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The Conference Board Employment Trends Index (ETI)™

Introduction

The Conference Board produces respected indexes of economic indicators like the Leading Economic Index™ (LEI) and Coincident Economic Index™ (CEI), and the Consumer Confidence Index™, the CEO Confidence Measure as well as individual indicators like the Help-Wanted Online Data Series (HWOL)™. On June 9, 2008, The Conference Board launched the Employment Trends Index (ETI)™, the only publicly available leading composite index for employment.

The Employment Trends Index (ETI)™ offers a short-term, forward look at employment on its own. It gives economists and investors a new forecasting tool. It also helps business executives sharpen their short- to medium-term hiring and compensation planning.

Employment is a critical part of the overall economic picture, the monthly payroll employment series from the U.S. Bureau of Labor Statistics (BLS) is a component of the CEI. But employment sometimes behaves very differently from the more general economic activity measured by the CEI or GDP. For example, economic activity started picking up at the end of 2001, while employment kept falling until the middle of 2003. And employment has fallen since the start of 2008, while some measures of economic activity, GDP in particular, have yet to peak.

As a composite index, the Employment Trends Index (ETI)™ aggregates eight labor-market indicators from different sources, each of which has proven accurate in its own area. The main benefit of looking at a composite index is that individual indicators sometimes show erratic movements from month to month that do not necessarily reflect underlying trends. This can happen, for example, because of changes in seasonal patterns, inaccuracies due to small samples, or one-off events. Aggregating a group of individual indicators, filters out this so-called "noise" to see the underlying trends more clearly.

The sections below describe the target variable chosen for The Conference Board Employment Trends Index (ETI)™, the components of the index, and its construction, followed by an evaluation and recommendations.

Target Variable

An employment measure was needed as a reference series in order to evaluate the quality of the indicators and the index itself. BLS has two monthly surveys that measure employment in the United States: the Current Population Survey (CPS), also known as the household survey, and the Current Employment Statistics (CES), also known as the payroll survey (Figure 1). These two measures are highly correlated and have very similar turning points. Most economists view the CES payroll survey as the more reliable measure of employment, especially because of its relative smoothness. The standard deviation of the change in the monthly growth in employment is 174,000 in the CES payroll survey, as compared to 435,000 in the CPS household survey, so the CES payroll survey was chosen as the target variable for the Employment Trends Index (ETI)™ analysis.

In addition, the unemployment rate is a very important U.S. labor-market indicator, related to — but with consistently different turning points from — employment. It takes more than a rise in employment to bring about a fall in unemployment; employment must increase faster than the labor force does to reduce the unemployment rate. When employment growth gradually declines before a recession, this normally leads to a trough in unemployment several months before the growth rate of employment turns negative. The same is true in a recovery. Thus, unemployment tends to lead employment in peaks and lag employment in troughs.

Figure 1-Household Survey and Payroll Survey

* Leads/lags are in relation to the turning points of Payroll Employment
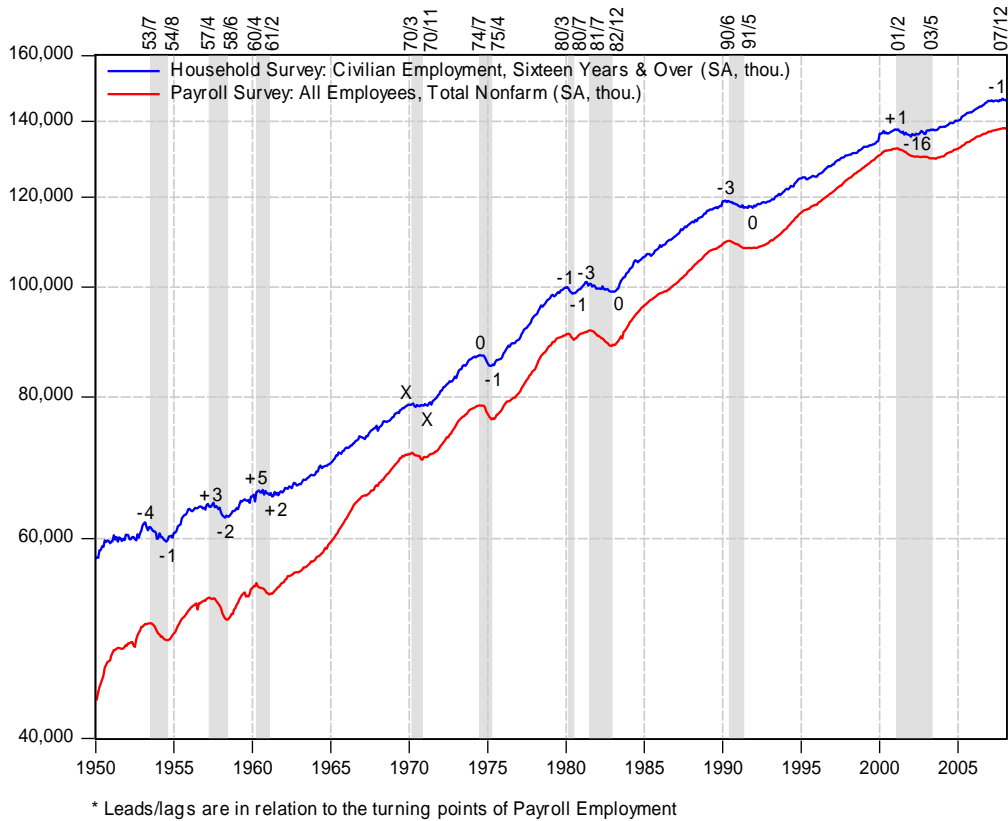
The Components

Below is a list of the eight components chosen for the Employment Trends Index (ETI)™. The criteria were: leading ability before turning points, smoothness, correlation with employment, period of availability, and frequency. Table 1 (see page 7) shows the lead in months that maximizes the correlation of the six-month growth rates of each component with the target variable. Table 2 (see page 14) shows the analysis of the turning points of each component relative to the turning points of the target variable.

1. **Percentage of respondents who say they find "Jobs Hard to Get" (The Conference Board Consumer Confidence Survey):** The difficulty of getting a job is determined by how many employees' companies are hiring and by the number of workers competing for each job, which is approximated by the unemployment rate.

This component is highly correlated with employment and consistently leads before peaks in employment.

2. **Initial Claims for Unemployment Insurance, State Programs (U.S. Department of Labor):** This component measures the number of new claims for unemployment compensation; this is also a component of the LEI. It tends to lead the unemployment rate (which in turn leads employment), consistently before both peaks and troughs. This component is not highly correlated with employment compared to the other components, and has the largest number of false signals.

3. **Percentage of Firms With Positions Not Able to Fill Right Now (© National Federation of Independent Business Research Foundation):** This component measures the demand for labor before hiring actually occurs. It consistently leads employment before peaks and is one of the components that do not produce false signals.

4. **Number of Employees Hired by the Temporary-Help Industry (U.S. Bureau of Labor Statistics)[1]:** Firms tend to let go of temporary workers before permanent ones as the economy weakens, and to hire temporary workers before permanent ones as they cautiously test a strengthening economy. This component is highly correlated with employment and tends to lead before peaks.

5. **Part-time Workers for Economic Reasons (BLS):** This component measures the number of employees who settle for part-time positions although they wanted full-time work instead. Companies tend to shift some of their workforce to part-time prior to reducing the number of workers. This component significantly leads employment before peaks, but has a relative low correlation with employment and produces several false signals[2].

6. **Job Openings (BLS, through Job Openings and Labor Turnover Survey):** Job Openings tend to lead employment.

7. **Industrial Production (Federal Reserve Board)** and

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[1] The time series Temporary Help Services is created as follows: The original data, as reported by BLS, comes in two segments. The currently active segment, NAICSTHS, tracks back only to 1990:1, and it is under the definition of NAICS. The second segment, SIC7363, spans from 1982:01 to 2003:04, and it uses the definition of SIC, which use has been discontinued by BLS. Although the two segments are slightly different in definition, they are indeed very similar in terms of their actual behavior. We can project one time series using the trend of another, to create one series that spans throughout the period. We take the ratios between NAICSTHS and the new SIC7363 in 1990:01 by dividing SIC7363 by NAICSTHS. Next, we take the ratio found using the same method.
[2] This component is calculated as the ratio between part-time workers for economics reasons, divided by total part-time workers.

8. **Real Manufacturing and Trade Sales (U.S. Bureau of Economic Analysis).** These last two components are good monthly indicators of economic activity, which is highly correlated with employment. In response to changes in economic activity, companies usually adjust productivity and work hours before changing their workforce. Both components are highly correlated with employment and consistently lead before peaks in employment.

The Composite Index

The aggregation of these eight components into the Employment Trends Index (ETI)™ is done using the same methodology as that used in constructing the Leading Economic Index™ (LEI). All components are equally weighted and volatility adjusted so that no single component can dominate the index. The volatility adjustment is done by calculating standardization factors determined by the standard deviation of the monthly percent change in each component. The period used for calculating the standardization factors begins in 1973 and ends at 2007. The standardization factors are then used to construct the index from 1973 to 2008. Below are the standardization factors for each component.

Standardization Factors	
Jobs Hard to Get	0.04
Initial Claims for Unemployment Insurance	0.04
NFIB	0.03
Temporary-Help Industry	0.19
Part-time Workers	0.06
Job Openings	0.08
Industrial Production	0.33
Real Manufacturing and Trade Sales	0.23
Total	1.00

Figure 2 plots the Employment Trends Index (ETI)™ against total non-farm employment.

Figure 2 - Employment Trends Index (ETI) and Total Employment

Millions   Index, 1996=100

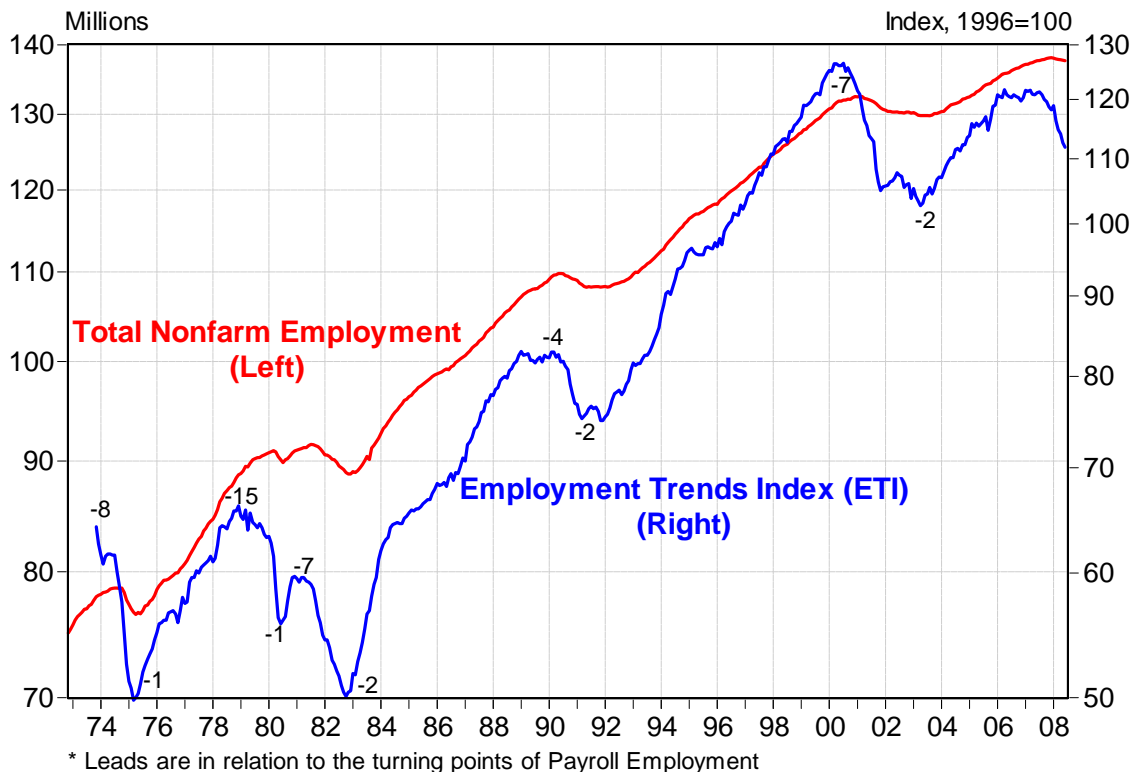* Leads are in relation to the turning points of Payroll Employment

Table 1 shows that the Employment Trends Index (ETI)™ leads employment by two months, and that the correlation between the six-month growth rates of employment and the index is very high (0.85). In fact, the correlation between employment and the Employment Trends Index (ETI)™ is higher than the correlation between employment and each of the index's components.[3]

Table 2 (see page 14, at the end of the document) shows that the index comfortably leads employment before every peak. It also leads employment before most troughs.

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[3] An exception to this is the Job Openings (JOLTS) which begun only in December 2000.

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Table 1 – Components & Correlations with Total Employment	Date Available	6-month growth rate**	
		Lag(+)/ Lead(-) (in	Cross
Index	From	months)*	correlation
Employment Trends Index (ETI)	1973M11	-2	0.8515
Component			
Consumer Confidence Appraisal Pres. Sit:Employment "Jobs Hard to Get" (% Respondents; SA)	1973M11	-2	-0.7676
Initial Claims for Unemployment Insurance, State Program, Wkly Avg (SA, Thou.)	1973M11	-3	-0.6131
NFIB: Percentage of Firms with Jobs Not Able to Fill Right Now (SA, %)	1973M11	-3	0.583
Number of Temporary Employees (SA, Thou.)	1982M01	-3	0.8318
Work Part Time: For Economic Reasons: All Industry (SA, Thou.)	1973M11	-2	-0.6988
Job Openings(SA, Thou.)	2000M12	-2	0.8766
Industrial Production Total Index (SA, 1997=100)	1973M11	-1	0.8084
Real Manufacturing and Trade Sales (mil. Chain 2000$)	1973M11	-2	0.7352

* The lead that maximizes the correlation
** Correlation of data from 11/1973 to 3/2008

Figure 3 shows the standard deviation of the change in the monthly growth rate of the components and the index itself. The index is smoother than seven of its eight components; four of the components are more than five times noisier than the index.

An out-of-sample forecasting framework is used to evaluate the forecasting ability of the Employment Trends Index (ETI)™. Such exercises use sub-samples to produce forecasts, then investigate the accuracy of the forecasts by comparing them to the true values of the dependent variables. These exercises tested whether the inclusion of the ETI in the

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regressions improved the accuracy of the forecasts. The out-of-sample exercise in this analysis was conducted in the following way: In the baseline specification of employment, the independent variables are only the lags of employment. It is first estimated for the period of 1974:2 to 1979:1. The first quarter of 1979 was used as the end period to allow for a long enough sample to estimate the initial parameters. Using the results of this estimation, the one-quarter-ahead forecast is calculated. The model is then continuously re-estimated after adding one quarter at a time, each time calculating the one-quarter-ahead forecast. The end result is a series of 115 quarterly forecasts that can be compared to the true value of the dependent variable. For each series of forecasts, the mean squared error is computed and is the basis for the comparison between the forecasting ability of different specifications.

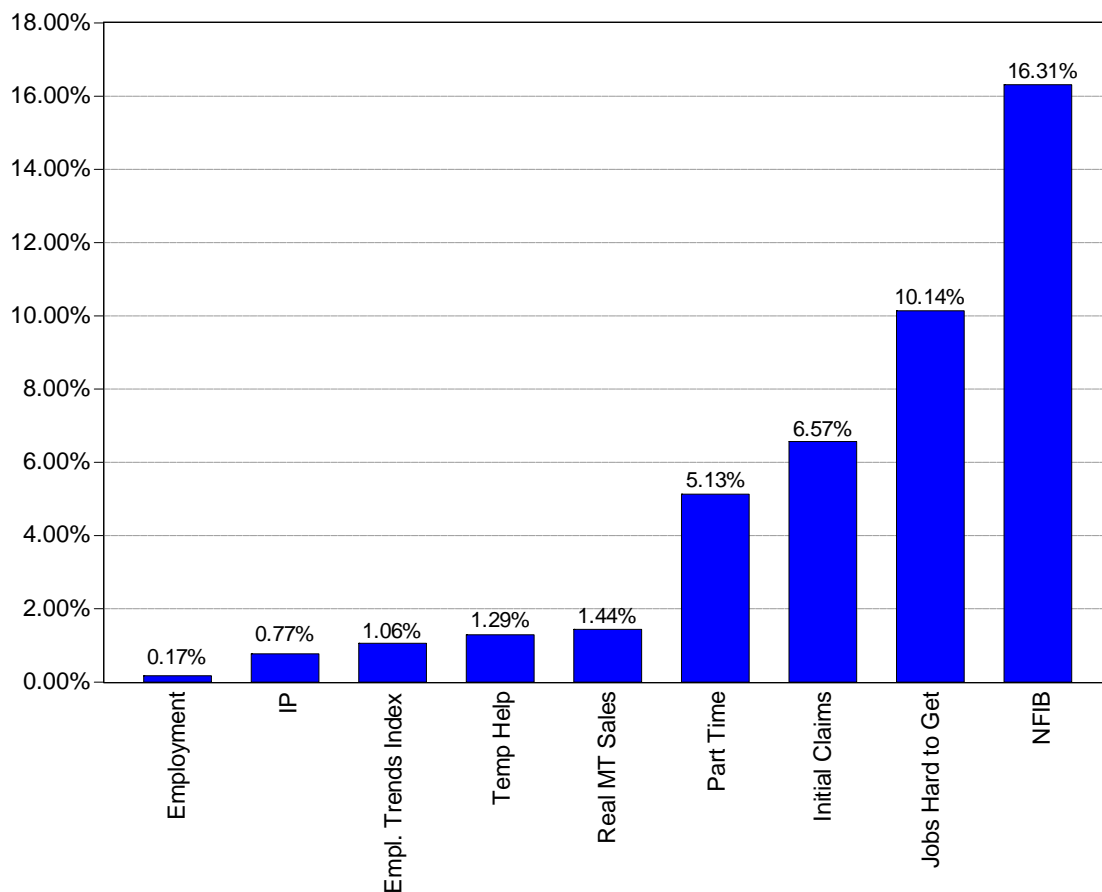**Figure 3 - Standard deviation of the change in the monthly growth rate**

Table 3 shows the ratio between the mean squared error derived from each specification and the mean squared error derived from the baseline model. Numbers smaller than 1 indicate an improvement in the forecasting accuracy. The results show that the inclusion of Employment Trends Index (ETI)™ reduced the MSE. However, that was not the case when individual components were added to the base specification.

The index has a trend that is steeper than the trend of employment. This is adjusted so that average growth rates of employment and the index are equal.

Table 3 – Out of Sample - MSE Divided by MSE of AR(2) Model

	Employment	Unemployment Rate
Employment Trends Index (ETI)	0.88	0.92
Jobs Hard to Get	1.08	1.09
Initial Claims for Unemployment Insurance	1.06	1.16
NFIB	1.07	1.07
Temporary-Help Industry	0.96	1.13
Part-time Workers	1.06	1.08
Industrial Production	1.04	1.07
Real Manufacturing and Trade Sales	1.24	1.11

Ratio between the mean squared error derived from each specification and the mean squared error derived from the baseline model. Numbers smaller than one indicate an improvement in the forecasting accuracy.

Conclusion

This new leading index for employment is highly correlated with employment, consistently provides leads before turning points in employment, and does not provide false signals. The Employment Trends Index (ETI)™ is more correlated with employment than its individual components are, and improves the ability to forecast employment and the unemployment rate. The Employment Trends Index (ETI)™ is an important new tool for tracking employment Trends.
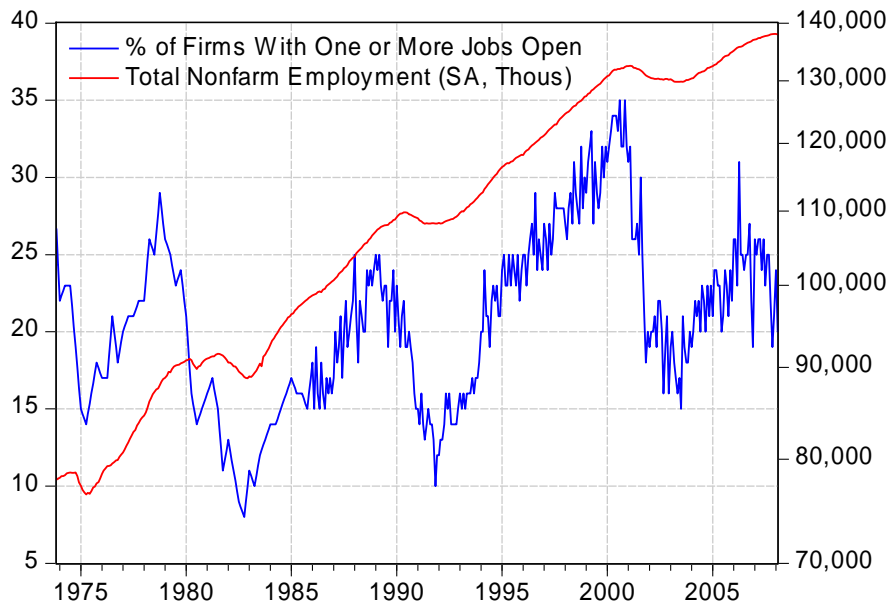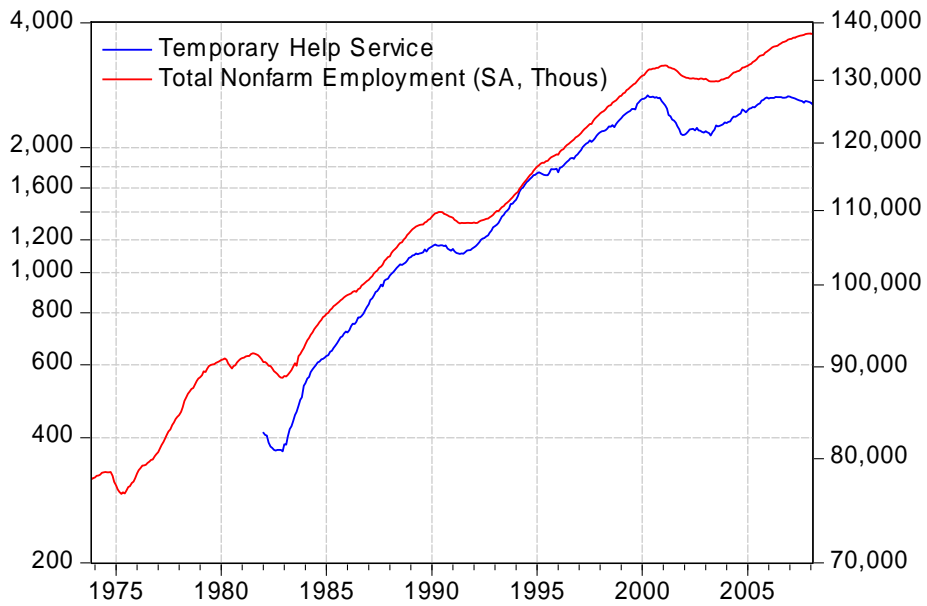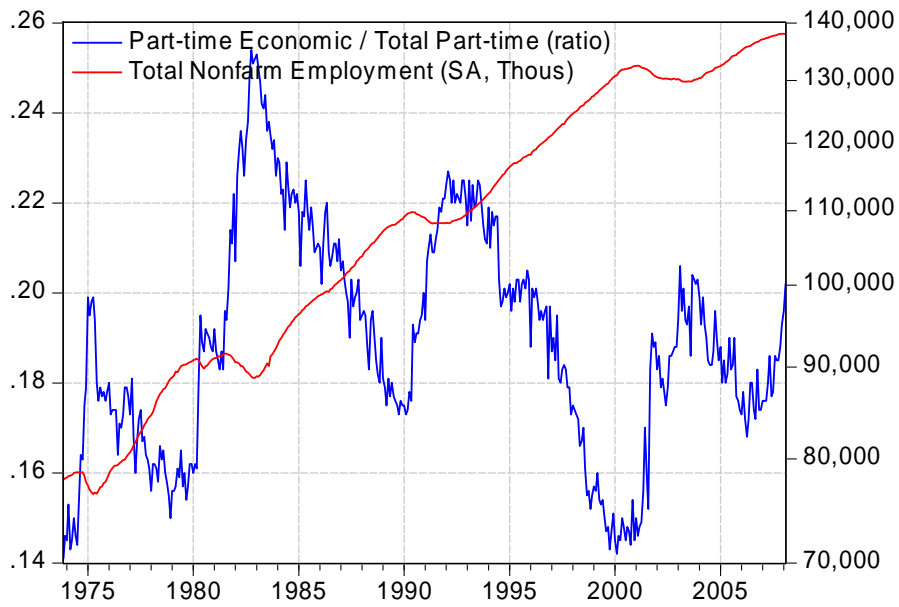
Appendix
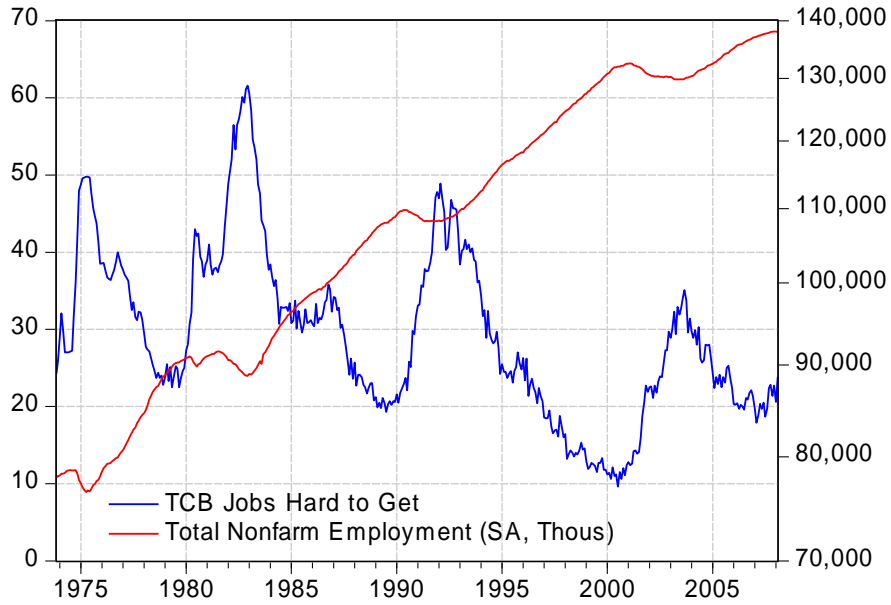
Source: BLS, TCB

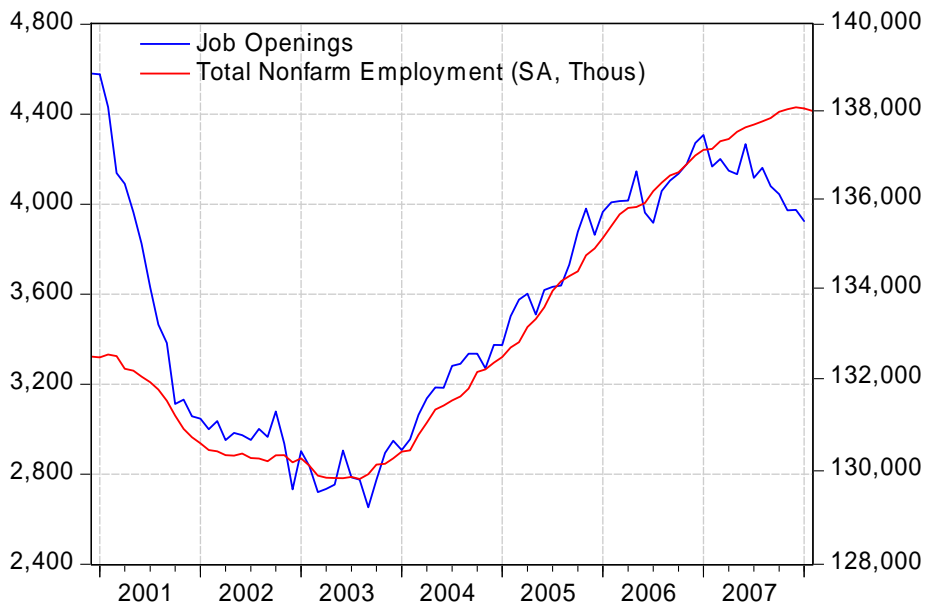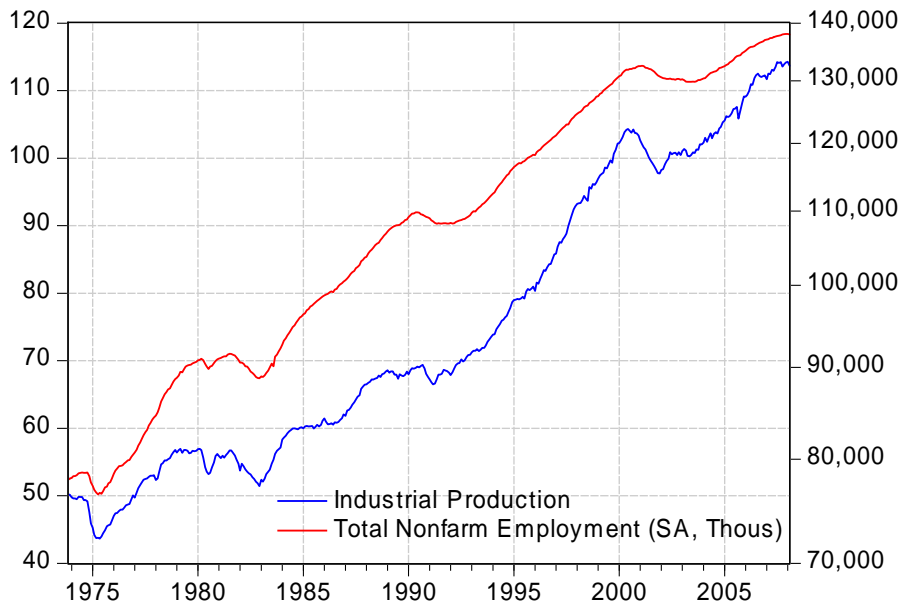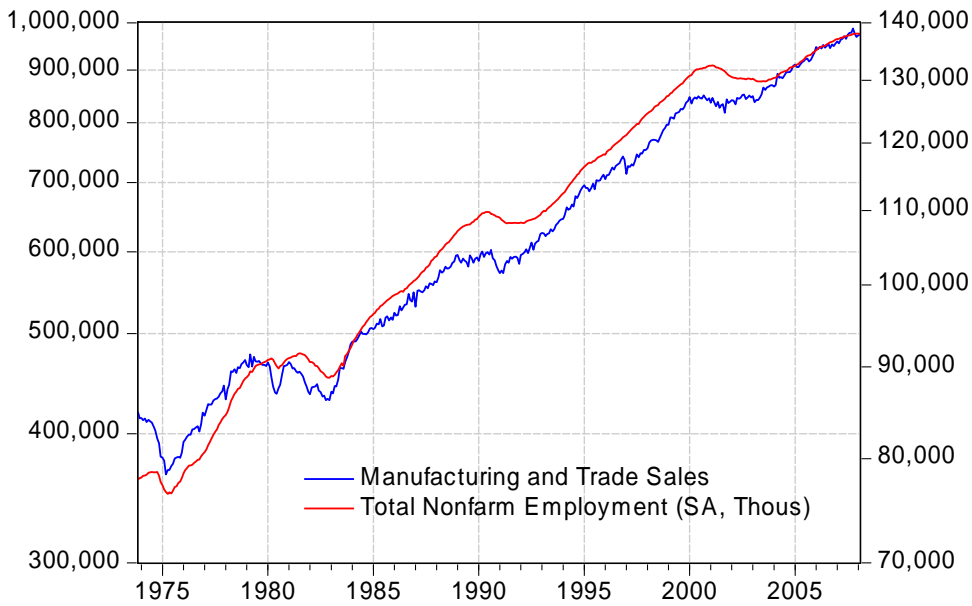Source: BLS, DOL

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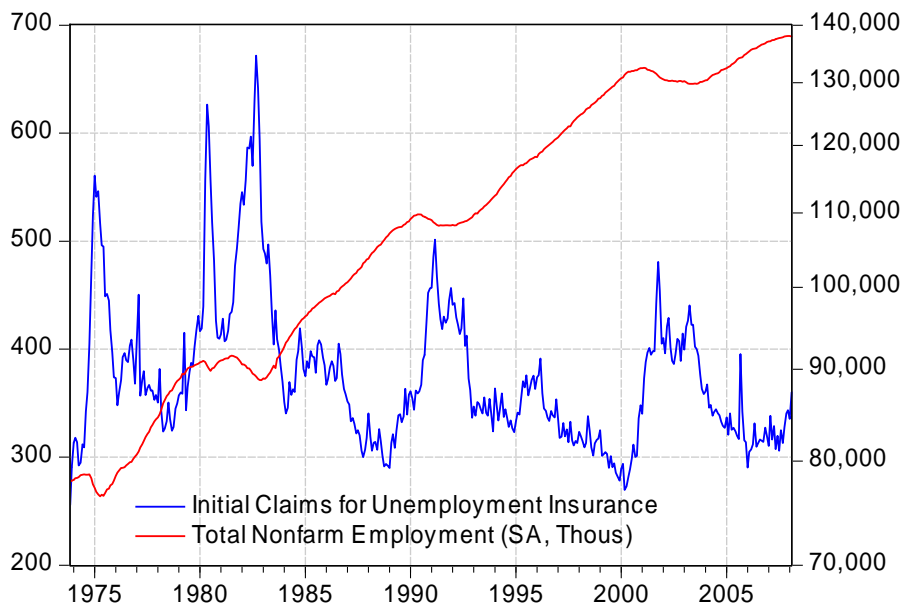
Source: BLS, NFIB

Source: BLS

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Source: BLS

Source: BLS

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Source: BLS, FRB

Source: BLS, BEA

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Table 2 – Components Considered: Turning Points Analysis

	Peaks			Troughs			Peaks + Troughs			Extra
	Mean	Median	Stdev.	Mean	Median	Stdev.	Mean	Median	Stdev.	
Jobs Hard to Get	-8.9	-9.0	3.8	2.7	1.5	3.8	-3.5	-3.0	7.0	1
Initial Claims for Unemployment Insurance	-14.0	-14.5	5.9	-1.9	-2.0	1.1	-8.3	-4.0	7.6	4
NFIB	-5.5	-5.5	7.4	1.2	0.0	3.4	-2.5	-2.0	6.7	0
Temporary-Help Industry	-2.3	-1.0	5.0	-0.4	0.0	0.9	-1.5	0.0	3.8	1
Part-time Workers	-12.3	-13.0	5.9	-0.9	-2.0	6.5	-6.9	-5.0	8.4	3
Job Openings	-5.0	-5.0	NA	2.0	2.0	NA	-1.5	-1.5	4.9	0
Industrial Production	-3.8	-4.0	4.2	-0.4	0.0	1.1	-2.2	-1.0	3.5	1
Real Manufacturing and Trade Sales	-4.9	-5.0	4.2	-2.3	-1.0	2.7	-3.8	-3.5	3.7	0
Employment Trends Index (ETI)	-7.7	-7.0	3.9	-1.6	-2.0	0.5	-4.9	-4.0	4.2	0

The lead/lag in months of turning points of each component relative to the turning points of the target variable.