The Role of Incentive Pay in the Volatility of the Employment Cost Index

It is often desirable for users of wage indexes to net out the effects of changes in rates of pay from other factors that can cause fluctuations in earnings on the job. BLS analysis of experimental indexes that exclude earnings changes in incentive-pay jobs shows index volatility to be reduced in most ECI industry and occupation series.

ANTHONY J. BARKUME
THOMAS G. MOEHRLE

Anthony J. Barkume is a senior research economist in the Compensation Research and Development Group. Thomas G. Moehrle is a senior economist in the Office of Compensation Levels and Trends, Bureau of Labor Statistics.

Telephone: Barkume (202) 691-7527
Moehrle (202) 691-6237
E-mail: Barkume_A@bls.gov
Moehrle_T@bls.gov

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By holding constant the mix of jobs for which data are collected, the Bureau of Labor Statistics' Employment Cost Index (ECI) attempts to measure the changes in earnings that result only from changes in rates of pay. In most jobs, time worked (hourly, weekly, or monthly) defines the rate of pay. In some jobs, however, rates of pay are defined wholly or in part on the results of worker efforts; for example, the earnings of sales workers receiving commissions will fluctuate with sales, and the earnings of workers receiving piece rates will fluctuate with individual production results. Thus, wage indexes that include some "payment by results" jobs can exhibit volatility even when the rates of pay of all jobs are unchanged. This volatility would stem from fluctuations in results of worker efforts (sales made or amount produced) among "payment by results" jobs rather than in their rates of pay.

Because a quarter of sales workers are paid on commissions, some ECI series now exclude sales occupations to better isolate underlying changes in the rates of pay for other workers. ECI wage and salary series that exclude sales workers often exhibit less short-term volatility than the corresponding series for all workers. Chart 1 shows that this difference in volatility occurs even in the ECI index for all private industry workers over the period March 1995 to December 1999. Looking at the standard deviation of 3-month percentage changes in the two indexes, we see that the volatility of the index that excludes sales occupations was 77 percent of the volatility of changes in the ECI index for all private industry workers.

However, many "payment by results" jobs are not sales jobs. Also, some sales jobs, such as cashiers and sales counter clerks, do not generally have a commission component in earnings. Thus, ECI series excluding sales occupations may nonetheless still include jobs with potentially volatile pay while excluding pay rate changes in sales jobs not paid commissions.

This article presents experimental ECI indexes that exclude earnings changes in jobs using pay rates based on results, which are defined as "incentive-pay" jobs in ECI data collection procedures. In the ECI, incentive pay is defined as payment that is linked

TABLE 1. **Distribution and incidence of incentive-pay compensation provisions in U.S. private industry employment, by major occupational group, March 1997**

Occupational group	Incidence[1]	Distribution[2]
Professional and technical	1.5	3.2
Executive, administrative, and managerial	6.1	7.9
Sales occupations	25.2	46.2
Administrative support, including clerical	1.5	4.2
Precision production, craft, and repair	7.2	11.1
Machine operators, assemblers, and inspectors	8.4	10.6
Transportation and material moving occupations	16.2	10.8
Handlers, equipment cleaners, helpers, and laborers	2.1	2.7
Service occupations, except private household	1.5	3.2

[1] Percent of total employment in the occupational group.
[2] Percent of all private industry employment in jobs with incentive-pay provisions.

TABLE 2. **Incidence of employment in sales occupations and jobs with incentive-pay provisions in U.S. private industry, by major industry, March 1997**

	Sales jobs		Incentive-pay jobs	
	Percent of industry employment	Percent with incentive-pay provisions	Percent of industry employment	Percent in sales occupations
All private Industry	9.9	25.2	6.9	46.2
Construction	1.2	47.9	1.6	35.2
Manufacturing	1.6	20.0	3.7	8.6
Transportation	1.9	39.4	9.1	8.4
Public utilities	7.7	60.4	7.2	64.8
Wholesale trade	19.7	40.3	12.2	64.8
Retail trade	42.0	14.9	8.9	70.6
Finance, insurance, and real estate	8.2	58.4	7.9	61.1
All services	6.1	32.3	5.4	38.1
Business services	7.1	56.0	6.9	58.0

by a formula to production or sales. Examples of incentive pay include commissions (payments based on sales), piece rates (payment per unit produced), or production bonuses (extra payment for exceeding standards on production or time). The presence of incentive-pay provisions identifies jobs in which earnings can fluctuate over time even when rates of compensation (such as the sales commission rate or piece rate) are unchanged.

Our major finding is that the experimental ECI indexes do show less volatility than published ECI indexes in most series examined over the period March 1995 to December 1999. In many cases, the volatility of these experimental series is similar to that of published ECI series that exclude sales occupations. However, in a few cases, we found noticeable differences in volatility between ECI series excluding sales occupations and the experimental series.

Incidence of incentive pay in U.S. private industry

Unpublished tabulations of ECI data indicate that employment in jobs using incentive-pay compensation represented a small share—less than 7 percent—of all U.S. private industry employment throughout the decade of the nineties. (However, the proportion of earnings due to incentive pay may have increased or decreased over time.) The incidence of employment in incentive-pay jobs varies considerably by occupation and industry and has a limited degree of overlap with sales occupations.

Occupational breakdowns of incentive-pay employment are given in table 1, using data for March 1997. Among occupations, the highest incidence of the use of incentive pay is in sales occupations; an estimated 25.2 percent of employment in these occupations had incentive-pay compensation provisions in March 1997. However, the occupational distribution of incentive-pay employment (second column) also shows that more than half of such employment was not in sales occupations. In March 1997, 32 percent was in the skilled blue-collar occupations (precision production, craft, and repair; machine operators, assemblers, and inspectors; and transportation and material moving occupations) and another 11 percent was in either professional and technical occupations or executive, administrative, and managerial jobs.

Industry breakdowns for both sales occupations and incentive-pay employment are given in table 2, again based on data for March 1997. The incidence of industry employment in sales occupations (first column) is the share of industry employment excluded from an ECI industry index that omits jobs in sales occupations. Correspondingly, the incidence of employment with incentive-pay provisions (third column) is the corresponding share of employment excluded from an ECI industry index that omits jobs with incentive-pay provisions. Thus, for example, an ECI excluding all sales occupations in retail trade would represent 58 percent of industry employment in March 1997, while the corresponding ECI excluding only jobs with incentive pay would represent 91 percent of industry employment in the same period.

Table 2 also presents two related measures of the overlap between employment in sales occupations and that in jobs with incentive-pay provisions. The second column reports the percent of employment in sales occupations with incentive-pay provisions, while the fourth column gives the percent of employment with incentive-pay provisions in sales occupations. These data show that there is no major industry in which sales occupations and jobs with incentive-pay provisions completely overlap each other.

While the data shown in tables 1 and 2 provide useful background information, incidence data alone cannot indicate the effect that excluding incentive-pay jobs will have on the ECI. Because incentive pay may be more volatile in some occupations and industries, the only way to assess its impact on the ECI is to construct experimental indexes by occupation and industry that exclude compensation changes arising from incentive-pay provisions. The methodology for constructing these experimental indexes is reviewed in the following section.

Derivation of the experimental ECI series

The computation of the experimental ECI series follows the same index methodology as the corresponding published series,[1] but incentive-pay occupations were excluded from all calculations. The ECI is designed as a Laspeyres, fixed-weight index at the occupational level with the purpose of eliminating the effects of employment shifts among occupations. The fixed-weight index computation involves two stages of aggregation. At the first stage, sampled jobs are sorted into major occupation and industry categories, or estimation cells, for which sample-weighted average hourly costs are computed. In total, there are 720 ECI estimation cells for private industry (10 major occupational groups sorted across 72 industries).[2]

In the second stage of aggregation, the average hourly costs are aggregated to publication levels (for example, all private industry workers, or all workers in manufacturing) using index aggregation weights. For each cell, the aggregation weights are the multiplication product of fixed-employment counts and average hourly costs. For these index aggregation weights, the average hourly costs are the estimation cell averages excluding incentive-pay jobs.[3] This procedure provides what we believe is a close approximation to the exact index number calculation. To follow strictly the same fixed-employment weighted methodology of the ECI (such as is done for the less-sales-workers series), the construction of the weights should exclude the incentive-pay workers within each estimation cell. However, the 1990 Occupational Employment Statistics Survey, the source for the fixed-employment counts, does not collect information on incentive pay.

While the ECI survey data do provide information on incentive pay, the ECI sample is not designed to measure the proportion of incentive-pay jobs in each of the 720 ECI occupational categories. The sample is simply too small to provide statistically reliable proportions. Hence, we do not feel confident that the ECI sample could accurately provide sample proportions for the many occupational categories that could in turn be used to adjust the employment weights. Nevertheless, because incentive-pay jobs constitute less than 7 percent of the total ECI private industry sample, we do not believe it imperative, for our volatility measurements, to adjust the index employment weights for incentive-pay jobs.

Admittedly, by not adjusting the index employment weights our proposed approximation may give too much weight to some occupational categories in which there is a high incidence of incentive-pay jobs, and too little weight to occupational categories that have a relatively low incidence of incentive-pay jobs. As a means to gauge the impact of incentive-pay jobs on the index weights and ultimately the volatility of rates of change, we experimented with a set of index weights that excluded incentive-pay workers within sales occupations, the occupational group with the highest incidence of incentive-pay jobs. If the exclusion of incentive-pay jobs from index weights has an important effect, it should surface among the sales-occupational estimates. To complete this exercise, we adjusted all sales occupational index weights by the ECI sample proportions within sale occupational groups.

As expected, the incentive-pay adjusted weights for sales occupations produced index numbers very close to our experimental index based on total-employment weights. The correlation between these two sets of index numbers was 0.95, with 10 of the 20 estimated 3-month percentage changes in the sales occupational series equaling each other. The mean for 3-month percentage changes is slightly higher than our experimental index, 0.87 compared with 0.85, and the volatility is marginally smaller. Thus, we are confident that our experimental index provides a good approximation of the reduction in volatility of ECI series even though the index weights are not adjusted for incentive-pay jobs.

We use the standard deviation of 3-month percentage changes in these experimental indexes over the period March 1995 to December 1999 as a measure of short-term volatility in a series. Using this measure, the volatility of an experimental series excluding jobs with incentive-pay provisions is compared with that of a corresponding series for all workers in an occupation or industry. The incidence data in tables 1 and 2 indicate roughly how much employment is excluded in the experimental series.

Results by occupation and industry

Chart 2 summarizes the effect of excluding incentive-pay jobs across occupations. Excluding these jobs reduces the volatility of the series in every occupation, with one exception. Volatility does increase in the administrative support, including clerical occupations, but incentive-pay jobs constitute only about 1.5 percent of employment in those occupations. (Table 1 provides data

CHART 1. **Three-month percent changes in the ECI wage and salary index for private industry, March 1995-December 1999**

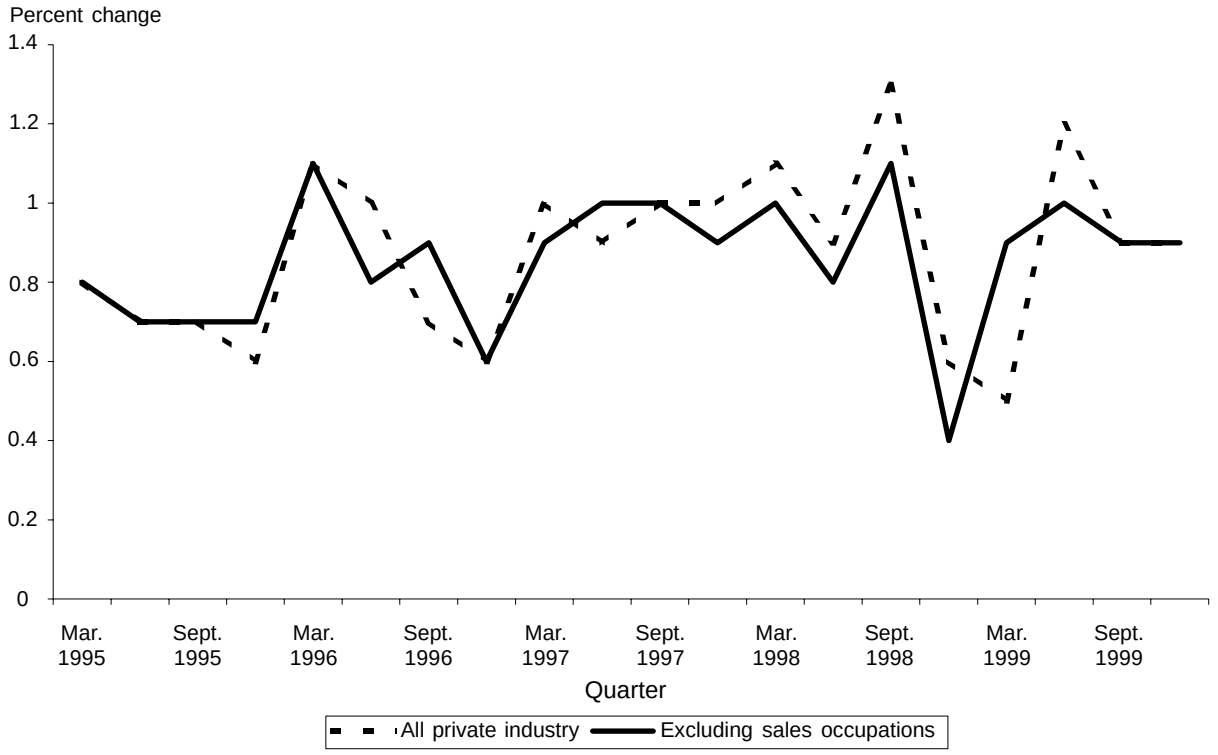

CHART 2. **Volatility of ECI vs. Experimental Index, by major private industry occupations, March 1995-December 1999**

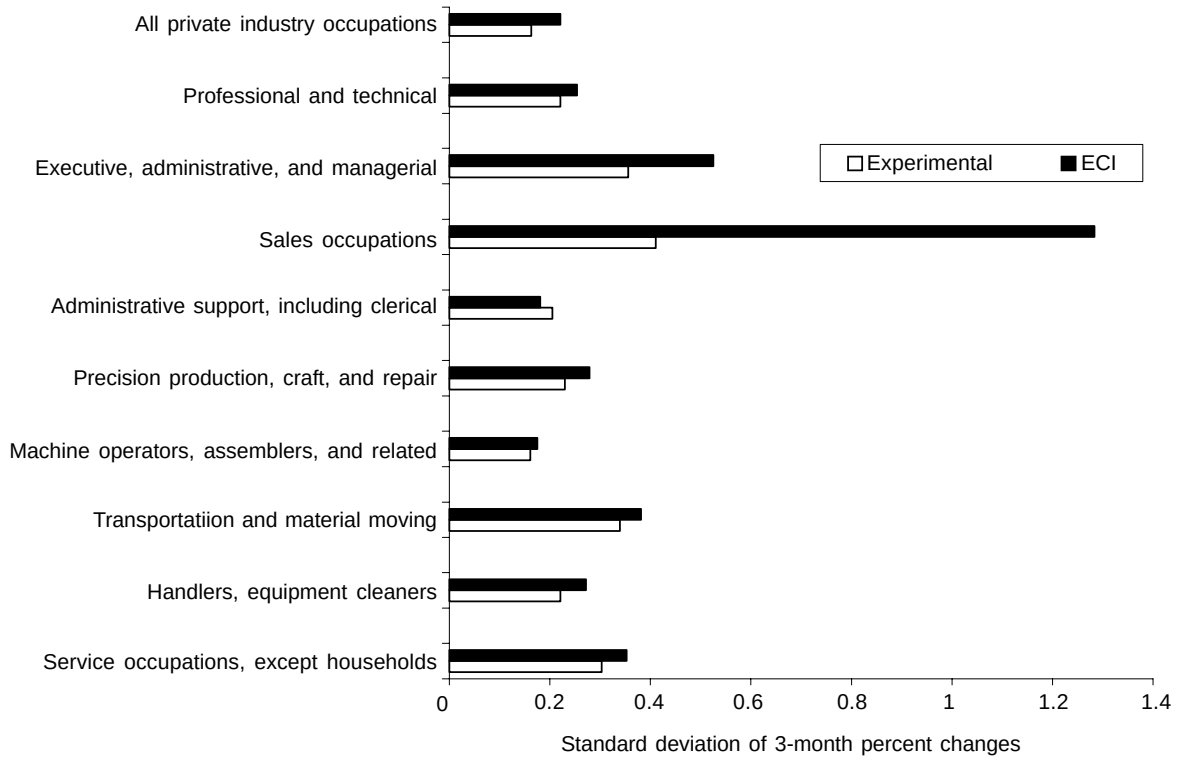

CHART 3. **Volatility of ECI vs. Experimental Index, by major industries, March 1995-December 1999**

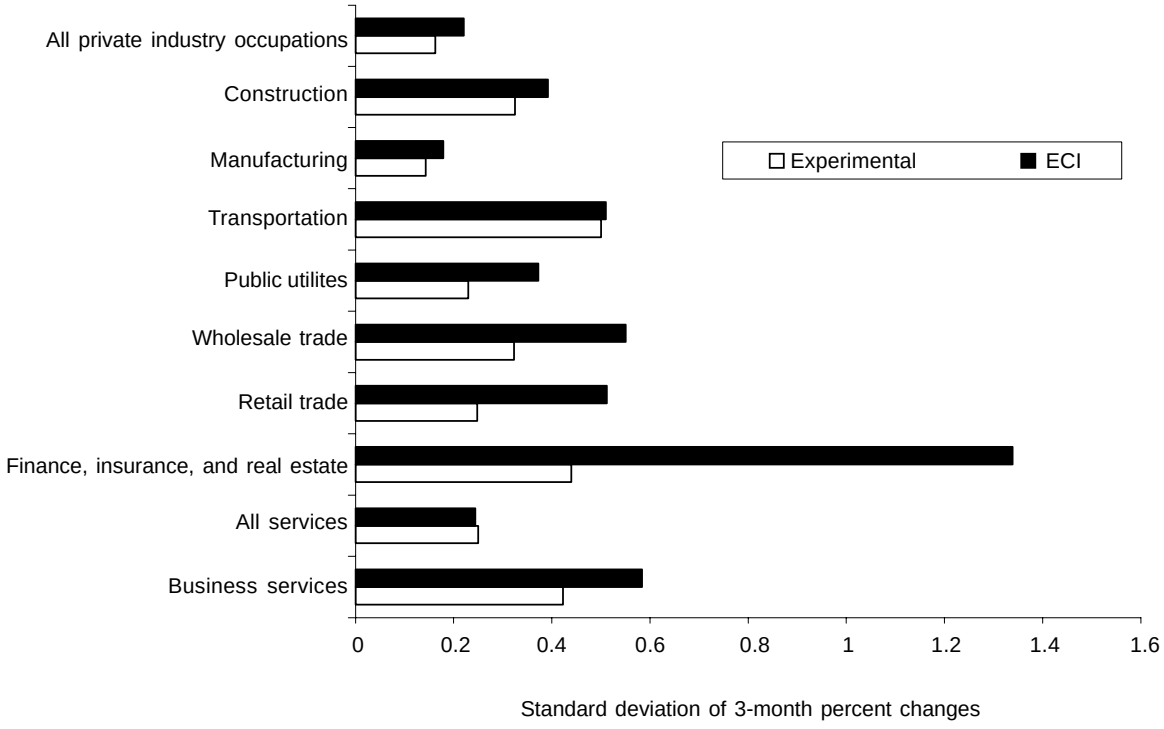

CHART 4. **Three-month percent changes in the ECI wage and salary index, finance, insurance, and real estate industry, March 1995-December 1999**

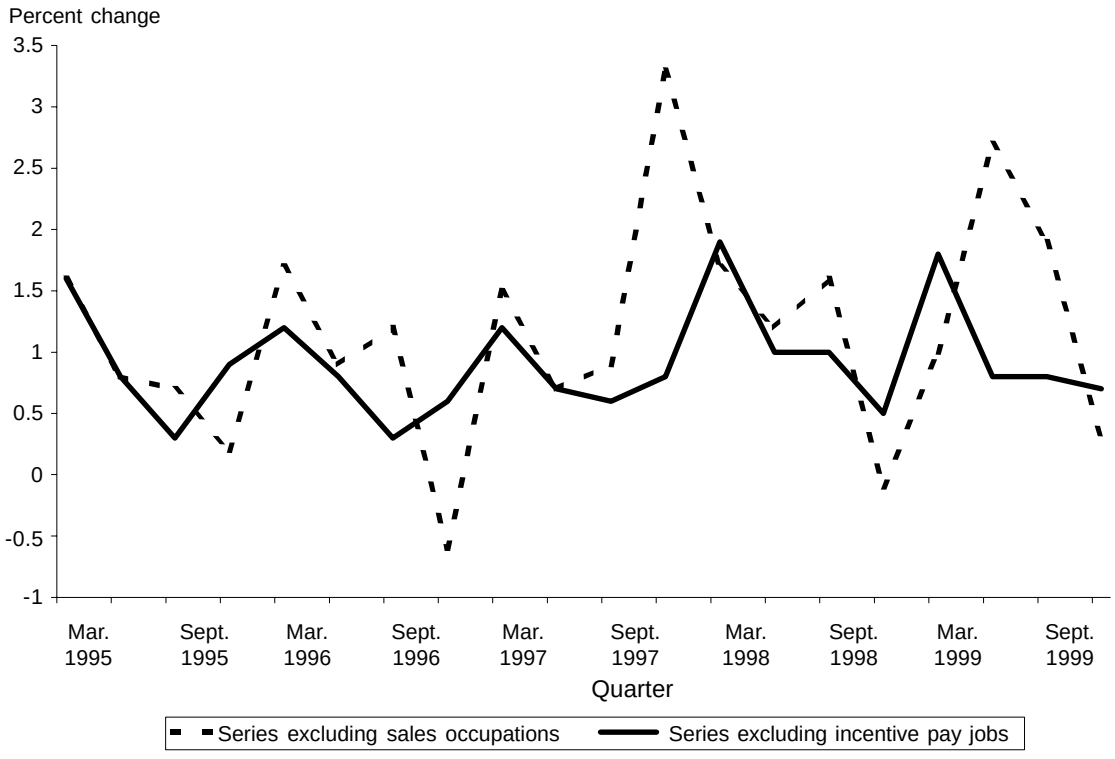

TABLE 3. **Comparisons of selected ECI wage and salary series excluding sales occupations with series excluding jobs with incentive-pay provisions, 3-month percent changes, March 1995-December 1999**

	Average wage growth[1] (in percent)	Volatility measure[2]
All private industry		
All private industry employment	0.88	0.22
Series excluding sales occupations	.86	.17
Experimental series excluding incentive-pay jobs	.82	.16
Nonmanufacturing white-collar occupations		
All nonmanufacturing white collar employment	.93	.33
Series excluding sales occupations	.91	.27
Experimental series excluding incentive-pay jobs	.86	.24
Wholesale trade		
All wholesale trade employment	1.01	.55
Series excluding sales occupations	1.00	.33
Experimental series excluding incentive-pay jobs	.91	.32
Finance, insurance, real estate		
All finance, insurance, and real estate employment	1.21	1.22
Series excluding sales occupations	1.16	.91
Experimental series excluding incentive-pay jobs	.92	.44

[1] Mean 3-month percent change in index.
[2] Standard deviation of 3-month changes in index.

on the incidence of incentive-pay provisions by occupation.) The largest reduction in volatility brought about by excluding incentive-pay jobs is for sales occupations. The volatility of pay changes also is notably reduced for the executive, administrative, and managerial occupations.

Chart 3 presents a similar comparison of volatility of series across industries. Excluding incentive-pay jobs has little effect on the volatility of the series for either the transportation or services industries; in all other industries, volatility is noticeably reduced. The largest reductions occur in the series for retail trade and finance, insurance, and real estate.

Comparisons with ECI series excluding sales occupations

Table 1 shows that fewer than half of all jobs with incentive-pay provisions are in sales occupations (mainly, sales workers paid commissions). Because jobs in sales occupations and jobs receiving incentive pay do partially overlap, selected experimental ECI series were compared with corresponding series that exclude sales occupations. Table 3 shows comparisons for all private industry; nonmanufacturing white-collar occupations; wholesale trade; and finance, insurance, and real estate. In each of these four sectors, the experimental series represent more employment than do the series excluding sales occupations, as the incidence of incentive-pay jobs is less than the incidence of sales jobs. (See table 2.)

In each of the four sectors, the experimental series excluding jobs with incentive-pay provisions exhibited less volatility than the all-worker series or the series excluding sales occupations. The only noticeable difference in volatility, however, is in the finance, insurance, and real estate sector, where the standard deviation of changes in the experimental index is about one-half of the standard deviation of the index excluding sales occupations (second column in table 3). The time series behavior of these two finance, insurance, and real estate series is plotted in chart 4.

It is interesting to note that, in each sector, both the experimental series and the series excluding sales workers show less average wage growth than the corresponding all-worker series. Thus, both sales jobs and jobs with incentive-pay provisions had higher earnings gains in the period studied, which was one of strong labor demand with the nationwide unemployment rate falling from 5.4 percent in March 1995 to 4.1 percent in December 1999.

IT IS OFTEN DESIRABLE for users of wage indexes to net out the effects of changes in rates of pay from other factors that can cause fluctuations in earnings on the job. Data collection for the ECI identifies jobs—"incentive-pay" jobs—that can have volatile earnings even when rates of pay are unchanged. By analyzing experimental indexes that exclude earnings changes in incentive-pay jobs, we find that index volatility was reduced in most ECI industry and occupation series. For U.S. private industry as a whole, the reduction in index volatility was similar to those obtained for ECI indexes that exclude all sales occupations. However, sales occupations are a different population of jobs than jobs with incentive-pay provisions; most sales jobs do not have incentive-pay provisions, and many jobs that do have such provisions are not sales jobs. Thus, the distinction between sales jobs and incentive-pay jobs may be important in analyzing the volatility of ECI series in particular occupations and industries. ■

[1] For further information about ECI, see *Handbook of Methods*, Bulletin 2414 (Bureau of Labor Statistics, September 1992), ch.8.

[2] The March 1995 reweighting of the index expanded the occupational groups from 9 to 10. See table 1 for a complete list of occupational groups. The professional and technical groups are shown together in the table.

[3] The average hourly cost component of the index weights is based on the average hourly costs as of December 1994. These hourly costs are moved forward each quarter by the change in sample-reported hourly cost for each estimation cell.