

Appendix

Forecasting real GDP using changes in employment levels

While economists everywhere continue to grapple with estimates of the total economic damage, the Illinois Policy Institute used initial claims data provided by the U.S. Department of Labor to forecast the decline in gross output in Illinois.

Following the existing literature (see Miller and Chin, 1996, Koenig, Dolmas, and Piger, 2001), we use monthly labor market data to predict current quarter real GDP.

First we construct quarterly time series of incoming monthly labor market data. We then forecast the current-quarter real GDP growth rate using labor market data from the same quarter. The general form of the forecasting model is:

$$y_t = c + \beta_j LM_t + \sum_{i=1}^4 \delta_i y_{t-i} + \varepsilon_t$$

where $y_t = \ln(GDP_t/GDP_{t-1}) \times 400$, the average annualized growth rate of GDP in the current quarter, and LM is the log ratio of the average of the current three-month period divided by the average of the previous quarter multiplied by 400. We also include four lags of real GDP growth.

We estimate the model using data from 2004:Q2 through 2019:Q4. The model is then used to forecast the first quarter of 2020.

Predicting monthly employment changes using initial claims data

$$LM_t = c + \beta_j weekly_t + \sum_{i=1}^{12} \delta_i LM_{t-i} + \varepsilon_t$$

where the dependent variable is the monthly growth in payroll jobs (LM_t).

We create a monthly series for initial claims by taking the logarithm of the ratio of the average of this month's four weekly releases to the average of the previous month's releases.