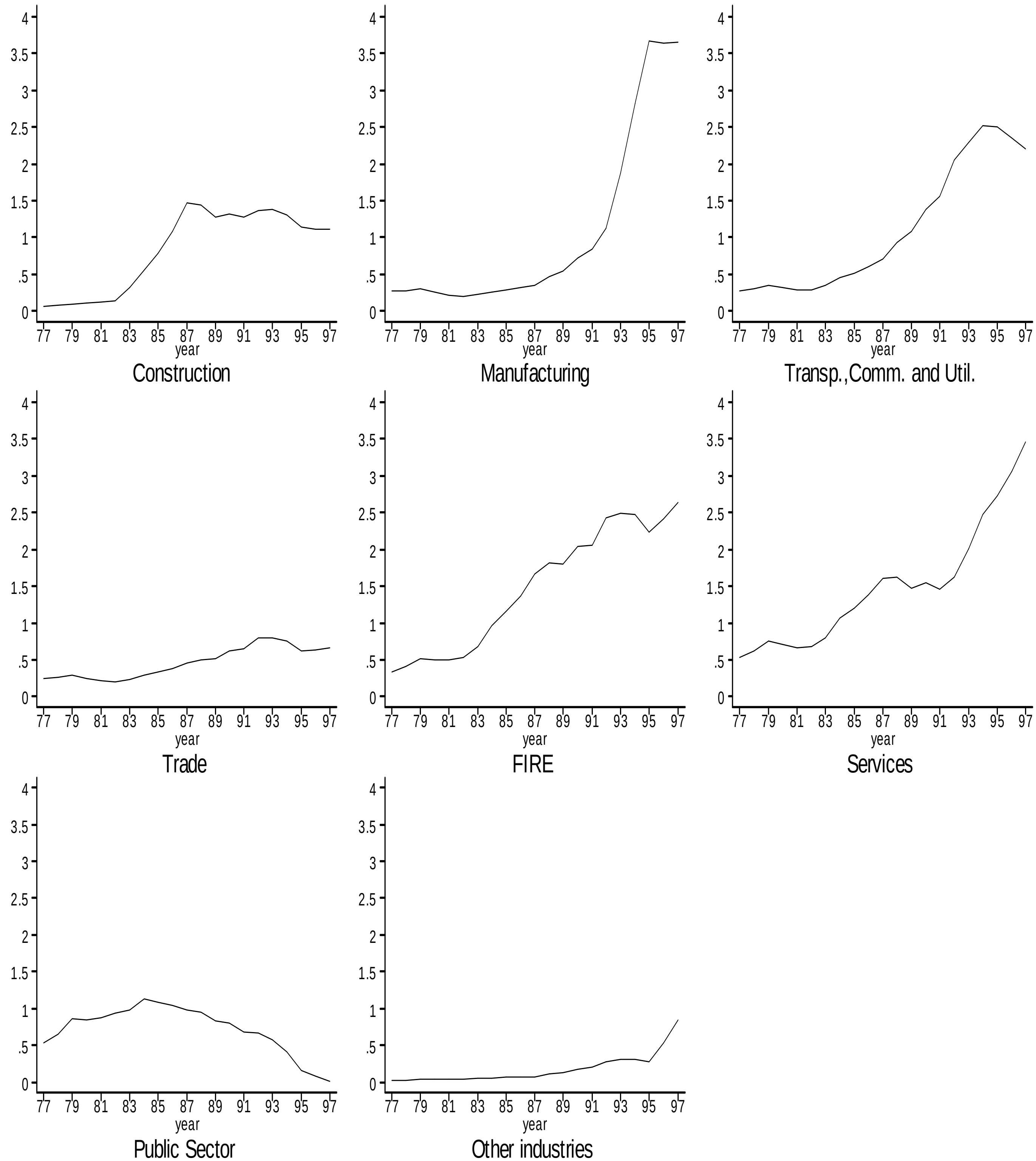


Figure 5

Proportion (%) of THS employment in manufacturing industries

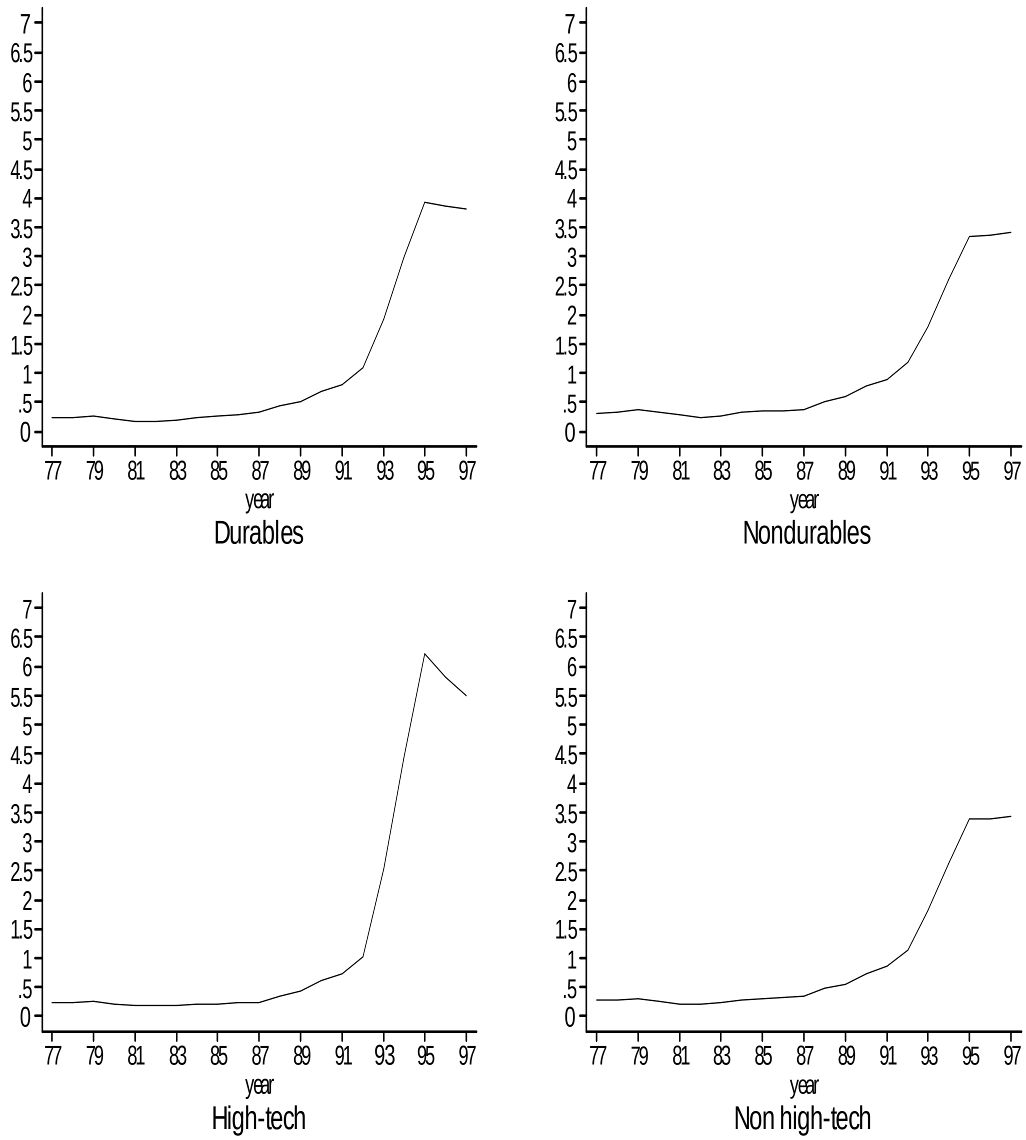


Figure 6
Reported and Adjusted Payroll Employment (thousands)
_ Reported o Adjusted

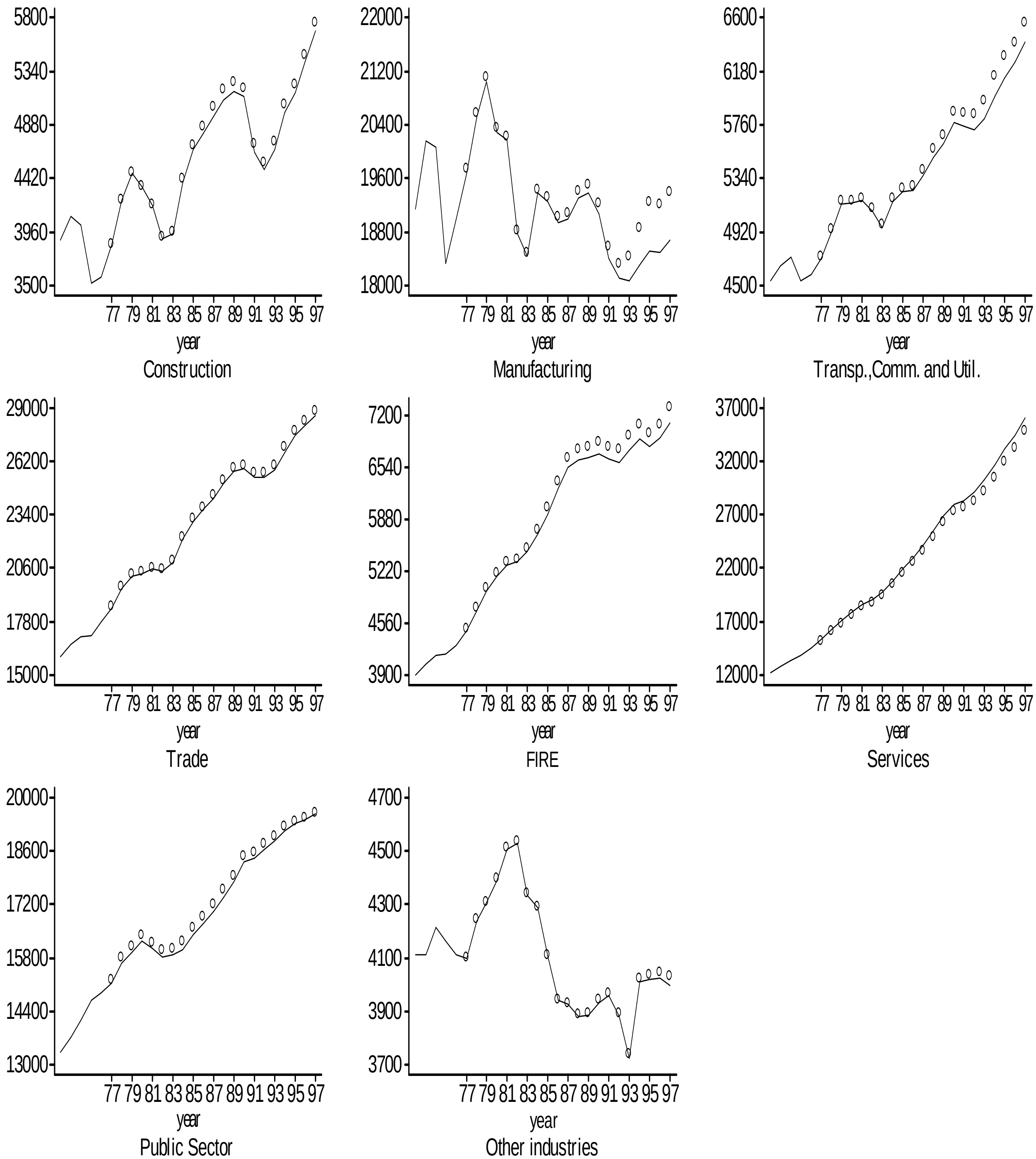


Table 1: Data Sources for Temporary Help Supply Employment and Hours

	Level of aggregation	**Periods Covered**	**Frequency of Data**	**Information about workers' characteristics**	**Information about industry of use**
National Association of Temporary Staffing Services (NATSS)	Employment in THS firms (NATSS uses the BLS-CES series for before 1987)	1972-97	Quarterly	Aggregate proportions by major occupations	No
Current Employment Survey (CES)[1]	Employment in THS firms (SIC 7362) during1972-82; Employment and hours in SIC 7363 (THS firms plus residual category) from 1982 onwards	1972-97	Monthly	No	No
Current Population Survey (CPS)[1] **March tapes**	Employment and hours in SIC 736	1972-97	Annual	Yes	No
Contingent Worker Supplement[1] **February tapes**	Employment and hours in THS firms	1995 and 1997	Two data points	Yes	Yes
Input-output tables[2]	Flow of output from SIC 736 to other industries	1977, 1982, 1987, 1992	Every 5 years	No	Estimated

Sources: [1] Bureau of Labor Statistics
[2] Bureau of Economic Analysis

Table 2: Distribution of Characteristics among Personnel Supply Services Workers

Percent except as noted

Year	Male	White	Average age	Usual number of hours per week	Part-time	High school graduate	Some college	College graduate	Pink collar[1]	Blue collar[2]	White collar[3]
77	34.46	94.97	33.91	32.51	46.75	38.81	28.83	18.83	31.06	14.37	36.10
78	29.02	79.35	34.12	32.81	46.82	34.23	28.43	19.05	39.83	6.68	29.95
79	25.26	89.05	38.12	32.06	41.47	35.50	25.49	23.51	33.99	9.56	30.19
80	30.49	83.93	34.34	34.17	36.80	42.74	23.51	19.19	38.80	14.38	25.56
81	28.46	87.90	32.97	33.73	43.30	30.02	27.30	32.85	45.41	9.88	29.80
82	32.35	80.74	33.97	33.52	42.42	32.23	35.79	22.40	43.97	8.39	27.83
83	28.74	80.42	34.65	34.06	41.72	31.34	29.70	25.06	33.67	8.91	33.91
84	22.42	79.42	36.89	32.89	46.41	38.99	27.66	22.71	30.32	8.52	36.30
85	17.03	81.08	37.27	33.80	44.37	33.49	29.91	24.94	31.49	5.97	35.11
86	26.38	81.14	35.87	33.86	41.02	31.86	30.22	27.43	31.09	10.28	27.83
87	31.96	76.27	37.13	34.33	41.03	31.14	33.79	21.92	27.12	14.83	36.36
88	25.40	75.76	36.00	33.31	42.08	32.49	31.49	23.11	27.61	11.40	32.57
89	25.42	73.91	35.71	33.25	44.40	33.38	31.70	22.54	33.02	9.89	27.18
90	26.47	76.65	34.88	33.46	42.20	31.98	36.20	21.71	32.63	12.43	26.77
91	33.55	76.54	35.52	34.10	40.94	34.17	31.58	26.42	30.07	16.91	28.48
92	31.00	77.84	34.92	33.40	43.10	37.01	29.68	21.62	29.39	18.73	25.90
93	37.77	75.80	36.23	33.60	39.15	35.93	28.12	24.35	25.73	20.82	31.70
94	37.66	82.04	34.64	34.08	40.56	31.03	36.30	21.74	37.35	20.31	23.63
95	44.09	77.13	35.76	35.07	38.56	39.38	31.69	20.64	33.06	25.05	22.29
96	42.24	72.45	35.04	34.69	39.79	27.61	39.83	23.55	37.46	27.12	22.70
97	37.35	76.95	36.19	35.04	37.40	33.85	28.54	22.95	35.25	24.33	26.59
77-87	27.87	83.12	35.39	33.43	42.92	34.58	29.15	23.44	35.16	10.16	31.72
87-97	34.10	76.51	35.49	34.00	40.82	33.68	32.51	22.86	32.16	18.70	26.78
92-97	38.35	77.04	35.47	34.31	39.76	34.14	32.36	22.48	33.04	22.73	25.47

[1]Mainly clerical workers; [2]Includes craftsmen, operatives and nonfarm laborers; [3]Nonfarm managers and administrators, and professional and technical workers.

Table 3: Growth Decomposition of the Ratio of THS to Total Civilian Employment

Percent

	Compositional component	Within component	Total Change
1977-82	.008	.087	.095
	(8.5)	(91.5)	
1982-87	.023	.441	.464
	(5.0)	(95.0)	
1987-92	.019	.284	.303
	(6.2)	(93.8)	
1992-97	.029	.777	.805
	(3.6)	(96.4)	
1977-97	.046	1.622	1.668
	(2.8)	(97.2)	
1977-87	.042	.517	.559
	(7.5)	(92.5)	
1987-97	.054	1.055	1.109
	(4.8)	(95.2)	

Note. Contribution to total change in parentheses.

Table 4: Growth Decomposition of the Ratio of THS to Total Civilian Employment By Industry

Percentage points

		Manufacturing	Services	Public	Construction	Trade	FIRE	Transportation, Communications, Utilities	Other	Total change
1977-1997	**Comp.**	-.150	.198	-.006	.000	.005	.008	-.004	-.007	.046
	Within	.648	.660	-.089	.048	.092	.127	.104	.033	1.622
	Total	.499	.858	-.095	.048	.097	.135	.100	.026	1.668
1977-1987	**Comp.**	-.015	.051	-.011	.002	.005	.011	-.002	-.001	.042
	Within	.015	.216	.075	.065	.045	.077	.023	.002	.517
	Total	.000	.267	.064	.068	.050	.088	.021	.002	.559
1987-1997	**Comp.**	-.055	.130	-.004	-.003	-.002	-.011	.001	-.003	.054
	Within	.553	.461	-.156	-.016	.049	.059	.078	.027	1.055
	Total	.498	.592	-.160	-.019	.047	.048	.079	.024	1.109

Table 5: Growth Decomposition of the Ratio of Manufacturing THS to Total Manufacturing Employment

Percentage points

Time period		Durables	Nondurables	Total change	High-tech	Low-tech	Total change
1977-1997	**Between**	.006	-.005	.000	.051	-.033	.018
	Within	2.105	1.272	3.378	.523	2.837	3.360
	Total	2.111	1.267	3.378	.574	2.804	3.378
1977-1987	**Between**	.000	.000	.000	.005	-.006	-.002
	Within	.048	.026	.074	.001	.074	.076
	Total	.048	.026	.074	.006	.068	.074
1987-1997	**Between**	.007	-.007	.001	-.008	.005	-.003
	Within	2.056	1.247	3.303	.576	2.731	3.306
	Total	2.063	1.241	3.304	.568	2.736	3.304

Note. High-tech industries defined as office and computing equipment (SIC 357) and electrical machinery, related equipment and supplies, excluding household appliances (SIC 36 excluding SIC 363).