

Chicago Fed Letter

Measuring the effects of the Covid-19 Delta wave on the U.S. hourly labor market

by Scott A. Brave, senior economist, Ross Cole, research analyst, and Stephanie Grove, senior research assistant

In this article, we take a closer look at the implications of rising Covid-19 cases and vaccination rates for the U.S. hourly labor market. To do so, we rely on geographic variation in the high-frequency data collected by the firm Homebase with its timekeeping software. This data source allows us to make use of U.S. state-level variation on a daily basis in order to decompose the effects on hourly employees and hours worked from both rising cases and vaccinations.

Covid-19 cases have been generally rising in the U.S. since July 2021, after leveling off or falling for a while earlier in the year. This resurgence in cases took place concurrently with the rise of the highly contagious Delta variant of Covid-19, which is now the [dominant strain](#) of the virus (over

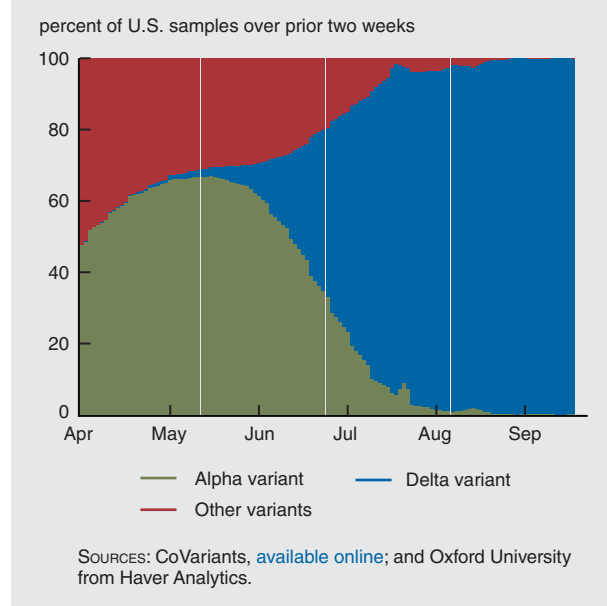
the Alpha variant) in the U.S. (see figure 1). At the same time, vaccination rates across the nation have continued to move up, although their rates of increase have slowed since the initial jump in the spring.

In this *Chicago Fed Letter*, we use high-frequency data from Homebase to quantify the impact of the Covid-19 Delta wave on hourly employment. We find that through late September 2021, the positive impacts of rising vaccination rates were sufficient to offset the negative impacts of the recent resurgence in the virus.

Homebase data and the leisure and hospitality sectors

Throughout the pandemic, the hourly employment data from Homebase have proven to be a reliable source for measuring the real-time impact of Covid-19 on the leisure and hospitality sectors.

1. The rise of the Covid-19 Delta variant in the U.S., 2021



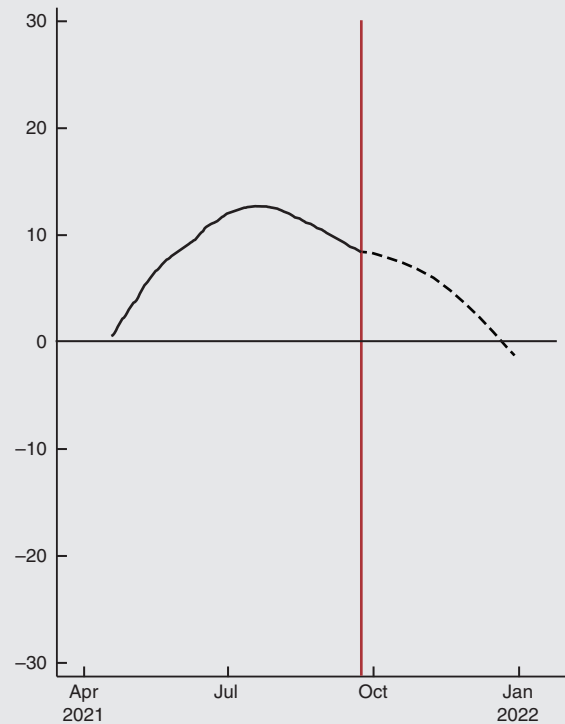
Despite representing only about 10% of nonfarm payrolls, the leisure and hospitality sectors have been front and center during this time: Payroll changes in these two sectors account for very large percentages of the decline in jobs during the 2020 recession, as well as the increase in jobs during the subsequent recovery.

5. Forecasting the combined impact of Covid-19 cases and vaccinations on the hourly labor market

A. Impact on Homebase hourly employees
percent change relative to April 2021 average



B. Impact on Homebase hours worked
percent change relative to April 2021 average



— Estimates - - - Forecasts

NOTES: Panel regression model estimates extend through September 24, 2021, as noted by the red vertical line. Forecasts (after September 24, 2021) are based on state data on Covid-19 cases and vaccinations when available and infection and vaccination projections from the IHME and Covid-19 case projections from the CDC otherwise.

SOURCES: Authors' calculations based on data from Haver Analytics, Centers for Disease Control and Prevention (CDC), and Institute for Health Metrics and Evaluation (IHME).

against putting too much emphasis on the exact numbers and timing shown in figure 5. That said, our results do suggest that we may be entering a new stage of the pandemic where the initial benefits of the Covid-19 vaccines on hourly employment are perhaps beginning to plateau.

Notes

¹ Homebase benchmarks its data to an average value for a reference month, which in the case of figure 2 is April 2021. This means that we can assess changes over time relative to the reference month, but we do not know the actual levels of total hourly employees and hours worked. The data are also not seasonally adjusted. We partially account for this fact in figure 2 by removing observations in Homebase hourly employees from the Friday before a federal holiday up until the Friday after the holiday.

² The payroll data come from the U.S. Bureau of Labor Statistics' (BLS) *Current Employment Statistics* survey, also known as the establishment or payroll survey

³ Of these types of businesses, only restaurants are considered part of the leisure and hospitality sectors. Additional discussion of the Homebase data can be found in an [article](#) forthcoming in *Business Horizons*.

⁴ Homebase covers about 100,000 small businesses (according to the firm's [website](#)). However, not all of these businesses operate in the leisure and hospitality sectors. [Kurmann, Lalé, and Ta \(2021\)](#) estimate that Homebase hourly employees in the leisure and hospitality sectors represented about 20% of all leisure and hospitality workers in February 2020. Taking into account that these workers represented about 70% of total hourly employees in Homebase in February 2020, we obtain our estimate of the impact on hourly leisure and hospitality jobs according to the following:
(*Leisure and hospitality payrolls in July 2021* × 0.2) × (*Rate of change in Homebase hourly employees over the July through September period of 2021* × 0.7).

⁵ Regressions are statistical exercises that estimate the degree of independent correlation between variables. In our case, each of the Homebase employment data series (hourly employees and hours worked) is the dependent variable (the outcome we are trying to explain) and the Covid-19 case and vaccination data are the independent variables (the factors we think can be used to explain the dependent variable). Through regression analysis, we come up with regression coefficients, which represent the mean change in the dependent variable for one unit of change in an independent variable while holding constant the other independent variables in the analysis that may affect the dependent variable.

⁶ To match the construction of the Homebase data, we measure both Covid-19 cases and vaccinations relative to their April 2021 average based on daily data from April 3 through April 30.

⁷ The use of state-level data in this way is a notable feature of our earlier work assessing the impact of Covid-19 vaccinations on leisure and hospitality payrolls; see our July 2021 *Chicago Fed Insights* [blog post](#).

⁸ Additional details on firm exit from the Homebase data can be found in a recent [working paper](#) in the Finance and Economics Discussion Series (FEDS) of the Board of Governors of the Federal Reserve System.

⁹ We use the *Quarterly Census of Employment and Wages* (QCEW) instead of the CES survey for this purpose because the BLS uses the former to benchmark the state payroll data. This benchmarking, however, occurs only once a year in March given lags in the availability of the QCEW. For further details on this process, see the following [article](#) published in the *International Journal of Forecasting*.

¹⁰ We use publicly available ensemble forecasts from the [Centers for Disease Control and Prevention](#) (as of September 29, 2021) and projections from the [Institute for Health Metrics and Evaluation](#) (as of October 1, 2021).

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