ADDENDUM TO THE APPENDIX

Construction of the Federal Reserve Bank of New York's Regional Coincident Economic Indexes: The Model in Practice

The regional coincident economic indexes (CEIs) draw upon information from four key data series: nonfarm payroll employment, real earnings (wages and salaries), the unemployment rate, and average weekly hours worked in the manufacturing sector. The CEIs are produced on a monthly basis, coinciding with the availability of new data for nonfarm payroll employment, the unemployment rate, and average weekly hours worked in the manufacturing sector; these data series are released monthly with a lag of three to four weeks. The real earnings series is released quarterly with a lag of approximately six months. Prior to estimation, the four data series are seasonally adjusted using an adaptation of the U.S. Census Bureau's X-11 Seasonal Adjustment program, which also removes outliers within the series. The four seasonally adjusted and smoothed data series then serve as inputs for the construction of the CEIs for the New York–New Jersey region.[1]

Although the regional CEIs are produced on a monthly basis, the estimation period for the seasonal factors, outliers, and the single-index model is held fixed for an entire year after the annual March release of benchmark revisions to the nonfarm payroll employment series, the unemployment rate, and the series on average weekly hours worked in the manufacturing sector. As designers of the regional CEIs, we adopt this convention not only for purposes of consistency, but also to minimize ongoing revisions to the CEIs resulting from updated estimates of seasonal factors, of the model's parameters, or both. After the release of the annual benchmark employment revisions, we extend and fix the estimation period for the seasonal factors and outliers and for the model's parameters for another year. We also use this opportunity to apply several diagnostic checking procedures to evaluate the specification of the single-index model.

Estimation of the single-index model allows the coincident index to be presented in two ways. One version is the "filtered" estimates of the coincident index, $\hat{C}_{t|t}$, which uses only information through the current time period *t*. We present the second version, the "smoothed" estimates of the coincident index, $\hat{C}_{t|T}$ which uses all information available through the end of the sample period *T*. Once we have selected the final specification of the model and estimated its parameters, we can update the coincident index continually in real time using the Kalman filter and smoother. We also calibrate the estimated regional CEIs for New York State, New York City, and New Jersey to match the mean and standard deviation of their respective real earnings series. The calibration provides a basis for comparison across the regional CEIs, with the real earnings series selected as a reasonable and relatively timely measure of regional economic growth.

An attractive feature of the Stock-Watson framework is that it can accommodate the mixed frequency of the data as well as take into account missing observations. The issue of missing observations is particularly relevant for our purposes because we have elected not to use the reported values of the New York City unemployment rate during the subperiod January 1994–June 1997. In this period, changes to benefit programs sharply increased labor force participation in the city, and the unemployment rate increased even as the city's economy was recovering. In addition, we elected not to use the reported values of the real earning series for New York State, New York City, and New Jersey during the subperiod 1992:Q4–1994:Q1. Changes in U.S. federal income tax laws prompted a shift in bonus and other income payouts from late 1992 to early 1993, which had a brief but pronounced effect on quarterly income data. In addition, the New York City series on average weekly hours worked in manufacturing was discontinued in January 2008.

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[1] We are grateful to Alan Clayton-Matthews for the computer program used to construct the regional indexes based on the Stock-Watson methodology.