The expanding role of temporary help services from 1990 to 2008

During the 1990–2008 period, employment in the temporary help services industry grew from 1.1 million to 2.3 million and came to include a larger share of workers than before in higher skill occupations; employment in this industry has been very volatile because temporary workers are easily hired when demand increases and laid off when it decreases

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Workers in the temporary help services industry, also referred to as contingent, contractual, seasonal, freelance, just-in-time, or "temp" employees, are those whose salaries are paid by a temporary help services agency that supplies them, upon request, to employers looking to fill a temporary full- or part-time staffing need.[1] Though the term of employment can range from a day or less to several years, a key feature is that the contractual employment relationship for temps is with their employment services firm and not with the requesting firm. Over time, temporary workers have grown in importance as firms have relied on them to meet their changing labor needs. Once known as a source of stopgap labor used primarily for routine clerical assignments, temp help services now plays an important role in the U.S. economy as a bridge to permanent employment[2] for those who are out of work or changing jobs and as an indicator of the overall job market closely watched by the Federal Reserve and other financial institutions as well as by policymakers.[3]

Using employment and wage data from the BLS Quarterly Census of Employment and Wages and Occupational Employment Statistics programs, this article examines the evolving role of the temp help services industry in the national economy and regional economies during the 1990-to-2008 period, which encompasses the explosive growth of temporary help services in the 1990s culminating in the 2000 peak in temp employment, as well as the economic recessions that began in 1990, 2001, and 2007. It also examines the factors that have contributed to the high growth and volatility seen in temp help services. The analysis also considers how employers' use of temps has evolved over the past two decades and the extent to which temp help services employment has expanded into a diversified base of industries, occupations, and geographic regions over the 18-year period.

The temporary help services industry is considered an indicator of the overall economy because movements in temp employment often have been a precursor to changes in the broader labor market.[4] As firms have increased their use of temporary workers over the past two decades, the use of temp help services has become an indicator of how businesses operate. In fact, around both the time of the 2001 recession and that of the recession that began in December 2007, temporary employment declined before total employment did and temp help services

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experienced employment growth before the overall job market did.[5] The shifts in temp help services appear to signal employment growth, employment shifts across regions within particular industries, and the demand for particular skills in an evolving labor market.

Overview of temporary help services

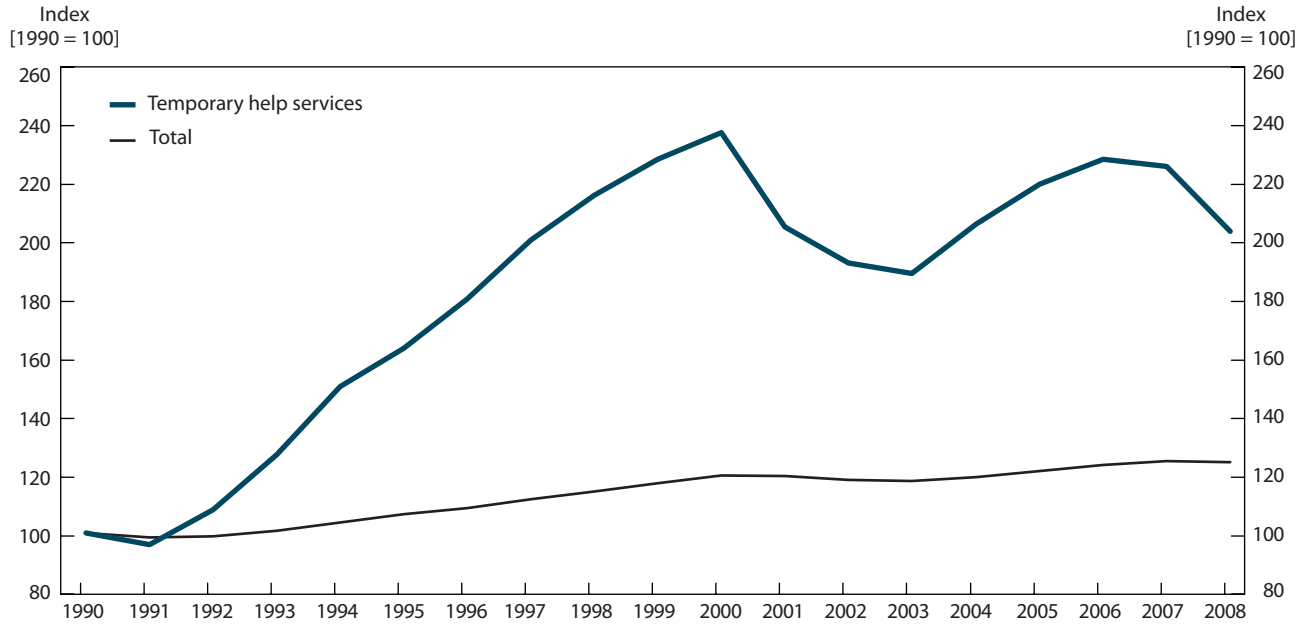
Temporary help services is an industry within the employment services industry group, and it makes up about 70 percent of employment in that group.[6] The other industries within the group are employment placement agencies and professional employer organizations.

Employment growth. The temporary help services industry is a relatively new player in the U.S. economy. Not until after World War II did the temporary help services industry develop into its modern form. In 1956, there were only about 20,000 employees in the employment services industry, and the industry's primary focus was to place employees in clerical and factory positions that involved routine or repetitive tasks.[7] By the early 1970s, the number of workers in the temporary help services industry had grown to approximately 200,000 but represented less than 0.3 percent of total U.S. employment. In the following decades, the industry experienced tremendous growth both absolutely and as a percentage of national employment. By 1990, the industry comprised slightly more than 1 million employees and accounted for 1.0 percent of total employment. Following 1990, temp employment experienced another decade of phenomenal growth, expanding to 2.7 million employees and accounting for 2.0 percent of U.S. employment by 2000. That year marked the peak in both employment for temp help services and the industry's share of total employment. (See chart 1.)

The growth of temp employment in the 1990s can be attributed to a variety of factors, including business' increased emphasis on specialization and their increased focus on gaining flexibility in response to changes in consumer demand.[8] The high turnover rate[9] and consequent lack of a long-term relationship between employer and employee also made temporary workers attractive to firms. As more businesses began to use temporary workers to quickly and efficiently address changing labor needs, other firms took note of this source of inexpensive[10] and flexible labor and altered their hiring patterns to make greater use of just-in-time labor.[11] Furthermore, staffing firms introduced new technologies for matching employees to jobs and expanded the services offered to clients to include more training. Matching workers to employers for specific geographic regions and industries became more efficient as partnerships formed between niche temp agencies and larger staffing firms.[12]

As both the demand for and supply of temporary em-

Chart 1. Indexed employment of temporary help services and of all industries, 1990–2008



SOURCE: QCEW data.

ployees grew, employers became more sophisticated about their use of temporary employees as a clutch to downshift during periods of lower demand and to upshift when demand rose, allowing the employers to insulate permanent employees from economic fluctuations.[13] The use of temp workers by employers as a buffer to obtain numerical flexibility during labor contractions and expansions[14] is demonstrated by the disproportionate share of job loss incurred by temp help services during and after the 2001 recession. Between 2001 and 2003, temp employment dropped by over 20 percent, or by approximately 550,000 workers. During the same period, total employment declined by 1.6 percent. In fact, more than 25 percent of all jobs lost during that period were in temporary help services, despite their accounting for less than 2 percent of total employment. That such a small sector could absorb such a large proportion of net job losses attests to the uniquely important function of temporary workers during periods of restructuring and of changes in the business cycle.[15] Similarly, since 12 months before the beginning of the most recent recession, temporary workers have shouldered a larger-than-average share of jobs lost. From December 2007 to December 2008, temp employment dropped by over 484,000 jobs, or about 19 percent, while total employment dropped by 2.3 percent.

Occupational trends in temporary employment

Over the past two decades, temporary employment has moved into a much wider array of occupations, and in more recent years, it has moved towards higher paying occupations. By 2008, temporary workers in clerical positions such as those of secretary, typist, receptionist, data-entry operator, and office clerk (the types of positions most commonly associated with temp work) represented less than a quarter of overall temp help services industry employment and accounted for only 16 percent of the industry's revenue.[16] The occupational employment distribution of employment services is shown in table 1.[17] Approximately 65 percent of jobs in the employment services industry in 2008 were in three occupational groups: office and administrative support, transportation and material moving, and production occupations. The next-largest occupational groups, which make up about 15 percent of temp help services employment, are the following: construction and extraction, healthcare practitioner, and business and financial operations occupations. According to a previous assessment,[18] office and administrative support occupations accounted for most of temp employment in 1984. By 2008, the occupational share of office occupations had shrunk by more than one-half, and the share of other occupations had risen.

Previous studies have found that high-skill occupations have started making up a larger share of employment in temporary help services and that they have caused the average wage in temp help services to increase.[19] Similarly, the present analysis finds that employment in employment services in recent years has shifted away from lower skilled and lower paying jobs to more highly skilled and higher paying staffing positions. In recent years, the fastest growing occupational groups have been legal;[20] business and financial operations; computer and mathematical; education, training and library; and community and social services occupations. (See table 1.) All of these groups have wages that exceed the average for all occupations. The fastest declining occupational groups were farming, fishing and forestry; food preparation and serving; and transportation and material moving occupations, all of which have below-average annual wages. (See table 1.) The most marked shift in employment services has been the recent fall in the employment of transportation and material moving occupations and the rise in that of production occupations. In short, temporary help services occupations have been diversifying and shifting towards higher skill and higher paying jobs over the last two decades and especially in recent years.

Industry trends

This section expands the previous analysis and determines which industries are prominent users of temporary workers and how the use of temps across industries has shifted over time. Temporary workers, regardless of their particular industry, are grouped together under one industrial code: temporary help services. Because of this generalization of temp workers, no direct data on their numbers in specific industries exist. To circumvent this issue, an econometric approach is needed to estimate the magnitude of temp help utilization in individual industries. By correlating the employment concentration of certain industries within particular counties with the employment concentration of temp help services within those same counties, the industry assignments for temporary workers and the existence and strength of relationships between temp help services and other industries can be tested.

The model developed to estimate the utilization of temps across industries measures the marginal effects (or the effects when all else is constant) of the employment concentrations of individual industries on the employment concentration of temp help services. The results of

Table 1. Employment and wages in employment services occupations for 2008, and percent change for 2004–08

	2008			Percent change, 2004–08	
	Employment	Percent of total	Mean annual wage	Employment	Real wage
All occupations, all industries	135,185,230	. . .	$42,270	5.5	0.2
All occupations, employment services	3,408,230	100.0	32,530	–.1	5.6
Office and administrative support	843,560	24.8	27,890	1.1	–2.0
Transportation and material moving	660,530	19.4	22,460	–21.6	3.6
Production	654,030	19.2	23,700	18.4	1.8
Construction and extraction	186,590	5.5	30,360	–4.9	8.8
Healthcare practitioner and technical	168,270	4.9	62,770	11.3	–1.1
Business and financial operations	156,300	4.6	57,640	49.7	7.5
Sales and related	102,930	3.0	37,560	13.3	8.3
Building and grounds cleaning and maintenance	91,970	2.7	21,730	–12.5	1.1
Healthcare support	79,940	2.4	26,200	–8.8	–3.2
Computer and mathematical	77,970	2.3	71,020	41.2	–7.4
Food preparation and serving related	74,490	2.2	20,800	–23.5	5.1
Management	58,090	1.7	97,990	–5.0	3.9
Installation, maintenance, and repair	54,880	1.6	35,600	10.4	2.1
Architecture and engineering	47,460	1.4	66,260	7.2	–2.6
Personal care and service	37,190	1.1	21,670	26.0	–3.4
Education, training, and library	30,930	.9	43,240	40.5	–2.9
Arts, design, entertainment, sports, and media	26,320	.8	49,670	23.3	–9.5
Life, physical, and social science	15,830	.5	52,130	11.3	12.4
Protective service	14,580	.4	24,220	24.8	–2.0
Legal	10,950	.3	80,650	87.2	14.7
Community and social services	7,940	.2	34,570	39.8	–1.8
Farming, fishing, and forestry	7,490	.2	23,030	–75.3	23.1

SOURCE: OES data

this model identify those industries in which positive or negative employment changes tend to have a significant positive or negative effect on temporary employment. See Appendix B for more information about the model.

Results from the model of county-level data from the Quarterly Census of Employment and Wages show that, from 1990 to 2008, counties with higher concentrations of employment in manufacturing; trade, transportation and utilities (henceforth referred to simply as "trade"); financial activities; and professional and business services (P&B) also tended to have higher concentrations of temporary employment. Consequently, it appears that these four industries tended to use temporary employees more heavily than other industries. Furthermore, during the same period, the relationships between the concentrations of manufacturing, trade, and P&B employment and the concentrations of temporary help services employment in the same counties strengthened, suggesting that the use of temporary employment intensified and that these industries were developing an even greater reliance on temporary workers. Studies from the 1980s and 1990s indicated that the largest users of temporary workers in office and administrative support occupations were in the manufacturing, trade, and financial activities industries.[21] (See table 2.)

Manufacturing. The analysis in this article indicates that, throughout the 1990s and 2000s (until 2008), the manufacturing industry has shown a statistically significant reliance on temporary workers. The analysis also shows that the use of temporary workers in manufacturing steadily intensified in the 1990s before sharply increasing in the early 2000s. Compared with the model results for 1990, the marginal effect of manufacturing employment concentration on temp help services employment concentration was 4.5 times greater in 2005. The model results show that, while manufacturing's share of total national employment fell from 16.2 percent in 1990 to 9.8 percent in 2008, manufacturing's use of temporary workers greatly intensified. A two-sample *t*-test also verifies that the difference between the parameter estimates of 1990 and 2008 is statistically different from zero, indicating that the observed increase in the use of temporary employment from 1990 to 2008 is statistically significant. (See chart 2 and tables A1–A4 of Appendix C.)

The model results support estimates from a previous study which found that temp workers accounted for about 4 percent of total employment in the manufacturing sector in 1997, compared with only 1 percent in 1992.[22] Other studies have shown that many manufacturing firms have become more "flexible," or dependent on just-in-time

Table 2. Relationships between the concentration of temporary help employment and the concentrations of employment in other industries

Industry	Relationship with temporary help			Change in strength of relationship	
	1990	2000	2008	1990–2000	2000–08
Natural resources and mining					
Construction					
Manufacturing	+	+	+	+	+
Trade, transportation, and utilities	+	+	+	+	+
Information					
Financial activities	+	+	+		
Professional and business services	+	+	+	+	
Education and health services					
Leisure and hospitality			–		
Other services			–		
Public administration					
R^2	0.73	0.77	0.70		

NOTE: A plus sign indicates a significantly positive relationship, a minus sign indicates a significantly negative relationship, and blank cell indicates that the relationship is not significantly different from zero. Significance testing is at $\alpha = 0.05$.

SOURCE: Model results calculated with QCEW data.

workers.[23] The combination of lower costs for flexible labor inputs—due to increased efficiency in matching temporary workers with firms—and the growth in networks of temp help services firms has contributed to manufacturing firms' increased reliance on and use of temporary workers.[24] Manufacturing plants tend to choose temporary workers over permanent workers when they expect output to fall, allowing them to avoid the costs of laying off permanent workers. Generally speaking, higher levels of uncertainty regarding output are associated with greater use of temporary workers.[25]

Trade, transportation, and utilities. The use of temp help services in the trade industry also significantly intensified between 1990 and 2008. In 2008, the marginal effect of increased concentration of trade industry employment on temp help services was 5 times the level seen in 1990. Statistical tests verify that this intensification is statistically significant at the 95 percent confidence level. (See chart 3 and tables A1–A4 of Appendix C.)

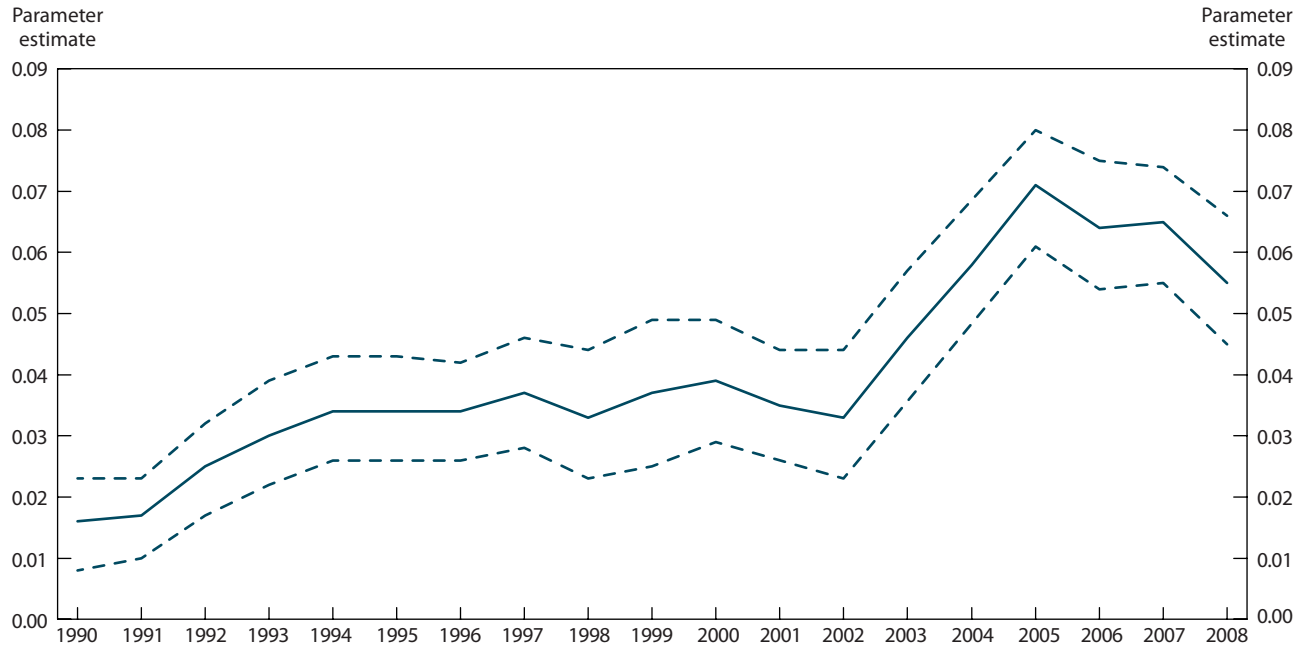
The model results—which point towards the growth of the use of temporary help in this industry—are consistent with estimates from a previous study which found that the share of temporary employment in the transportation and utilities sector increased from about 1.5 percent to 2.5 percent during the mid-1990s, while the employment share for trade remained fairly stable at around 0.7 percent.[26] The estimate of increasingly positive correlation between employment in trade, transportation, and utilities and employment in temp help services is also consistent with data showing an increase in the use of temps in material moving and retail sales occupations in recent years.[27]

Professional and business services. The use of temporary workers in the professional and business services industry intensified in the 1990s and then weakened, but remained positive, during most of the 2000s. Despite the fluctuations, the professional and business industry made significant use of temporary workers throughout the 1990-to-2008 period. A separate two-sample *t*-test shows that the intensification in the use of temps during the 1990s is statistically significant at the 95 percent confidence level. (See chart 4 and tables A1–A4 of Appendix C.) The statistical test also shows that the use of temps by P&B has grown less intense in recent years. This is substantiated by evidence that the share of clerical and data-entry operator positions occupied by temporary workers has dropped in recent years, as explained in the section on occupational trends in temporary employment. In addition, lower skilled occupations in P&B such as filing clerks and data-entry operators have been outsourced or eliminated in many firms because of greater automation and digitization of business records.

Financial activities. Model estimates also show that the concentration of financial activities employment was a significant determinant of the concentration of temporary employment over most of the 1990–2008 period. This indicates that the financial activities sector was a major employer of temps during this timespan. Throughout the 1990s, the use of temps in financial activities was fairly stable. In the early 2000s, however, the use of temporary workers decreased, and it then intensified from around 2003 onwards. Statistical testing shows that this intensification was statistically significant at the 95 percent confidence level. (See chart 5 and tables A1–A4 of Appendix C.)

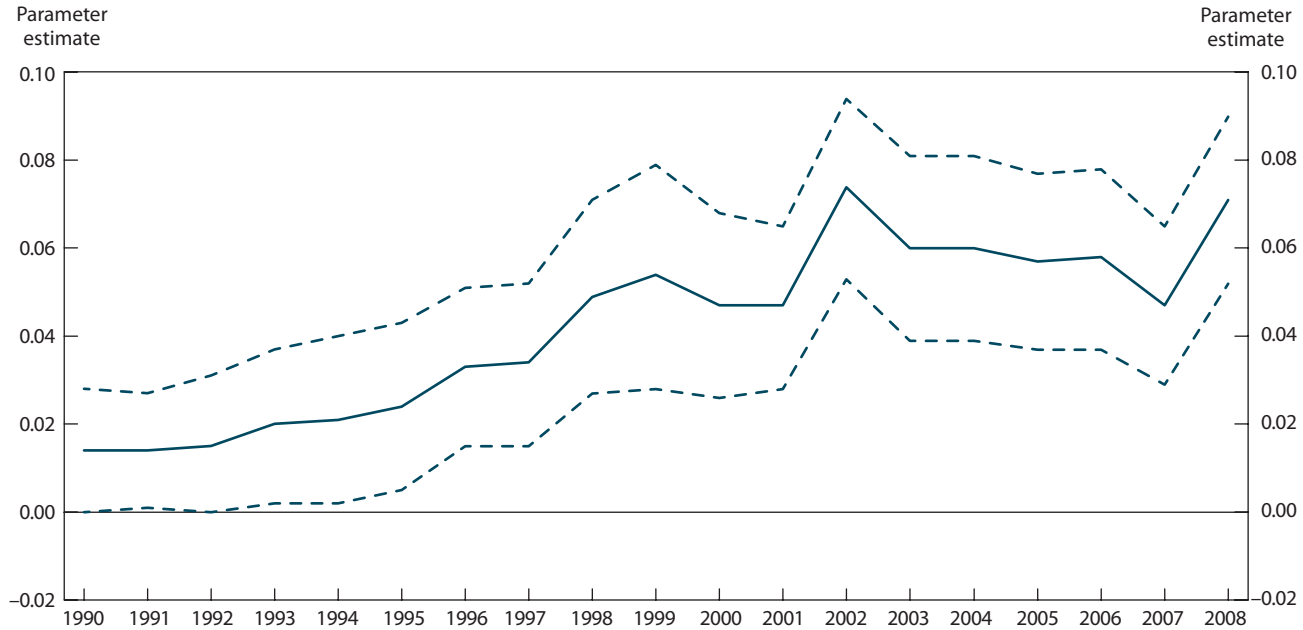
The model results corroborate estimates from a previous study which found that the proportion of temporary employment in finance increased from about 0.5 percent in the early 1980s to about 2.5 percent by 1990 then remained stable during the 1990s.[28] Following the passage in 2002 of the Sarbanes-Oxley Act, which enhanced financial accounting standards, demand soared for financial accounting professionals able to navigate firms through the new legislation. Instead of remaining tied down to one firm,

Chart 2. **Parameter estimates for manufacturing, 1990–2008**



NOTE: The dashed lines indicate a 95 percent confidence interval. The parameter estimate for a particular industry is the marginal effect (or the effect when all else is constant) of that industry's employment concentration on the concentration of temporary employment. Larger parameter estimates suggest greater reliance on temps.
SOURCE: Model results calculated with QCEW data.

Chart 3. **Parameter estimates for trade, transportation, and utilities, 1990–2008**

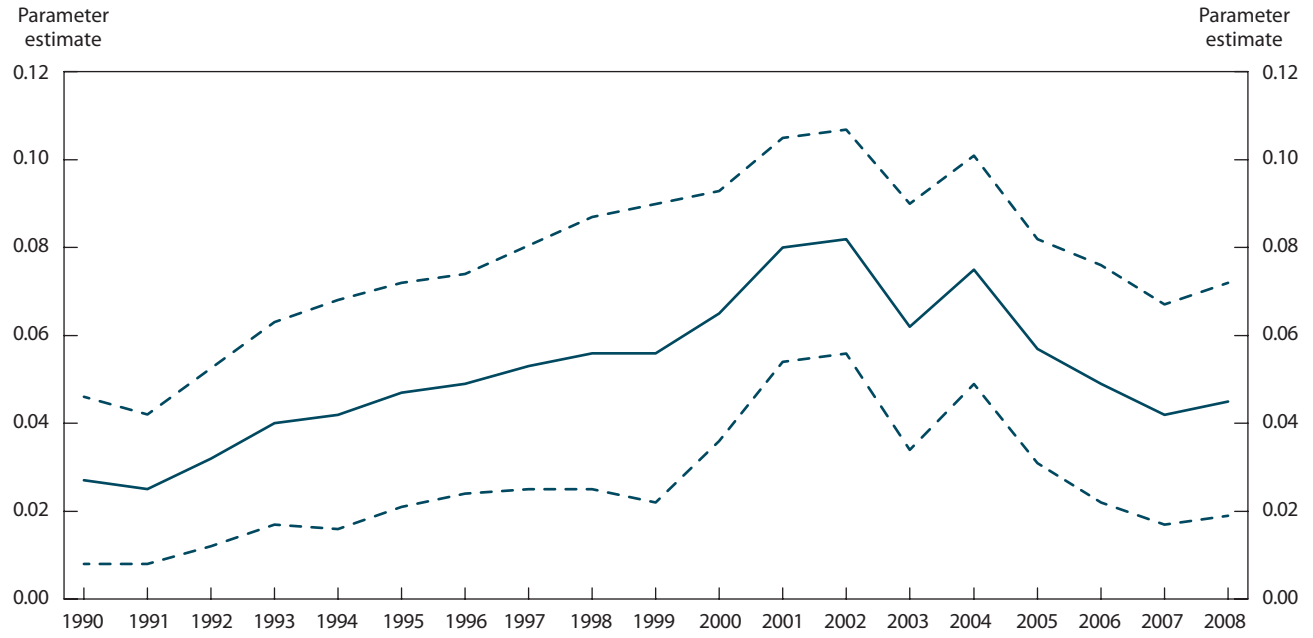


NOTE: The dashed lines indicate a 95 percent confidence interval. The parameter estimate for a particular industry is the marginal effect (or the effect when all else is constant) of that industry's employment concentration on the concentration of temporary employment. Larger parameter estimates suggest greater reliance on temps.
SOURCE: Model results calculated with QCEW data.

many of these finance professionals became temporary or contract workers and were able to demand greater pay and flexibility.[29] This article's model estimates are also corroborated by the growth of employment services jobs in business and financial operations occupations, shown in table 1.

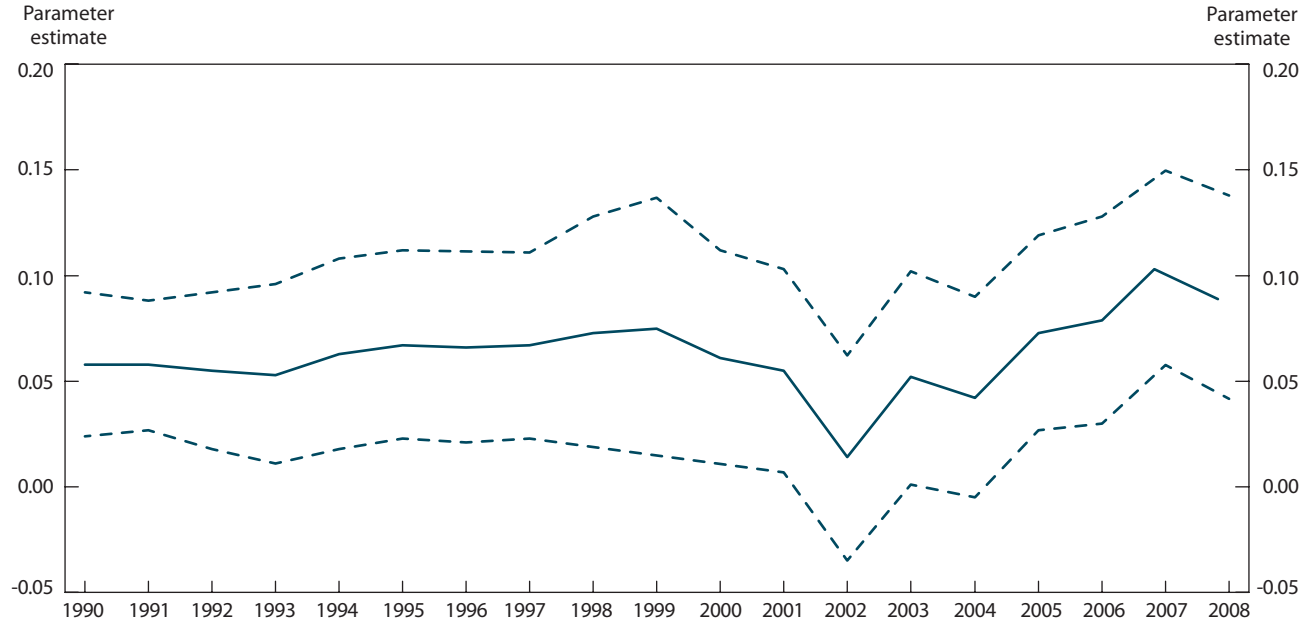
Other industries. The analysis in this article of the 1990-to-2008 period indicates that other industries such as

Chart 4. Parameter estimates for professional and business services, 1990–2008



NOTE: The dashed lines indicate a 95 percent confidence interval. The parameter estimate for a particular industry is the marginal effect (or the effect when all else is constant) of that industry's employment concentration on the concentration of temporary employment. Larger parameter estimates suggest greater reliance on temps.
SOURCE: Model results calculated with QCEW data.

Chart 5. Parameter estimates for financial activities, 1990–2008



NOTE: The dashed lines indicate a 95 percent confidence interval. The parameter estimate for a particular industry is the marginal effect (or the effect when all else is constant) of that industry's employment concentration on the concentration of temporary employment. Larger parameter estimates suggest greater reliance on temps.
SOURCE: Model results calculated with QCEW data.

natural resources and mining, construction, information, education and health services, leisure and hospitality, other services (except public administration), and public administration were not significant factors in the concentration of temp help services employment in the average county in nearly all years.

Regional trends

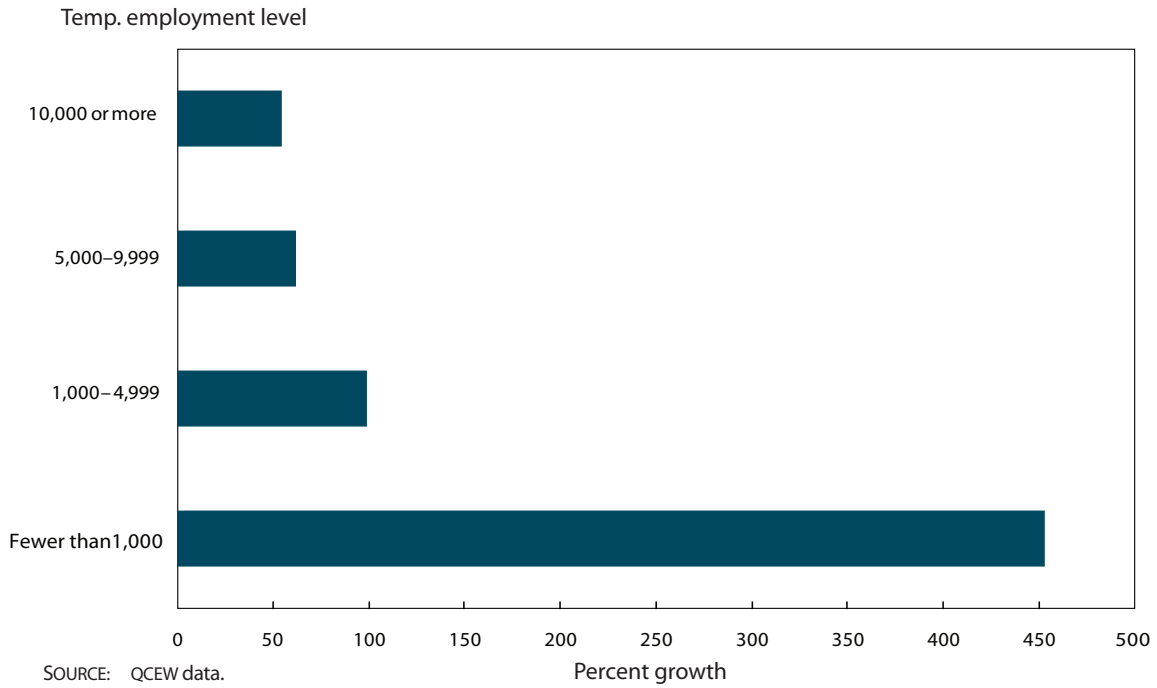
In addition to being associated more with certain industries than with others, the temporary help services industry is associated with counties with certain characteristics and with particular regions. As discussed later in this section, temp help services has evolved and grown differently in different counties and regions of the United States. Building upon the analysis of changes in temporary help services by occupational group and industry, this section shows how the growth of employment in temp help services has varied on the basis of the size of temp employment in given areas in 1990 and has varied by region as well.

Temp employment growth rates by 1990 temp employment level. Over the past two decades, the distribution of temporary employment has shifted towards areas with lower initial (i.e., 1990) employment in temporary help services. The average percent growth of temp employment from 1990 to 2008 was much greater in counties with fewer than 1,000 temporary employees in 1990 than in counties with higher initial employment in temp help services.[30] (See chart 6.) Counties with temp help employment of 10,000 or more in 1990 grew by an average of 55 percent over the next 18 years. During the same period, counties that had 1990 temp employment of 5,000–9,999 had average growth of 62 percent, and those with 1990 temp employment of 1,000–4,999 nearly doubled their temporary employment. Finally, counties with temporary employment of fewer than 1,000 had an average growth rate of over 450 percent. Therefore, smaller counties have been the emerging markets for temporary employment while larger counties have grown more slowly in temp employment, probably because they were closer to the saturation point.

This larger relative growth of temp help services employment in counties with lower 1990 temp employment has greatly increased the share of temporary employment in these counties. (See chart 7.) In 1990, the 20 counties with the highest employment in temporary help services contained over 30 percent of all temp employment in the Nation, and the 100 counties with the highest temp employment had about 60 percent. By 2008, the top 20 counties held less than a quarter of total temp employment, and the share for the top 100 counties had fallen to less than half.

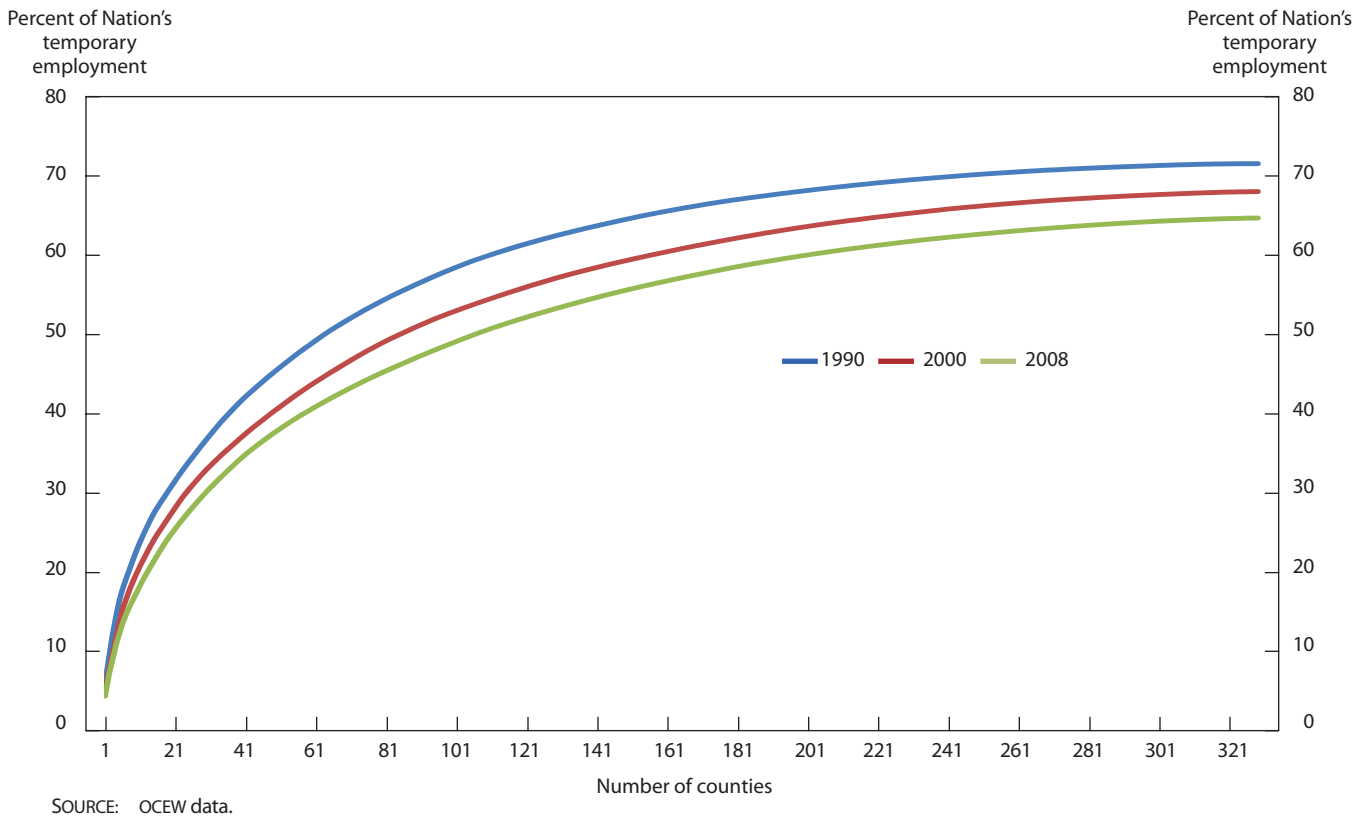
Temporary help services employment by region. Temporary help services employment has distinct patterns in its growth that differ by region of the country. Between 1990 and 2008, among the four U.S. Census regions,[31] the South had the largest employment growth, at 126 percent,

Chart 6. Average growth from 1990 to 2008 in temporary employment for counties grouped by level of temporary employment in 1990



SOURCE: QCEW data.

Chart 7. Cumulative distribution of temporary help services employment, among the 329 counties with the most such employment, 1990, 2000, and 2008



SOURCE: OCEW data.

followed by the Midwest (117 percent), the West (88 percent), and the Northeast (68 percent). (See chart 8.)

In the South, the concentration of temporary help services employment has stayed consistently above the national average. The gap between temporary employment concentration in the South and that in the Nation as a whole has increased since 1990 because of a larger-than-average growth rate in temp employment in the South. Despite a steep decline after 2006 in the concentration of temp employment, the South region still had temp employment of nearly 900,000 in 2008, or 39 percent of all temporary employment in the country.

The concentration of temporary employment in the Northeast region has stayed consistently below the national average. (See chart 9.) The gap between temp help services concentration in the Nation as a whole and that in the Northeast was larger in 2008 than it was in 1990 because the employment concentration of temp help services grew more slowly in the Northeast during the 1990–2008 period as a whole. Despite this slower growth, temp help employment concentration in the Northeast stood at nearly 1.4 percent in 2008, considerably higher than the 1990 figure of 0.9 percent.

In the West, the concentration of temp help services employment stayed above the national average during most of the 18-year period. In 2007 and 2008, though, the concentration of temps in the West region was below the national average. One factor that may have played a role in the recent decline in the concentration of temporary help services employment in the West is the large decline in construction employment following the housing bubble, which was most acute in the West region. Temporary workers allowed construction firms to scale production up during the housing boom and scale it down following the collapse in housing prices in order to meet increases and decreases in demand without incurring the costs associated with hiring or laying off permanent workers.[32]

The concentration of temporary worker employment in the Midwest stayed similar to that in the Nation as a whole for much of the 1990–2008 period. However, somewhere around 2006 a gap in temp employment concentration between the Midwest and the Nation as a whole opened up, with the Midwest's concentration overtaking the national average, and the gap was more

Chart 8. **Temporary employment by region in 1990 and 2008, and 1990–2008 percent change**

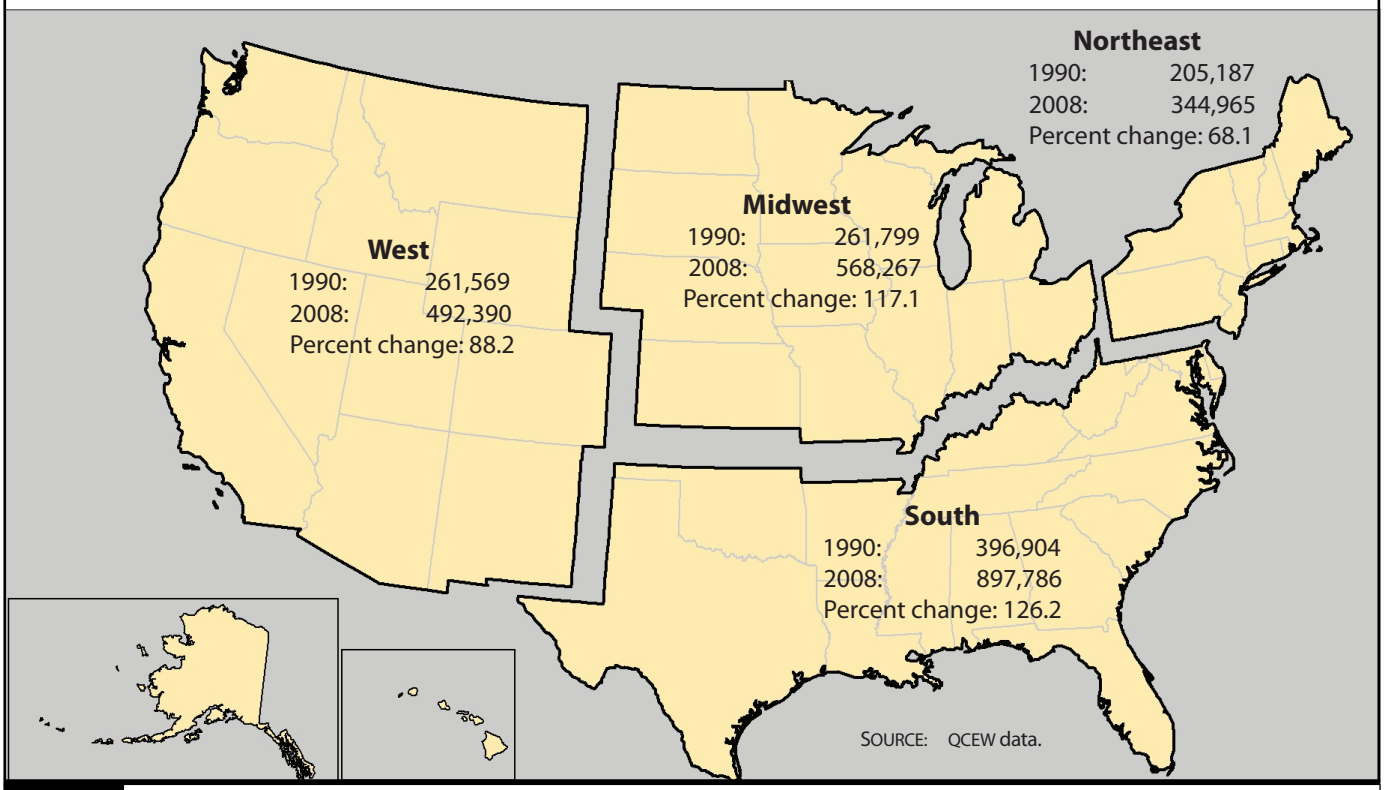
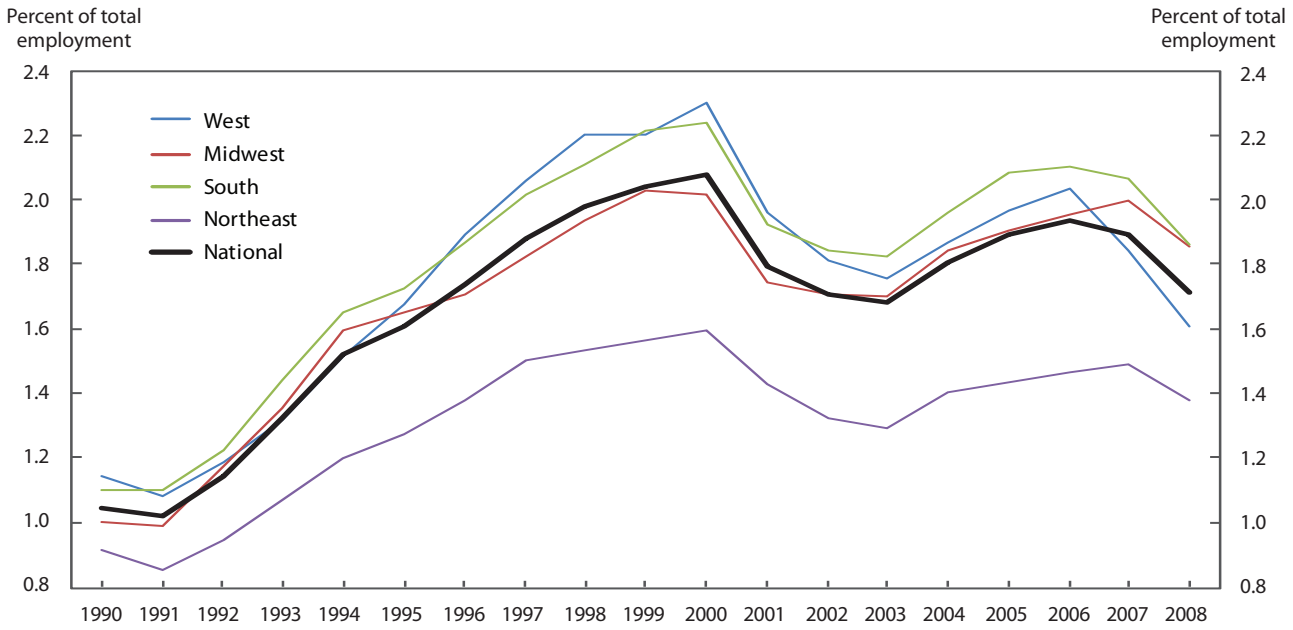


Chart 9. **Concentration of temporary help services employment, by region, 1990–2008**



Source: QCEW data.

pronounced in 2007 and 2008.

THE TREMENDOUS GROWTH OF TEMPORARY HELP services has been driven by the flexibility and low labor cost of temporary workers. From 1990 to 2008, total temporary employment in the United States went from 1.1 million to 2.3 million, and in 2008 it represented 1.7 percent of total U.S. employment. Traditionally, temporary

workers have worked in lower paying occupations such as office and administrative support, transportation and material moving, and production occupations; however, temporary help services has gained prominence in recent years in higher skilled and higher paying occupations.

The analysis in this article indicates that industries which typically employ temporary workers include manufacturing; trade, transportation, and utilities; financial activities, and professional and business services. The use of temporary workers intensified in manufacturing between 1990 and 2005 but decreased slightly after 2005. In the trade, transportation, and utilities industry, the use of temporary workers has intensified since 1990. The use of temps in the professional and business services industry increased between 1990 and 2001 but decreased significantly in subsequent years. In the financial activities industry, the use of temporary workers remained fairly stable between 1990 and 2001 but significantly increased after 2001.

Regional differences in temp employment also are apparent. In the South, temp employment grew by 126 percent during the 1990–2008 period, and the region had a higher concentration of temporary workers than any other region of the United States for much of the period. Until recently, the concentration of temps in the West region also was higher than the national average. The growth and concentration of temporary employment were lower in the Northeast than in the rest of the Nation throughout the 18-year period analyzed, while the Midwest maintained a concentration of temp help services employment similar to that of the Nation as a whole.

Despite a steep decline in temporary employment in recent years, the industry has remained an important indicator of the overall economy. Employers rely on temporary workers to achieve greater workforce flexibility. During economic expansions, temp workers are among the first to be hired, and during times of recession, temporary workers are laid off in disproportionate numbers.[33] Hence, temporary help services has grown in importance not only with respect to the industries and occupations associated with it and the areas where it is found, but also because of its function as a macroeconomic buffer during periods of economic volatility. □

Notes

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[1] Wayne J. Howe, "Temporary help workers: who they are, what jobs they hold," *Monthly Labor Review*, November 1986, pp. 45–47; and Anne E. Polivka and Thomas Nardone, "On the definition of 'contingent work,'" *Monthly Labor Review,* December 1989, pp. 9–14.

[2] See page 129 of Lewis M. Segal and Daniel G. Sullivan, "The Growth of Temporary Services Work," *Journal of Economic Perspectives*, spring 1997, pp. 117–36, citing a study which states that 38 percent of temporary workers were offered permanent jobs at the firms where they worked as temps.

[3] Edward A. Lenz, "Staffing Industry's Positive Role in U.S. Economy" (Alexandria, Virginia, American Staffing Association, Mar. 4, 2008) on the Internet at **www.americanstaffing.net/legalandgovernment/issue_papers/Staffing_Industry_Positive_Role.pdf** (visited Aug. 2, 2010).

[4] Jamie Peck and Nik Theodore, "Flexible recession: the temporary staffing industry and mediated work in the United States," *Cambridge Journal of Economics*, March 2007.

[5] Around the time of the 2001 recession, year-over-year percent change for temp employment switched from positive to negative 7 months before the switch for total nonfarm employment; around the time of the recession that started in December 2007, the switch occurred 17 months earlier for temp employment than for total nonfarm employment.

[6] During the 1998–2008 period, employment in temporary help services made up on average 69.8 percent of employment services employment, although it exceeded 70 percent in all months from the last calendar quarter of 2004 through at least the end of 2008, when it was 73.2 percent.

[7] Martin J. Gannon, "Preferences of temporary workers: time, variety, and flexibility," *Monthly Labor Review*, August 1984, pp. 24–28.

[8] Katharine Abraham and Robert McKersie, ed., *New Developments in the Labor Market: Toward a New Institutional Paradigm* (Cambridge, Massachusetts, MIT Press, 1990), chapter 4; Dwight R. Lee, "Why is Flexible Employment Increasing?" *Journal of Labor Research*, December 1996, pp. 543–53; and Barbara A. Wiens-Tuers, "Employee Attachment and Temporary Workers," *Journal of Economic Issues*, March 2001, pp. 45–60.

[9] Jeffrey B. Wenger and Arne L. Kalleberg, "Employers' Flexibility and Employment Volatility," *American Journal of Economics and Sociology*, April 2006, pp. 347–82. On page 352, the authors estimate that less than one-third of temporary workers are likely to be employed in the industry a year later.

[10] In 1990, the average annual wage for temp help services was $12,500, compared with $23,600 for overall national employment. By 2008, both temp help services wages and national average wages doubled, to $25,500 and $45,600, respectively. Real wage growth in this period was 23.9 percent for temp help services and 17.2 percent for overall employment.

[11] Angela Clinton, "Flexible labor: restructuring the American work force," *Monthly Labor Review*, August 1997, pp. 3–27.

[12] Based on an internal BLS report.

[13] Rachel Krantz, "Employment in business services: a year of unprecedented decline," *Monthly Labor Review,* April 2002, pp. 17–24.

[14] Wenger and Kalleberg, "Employers' Flexibility and Employment Volatility"; Lonnie Golden, "The Expansion of Temporary Help Employment in the U.S., 1982–1992: A Test of Alternative Economic Explanations," *Applied Economics*, September 1996, pp. 1127–41; and Karylee Laird and Nicolas Williams, "Employment Growth in the Temporary Help Supply Industry," *Journal of Labor Research*, December 1996, pp. 663–81.

[15] Nik Theodore and Jamie Peck, "Temporary downturn? Temporary staffing in the recession and the jobless recovery," *Focus*, spring 2005, pp. 35–41; Nik Theodore and Jamie Peck, "The Temporary Staffing Industry: Growth Imperatives and Limits to Contingency," *Economic Geography*, October 2002, pp. 463–93; and Peck and Theodore, "Flexible recession."

[16] Revenue was estimated by Staffing Industry Analysts, Inc.; data were provided to the authors by Jon Osborne, vice president of research at Staffing Industry Analysts, on Feb. 17, 2010.

[17] See Appendix A for notes on these data.

[18] Max L. Carey and Kim L. Hazelbaker, "Employment growth in the temporary help industry," *Monthly Labor Review*, April 1986, pp. 37–44.

[19] Elizabeth Dietz, "A Look at Temporary Help Wage Rates," *Compensation and Working Conditions*, September 1996, pp. 46–50; and Patrick Kilcoyne, "Occupations in the Temporary Help Services Industry," in *Occupational Employment and Wages, May 2004*, Bulletin 2575 (Bureau of Labor Statistics, September 2005), on the Internet at **www.bls.gov/oes/2004/may/temp.pdf** (visited Aug. 4, 2010) pp. 6–9.

[20] According to estimates from Staffing Industry Analysts, Inc., legal occupations also had the largest revenue growth from 2004 to 2008.

[21] Carey and Hazelbaker, "Employment growth in the temporary help industry"; and Marcello M. Estevao and Saul Lach, *The Evolution of the Demand for Temporary Help Supply Employment in the United States*, NBER Working Paper W7427 (Cambridge, MA, National Bureau of Economic Research, December 1999).

[22] Estevao and Lach, *The Evolution of the Demand for Temporary Help.*

[23] Donald S. Allen, "Changes in Inventory Management and the Business Cycle," Federal Reserve Bank of St. Louis *Review*, July/August 1995, pp. 17–26.

[24] Segal and Sullivan, "The Growth of Temporary Services Work."

[25] Yukako Ono and Daniel Sullivan, *Manufacturing Plants' Use of Temporary Workers: An Analysis Using Census Micro Data*, WP 2006-24 (Federal Reserve Bank of Chicago, originally published in 2006 and revised in February 2010).

[26] Françoise Carré, Marianne A. Ferber, Lonnie Golden, and Stephen A. Herzenberg, eds., *Nonstandard Work: The Nature and Challenges of Changing Employment Arrangements* (Champaign, IL, Industrial Relations Research Association, 2000), chapter 4; and Marcello and Lach, *The Evolution of the Demand for Temporary Help*, p. 131.

[27] This increase was calculated by use of the same Occupational Employment Statistics dataset used for the analysis of individual occupations.

[28] Estevao and Lach, *The Evolution of the Demand for Temporary Help*.

[29] Conversation with Jon Osborne, director of research at Industry Staffing Analysts, on Feb. 12, 2010.

[30] QCEW county-level annual data were used for these calculations. The data pertain to temporary employment in 330 counties across the Nation for the years 1990, 2000, and 2008.

[31] The U.S. Census Bureau divides the United States into regions: the West, Midwest, South, and Northeast; see **www.census.gov/geo/www/us_regdiv.pdf** (visited Aug. 6, 2010).

[32] "Current Trends in Construction Employment," *Issues in Labor Statistics* (Bureau of Labor Statistics, Oct. 5, 2007), on the Internet at **www.bls.gov/opub/ils/pdf/opbils62.pdf** (visited Aug. 6, 2010).

[33] Peck and Theodore, "Flexible recession."

Appendix A: Data notes

The two main datasets used in this paper are those of the Quarterly Census of Employment and Wages (QCEW) and Occupational Employment Statistics (OES) programs, both of which are part of the Bureau of Labor Statistics. County-level, State-level, and national-level data were used for years 1990 through 2008 from the QCEW database, and national-level data were used for years 2004 and 2008 from the OES database. The following list displays the industries that are used for the analysis of this article. They all are are either supersectors or NAICS sectors except for temporary help services, which is classified as a NAICS industry.

- Natural resources and mining
- Construction
- Manufacturing
- Trade, transportation, and utilities
- Information
- Financial activities
- Professional and business services
- Temporary help services
- Education and health services
- Leisure and hospitality
- Other services (except public administration)
- Public administration

Note: NAICS groups establishments into industries on the basis of the activities in which they are primarily engaged. In this article, professional and business services employment excludes temporary help services employment.

QCEW data notes. The QCEW program produces a comprehensive set of employment and wage data for workers covered by State unemployment insurance laws and Federal workers covered by the Unemployment Compensation for Federal Employees program. The program serves as a near census (covering 98 percent of U.S. jobs) of monthly employment and quarterly wage information; the data are organized by six-digit NAICS industry at the national, State, and county levels.

OES data notes. The OES program produces employment and wage estimates for over 800 occupations. The OES survey is currently constructed from a sample of 1.2 million establishments that are surveyed over six semiannual "panels." These panels are

combined in a weighted fashion and benchmarked to May of the survey year. The occupational trends section of this paper uses a tabulation of the OES database for years 2004 and 2008 to analyze recent occupational patterns in the temporary staffing industry. Because of the unavailability of data at the temporary help services industry level, the employment services industry is analyzed instead.

The OES survey was converted from an annual survey to a semiannual survey in November 2002, making May 2003 the first time that BLS created estimates for a 3-year period that included two semiannual panels; it did so by incorporating data from the two semiannual panels with data from two annual panels. Unfortunately, the May 2003 estimates for employment services do not include data on two major occupational groups and thus could not be compared with estimates from May 2008. The occupational analysis in this article is based on a comparison of the staffing patterns in May 2004 and May 2008. May 2008 is the most recent month for which data are available, and May 2004 is far enough away in time that data from the two periods do not include any overlapping panels.

Appendix B: Multivariate linear regression model

A cross-sectional, multivariate linear regression model was used to estimate the relationship between the concentration of a given industry's employment in a given area and the concentration of temporary help services employment in the same area. The equation used is

$$THS_{it} = \beta_1 MINING_{it} + \beta_2 CONSTR_{it} + \beta_3 MANUF_{it} + \beta_4 TTU_{it} + \beta_5 INFO_{it} + \beta_6 FINANCE_{it} + \beta_7 (P\&B - THS)_{it} + \beta_8 EDUC_{it} + \beta_9 LEISURE_{it} + \beta_{10} OTHER_{it} + \beta_{11} GOV_{it} + \varepsilon_{it}$$

where THS_{it} is the concentration of temporary help services employment in county i at year t, and each independent variable is the concentration of the employment of the industry in question. This model was run for each year from 1990 to 2008. The model does not include an intercept, because temporary employment can be attributed to all of these industries. Since temporary workers serve other industries by nature, it is assumed that no temporary workers are employed independently of another industry.[1]

The sign and significance of each coefficient shows the direction and strength of the relationship between the employment concentration of each industry and the concentration of temporary employment. In a multivariate regression framework,[2] cross-industry correlations are controlled. "β_k is the change in the expected value of y if x_k is increased by one unit and the other x's are held fixed."[3] For example, if the estimate for β_3 is positive and significant, then an area with a higher concentration of manufacturing employment would, on average, have a higher concentration of temp help services employment than an area with a lower concentration of manufacturing employment concentration, assuming constant concentrations of other industries' employment.

The increase in the strength of a parameter estimate[4] of the linear model across time demonstrates the change in the use of temporary help services by industries across counties. Furthermore, a significantly positive coefficient means that the employment concentration of an industry is positively related to the concentration of temp employment, suggesting that the industry tends to rely on temporary workers. A positive coefficient which increases in value suggests that an industry is increasing its reliance on temporary workers.[5]

Notes

[1] Note that the estimates for P&B exclude temp help services employment.

[2] A multiple regression model is used to accommodate many explanatory variables that may be correlated, and allows one to explicitly control for many other factors that simultaneously affect the dependent variable. A least squares model with multiple regressors captures the variation in temporary employment that is due to the variation in a particular industry only; that is, it captures the partial effect of that industry's employment concentration on temporary employment concentration. See Jeffrey M. Wooldridge, *Introductory Econometrics: A Modern Approach*, fourth edition (Cincinnati, OH, South-Western, 2009), p. 61).

[3] John A. Rice, *Mathematical Statistics and Data Analysis*, third edition, (Belmont, CA, Duxbury, 2007), p. 545.

[4] To test for significance in changes in a parameter estimate between two periods, a two-sample t-test with unequal variances was used. The difference in the parameter estimate is statistically significant if the following is true:

$$\frac{\left|\beta_i^{t=1} - \beta_i^{t=0}\right|}{\sqrt{SE^2_{\beta_i^{t=1}} + SE^2_{\beta_i^{t=0}}}} > t_{\frac{\alpha}{2},df}$$

[5] In a perfect world where, in every county, each industry's use of temporary help services is exactly proportional to the employment of the industry, an industry's employment concentration is either (surely) significantly positive (if that industry uses temporary workers, even a little), or is not significantly different from 0 (if that industry does not use temps). However, in reality, it is not the case that each industry in each county employs temporary workers at the same rate; therefore, an insignificant result may not be associated only with an industry's nonemployment of temps. It is not possible to distinguish whether statistical insignificance indicates that some industries employ substantial numbers of temps and others do not or insignificance indicates that no industries have a substantial number of temps, but one can reasonably assume that each industry employs at least some temporary workers.

Appendix C: Additional tables

Table A1. Model estimates for 1990

Industry	Parameter estimate	*t*-statistic	Statistical significance
Natural resources and mining	–0.008	–0.86	
Construction	.024	1.39	
Manufacturing	.016	4.25	****
Trade, transportation, and utilities	.014	1.94	*
Information	–.003	–.10	
Financial activities	.058	3.34	***
Professional and business services	.027	2.81	****
Education and health services	–.006	–.60	
Leisure and hospitality	–.004	–.36	
Other services	–.012	–.25	
Public administration	–.007	–.71	

NOTE: * significant at the 10 percent α level, ** significant at the 5 percent α level, *** significant at the 1 percent α level, **** significant at the 0.1 percent α level

Table A2. Model estimates for 2000

Industry	Parameter estimate	*t*-statistic	Statistical significance
Natural resources and mining	0.005	0.28	
Construction	–.005	–.19	
Manufacturing	.039	7.53	****
Trade, transportation, and utilities	.047	4.46	****
Information	.045	1.04	
Financial activities	.061	2.33	**
Professional and business services	.065	4.45	****
Education and health services	–.018	–1.30	
Leisure and hospitality	–.006	–.46	
Other services	–.090	–1.23	
Public administration	.000	.02	

NOTE: * significant at the 10 percent α level, ** significant at the 5 percent α level, *** significant at the 1 percent α level, **** significant at the 0.1 percent α level

Table A3. Model estimates for 2008

Industry	Parameter estimate	*t*-statistic	Statistical significance
Natural resources and mining	0.008	0.63	
Construction	–.020	–1.00	
Manufacturing	.055	10.40	****
Trade, transportation, and utilities	.071	7.43	****
Information	–.003	–.07	
Financial activities	.089	3.54	****
Professional and business services	.045	3.39	****
Education and health services	–.014	–1.51	
Leisure and hospitality	–.025	–2.32	**
Other services	–.226	–4.19	****
Public administration	–.017	–.80	

NOTE: * significant at the 10 percent α level, ** significant at the 5 percent α level, *** significant at the 1 percent α level, **** significant at the 0.1 percent α level

Table A4. Changes in parameter estimates, 1990–2000 and 2000–08

Industry	1990–2000			2000–08		
	Difference, in percent	*t*-statistic	Statistical significance	Difference, in percent	*t*-statistic	Statistical significance
Natural resources and mining	1.3	0.68		0.3	0.17	
Construction	–2.9	-0.94		–1.5	–.48	
Manufacturing	2.3	3.65	****	1.6	2.21	**
Trade, transportation, and utilities	3.3	2.60	***	2.4	1.69	*
Information	4.9	.90		–4.9	–.74	
Financial activities	.3	.09		2.8	.77	
Professional and business services	3.7	2.14	**	–1.9	–.98	
Education and health services	–1.2	-.69		.4	.25	
Leisure and hospitality	–.3	-.15		–1.9	–1.08	
Other services	–7.8	-.90		–13.7	–1.51	
Public administration	.8	.30		–1.8	–.56	

NOTE: * significant at the 10 percent α level, ** significant at the 5 percent α level, *** significant at the 1 percent α level, **** significant at the 0.1 percent α level