COVID-19 Conversations

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COVID19Conversations.org
#COVID19Conversations
Context

- At one point almost every U.S. state had imposed lockdown orders to stem the spread of the coronavirus.

- Most states now beginning to relax, easing “stay at home” orders and restrictions on nonessential businesses and activities.

- Can have economic benefits, there will also be a public health cost in more people contracting the virus and dying.
Simulator Interface

https://budgetmodel.wharton.upenn.edu/issues/2020/5/1/coronavirus-reopening-simulator
Estimation Strategy

• Principal Component Analysis: extract a (daily) common factor for these variables that we think is social distancing
  • Expands on Lewis, Mertens and Stock (2020)
  • For GDP/employment, we also combining principal component with weekly GDP/employment data in order to generate daily data

Diff-in-diff across time and across treatment, with numerous controls (e.g., number of confirmed cases, density, population, age, etc.)

1. For each metric of social distancing policies, we compare states that did and did not implement the policy—the first “difference”

2. Then we examine how this difference between groups changes as the policy is implemented —the second “difference
Validation (pre- vs. post-period)
SEIIR Model

Susceptible → Exposed → Infected → Resistant

- Contact rate, duration of infections
- Incubation period, symptomatic share of infections
- Duration of infection, case fatality rate
- Duration of infection

Recovered
Estimates of $R$: fallen dramatically in every state, but some remain above 1.
## Results

<table>
<thead>
<tr>
<th>Projection Type</th>
<th>Policy Scenario</th>
<th>Behavior Scenario</th>
<th>Cumulative Cases</th>
<th>Cumulative Deaths</th>
<th>Change in Net Jobs (millions) over forecast window</th>
<th>Year-over-Year GDP (% change)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline (levels)</td>
<td>Baseline Policy</td>
<td>Baseline Behavior</td>
<td>2,756,545</td>
<td>153,816</td>
<td>1.6 million</td>
<td>-4.3%</td>
</tr>
<tr>
<td>Lift Remaining Stay-At-Home Orders</td>
<td>Baseline Behavior</td>
<td>+170,031</td>
<td>+9,121</td>
<td>+0.0 million</td>
<td>+0.0 p.p.</td>
<td></td>
</tr>
<tr>
<td>Baseline Policy</td>
<td>Reduced Social Distancing</td>
<td>+529,948</td>
<td>+28,141</td>
<td>+1.2 million</td>
<td>+3.2 p.p.</td>
<td></td>
</tr>
<tr>
<td>Lift Remaining Stay-At-Home Orders</td>
<td>Reduced Social Distancing</td>
<td>+1,567,252</td>
<td>+83,773</td>
<td>+1.2 million</td>
<td>+3.2 p.p.</td>
<td></td>
</tr>
<tr>
<td>Full Reopening</td>
<td>Reduced Social Distancing</td>
<td>+8,622,554</td>
<td>+469,791</td>
<td>+10.2 million</td>
<td>+5.7 p.p.</td>
<td></td>
</tr>
</tbody>
</table>

* Difference from baseline calculated by taking the level under the scenario and subtracting the baseline level.