

Employment in services industries affected by recessions and expansions

Although employment in the Services Division has had a recession-resistant image, some industries within Services do lose jobs while others gain more jobs than usual during recessions

William C. Goodman

The services industries' reputation of resisting recessions is well deserved in one sense, as most of the major groups within the Services Division, as well as the division as a whole, generally do not show a net decline in employment from the official start of a recession period to its completion. Employment in the division, however, is affected by recessions. Its growth in jobs slows considerably, and with statistical significance. Furthermore, most of the division's 16 major industry groups decelerate in job growth or lose jobs during recessions. Five major groups in Services, however, are at least slightly countercyclical, gaining jobs faster during recessions than in normal times. One extremely large and important group, healthcare, is countercyclical. Furthermore, healthcare shows countercyclicity with statistical significance. This article identifies and discusses the cyclical and countercyclical industry groups of the Services Division and some of the different causes of cyclical and countercyclical trends.

Methodology

For each employment series examined in this analysis, quarterly averages were computed from seasonally adjusted monthly observations so that each series could be compared in trend with GDP, which is available as a quarterly series. Next, the quarter-to-quarter percent changes of

each series were calculated. Within each series, the percent changes were divided into two groups: those during officially declared recessions and those outside of official recessions. The average quarterly percent change during recessions and the average quarterly percent change during other times were calculated. The difference between the two averages determined whether the series is classified in this article as cyclical or countercyclical; when the average percent change during economic expansions is greater than the average change during recessions, the series is called cyclical, and when the average percent change during recessions is greater than that during economic expansions, the series is considered countercyclical.

The period used in this article generally starts at the beginning of the individual series and continues through the third quarter of 2000. (See table 1 for dates.) Later data were not used because the state of the economy (that is, in expansion or in recession) during the recent period has not been determined as of the writing of this article. The employment trends in Services since the third quarter of 2000 are described in the second-to-last section of this article.

A Student's *t* test was applied to the recession and nonrecession changes to see if the difference between the two groups of changes is statistically significant. Statistical significance implies that the series is cyclical or

William C. Goodman is an economist in the Office of Employment and Unemployment Statistics, Bureau of Labor Statistics.

Table 1. Cyclical and countercyclical employment series from the Services Division, 1947 to 2000

Industry group	Starting point of data	Number of recessions in series	Difference ¹	Statistical significance ²	Loses jobs in average recessionary quarter?
Total Services Division	1947 ³	9	0.5	Yes	No
Gross domestic product	1947 ³	9	1.5	Yes	N/A
Cyclical groups					
Engineering, management services	1988	1	1.8	Yes	Yes
Business services	1958	6	1.4	Yes	No
Agricultural services	1976	3	1.1	Yes	No
Automotive services	1972	4	1.1	Yes	No
Miscellaneous repairs	1964	5	1.0	Yes	Yes
Lodging	1972	4	.7	Yes	No
Personal services	1958	6	.7	Yes	Yes
Miscellaneous services	1988	1	.4	No	No
Motion pictures	1988	1	.4	No	No
Museums, gardens, zoos	1988	1	.2	No	No
Membership organizations	1972	4	.1	No	No
Countercyclical groups					
Private education	1958	6	-.5	No	...
Legal services	1972	4	-.4	No	...
Health services	1958	6	-.3	Yes	...
Social services	1972	4	-.2	No	...
Amusements, recreation	1988	1	-.1	No	...

¹ "Difference" is the difference between the average quarter-to-quarter percent change during general economic expansions and the average quarter-to-quarter percent change during recessions.

² Statistical significance is based on a Student's *t* test, comparing quarter-to-quarter percent changes during recessions with those of other times. A two-tailed test with a 5-percent probability criterion was used.

³ Data are available earlier than the date shown, but only data from 1947 to the third quarter of 2000 are used in this article.

countercyclical by its nature rather than by chance and therefore further implies that the series is likely to remain cyclical or countercyclical in the future, unless some aspect of the industry changes in a way that affects the trends of the industry's employment.

The approach used in this article, then, is designed to show differences in job trends between periods of general economic expansions and periods of recession. The results do not reflect another form of cyclicity: the degree of association of an industry's job trends with GDP trends *within* periods of general economic growth (neither within a single period of expansion nor across various expansions). Similarly, the results stated here do not reflect the degree of association of industry-specific employment change with GDP change *within* a recession, nor across various recessions. In another article, correlations between the trend of a specific industry and the trend of GDP capture how the industry does or does not accelerate or decelerate along with GDP over time regardless of whether the economy continues to expand, turns, or continues to decline.¹ By contrast, this article primarily describes differences between a series' trend during recessions and its trend during general economic expansions.

Caveats

The various time-series may have differing cycles of their own, leading, lagging, or behaving independently of the overall business cycle. To compare the cyclicity of the various series, some common basis of comparison had to be used. The official recession periods were chosen.² This study, then, may not capture all the cyclicity of employment in some industries, particularly any whose timing of expansion and contraction differs much from the general business cycle. This study does, however, directly reflect the various industries' participation in, or reduction of the general economic cycle.

Certain employment series in services have relatively short histories, starting in 1982 or later. Those series include only one official recession in its entirety: the recession of July 1990 to March 1991. Possibly, the industry behaved differently in the one official recession than in other recessions. In the cases of industries with recorded employment including only the one recession, particular attention should be paid to statistical significance or the lack of it. Deceleration or decline in the one latest recession without statistical significance may be by chance.

The major industry groups

Table 1 identifies which major industry groups of the services division have cyclical or countercyclical histories and which major groups show statistical significance in their cyclicity or countercyclicity. In the table, the major groups are divided into two categories: cyclical and countercyclical. Within each category, industry groups are shown in order of the amount of difference between their behavior in recessions and their behavior in general economic expansions. Specifically, the groups within each category are ordered according to the difference between average quarterly percent change during general economic expansions and average percent change during recessions. Two major industry groups, engineering and management services and business services, have degrees of cyclicity, as indicated by their difference, comparable to that of GDP. Other major groups, including both cyclical and countercyclical ones, have milder differences.

The most cyclical industries

As previously stated, the Services Division as a whole is cyclical. (See chart 1.) Among the division's major components, *engineering and management services* are most cyclical, and furthermore have been one of the few major groups in the division to lose jobs, as opposed to merely decelerating, in the average recessionary quarter. All of the group's four main components (engineering and architectural services, accounting and auditing, research and testing, and management and public-relations services) have been cyclical, and three of them (excluding only the smallest component, research and testing) have lost jobs in the average quarter of a recession.

Engineering and management services are sold mainly to businesses. The engineering and architectural component sells 70 percent of its output to businesses, and more than half of that 70 percent is sold to construction contractors. Nine percent of the portion of output sold to businesses is sold to manufacturers. Contractual engineering and architectural services depend, then, on demand from construction and manufacturing.³

Eighty-four percent of the output of management and public-relations services is sold to businesses, most of all to the Services Division. Management consulting is an important industry within management and public relations. Both *engineering and architectural services* and *management and public-relations services* depend heavily on projects, as opposed to ongoing production, for demand. Such projects include construction projects, development of new products, and major changes to internal business processes. Both *engineering and architectural services* and *management and public-relations services* show cyclicity with statistical significance and furthermore actually lose jobs in recessions.

Business services, another cyclical major group (chart 2),

include two large components, *help supply* and *computer services*. Both components show cyclicity with statistical significance. Help supply, which is composed of agencies that provide workers to other businesses on a contractual basis, employs massive numbers of workers and actually declines in employment during recessions. Help supply lost 41,000 workers from January 1982 (the earliest point in the time-series, which happened to be during a recession) to the end of the recession in November 1982 and lost 56,000 workers in the recession of the early nineties. The computer services industry, which includes production of software, has a longer time-series (since 1972). During recessions, the industry has slowed but has not lost jobs. Somewhat like engineering and management services, help supply and computer services benefit from projects as well as from ongoing activities. While some employees who are furnished by staffing agencies may work indefinitely or intermittently for clients, others are used for specific temporary activities. Computer services include custom software creation, as in a corporate, military, or nondefense government project; the corporate projects are often designed to improve a business process.

Like engineering and architectural services, *agricultural services*, because of their *landscaping and horticultural* component, are partially dependent on the level of activity in construction. *Agricultural services* also have a cyclical history. Although they sell a majority (60 percent) of their output to businesses, the growth in sales has been mainly in sales to consumers, who may also cut back on professional horticultural services when they become unemployed or become less confident of continued employment.

Automotive services also are cyclical. *Passenger-car rental and leasing, automotive repair, and other automotive services*, such as car washes, are all cyclical with statistical significance. Automotive repair, the largest component, is most responsible for the cyclicity of automotive services as a whole.

The *miscellaneous repair* industry also is cyclical. Surprisingly perhaps, most of its output (71 percent) is sold to businesses. The largest chunk of its sales to businesses (about a third of the portion of output sold to businesses) is purchased by the manufacturing division, suggesting that warranty work accounts for much of the output of the *miscellaneous repair* industry. Reduced sales of appliances and other machinery during recessions would account for a considerable loss of warranty business. The miscellaneous repair business does lose jobs, instead of just decelerating, during the average recessionary quarter.

The *lodging industry* sells about half of its services to consumers and about half to businesses. Lodging is highly cyclical in the context of the division. Although lodging does not lose jobs during the average recessionary quarter, its rate of growth is cut to about one-sixth of its rate during economic expansions.

Personal services is one of only three cyclical major groups

Chart 1. Quarter-to-quarter change in jobs in the Services Division through business cycles, 1950 to 2000

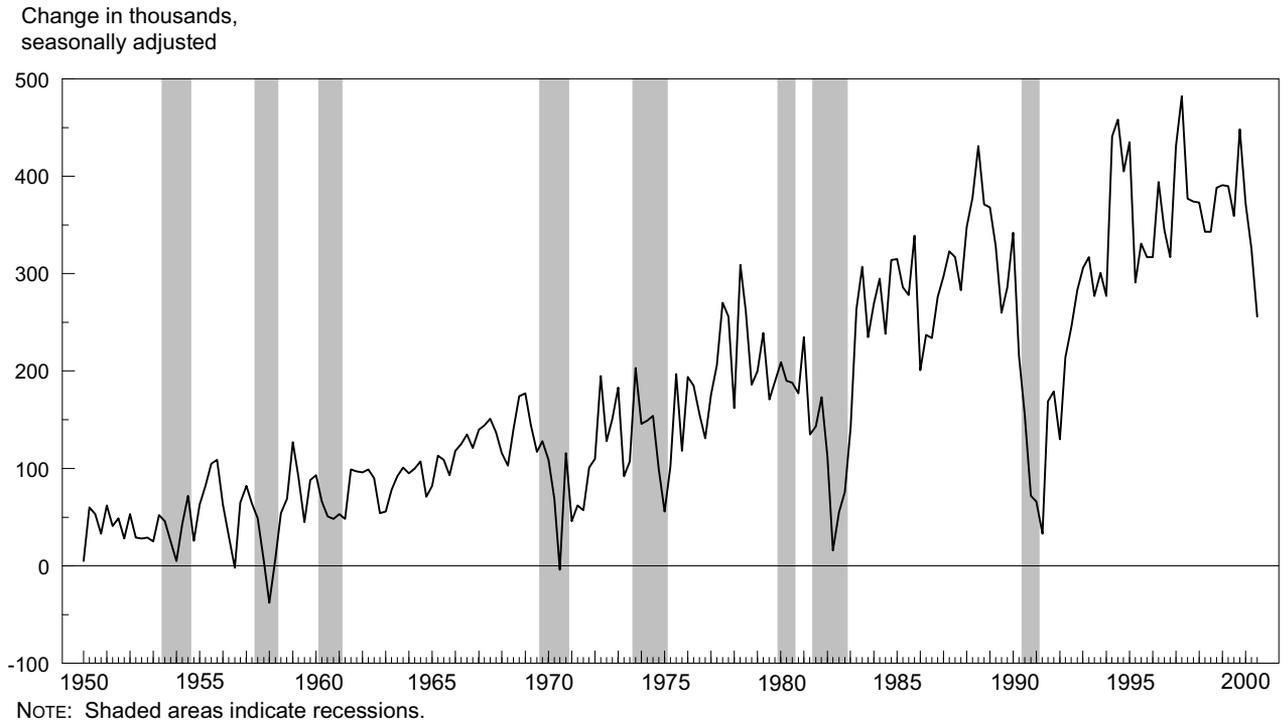


Chart 2. Quarter-to-quarter change in business services through economic cycles, 1958 to 2000

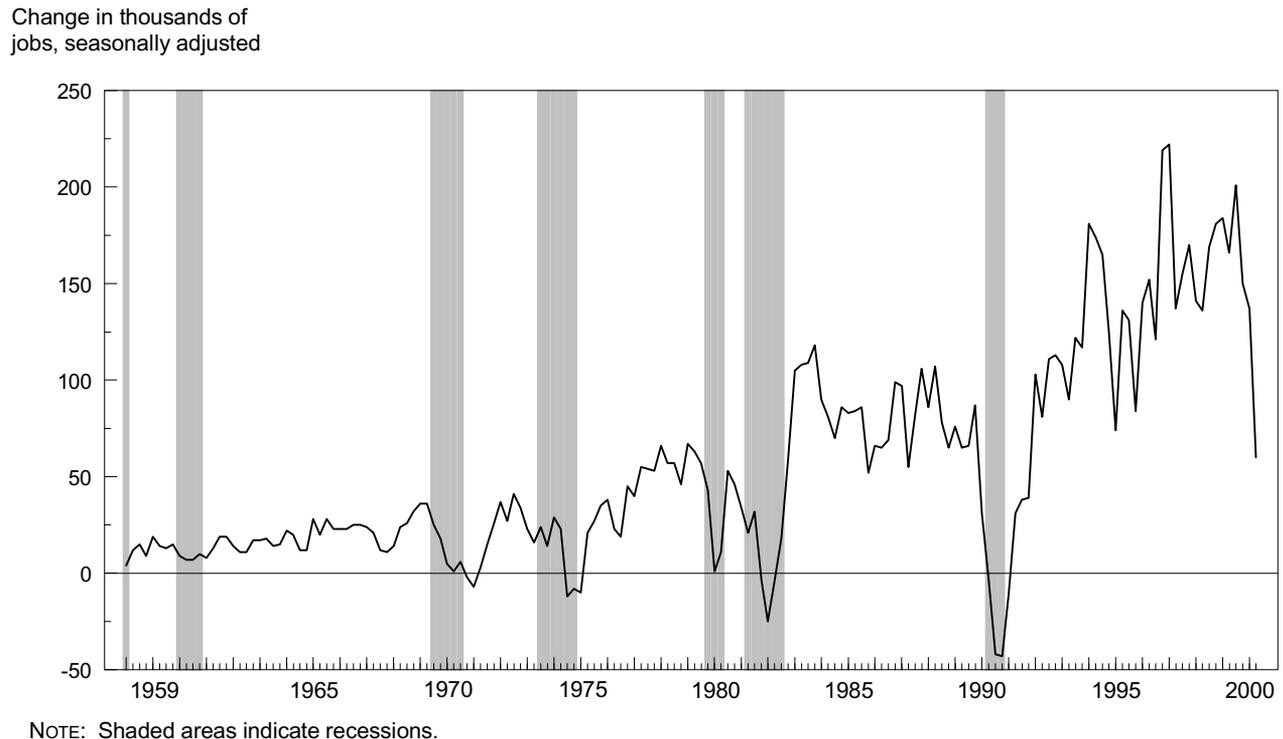


Table 2. Percent change in enrollment in private higher education, 1965 to 1997

Year	Percent change
1965	7.7
1966	4.6
1967	2.7
1968	-7
1969	1.2
1970 ¹	2.1
1971	-4
1972 .....	.0
1973	1.8
1974 ¹	2.4
1975	5.1
1976 .....	.4
1977	3.4
1978	1.4
1979	2.4
1980	4.2
1981 ¹	3.2
1982 ¹ .....	.2
1983	1.9
1984	-6
1985 .....	.1
1986 .....	.8
1987 .....	.1
1988	3.6
1989	2.3
1990 ¹ .....	.4
1991	2.5
1992	1.8
1993 .....	.4
1994 .....	.9
1995 .....	.8
1996	1.3
1997	-3

¹ A recession was in progress during fall of the year.
SOURCE: U.S. Department of Education.

in the Services Division to lose jobs in the average quarter of a recession. The cyclical nature of personal services is attributable to two of its components: *laundry, cleaning, and garment services* and *barber shops*. The laundry, cleaning, and dry-cleaning industry gains workers during the average quarter of general expansion and loses far more workers (0.9 percent) during a quarter of recession. *Barber shops* lose workers normally, but lose far more (2.4 percent per quarter or 9.2 percent annually) during recessions. Both industries exhibit statistically significant cyclical nature.

Motion pictures, surprisingly perhaps, sells slightly more of its output to businesses than to consumers. One explanation is that production of filmed advertisements is included. Advertising activities are cut back in recessions; employment in the advertising industry itself also is cyclical.

In summary, the two largest and most cyclical of the cyclical major groups in the Services Division (*business services* and *engineering and management services*) sell more of their output to the business community than to consumers. Cut-

backs in interindustry purchases, as opposed to consumption, account directly for most of the cyclical nature of the Services Division.

Countercyclical industries

As shown in table 1, there are fewer countercyclical main components in the Services Division than there are cyclical ones. Just the same, the major industry group with the greatest employment in the division, health services (with more than 10 million employees), is countercyclical. (See chart 3.) Demand for health care is relatively unaffected by recessions, because to the consumer, healthcare can be a necessity rather than an optional commodity whose purchase can be postponed. Furthermore, Medicare, Medicaid, and private insurance provide funding dedicated solely to healthcare, so that much of the funding is not subject to competition with other types of purchases, and benefits remain available to persons during periods of unemployment.⁴

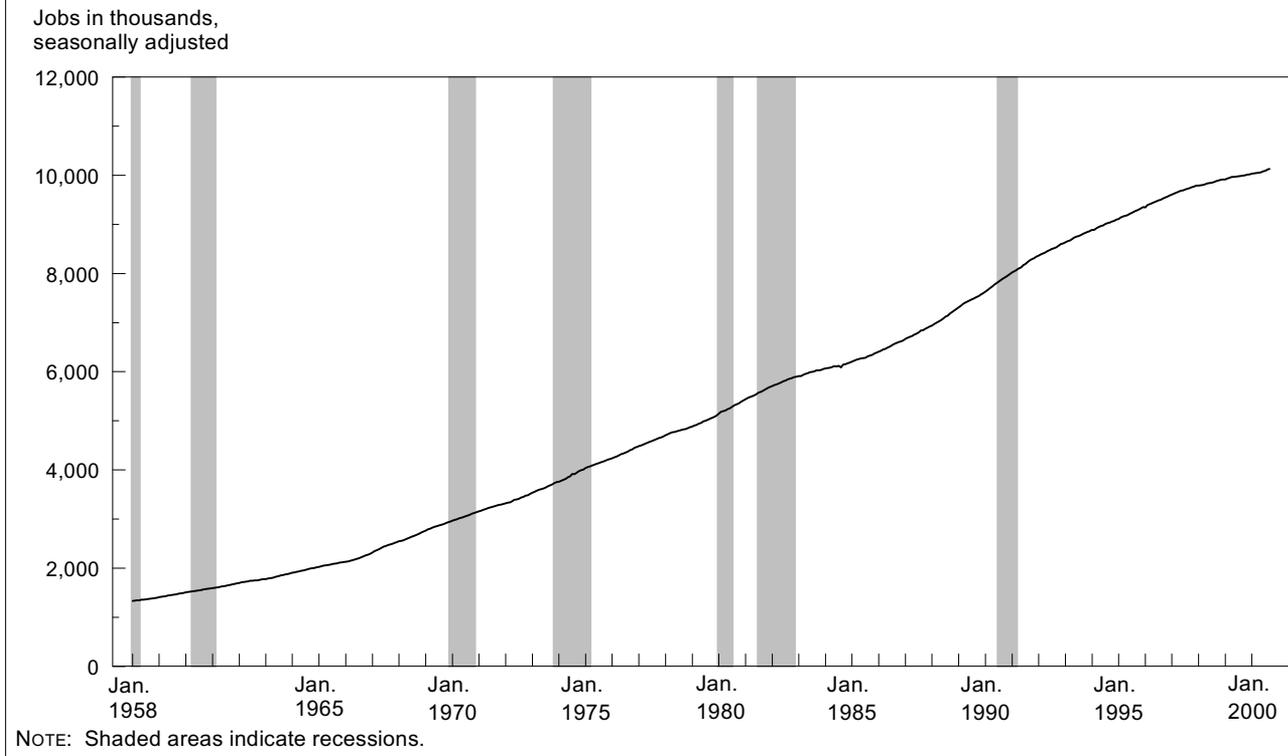
But to be truly countercyclical as defined in this article, the industry must not only resist recessions but also must grow more rapidly during recessions than during expansions. Table 1 indicates that employment in health services is indeed countercyclical. If people need more healthcare services during recessions, countercyclical demand for treatment is implied. But a study by Christopher J. Ruhm provides evidence that health actually improves during recessions. He shows that mortality and eight major causes of death are more frequent in times of economic expansion. He cites empirical support for two explanations. "Tobacco use exhibits a strong procyclical variation, possibly explaining some of the health improvement that accompanies economic downturns. A one percentage point increase in the state unemployment rate reduces the predicted number of current smokers by 0.3 percentage points." Also, he provides evidence indicating that "physical activity rises and diet improves when the economy weakens."⁵ The idea that worsening health conditions during recessions create greater demand, then, is questionable.

While worse health during recessions may not be a reality, another factor is. Considerable evidence shows that healthcare is subject to labor shortages, which intensify in prosperous times and are somewhat relieved in a sluggish or shrinking economy. The countercyclical effects of labor shortages in hospitals are described by John Andrews:

An economic downturn means the unemployment rate could rise and people will actually need jobs. That would be a great relief to an industry [healthcare] with job vacancies galore, created by forces outlined in Economics 101: high demand for workers that are in short supply.⁶

In addition to the problems of hospitals, low pay in *nurs-*

Chart 3. Employment in health services through business cycles, 1958 to 2000



ing homes, another part of the healthcare industry, has been identified as a factor contributing to the nursing-home labor shortage.⁷

The introduction of more restrictive rules governing Medicare and Medicaid payments constitutes another factor that has contributed to the countercyclicality of healthcare. Important restrictions were introduced in 1983, 1996, 1997, and 1998, which were all years of economic expansion. The restrictions of Medicare and Medicaid payments slowed the growth of healthcare jobs.⁸ The timing of the restrictions, during economic expansions, may be considered a factor that is extraneous to the business cycle. The health services group may not be *intrinsically* as countercyclical as it appears.

The remaining ostensibly countercyclical industries do not show statistical significance in their countercyclicality. Therefore they should not be regarded as having any proven countercyclical nature, at least not in terms of the statistical approach used in this article. Just the same, one may ask why the industries did not clearly participate in business cycles. The following factors may at least prevent the industries from being more cyclical than they are.

Among ostensibly countercyclical major groups of the division, private education reportedly has countercyclical tendencies because more people go to school when they cannot find jobs. Figures representing enrollment in private higher education, however, show no readily apparent distinction

between recession periods and other years. (See table 2.)

Instead, we can consider a factor that may explain much of the countercyclicality of various industries. That factor is the availability of more attractive job opportunities in other industries during times of economic expansion. In addition to the health services industry, a shortage of *child day care* workers (in the broader category of *social services*) also has been attributed to better paying opportunities; “demanding work for little pay” typifies the day-care industry.⁹ Another of the countercyclical groups, amusements and recreation, also pays much less on average than nonagricultural private employment in general. Private colleges also typically offer many low-paying jobs. Labor shortages in lower paying industries during economic expansions, then, may contribute to their noncyclical or countercyclical behavior.

Alternative comparison

A preceding section noted that an earlier article used a different definition of cyclicity. In that article,¹⁰ Berman and Pfleeger correlated employment of various industries with GDP, and used the correlation coefficients as indications of cyclicity. The present article, instead, uses the difference between series’ behavior during recessions and their behavior during economic expansions as an indication of cyclicity. The main question in this article is whether the employment

series behave differently during recessions than they do in other times; a major question in the Berman-Pfleeger article is how closely the employment series follow the trends of GDP as it fluctuates, regardless of whether or not a recession is occurring.

Because this article utilizes somewhat different industry strata than those used by Berman and Pfleeger and because it uses later data, new correlations between the appropriate employment series' quarterly percent change and the percent change of GDP were calculated. Table 3 compares the new correlation coefficients with the "differences" defined in table 1. Not surprisingly, the industries with the higher differences generally have the higher correlation coefficients. To compare the overall results of the two methods, the differences (shown in the second column of table 3) were correlated with the correlation coefficients (in the third column). The resulting correlation coefficient of 0.852 is statistically significant well beyond the 0.2 percent level of probability, meaning that agreement between the two sets of results is almost certainly not by chance. We can conclude that those Services Division industries that decelerate most during recessions are generally those whose trends most resemble the trends of GDP through all sorts of economic times.

Latest trends

From the third quarter of 2000 to the second quarter of 2001, there was a decelerating trend in employment as estimated from the Current Employment Statistics survey. The Services Division participated in the slowdown, exhibiting cyclical and countercyclical behavior in various components.

The Services Division as a whole gained jobs in the three

quarters starting with the last quarter of 2000 at a rate closer to its recessionary average than to its average during expansions. In fact, the percent increase per quarter (0.36 percent) in the three recent quarters is actually well below even the average during recessions (0.60 percent).

To identify which Services industries contributed most to the slowdown that began in the last quarter of 2000, the employment change during the first three quarters of 2000 was compared with the change during the subsequent three quarters. In table 4, a negative value in the "Difference" column represents a slowdown or reversal in the more recent period.

Within the division, *business services* contributed most heavily to the slowdown in hiring. Although business services has not lost jobs in the average quarter of official recessions, business services declined by 224,000 jobs in the recent three quarters. *Personnel supply services*, although rapidly expanding until recently, were primarily responsible for the change in trend in *business services*. Personnel supply lost 342,000 jobs during the recent three quarters.

Engineering and management services and *lodging*, two additional definitely cyclical groups, made the second- and third-largest contributions to the slowdown in the division. *Lodging* and *engineering and management* each slowed by about 45,000 jobs. The rate of increase in the last three quarters in *lodging* was almost exactly equal to its average in recessions. *Engineering and management services*, however, have not behaved recently quite as they do in recessions. *Engineering and management services* lose jobs in the average quarter of a recession but gained jobs in the last three quarters, though at a rate reduced from the prior three quarters.

The bulk of the slowdown in the division, then, is due to

Table 3. Comparison of two indications of cyclicity in Services-Division industry groups, seasonally adjusted, 1958 to 2000

Industry group	Difference between average quarterly percent change during general economic expansion and average quarterly percent change during recession	Correlation coefficient from correlation of percent change in industry's employment with percent change in GDP
Engineering and management services	1.8	0.480
Business services	1.4	.515
Agricultural services	1.1	.287
Automotive services	1.1	.550
Miscellaneous repairs	1.0	.354
Lodging .....	.7	.385
Personal services .....	.7	.173
Miscellaneous services .....	.4	-.082
Motion pictures .....	.4	.045
Museums, gardens, zoos .....	.2	.046
Membership organizations .....	.1	.038
Amusements and recreation	-.1	.073
Social services	-.2	.089
Health services	-.3	-.058
Legal services	-.4	.074
Private education	-.5	-.105

Table 4. Contributions of major industry groups in the Services Division to the job-growth slowdown of 2000 to 2001

Industry group	Change in jobs, thousands, seasonally adjusted ¹		
	2000: 1st quarter through 2000: 3rd quarter (A)	2000: 4th quarter through 2001: 2nd quarter (B)	Difference (B minus A)
Services Division	953	437	-516
Cyclical groups			
Engineering and management services	127	80	-47
Business services	348	-224	-572
Agricultural services	19	29	10
Automotive services	36	50	14
Miscellaneous repairs	-3	-3	0
Lodging	55	10	-45
Personal services	19	20	1
Miscellaneous services	0	1	1
Motion pictures	-8	3	11
Museums, gardens, zoos	5	3	-2
Membership organizations	17	23	6
Countercyclical groups			
Amusements and recreation	63	35	-28
Social services	70	139	69
Health services	100	188	88
Legal services	8	14	6
Private education	55	71	16

¹ Major groups do not add to Division because the Services Division also includes nonclassifiable establishments, not shown.

three major groups with definitely cyclical histories. The four other services industries that are cyclical with statistical significance either show no difference in growth between the two 9-month periods (miscellaneous repairs and personal services) or show stronger growth in the three later quarters (agricultural services and automotive services).

Two major groups with at least nominally countercyclical histories accelerated substantially. *Health services* and *social services* gained jobs impressively.

In the latest three quarters, health services accelerated by 88,000 jobs. The acceleration, however, is probably due, at least in part, to recent changes in Medicare and Medicaid payment policies, which might exaggerate a countercyclical pattern.

Social services accelerated by 69,000 jobs. Although social services has not established statistically significant countercyclical, its acceleration in job growth during the recent general slowdown adds to the evidence suggesting that the group is countercyclical.

Conclusion

The Services Division as a whole and a majority of its main components show cyclical, at least in the sense that the growth of jobs slows during recessions. Only three of the main components, namely engineering and management services, personal services, and miscellaneous repairs, actually

lose jobs in the average quarter of a recession. The components contributing most to the cyclicity of the division, engineering and management services and business services, sell their output primarily to other businesses, so that the cyclicity of the division is driven more by business activity than by consumer purchases.

Five major groups show countercyclicity in the sense that growth during recessions exceeds growth during general economic expansions. Partly because of the countercyclical components, the division as a whole has relatively mild cyclicity; its rate of growth is reduced by about one-half percentage point during the average recessionary quarter, while the quarterly percent change of GDP shows three times the effect, varying by 1.5 percentage points between the average recessionary quarter and the average quarter of economic expansions.

Reasons for the countercyclicity of various components of the division vary. Several at least ostensibly countercyclical components, however, appear to be subject to the effects of labor shortages, which ease during recessions, thus making more people available for less desired, often lower paying jobs.

In recent quarters, business services and engineering and management services, two cyclical and enterprise-related components, contributed most heavily to the slowdown in hiring within the division. □

Notes

¹ Jay Berman and Janet Pfleeger, "Which industries are sensitive to business cycles?" *Monthly Labor Review*, February 1997, pp. 19–25.

² Recessions are determined by the National Bureau of Economic Research.

³ Sales data in this article are from the Office of Occupational Statistics and Employment Projections, Bureau of Labor Statistics.

⁴ David R. H. Hiles, "Health services: the real jobs machine," *Monthly Labor Review*, November 1992, p. 13.

⁵ Christopher J. Ruhm, "Are Recessions Good for your Health?" *Quarterly Journal of Economics*, May 1, 2000.

⁶ John Andrews, "Labor shortages plague hospitals A shrinking labor pool is forcing hospitals to get creative," *Materials Management in Health Care*, Feb. 2001. See also Che Parker, "AHA report shows staffing shortages threaten access to quality health care," *AHA News* (Ameri-

can Hospital Association), June 11, 2001.

⁷ Joan Conroy, past president of the Maryland chapter of the National Association of Directors of Nursing in Long Term Care, is quoted in Diana K. Sugg and staff, "Nursing staffs shrink; quality, availability of medical care suffer," *The Baltimore Sun*, Mar. 19, 2000.

⁸ Hiles, pp. 3–16, and Cynthia Engel, "Health services industry: still a job machine?" *Monthly Labor Review*, March 1999, pp. 3–14.

⁹ See the website of the Children's Defense Fund <http://navigation.helper.realnames.com/framer/1/112/default.asp?realname=Children%27s+Defense+Fund&url=http%3A%2F%2Fwww%2Echildrensdefense%2Eorg&frameid=1&providerid=112&uid=30008170> (visited July 18, 2001) and, as one example of a newspaper account, "Miss. day-care centers face downside of good economy," *Baton Rouge Advocate*, Dec. 29, 1998. Quote is from latter source.

¹⁰ Berman and Pfleeger, *Monthly Labor Review*, pp. 19–25.