A First Look at the Impact of COVID-19 on Commercial Real Estate Prices: Asset-Level Evidence

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Webinar: MIT – COVID-19’s Impact on Commercial Property Pricing
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Motivation

• Capital markets

• Most studies examine how stock returns have responded to changes in investors’ expectations about COVID-19 at the index-level or firm-level.

• The price effects are driven by the perceived productivity of the firm’s underlying assets.
Motivation cont.

• **Property Markets**
  
  • Property market liquidity has declined substantially. The relation between price & liquidity might no longer hold (Van Dijk et al., 2020)
    • The health crisis might limit our ability to detect rent and price movements in “real time”

• **Local COVID-19 policy effectiveness**
  
  • These policies might influence property markets and user markets
  • Non-pharmaceutical interventions (e.g., Correia et al., 2020; Lilley et al., 2020)
  • Reopenings (e.g., Chetty et al., 2020; Bartik et al., 2020; Villas-Boas et al., 2020)
This Paper...

• Ours is the first academic paper to examine how COVID-19 pandemic has affected stock returns through a firm’s underlying assets

• We focus on asset-level evidence using commercial real estate (CRE) assets owned by listed U.S. equity REITs

• The effects of COVID-19 we observe in liquid stock markets are indicative of effects occurring in private CRE markets
Summary

• We construct a **Geographically Weighted Case Growth** (*GeoCOVID*)

• We find the key drivers are the:
  • Property type focus of the REIT
  • REIT’s geographic exposure of assets to the pandemic (i.e., *GeoCOVID*)

• Local non-pharmaceutical interventions (NPIs) helped moderate the negative return impact of *GeoCOVID*

• Reopenings have limited effects on the performance of CRE markets
• March of 2020: total return index on S&P 500, equity REITs, and Russell 2000 declined 16%, 23%, & 26%, respectively
• Decline in REIT share prices far exceeds reduction that can be explained by a temporary loss in rental income
March of 2020: cumulative total return index for retail REITs declined 49%, followed by: hospitality REITs (-44%); health care REITs (-41%); office REITs (-25%); residential REITs (-26%); industrial REITs (-10%)
• But...# of reported COVID-19 cases varies substantially by county/regions
• Thus, property type indices mask significant variation across firms in the exposure of CRE portfolios to the pandemic
1-day, 2-day, and 3-day risk-adjusted returns

+0.03% to +0.6%  

-0.05% to -1%
Research Design

• How do we measure COVID-19-induced shocks to a firms’ asset-level productivity? Two steps to construct GeoCOVID:
  1. Quantify magnitude of local productivity shocks
     • log of daily change in reported cases by county
     • COVID-19 Global Cases database at Johns Hopkins University
  2. Measure a firm’s geographic exposure to these daily changes in case growth
• Firm-Level Stock Performance (daily abnormal returns)
  • Estimate betas using daily return data: Jan 1, 2019 to Jan 20, 2020
    • Based on either S&P 500 Index or NAREIT Equity Index
  • Estimate daily abnormal returns: Jan 21, 2020 through Apr 15, 2020
  • Also construct non-overlapping cumulative abnormal returns over 2-day & 3-day windows
• Sample of 11,210 firm-day observations for 198 equity REITs
Daily Abnormal Returns by Property Type (based on S&P 500)
Daily Abnormal Returns by Property Type (based on S&P 500)
Multivariate Analysis

• Regress 1-day, 2-day, & 3-day abnormal returns (ARs) on each REIT’s GeoCOVID on day \( t-1 \)
• Include # number of days since first reported case in any county in which the REIT owns properties (Wheaton & Thompson, 2020)
• Construct a geographically-weighted population density variable based on each property held by a REIT
• Include asset-specific controls: extent to which portfolio is concentrated by (county) location or by property type
• Include a large set of other firm characteristics as controls
  • Leverage, cash, size, Tobin’s Q, lagged returns, institutional ownership, investment, EBITDA/TA
## Baseline Results

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<tr>
<td><strong>GeoCOVID</strong></td>
<td>-0.024***</td>
<td>-0.026***</td>
<td>-0.022***</td>
<td>-0.070***</td>
<td>-0.086***</td>
<td>-0.080***</td>
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<td>(-4.70)</td>
<td>(-3.82)</td>
<td>(-3.01)</td>
<td>(-5.98)</td>
<td>(-5.13)</td>
<td>(-5.91)</td>
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<td><strong>Days since outbreak</strong></td>
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<td>(-7.01)</td>
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<td>(-5.98)</td>
<td>(-6.39)</td>
<td>(-6.23)</td>
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<td><strong>Days since outbreak^2</strong></td>
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<td>(8.24)</td>
<td>(9.00)</td>
<td>(8.42)</td>
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<td>(8.42)</td>
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<td><strong>ln(GeoDensity)</strong></td>
<td>0.001***</td>
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<tr>
<td><strong>Constant</strong></td>
<td>-0.005***</td>
<td>-0.001</td>
<td>-0.004***</td>
<td>-0.008***</td>
<td>-0.003</td>
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<td>-0.013***</td>
<td>-0.002</td>
<td>-0.011***</td>
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<td></td>
<td>(-12.18)</td>
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<td>(-8.99)</td>
<td>(-10.00)</td>
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<td><strong>R Squared</strong></td>
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<td>0.018</td>
<td>0.041</td>
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<tr>
<td><strong>Observations</strong></td>
<td>11,210</td>
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<td>3,800</td>
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- Property type fixed effects, or firm fixed effects, are included; results for control variables are suppressed.
- SD increase in GeoCOVID on day t-1 is associated with:
  - a 0.24 percentage point decrease in ARs on day t, equivalent to 40% of sample mean (-0.6%) of ARs
  - a 0.80 PP decrease in ARs during days t & t+1 (2-day window)
  - a 0.93 PP decrease in ARs during days t-1, day t, & day t+1 (3-day window)
- Strong negative association between GeoCOVID & abnormal returns is **not** driven solely by the national trend in reported cases.
The Effects of Non-pharmaceutical interventions (NPIs)

Market Reactions to State-of-Emergency (SOE) Declaration

- Examine “top 3” SOEs, “top 3” SIPOs, & SOE announcements in HQ state
- Identify NPIs: Jataware, a machine learning company that automates collection of news articles, detects whether an article mentions a COVID-19 NPI, verify our NPI event dates using Google searches
- Again...there is substantial variation across property types
The Effects of Reopenings

Market Reactions to State-of-Emergency (SOE) Declaration

- Examine “top 3” reopenings using data through June 30
- Identify reopenings: the date the state government allowed the first set of businesses to reopen (Chetty et al., 2020; Nguyen et al., 2020)
- We find no discernable pattern of market reactions to reopening announcements
- Firms and businesses may choose not to open, or fully open, even after restrictions are lifted...
GeoCOVID & Policy Interventions

GeoNetExp = % exposed to NPIs - % exposed to reopenings

- Both proportions are measured at the state level
- Reopenings are intended to nullify NPIs
- The inverse-U shape corresponds to an increase in average NPI exposures until April 3, followed by a decline after April 20 as reopenings began to occur
### GeoCOVID & Policy Interventions

<table>
<thead>
<tr>
<th>Ret (1-day)</th>
<th>Post NPI</th>
<th>GeoNPI</th>
<th>GeoReopen</th>
<th>GeoNetExp</th>
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<tr>
<td></td>
<td>After Apr 15</td>
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<tr>
<td>GeoCOVID × Policy</td>
<td>0.067*** (3.85)</td>
<td>0.150*** (4.29)</td>
<td>-0.050 (0.67)</td>
<td>0.003** (2.55)</td>
<td>0.009*** (3.10)</td>
<td>-0.003 (-1.37)</td>
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<td>GeoCOVID</td>
<td>-0.078*** (-9.49)</td>
<td>-0.035*** (-4.30)</td>
<td>-0.186*** (-3.20)</td>
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<td>0.011*** (3.27)</td>
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- Property type fixed effects, or firm fixed effects, are included; results for control variables are suppressed.
- SD increase in GeoCOVID on day $t-1$ is associated with:
  - a 0.10 percentage point decrease in ARs on day $t$ in the post-NPI period.
  - Compared to pre-NPI level of 0.73.
- Compared to a firm with no exposure to NPIs ($GeoNPI = 0$), firm with 10% NPI exposure ($GeoNPI = 10$) experiences a decline in 1-day abnormal returns that is 57% less than mean.
## GeoCOVID & Reopenings

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- Property type fixed effects, or firm fixed effects, are included; results for control variables are suppressed
- There is no evidence that reopenings boosted the expected performance of CRE markets
Conclusion

• Ours is first paper to examine how COVID-19 pandemic has affected stock returns through a firm’s underlying assets
  • Specifically, the location of those assets

• First to examine how outbreak of the COVID-19 pandemic affects the CRE market

• Researchers have found that existing models may no longer be adequate (Barro et al., 2020; Alfaro et al., 2020)...

• ...And are exploring ways to better capture firm-level exposures to diseases (e.g., Hassan et al., 2020)

• Our findings suggest models need to control for cross-sectional variation in firms’ geographic exposure to pandemics
  • geography of assets & extent to which “local” information about productivity of a firm’s assets is capitalized into stock prices
Thank You!

• Latest version: