Mobility during the Pandemic: the Swing Tilted to One Side

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Background

- Political stance affects customer behavior (Jung et al., 2017)
- Political stance affects the perception of COVID-19 (Bock et al., 2022)
- Does political stance influence mobility pattern?
Research Aim

- **Identify potential difference in human mobility patterns among the Democratic, Swing, Republican counties**
- **Study time:** February 1st - April 30th, 2020 (the first pandemic wave)
- **Study area:** The Contiguous US (3108 counties)
### Definition of Political Stance

<table>
<thead>
<tr>
<th></th>
<th>2016 Election</th>
<th>2020 Election</th>
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</thead>
<tbody>
<tr>
<td><strong>The Democratic counties</strong></td>
<td><img src="#" alt="Blue" /></td>
<td><img src="#" alt="Blue" /></td>
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<tr>
<td><em>(n = 468)</em></td>
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<tr>
<td><strong>The Republican counties</strong></td>
<td><img src="#" alt="Red" /></td>
<td><img src="#" alt="Red" /></td>
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<tr>
<td><em>(n = 2560)</em></td>
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<tr>
<td><strong>The Swing counties</strong></td>
<td><img src="#" alt="Red" /></td>
<td><img src="#" alt="Blue" /></td>
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<td><em>(n = 80)</em></td>
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Characterizing Mobility Change

**Mobility Volume:**
- The number of daily trips in each county (normalized)
- Raw data: origin destination matrices (Kang et al., 2020)
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**Structural Break Analysis** (Guler et al., 2019):
- capture mobility changes
Characterizing Mobility Change

- **Structural Break** (Guler et al., 2019):
  - An abrupt change in time series
  - The changes in the parameters of regression models

Figure: Harford County, Maryland is taken as an example
Characterizing Mobility Change

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Figure: Harford County, Maryland is taken as an example
Characterizing Mobility Change

- **Mobility Volume Difference**: the level of change
- **Before-break Slope**: the rate of change before break point
- **After-break Slope**: the rate of change after break point
Results

- The Democratic counties had greater reduction than the Republican counties
Results

The Swing Counties?
Results

- The Democratic counties had the same mobility pattern as the Swing counties
Discussion
- The Swing and Democratic: largest and constant decreases
- Most counties had the breakpoints on the same day, March 16th 2020
Extended Work

- **Spatial regression**
- **Study time**: pre-pandemic, 5 waves, post-pandemic
- **Socioeconomic factors**: political stance
Extended Work

- **Spatial regression**
- **Study time**: pre-pandemic, 5 waves, post-pandemic
- **Socioeconomic factors**: political stance, poverty rate, aging rate