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Cyclical Aggregation Bias

Michael K. Lettau

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Abstract

The paper estimates the aggregation bias in compensation per hour for the United States, where aggregation bias is defined as the difference over the business cycle between compensation in the typical job and average compensation in the labor market. It compares the Employment Cost Index with the Employer Cost for Employee Compensation, both of which are calculated using the same data from a panel survey of jobs. The results suggest that the aggregation bias is countercyclical, so compensation in the typical job is more procyclical than average compensation in the labor market.

Michael K. Lettau
Office of Compensation and Working Conditions
Bureau of Labor Statistics, mail stop 4130 PSB
2 Massachusetts Avenue NE
Washington, DC 20212
Phone: (202) 606-7396
Fax: (202) 606-6310
lettau_m@bls.gov

I. Introduction

Previous studies of the wage rate over the business cycle define aggregation bias as the difference between the cyclical movement of the wage rate for a typical worker and the average wage rate in the labor market. Average wage measures may misrepresent the movement of the typical worker's wage because the composition of workers changes over the cycle. Previous studies therefore create a panel of continuously employed workers to calculate a wage series that is uncontaminated by changes in the labor force. They disagree as to the sign and magnitude of the aggregation bias, although the preponderance of the evidence suggests it is countercyclical. That is, the typical worker's wage rate is more procyclical than the average wage rate in the labor market. See Abrahams and Haltiwanger (1995) for a review of the literature.

For their uncontaminated series, previous studies focus primarily on holding the set of workers constant over the cycle. Holding the job situation of workers constant receives at most secondary consideration. Bils (1985) finds that wage rates of young men are strongly procyclical for workers who change employers. However, his estimate is much smaller in magnitude and not statistically significant for young men who remain with the same employer. In contrast, Solon, Barsky, and Parker (1994) report that wage rates are only slightly less procyclical for prime-aged male workers who remain with the same employer than for all prime-aged male workers.

This paper also compares the cyclical movement of an average compensation series with a compensation series that is not contaminated by changes in the composition of the labor force. It compares the Employer Cost for Employee Compensation (ECEC) with the Employment Cost Index (ECI), both of which are calculated using data from the

National Compensation Survey (NCS) of the U. S. Bureau of Labor Statistics (BLS). Because the NCS is a panel survey of jobs rather than individuals, the ECI focuses on holding the detailed job situation constant over time, not the individual worker. Therefore, this paper addresses a somewhat difference question from previous studies. How does the cyclical movement of average compensation in the labor market compare to the movement of compensation in the typical job?[1]

Other unique aspects of the paper are the following. The ECI and ECEC are based on the same micro data from the NCS. They differ only in the way these micro data are aggregated. Therefore, they provide an opportunity to compare two widely-reported compensation series that use the same concepts and data collection procedures. Moreover, the NCS is specifically designed and replenished to produce an uncontaminated series that continually represents private and state and local government workers. Further advantages are that the data are collected quarterly, which corresponds more closely to a business cycle frequency than annual measures. Also, the ECI and ECEC report employer costs for fringe benefits as well as wages and salaries. Finally, the data are collected from establishments rather than households, so they may be subject to less measurement error.

The paper is organized as follows. The next section describes the National Compensation Survey and how the ECI and ECEC are calculated. The third section presents the empirical results. The results suggest that the aggregation bias is countercyclical, so compensation in the typical job moves more procyclically than average compensation in the labor market. The final section summarizes.

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[1] Wilson (1996) and Solon, Whatley, and Stevens (1997) each use data from two firm to estimate the cyclicality of wage rates for workers who remain in the same job and workers who remain with the same

II. Description of ECI and ECEC

The NCS is a quarterly survey of jobs within establishments. Like all index number programs, the ECI must define a good that it can price from one quarter to the next. Jobs in the NCS for purposes of the ECI and ECEC are chosen as follows. For each establishment in the survey, a small number of workers are chosen randomly from an employee list. The establishment is then asked which jobs the chosen employees hold. The job refers to the most detailed job classification recognized by the establishment. These jobs become the units of observation, and the NCS collects average data among the workers in the job. Thus, relative to other index number programs at the BLS, the ECI largely defers to the supplier of its data, the establishment, to define what is considered the same good over time. The jobs are scheduled to remain in the NCS for roughly four to five years. See the <u>BLS Handbook of Methods</u> (1997) for a complete description of the NCS.

The ECI is reported as an index number, with a base period arbitrarily defined as 100. The ECEC is reported in dollars and cents. They use the same micro data in their calculation. They just aggregate the micro data differently. This paper interprets their log difference as the aggregation bias. Let the ECI for quarter t equal I_t and let the ECEC for quarter t equal W_t. Their log difference equals the following.

$$[1] \qquad \ln(I_t) - \ln(W_t) \quad = \quad K_o + \ln\left(\sum_i E_{ib} w_{it}^{ECI}\right) - \ln\left(\sum_i E_{it} w_{it}\right)$$

The K_0 term depends on the quarter in which the ECI is defined to equal 100, but it does not vary with t otherwise.

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firm but switch jobs.

Interpretation of the right-hand side of equation [1] as the aggregation bias requires an explanation of how the ECI and ECEC are calculated. The labor market is divided into categories of labor, which are defined by the cross-section of approximately 70 industry and ten occupation groups. The i in equation [1] is the subscript for the categories. The ECI and the ECEC are both calculated in two steps. First, compensation is estimated for each category. Second, the categories are aggregated into the overall estimate. Both steps differ between the ECI and ECEC.

The ECI, which is designed to remove quarter-to-quarter changes in the composition of jobs, calculates compensation for each category of labor using an updating procedure.

$$[2] \qquad w_{it}^{ECI} = w_{it-1}^{ECI} \times r_{it}$$

The variable r_{it} equals average compensation in quarter t divided by average compensation in quarter t-1 among jobs from category i in the sample for both t and t-1. Thus, the ECI does not estimate compensation for category i in quarter t by simply averaging compensation among jobs from the category currently in the sample. Instead, it updates compensation for quarter t-1 by the growth in compensation between t-1 and t among a set of matched jobs. Similarly, the category's compensation in t+1 equals compensation in t updated by the set of jobs matched between t and t+1, etc.

Because the sample is constantly being replenished, jobs matched between t-1 and t will not equal jobs matched between t and t+1, etc. However, the updating procedure ensures that the level of compensation in jobs entering the sample is never compared to the level of compensation in jobs they replace. Consequently, if the distribution of jobs in the labor market is moving toward lower-paying jobs, but the growth rate in compensation is the same for all jobs, the ECI will reflect the constant growth rate. It will not pick up the trend toward lower-compensation jobs, even though jobs entering the sample tend to have lower compensation than the jobs they replace. The ECI is designed specifically to chain out such changes in the distribution of the jobs.

In contrast, the ECEC uses no updating procedure. The ECEC simply uses average compensation among jobs from category i currently in the sample to estimate the category's compensation, which is the numerator for the updating ratio in equation [2]. Therefore, the ECEC will reflect a trend in the labor market toward lower or higher-paying jobs.

The second step for both the ECI and the ECEC is to combine the estimates for the categories of labor into the overall measure. Again, the ECI and ECEC handle the step differently. The ECI continues to focus on removing composition changes, so the categories are aggregated using a fixed set of employment weights from a base period, represented by the E_{ib} terms in equation [1]. In contrast, the ECEC uses current employment shares for the categories of labor, represented by E_{it} in equation [1].

III. Empirical Results

Previous studies on the cyclicality of wage rates generally proceed as follows. They first deflate the average wage series and the uncontaminated series using a price index. They then regress the deflated series separately on a measure of the business cycle. The difference in the coefficient estimates for the cyclical measure estimates the aggregation bias. In contrast, this paper estimates the aggregation bias directly. The log difference between the ECI and the ECEC is regressed on the unemployment rate, which is used as the measure of the cycle. The coefficient for the unemployment rate gives the estimate of the aggregation bias. Estimating the aggregation bias directly has the advantage that any aggregate price index used to deflate both the ECI and ECEC will cancel out of equation [1]. Thus, the relationship between their log difference and the unemployment rate can be interpreted as the aggregation bias in average real compensation as well as average nominal compensation, without the need to introduce a price index into the estimation.

For the empirical exercises, the ECI and ECEC series begin in March 1986 and run through December 1997, although March 1986 is defined as 100 for the ECI, so the sample effectively begins in June 1986. The ECEC was first published in 1987, but the BLS recently reported estimates for 1986.[2] The BLS publishes the ECEC for March quarters only, but this paper calculates ECEC estimates for all quarters using the same procedure. In June 1986, the ECI began using the 1980 Census for the fixed employment weights, as represented by E_{ib} in equation [1]. In March 1995, the ECI switched to the 1990 Occupation Employment Survey (OES). However, this paper continues to use the 1980 Census weights to avoid a slight break in series. The results are very similar when the 1990 OES weights are used for the fixed weights throughout the period. Although the NCS also collects data for workers in state and local government, the results are restricted to workers in private industries.

The results presented are mainly coefficient estimates for the unemployment rate from the following regression.

$$[3] \qquad \ln(I_t) - \ln(W_t) \quad = \quad \alpha_o + \alpha_1 t + \alpha_2 t^2 + \delta' S_t + \beta U_t + \varepsilon_t; \quad \varepsilon_t = \rho \varepsilon_t + \nu_t$$

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[2] See Schwenk (1997).

The S_t terms are dummy variables for June, September, and December, so the log difference between the ECI and the ECEC is regressed on the unemployment rate U_t, a quadratic time trend, and seasonal dummy variables. The error term is assumed to follow first-order autocorrelation.

As background, Chart 1 shows the log difference between the ECI and ECEC for wages and salaries, benefits, and total compensation. Total compensation equals the sum of wages and salaries and benefits. The log difference is set to zero in March 1986 for each of the three series. The ECI grew relative to the ECEC for all of them, although the differential increased the most for benefits. From March 1986 through December 1997, the ECI grew by 49, 68, and 54 percent for wages and salaries, benefits, and total compensation, respectively, while the ECEC grew by 39, 41, and 39 percent.

Superimposed on the right-hand axis of Chart 1 is the unemployment rate. The unemployment rate series is for private wage and salary workers in all nonagricultural industries except private households, because it matches the scope of the NCS most closely. The unemployment rate declines from the beginning of the period through the end of the 1980s. It then increases to the trough of the business cycle at the end of 1991 and the beginning of 1992. The unemployment rate declines steadily after 1992.

Lettau, Loewenstein, and Cushner (1997) documents the dominant feature in Chart 1, the divergent growth between the ECI and the ECEC, which suggests a shift toward lower-compensation jobs. Here, the focus is on the business cycle. As specified in equation [3], if an expansion in the labor market augments the shift toward lower-compensation jobs beyond the time trend, the aggregation bias is countercyclial.

Conversely, if an expansion offsets the longer-term trend, the aggregation bias is procyclical.

The top third of Table 1 shows estimates of the unemployment rate coefficient in equation [3] for workers from all private industries. The columns present separate results for wages and salaries, benefits, and total compensation. For all three dependent variables, the coefficient estimate for the unemployment rate is negative, although it is not statistically significant for benefits. The negative estimates suggest the aggregation bias is countercyclical, so compensation in the typical private job is more procyclical than average compensation among private workers.

Chart 2 makes the negative comovement between the aggregation bias and the business cycle more transparent. It plots the residuals of the log difference between the ECI and ECEC and the unemployment rate from regressions on the quadratic time trend and the seasonal dummy variables. The residuals for the log difference clearly tend to be above zero when the residuals for the unemployment rate are below zero, and vice versa. One exception is during the recession of the early 1990s, when the residual for the unemployment rate becomes positive a few quarters before the residual for the log difference becomes negative. However, due to some details of the ECEC calculation, the aggregation bias might be expected to lag the unemployment rate by at least a quarter or two. It is actually somewhat surprising how contemporaneous their comovement is. The next section explores these details of the ECEC more fully.

One way to gauge the magnitude of the coefficient estimates for the unemployment rate is to compare them to the time trend. The countercyclical aggregation bias implies that a contraction in the labor market partially offsets the trend toward lower-compensation jobs. Between June 1986 and September 1997, the median unemployment rate is 5.9, while the maximum is 8.4. For wages and salaries, an increase in the unemployment rate from 5.9 to 8.4 reduces the expected log difference between the ECI and the ECEC by 0.01. Equation [3] specifies the time trend as quadratic, but evaluated at the median for the period, the estimated time trend must be multiplied by 8.1 quarters to equal 0.01. Thus, for wages and salaries, an increase unemployment rate from the median to the maximum offsets about two years of the trend shift toward lower-compensation jobs.

For benefits and total compensation, the estimates for the unemployment rate coefficients are smaller in magnitude relative to their time trends. For total compensation, an increase in the unemployment rate from 5.9 to 8.4 offsets about five quarters of the trend shift toward lower-compensation jobs. For benefits, where the coefficient estimate is not statistically significant, the same increase in the unemployment rate offsets only about two and a half quarters of the time trend. The shorter offset period for benefits is due at least in part to the stronger trend in the shift toward lower-compensation jobs.

To summarize the results so far, after controlling for trend and seasonal effects, the aggregation bias is countercyclical, at least for wages and salaries. Thus, movement in the average compensation in the labor market tends to understate the procyclical movement of compensation for the typical job.

Panel effects in the ECEC

The analysis so far ignores details of the calculation of the ECEC that potentially affect the results. As mentioned above, jobs in the NCS sample are scheduled to remain for four to five years after they enter the calculation of the ECI and the ECEC. This design suits the ECI. The BLS introduced the ECEC as a byproduct of the ECI because data users wanted a level series in addition to the index series. Ideally, for purposes of the ECEC, the entire sample would be replenished each quarter. However, the average overlap for the set of jobs matched between t-1 and t and between t and t+1 was 91 percent for June 1986 through December 1997, so the sample is replenished slowly. At the lower level of aggregation, compensation for each industry-occupation category differs between the ECI and the ECEC only to the degree to which the sample is replenished. Therefore, a general trend in the labor market toward lower-compensation jobs may show up as cyclical movement if the replenishment scheme of the NCS corresponds to the business cycle.

Three extensions to the initial results attempt to control for this. First, separate results are presented for goods-producing and service-producing industries. Second, direct measures of the replenishment scheme are included in the regressions as control variables. Third, the ECEC series are replaced by experimental ECEC series, which attempt to remove panel effects due to sample replacement.

Until recently, the NCS used an industry rotation system. Each quarter, a group of two-digit industries was chosen to have its sample replaced. All establishments from these industries left the sample and replacement establishments entered the sample. Therefore, any split by industry group produces two samples with quite different time patterns for their replenishment. The bottom two-thirds of Table 1 shows results separately for goods-producing industries, which are mining, construction, and manufacturing, and service-producing industries, which are the balance of industries.

This split is not on the theoretic grounds that these are separate labor markets or that the aggregation bias is larger for one industry group than the other. It is merely to compare two groups with different replenishment schedules. The groups are not equal in size. In September 1997, service-producing industries contained about three-quarters of employment, while goods-producing industries contained one-quarter. Also, the unemployment rate now corresponds to the relevant industry group.

Splitting the sample by industry group has a large effect on the estimate of the aggregation bias. For the goods-producing industries, the coefficient estimates for the unemployment rate are small in magnitude and not statistically significant. In contrast, for service-producing industries, the coefficient estimates for wages and salaries and total compensation remain statistically significant, and they become larger in magnitude. Chart 3 shows the residuals after the regression on the time trend and the seasonal variables for wages and salaries in service-producing industries. As in Chart 2, the negative comovement between the residuals for the log difference and the unemployment rate is apparent. In fact, removing the goods-producing industries strengthens the countercyclical movement of the aggregation bias.

A second test for the effect of the sample replenishment on the results is to include a direct measure of the replenishment scheme in the regressions as a control variable. The variable used is the average time in the NCS among quotes in the quarter's sample. The percent of overlap between matched jobs from one quarter to the next was also tried, but the time-in-sample variable seems more appropriate. The log difference between the ECI and the ECEC is a cumulative measure of the divergence in the two series. Correspondingly, the average time in sample for the jobs is a cumulative measure of the replenishment scheme.

Chart 4 demonstrates the effect of including the time-in-sample variable. It shows two sets of residuals for the log difference between the ECI and ECEC for benefits in goods-producing industries. The first set is from a regression on the quadratic time trend and the seasonal variables, which determines the statistically insignificant coefficient estimate in the middle of Table 1. The second set is from the same regression, but with the average time in the NCS for the quarter's sample added an explanatory variable. The residuals without the time-in-sample variable reveal when the manufacturing industries had their sample replenished, at the end of 1989 and again in 1994. They show a sawtooth pattern, which is expected for the detrended difference between two series that differ only because jobs entering the sample have lower compensation than the jobs they replace. However, including the time-in-sample variables removes the sawtooth pattern. In fact, the residuals start to show a bit of the cyclical pattern. With the time-in-survey variable included in equation [3], the coefficient estimate for benefits in goods-producing industries becomes statistically significant at –0.0032 with a standard error of 0.0014. For service-producing industries, including the time-in-sample variable has little effect on the estimates for the unemployment rate coefficient.

The final test for the effect of replenishment uses experimental ECEC series, which attempt to lessen the panel effects. The update procedure in equation [2] requires a job to be in the NCS at least one quarter before it enters the calculation of the ECI. Because the ECEC uses the same production sample as the ECI, jobs enter its calculation with at least a one-quarter lag.[3] Therefore, the first experimental ECEC introduces jobs into its calculation more quickly than the published estimates. However, the estimates for the unemployment rate coefficients do not change much.

A more radical experimental ECEC uses the quarter of overlap between exiting and replacement quotes to smooth the transition to the replacement quotes. Assume that, after accounting for sampling variation, the difference in compensation between the incoming and outgoing jobs in the overlap quarter represents bias that has accumulated in the outgoing panel. Assume further that this bias accumulates at a constant rate as the panel ages. Compensation in previous quarters can then be adjusted by the bias estimate. This adjustment smoothes the transition to the replacement jobs, and it also helps to account for the lack of representativeness of the sample due to its infrequent replenishment.

Table 2 shows estimates for the unemployment rate coefficient after this experimental ECEC replaces the standard ECEC. Because the adjustment for the bias becomes available only after the jobs rotate out of the sample, the time period runs only through June 1994. Even though the time period is shorter, the standard errors for the coefficient estimates are smaller than in Table 1, which likely results from the smoother ECEC series. Consequently, the coefficient estimates when the log difference in benefits is the dependent variable become statistically significant. For wages and salaries, the magnitude of the coefficient estimates is smaller in Table 2 than Table 1. However, this

[3] Beginning in March 1996, the production samples for the ECI and ECEC have differed slightly. Their difference is due primarily to a treatment of suppression codes. It is not due to a faster introduction of jobs into the calculation of the ECEC. This paper replicates the ECI and ECEC estimates using programs written by the Compensation Research Group of the Office of Compensation and Working Conditions at the BLS. The production samples for these replications are identical.

is due in part to the different time period. When the sample is restricted to the shorter time period, the estimates using the standard ECEC are more similar.

In summary, although the structure of the ECI sample scheme is not ideal for the calculation of the ECEC, panel effects do not seem to drive the finding of a countercyclical aggregation bias. Both incorporating direct measures of the replenishment scheme and using the experimental ECEC series tends to strengthen, rather than weaken, the evidence for a countercyclical bias.

Results using the average hourly earnings from the CES

Perhaps the best-known average wage series the BLS produces is the average hourly earnings series from the Current Employment Survey (CES) program. The results comparing the ECI and ECEC therefore raise the question of whether a countercyclical aggregation bias also results from comparing the ECI and the CES.

The ECI must be modified to match the scope and concepts of the CES. When the log difference between the modified ECI and average hourly earnings from the CES is the dependent variable in equation [3], the estimate for the unemployment rate coefficient is actually positive and marginally significant at twelve percent. However, the positive correlation is due to a mechanical difference between how the two series account for overtime. The NCS collects overtime hours for a job only when it enters the survey. Overtime hours are held constant in subsequent quarters. Consequently, the update procedure in equation [2] ensures that the modified ECI for wages and salaries plus overtime is virtually identical to the ECI for wages and salaries.

Separate regression results for industry groups demonstrate the effect of the collection of overtime. For nonsupervisory workers in service-producing industries, the coefficient estimate for the unemployment rate is negative, though not statistically significant. In contrast, for production workers in manufacturing industries, where overtime hours are more prevalent, the corresponding coefficient estimate for the unemployment rate is positive and statistically significant.

The procyclical estimate of the aggregation bias for production workers in manufacturing is due entirely to the procyclicality of overtime hours in the CES. When the dependent variable in equation [3] is the log difference between the ECI for wages and salaries and straight-time hourly earnings from the CES, the estimate for the unemployment rate coefficient is not statistically significant and very close to zero. Thus, the procyclical movement of overtime hours in the CES drives the procyclical estimate for the aggregation bias. There is no additional evidence for either a procyclical or a countercyclical aggregation bias. However, it may be too much to expect two surveys with disparate methods of data collection to show more than a long-run correspondence. Abrahams, Spletzer, and Stewart (1998) describes the calculation of average hourly earnings from the CES.

IV. Summary

This paper defines aggregation bias as the difference over the business cycle between compensation in the typical job and average compensation in the labor market. It compares the Employment Cost Index with the Employer Cost for Employee Compensation, both of which are based on the same micro data from the National

Compensation Survey. The results suggest that the aggregation bias is countercyclical, so compensation in the typical job is more procyclical than average compensation in the labor market.

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Table 1

Regression Results for Log Difference between the ECI and the ECEC
Coefficient Estimates for the Unemployment rate

	Wages and Salaries	Benefits	Compensation
workers in all private industries			
unemployment rate	-0.0040**	-0.0034	-0.0034**
	(0.0013)	(0.0028)	(0.0016)
autocorrelation of residual	0.52	0.63	0.63
number of quarters	47	47	47
workers in goods-producing industries			
unemployment rate	-0.0009	-0.0022	-0.0013
	(0.0018)	(0.0029)	(0.0020)
autocorrelation of residual	0.70	0.61	0.66
number of quarters	47	47	47
workers in service-producing industries			
unemployment rate	-0.0078**	-0.0050	-0.0068**
	(0.0016)	(0.0039)	(0.0020)
autocorrelation of residual	0.39	0.58	0.52
number of quarters	47	47	47

Standard errors are in parentheses; * indicates statistical significance at 10%; ** indicates statistical significance at 5%. All regressions also include a quadratic time trend and seasonal dummy variables.

Table 2

Regression Results for Log Difference between the ECI and the Experimental ECEC

Coefficient Estimates for the Unemployment rate

	Wages and Salaries	Benefits	Compensation
workers in all private industries			
unemployment rate	-0.0021**	-0.0036**	-0.0025**
	(0.0009)	(0.0010)	(0.0008)
autocorrelation of residual	0.40	0.32	0.32
number of quarters	33	33	33
workers in goods-producing industries			
unemployment rate	-0.0005	-0.0019**	-0.0011**
	(0.0006)	(0.0005)	(0.0004)
autocorrelation of residual	0.32	-0.04	0.07
number of quarters	33	33	33
workers in service-producing industries			
unemployment rate	-0.0044**	-0.0075**	-0.0050**
	(0.0015)	(0.0020)	(0.0014)
autocorrelation of residual	0.42	0.44	0.44
number of quarters	33	33	33

Standard errors are in parentheses; * indicates statistical significance at 10%; ** indicates statistical significance at 5%. All regressions also include a quadratic time trend and seasonal dummy variables.

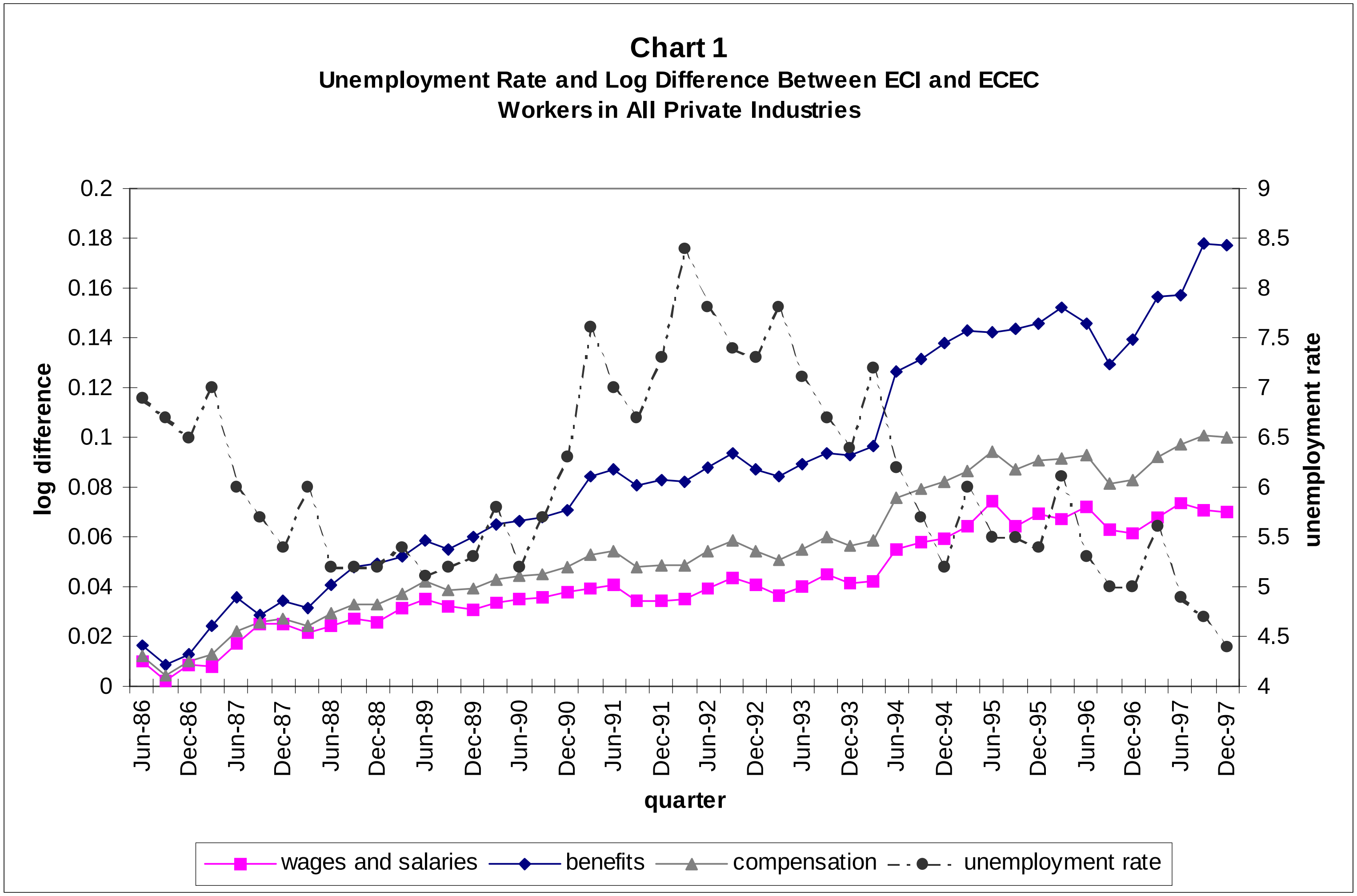
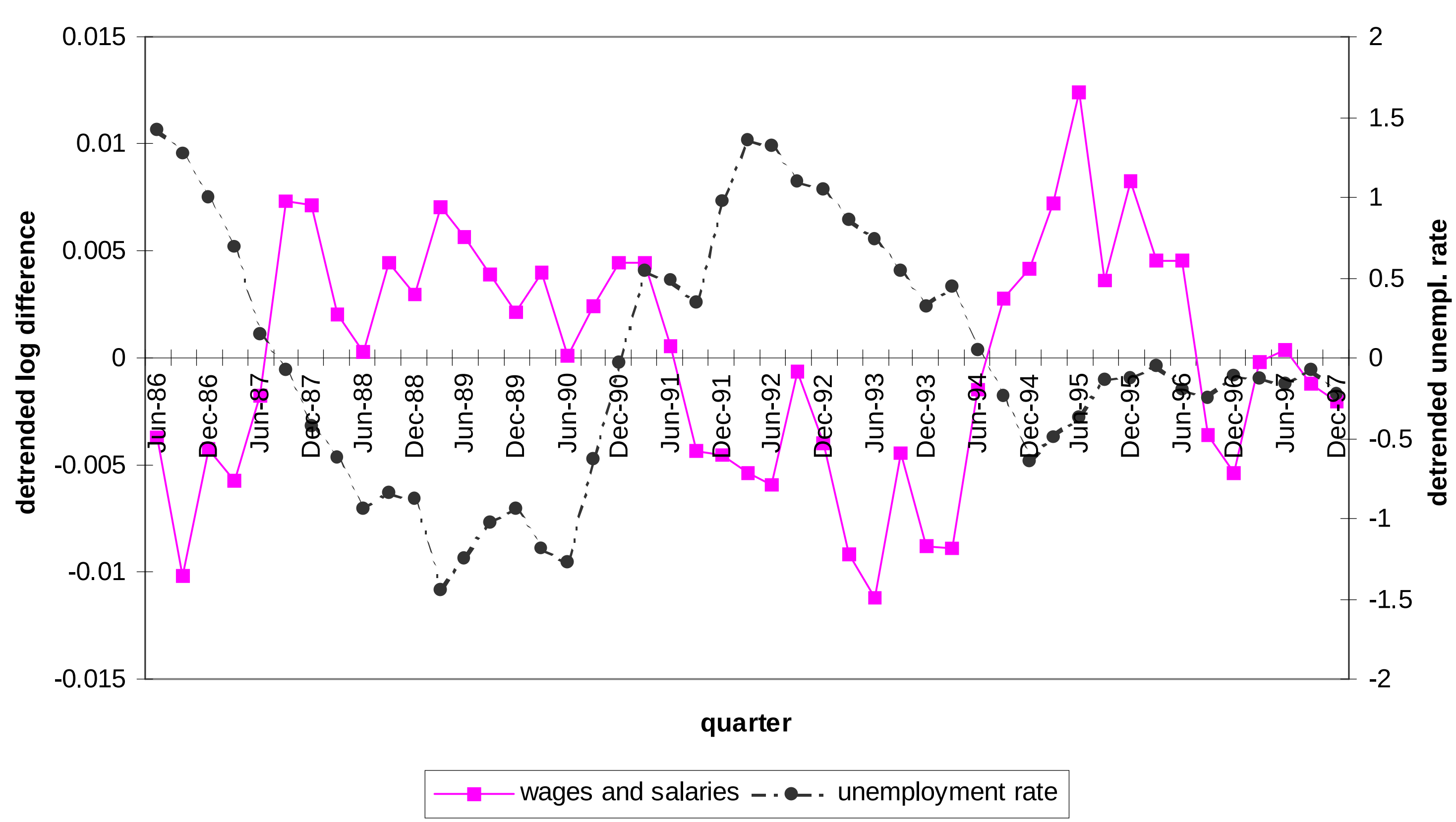


Chart 1
Unemployment Rate and Log Difference Between ECI and ECEC
Workers in All Private Industries
log difference
unemployment rate
quarter
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
4
4.5
5
5.5
6
6.5
7
7.5
8
8.5
9
Jun-86
Dec-86
Jun-87
Dec-87
Jun-88
Dec-88
Jun-89
Dec-89
Jun-90
Dec-90
Jun-91
Dec-91
Jun-92
Dec-92
Jun-93
Dec-93
Jun-94
Dec-94
Jun-95
Dec-95
Jun-96
Dec-96
Jun-97
Dec-97
wages and salaries
benefits
compensation
unemployment rate

Chart 2

Unemployment Rate and Log Difference Between ECI and ECEC Workers in All Private Industries



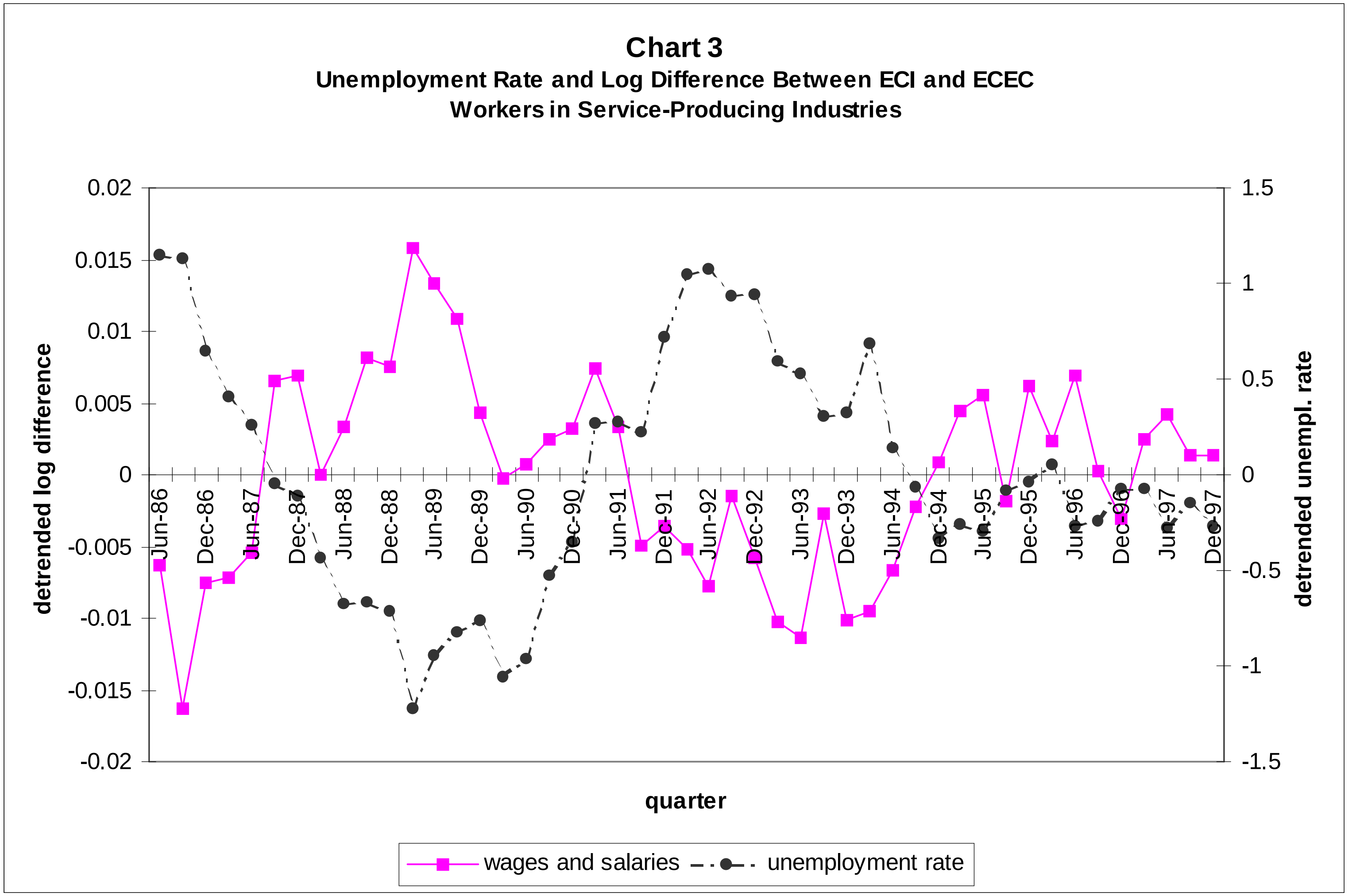


Chart 3
Unemployment Rate and Log Difference Between ECI and ECEC
Workers in Service-Producing Industries
detrended log difference
detrended unempl. rate
0.02
0.015
0.01
0.005
0
-0.005
-0.01
-0.015
-0.02
1.5
1
0.5
0
-0.5
-1
-1.5
Jun-86
Dec-86
Jun-87
Dec-87
Jun-88
Dec-88
Jun-89
Dec-89
Jun-90
Dec-90
Jun-91
Dec-91
Jun-92
Dec-92
Jun-93
Dec-93
Jun-94
Dec-94
Jun-95
Dec-95
Jun-96
Dec-96
Jun-97
Dec-97
quarter
wages and salaries
unemployment rate

Chart 4
Detrended Log Difference Between ECI and ECEC Workers in Goods-Producing Industries