

Economic Decisions, Covid Infection Rates and the Economy's Path Forward

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August 12, 2021

COVID-19 Pandemic in Context

Historical events and developments that matter (social, political, economic) –many have economic feedback effects

- ▶ Great Depression
- ▶ WWII
- ▶ Vietnam
- ▶ NASA Moon landing mission
- ▶ PC, internet, cell phone technology
- ▶ 9-11, Iraq, Afghanistan wars
- ▶ Great Recession

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- ▶ Ongoing:
 - ▶ Trump ... Jan 6
 - ▶ COVID-19 pandemic
 - ▶ Climate change and weather events

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COVID-19 pandemic has significant cyclical feedback effects

This Talk – Themes

- ▶ Covid was an exogenous shocks in March 2020
 - causing a recession like no other before it.
- ▶ Since Spring 2020 the economy, public policies, and Covid transmissions have been on a feedback loop
 - Decisions matter!**
- ▶ Vaccines could short circuit the feedback effects.
 - region by region!

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 - region by region!
- ▶ The past 18 months and COVID-19 cases reporting highlight economic data issues
 - BEA, CENSUS, BLS, DOL could do better
 - Counts of Confirmed Covid cases are timely but flawed

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 - region by region!
- ▶ The past 18 months and COVID-19 cases reporting highlight economic data issues
 - BEA, CENSUS, BLS, DOL could do better
 - Counts of Confirmed Covid cases are timely but flawed
- ▶ Which is harder to forecast:
 - Economy over next 12 months** or
 - Covid Infections over the next 6 months?**

Main Question

**Can we assume the negative effects of the Covid-19 pandemic on the US economy are unwinding?
And if so, how fast?**

Issues

- ▶ Current condition of the national economy
– tracking the national recovery
- ▶ Local conditions (brief)
- ▶ Critique of the BEA's GDP numbers
and the consensus forecast
- ▶ Role of Covid-19 infections, Delta Wave

Main Question

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Data issues – what we do not know and can not easily learn

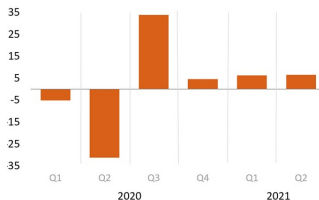
- ▶ True Covid infection rates (for forecasting and policy)
- ▶ The current strength of the economy (official statistics problem)

Gross Domestic Product, Second Quarter 2021 (Advance Estimate)

Q2 2021 (Adv)	+6.5%
Q1 2021 (3rd)	+6.3%

Real gross domestic product (GDP) increased at an annual rate of 6.5 percent in the second quarter of 2021, reflecting the continued economic recovery, reopening of establishments, and continued government response related to the COVID-19 pandemic. In the second quarter, government assistance payments in the form of loans to businesses and grants to state and local governments increased, while social benefits to households, such as the direct economic impact payments, declined. In the first quarter of 2021, real GDP increased 6.3 percent (revised).

Real GDP: Percent change from preceding quarter



U.S. Bureau of Economic Analysis

Seasonally adjusted at annual rates

The Speed of the Recovery Will Depend on Consumer Confidence

Consumer Confidence Index®

Index, 1985 = 100



(p) - preliminary

*Shaded areas represent periods of recession.

Sources: The Conference Board; NBER

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CB Survey about Consumer Expectations (Six Month Hence)

Consumers are optimism (almost unchanged, June to July).

Report: July 27, 2021. Survey cutoff: July 22.

- ▶ 33.4% expect business conditions will improve, down from 33.7%.
- ▶ 10.5% expect business conditions to worsen, down from 10.8%.

Mixed about the short-term labor market outlook

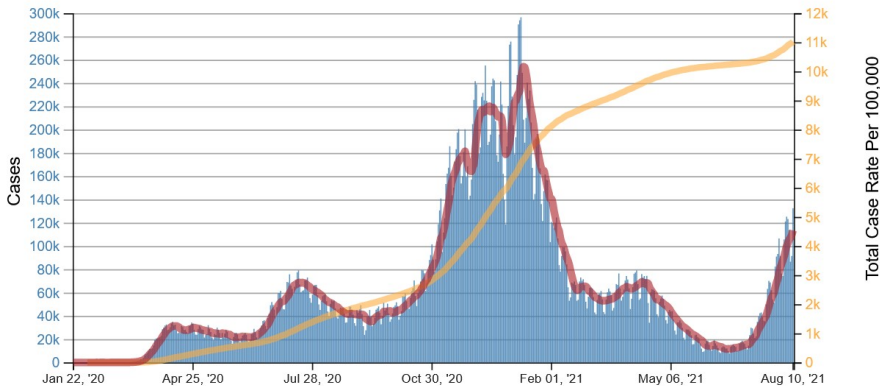
- ▶ 27.7% expect more jobs to be available, up from 26.6%.
- ▶ 16.8% anticipate fewer jobs, up from 15.7%.

Consumers remain upbeat about their short-term financial prospects.

- ▶ Only 8.6% expect their incomes will decrease

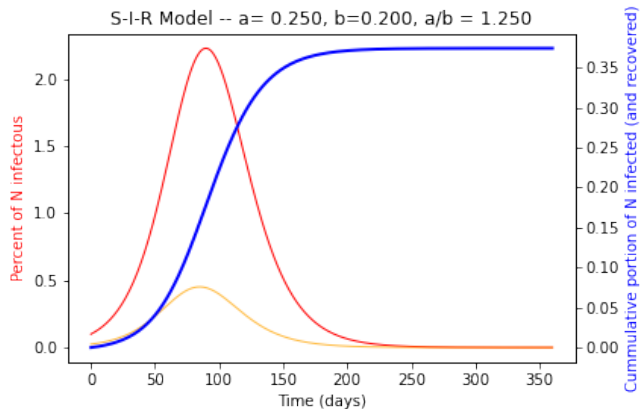
Next release: Tuesday, August 31

Daily Trends in Number of COVID-19 Cases in the United States Reported to CDC and Total and Cumulative Incidence Rate of COVID-19 Cases per 100,000 population



<https://covid.cdc.gov/covid-data-tracker/#trends.dailytrendscases>

S-I-R Model of Infections in a Population

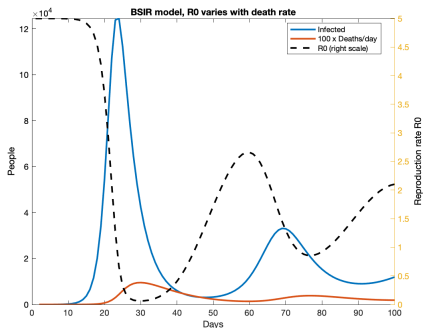


Red Line – Active Infections (as a percent of population)

Yellow Line – New infections, from the actives re-transmission

Blue Line – Fraction of population previously infected (now immune)

COVID-19 – Economy Feedback



It is entirely individually rational for people to go out and party when very few around them are infected. Sadly, that means the disease collectively ramps up. Then it is individually rational for people to cut back, and the disease slows down. Cycles can result.

John Cochrane, The Grumpy Economist Blog, Covid cycles November 8, 2020

Ioannidis, Cripps, Tanner **Forecasting for COVID-19 has failed**
International Journal of Forecasting, August 25 2020

- ▶ Failure in epidemic forecasting is an old problem ... [but] epidemic forecasting continued to thrive, perhaps because vastly erroneous predictions typically lacked serious consequences.
- ▶ In fact, erroneous predictions may have even been useful. A wrong, doomsday prediction may incentivize people towards better personal hygiene.
- ▶ However, with COVID-19, espoused wrong predictions can devastate billions of people in terms of the economy, health, and societal turmoil at-large.
- ▶ One reason for forecasting problem: Poor data input on key features of the pandemic that go into theory-based forecasting (e.g. SIR models)

Note: written before the third US wave and waves in UK, India and elsewhere.

Pre-Pandemic

Think back to December 2019 - February 2020, before ...

- ▶ GDP growth in 2019: 4.1% nominal, 2.4% real
- ▶ Payroll employment: +2 million jobs, +1.3% in 2019
- ▶ Unemployment rate: 3.5%
- ▶ Labor force participation: 63%
- ▶ Inflation: 1.5 - 2.0%
- ▶ Consensus medium term outlook 2.0 - 2.5% real growth

Question at the time:

What might cause the next recession and how will we know it has started?

Pre-Pandemic – Regional Conditions

- ▶ Gross State Product (GSP) in 2019

 - Nominal increase

 - PA: 3.9% NJ: 3.6% DE: 3.9% MD: 3.7% NY: 3.9%

 - Real growth

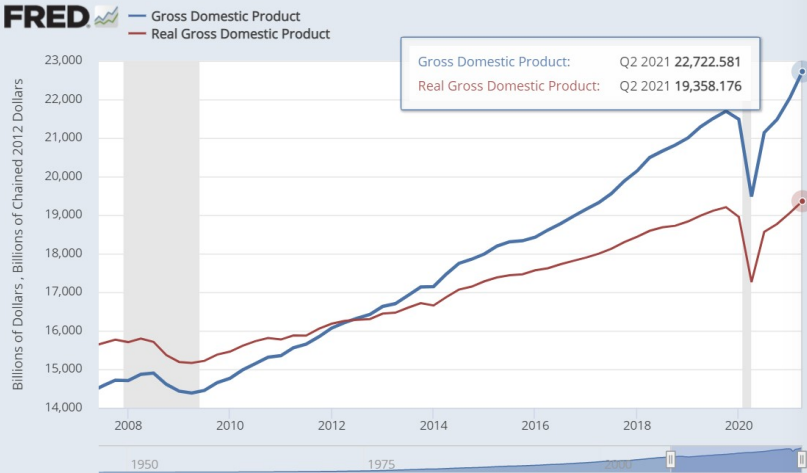
 - PA: 2.4% NJ: 1.4% DE: 1.8% MD: 1.4% NY: 1.6%

- ▶ Philadelphia MSA

 - Unemployment rate: 4.1%

 - Job growth in 2019: +1.5% revised from +0.8%

US Output Has Recovered, According to the BEA



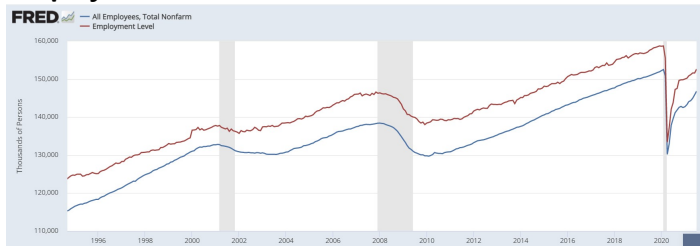
Shaded areas indicate U.S. recessions.

Source: U.S. Bureau of Economic Analysis

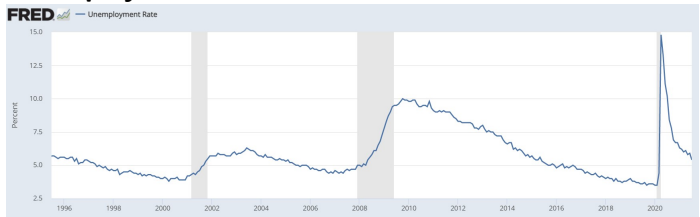
fred.stlouisfed.org

Labor Market Has Not Recovered, According to the BLS

Employment

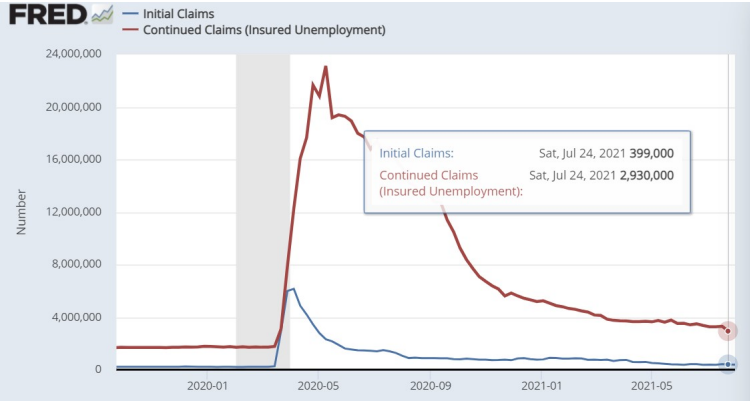
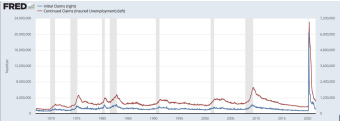


Unemployment Rate



Continuing Claims Are Still Exceptionally High

Unemployment Insurance Claims

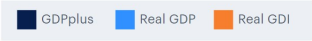
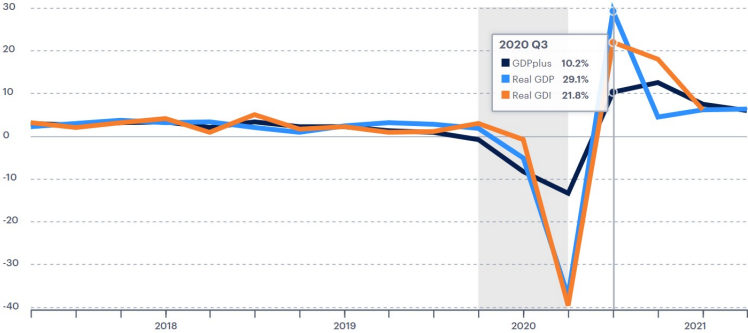


Evidence of GDP Uncertainty

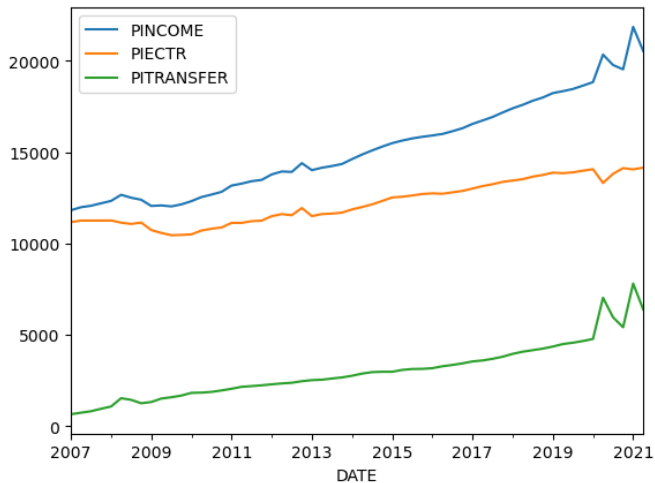
GDP Plus (FRB-Phila)

combines output and income accounts

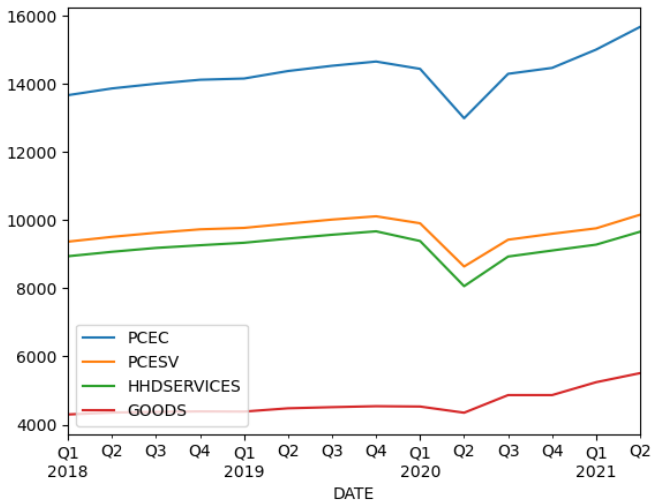
PERCENTAGE (%)



Income Transfers Are Still Significant

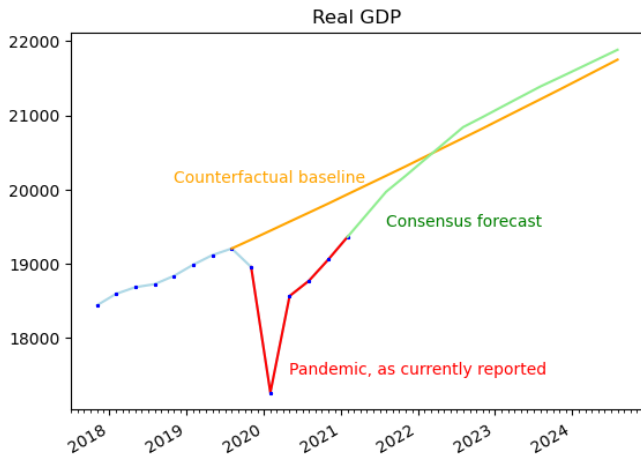


Personal Consumption Expenditure Back to Prior Levels



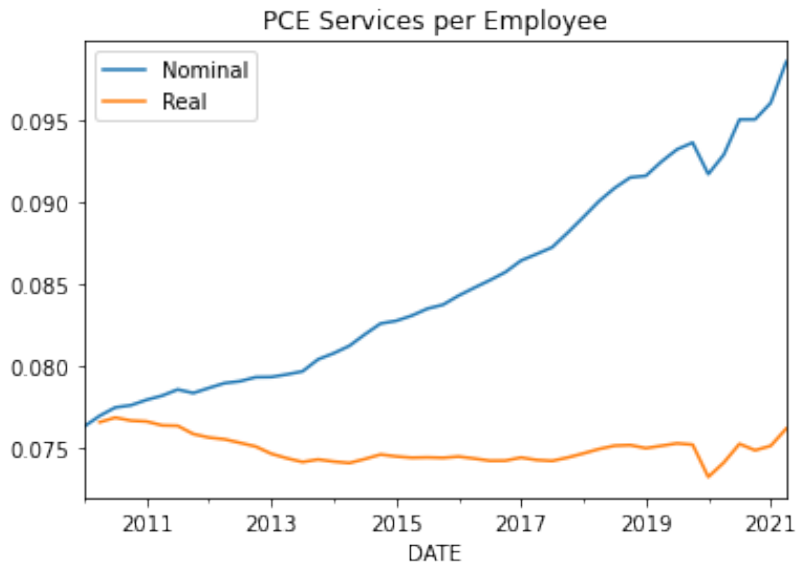
Note: Services fell noticeably in the 2020 downturn, which is an historical business cycle anomaly

A Full Recovery before 2023?



Consensus yields about 1.5 trillion in 'lost' Real GDP over 3 years
Similar baseline for prior recession: 2.3 trillion over 3 years

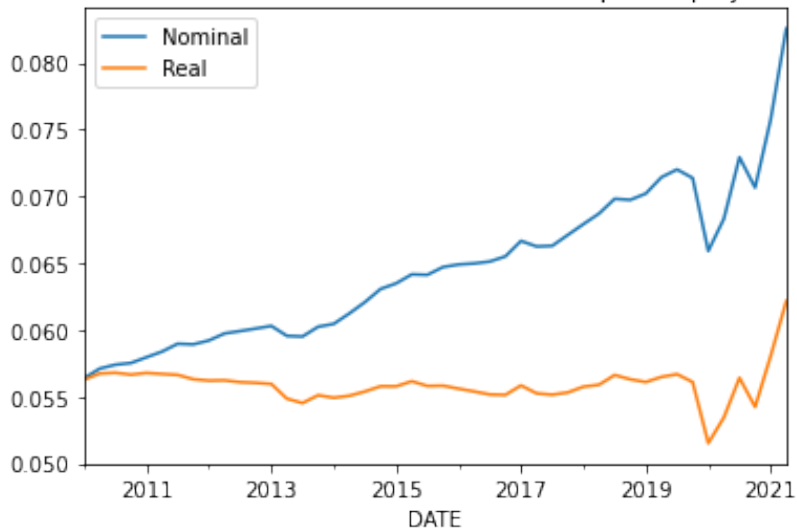
A Look at PCE Services



Dividing BEA PCE (GDP component) by BLS payroll employment

PCE Services – Food and Accommodation

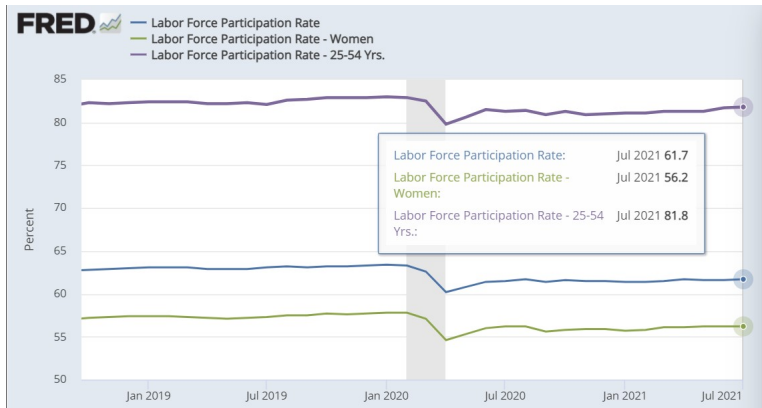
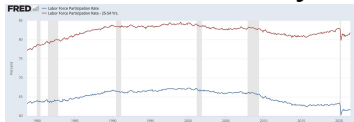
PCE Services, Food and Accommodations per Employee



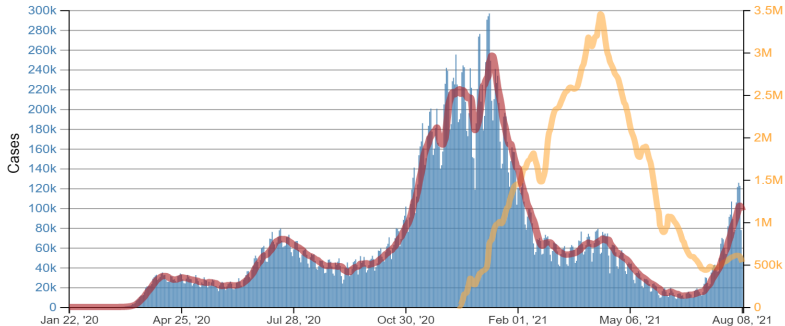
Same calculation, dividing BEA PCE component by BLS payroll employment

Labor Force Participation Remains Low

BLS Household Survey

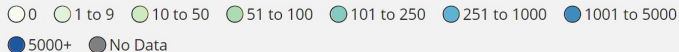
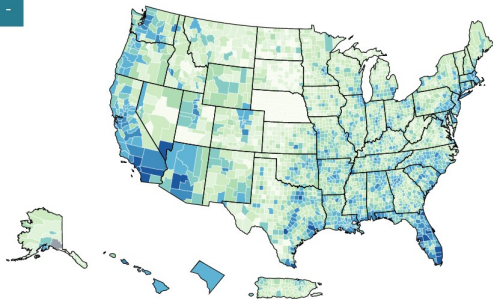


Daily Trends in Number of COVID-19 Cases in the United States Reported to CDC and 7-day Moving Average of Total Vaccine Doses Administered.



Regional Look at New COVID-10 Cases

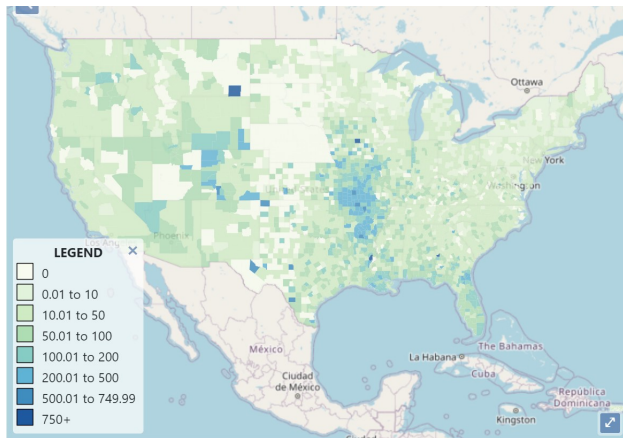
Time Period: Sun Aug 01 2021 - Sat Aug 07 2021



New Cases per 100,000 reported to CDC in 7 days ending August 7, 2021

CDC: Over 100 per 100,000 (1 per 1000, 0.1%) per week is considered worrisome

Regional Look at New COVID-10 Cases



New Cases per 100,000 reported to CDC in 7 days ending July 9

<https://covid.cdc.gov/covid-data-tracker/#county-view>

Infectious Disease Compartment Model

S-I-R is the simplest case

Three containers for N individuals in total population

- ▶ **S**usceptible (not immune)
- ▶ **I**nfectious
- ▶ **R**emoved (or Recovered and immune)

Applied Model: Response variable Y, Weekly frequency,
Cumulative cases at end of week - cumulative cases 7 days ago
or New Cases over 7 days

$$Y_t/N = R_t * Y_{t-1}/N$$

County level S-I-R Motivated Model

Dependent (response) variable:

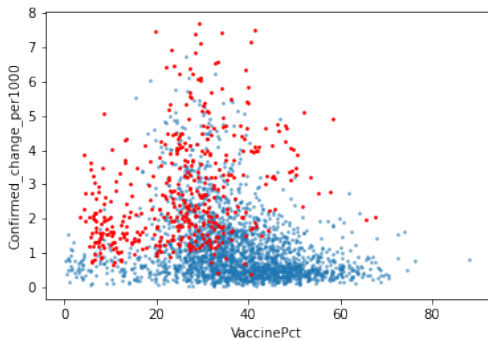
New Confirmed Cases per 1000 in county, weekly frequency

Lagged dependent value is the most important explanatory variable

$$y_{i,t} = a_t + b(X_i)(S_{i,t-1}/N_i) * y_{i,t-1}$$

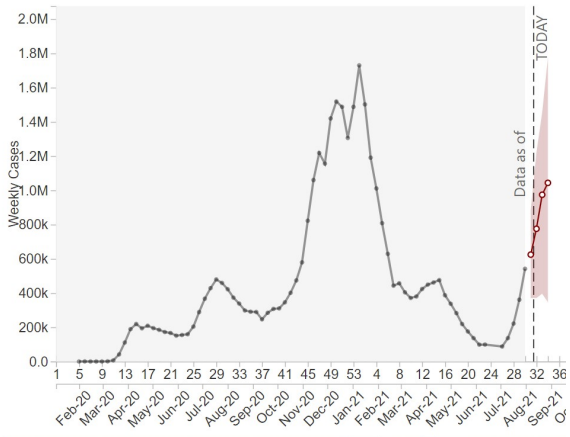
Problems:

- ▶ Assumes no inter-county transmission and infection state ends in 7 days– adds noise but $y_{i,t-1}$ may still be a good proxy for the number of infected walking around.
- ▶ Need a good proxy for the effective S/N (fraction susceptible in county)
- ▶ Explanatory power of 'reasonable' X's is low
- ▶ \hat{b} less than 1 as proxy for R, implies infections always fall



Shows x,y relationship between vaccine percentage (of adults) 4 weeks ago vs. average new cases per 1000 average during past 4 weeks (at county level).
Red dots: AL FL GA MS LA

Observed and forecasted weekly COVID-19 cases in the United States



Review: Tracking the Recovery

Views, facts, assumptions ...

- ▶ Recession started in March 2020. NBER trough: April 2020
Different in many ways and the economic data in 2020-Q1 and 2020-Q2 are outliers (relative to prior time series history).
- ▶ Economic view: COVID-10 was a large supply shock combined with a suppression of demand. Net increase in prices, but not necessarily inflation.
- ▶ Massive government programs propped up the economy. With deficit spending and Fed accommodation, higher inflation seems inevitable.
- ▶ The available data (monthly economic indicators, GDP and components, Covid related counts) are limited in many ways. GDP may be overestimated.
- ▶ A true economic recovery will not occur until the public feels the end to the pandemic is in sight (or over).
- ▶ Open question: Is the stock market overvalued or simply subject to greater downside risks?

Take-Aways

- ▶ BEA's GDP bounceback may overstate the truth
- ▶ The consensus GDP forecast seems too optimistic
- ▶ The available economic numbers do not reflect the new COVID Delta wave
- ▶ Further recovery will have significant regional dimensions
 - more than usual
- ▶ There are labor force participation and output-per-worker issues and mysteries
- ▶ Data is a BIG problem
 - for understanding the economy and fighting COVID waves