The Impact of Recent Unemployment Shock on the U.S. Housing Market and Public REITs

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Executive Summary

In this report, we examine the recent trends in both the U.S. housing market and public REIT sectors, mainly focusing on the impact of adverse unemployment shock on housing values and REITs' excess returns. We show that the real estate industry has been affected in different ways by region and property type. In the residential sector, counties in which the housing values dropped more than 1.5 percent during the past five months are characterized by low median household incomes and high poverty rates. We also find a high occupational concentration in the traveler accommodation, the automotive rental, and the retail industries in those counties recently experienced a rapid drop in housing prices.

The Public REIT sectors have been hit by the pandemic more noticeably. For the first quarter of 2020, the worst-hit property types were regional malls (-60%), lodging/resorts (-51.3%), shopping centers (-49.5%), and retail (-48.7%), by the percentage change of the total index.

By property type, we find that the office REITs have been adversely impacted by the unemployment shock at the highest level, followed by lodging/resorts REITs.

However, REIT properties showed a quick recovery during the second quarter of 2020, particularly for the shopping center, retail, and regional mall REITs.

Introduction

The U.S. unemployment rate has dramatically increased to 13.3 percent in May 2020 over the past few months, from 3.6 percent in January 2020. In New York State, the rate increased from 3.8 percent in January to 14.5 percent in May. The unemployment rate in New York City increased even higher than the statewide rate, reaching 18.3 percent in May. (For reference, the unemployment rate was 9 percent in April 2009 during the Great Recession.)

At the same time, the U.S. real GDP decreased at an annual rate of 5 percent in the first quarter of 2020. At the state level, the decrease in real GDP was the largest in New York State by –8.2 percent.

By industry type, "*mining, quarrying, and oil and gas extraction*" and "*leisure and hospitality*" industries recently lost the highest number of employees. According to the most recent data from the Bureau of Labor Statistics (BLS), the unemployment rate in the *real estate and rental/leasing* industry increased from 2.4 percent in June 2019 to 8.8 percent in June 2020.

While the economy is struggling with the spread of the COVID-19 pandemic, how are the U.S. housing and Public REIT sectors responding to the market uncertainty? In general, the adverse income shocks, caused by high unemployment rates, decrease housing demand across the U.S., particularly in the owner-occupied housing sector. This potentially becomes a threat to housing

stability. For instance, a recent study[1] on the Covid-19 Mortgage Forbearance Program shows that 7 percent of the total sample loans were flagged for a Covid-19 related forbearance as of April 2020, which was only a few weeks from March 12th, when diagnosed cases of COVID-19 in the U.S. exceeded a thousand.

In this context, the first part of our report examines recent trends in housing values, mostly at the county level. The second part analyzes the impact of unemployment shock on public REITs' performance by property type.

Residential Real Estate

Based on Zillow's Home Value Index (ZHVI), the housing prices increased by 4.3 percent nationwide over the year between May 2019 and May 2020, and by 1.5 percent from January 2020 to May 2020. As for rental prices, the nationwide rental index, obtained from Zillow, increased by 2.9 percent over the year (May 2019 – May 2020), and by 0.9 percent in 2020 (January – May 2020).

However, zooming into the county-level changes in housing prices, 20 percent of our sample counties (570 out of 2848 counties) recently experienced a price drop between January and May 2020 by –0.9 percent, on average. Two New York City boroughs have lost housing values during the same period by –1.2 percent and –0.4 percent in Manhattan and Bronx, respectively.

Figure 1-1. Top Ten Counties Recently Lost Housing Values (January—May 2020)

Rank	County	State	% Change in Housing Values
1	Gregg	TX	**-9.1%**
2	Sherman	OR	**-7.6%**
3	Edmunds	SD	**-6.4%**
4	Rolette	ND	**-6.0%**
5	Butte	CA	**-4.2%**
6	Tunica	MS	**-4.1%**
7	La Salle	IL	**-4.1%**
8	Pope	IL	**-3.7%**
9	Osage	OK	**-3.7%**

Figure 1-2. New York City Housing Value Changes (January—May 2020)

County	% Change in Housing Values
Manhattan	**-1.2%**
Bronx	**-0.4%**
Kings (Brooklyn)	**0.1%**
Queens	**0.1%**
Richmond (Staten Island)	**0.4%**

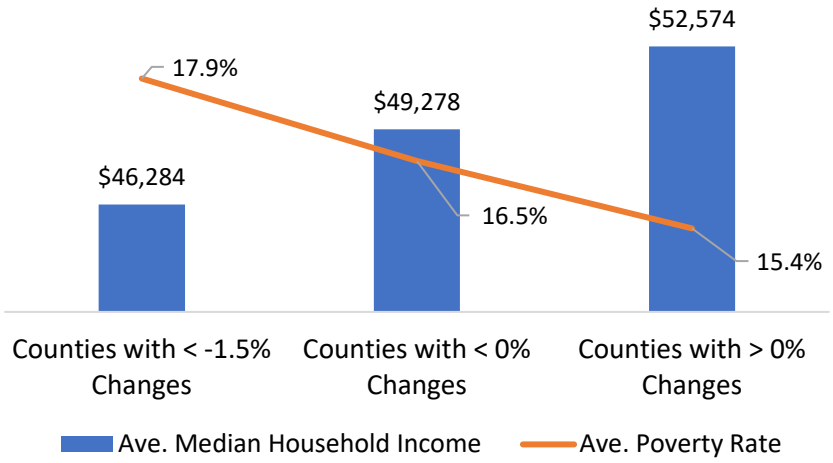
Data source: Zillow

[1] "Communications Between Borrowers and Servicers: Evidence from the Covid-19 Mortgage Forbearance Program" by Agarwal, et al. (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3676546)

We categorize our sample counties into three groups to understand socioeconomic differences among groups. The three groups are (1) counties experienced positive changes in housing values over the last five months, (2) counties experienced negative changes in housing values, and (3) counties lost housing values more than 1.5 percent over the same period.

Figure 2 compares the median household incomes and poverty rates for the three groups of counties. It reveals that those counties with more rapid housing price drops (Group #3) have the lowest median household income ($46,284), while the poverty rate is the highest compared to the other two groups. The counties with increased housing prices, on the other hand, are associated with the highest median household income and the lowest poverty rate.

***Figure 2*. Median Household Income and Poverty Level**



Notes: We merge two separate data sets from Zillow and the U.S. Census, by county FIPS code to create this figure. We use Zillow's Home Value Index (ZHVI) in December 2019 and May 2020 to compute the recent changes in housing values. We use the 2018 American Community Survey (ACS) 5-year estimates for the median household incomes and poverty rates at the county level.

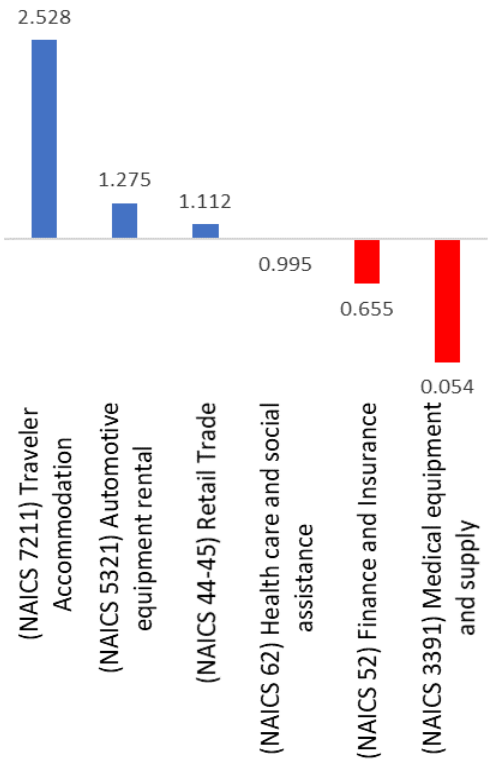
Furthermore, we find that those counties associated with negative changes in housing values are different from the counterpart counties in terms of primary industry types. Specifically, we use the location quotients (LQ), obtained from the Occupational Employment Statistics (OES) of the BLS, to identify which occupations are highly concentrated in the counties with recent housing price drops greater than -1.5 percent. A location quotient represents a specific occupation's share of a county's employment relative to the national share of the same occupation. For instance, a location quotient of 2 for industry *i* in county *j* shows that the occupation of the industry sector accounts for twice the share of employment in county *j,* than the employment share nationwide.

In other words, a higher LQ indicates that a particular industry is highly specialized in a county. A location quotient less than 1 indicates that a corresponding industry is less concentrated in a county compared to the national share.

$$LQ_i = (\frac{e_i}{e}) / (\frac{E_i}{E})$$

where e_i = the number of local employees in industry *i*, e=local number of total employees, E_i= national number of employees in industry *i*, and E = national number of total employees.

Figure 3. **Employment Location Quotients for Selected Industries**



Notes: This figure compares the employment location quotients for selected six industries for the counties experienced a rapid drop in housing values from December 2019 to May 2020.

Figure 3 shows that those counties recently experienced a rapid drop in housing values are characterized by highly concentrated employment in the traveler accommodation, the automotive rental, and the retail trade industries, with LQs of 2.53, 1.28, and 1.11, respectively.

The right-hand side of Figure 3 represents that health care and social assistance, finance and insurance, and the medical equipment and supply industries are less specialized in the counties, compared to the national employment share of the corresponding occupations.

Commercial Real Estate – Public REIT Sectors

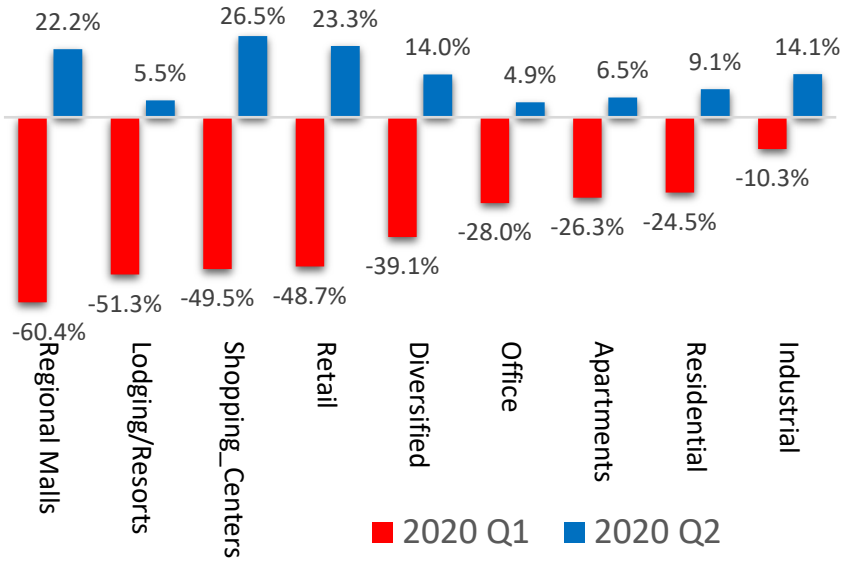
As described, the high level of unemployment over the past few months raised uncertainties in the overall real estate market. Compared to the residential sector, the commercial real estate sectors, focusing on public REITs, have been hit by the pandemic more noticeably.

For the first quarter of 2020 in the equity-REIT sector, the worst-hit property types were regional malls (-60%), lodging/resorts (-51.3%), shopping centers (-49.5%), and retail (-48.7%), by the percentage change of the total index between the end of December 2019 and the end of March 2020.

For comparison, the REIT's index, including all sectors both in the equity and mortgage REITs, experienced a 25.4 percent drop in the total index during the same period.

However, the next quarter (Q2 of 2020) showed recovering trends for all primary equity REIT sectors. Shopping centers regained their value by 26.5 percent, followed by retail (23.3%), and regional malls (22.2%). The total REITs' index, including all sectors both in the equity and mortgage REITs, immediately recovered by 14.0 percent in the Q2 of 2020.

Figure 4. **Percentage Changes in the Total Index by Equity REITs Sector (Q1 and Q2 in 2020)**



Data source: NAREIT

Separating the mortgage REITs from the equity REITs, it revealed a more rapid drop and recovery during the first half of 2020: -56.1 percent loss in Q1 and 37.8 percent gain in Q2.

To examine the impact of macroeconomic shock, proxied by the unemployment rate, on the REITs' returns over the past five years (June 2015 through May 2020), we run a series of regression models for each REIT sector. As specified below, we regress REITs excess return $R_t^e := R_t - R_t^f$, on the Fama-French three factors (the stock market, the size (SMB), and the value (HML) factor), and the unemployment rate. We use the historical 30-day T-bill monthly returns as a proxy for the risk-free rate, R_t^f, to compute excess returns.

$$R_t^e = \alpha + \beta_{stock} R_t^{stock,e} + \beta_{SMB} R_t^{SMB,e} + \beta_{HML} R_t^{HML,e} + \beta_{unemp} R_t^{unemp,e} + \varepsilon_t$$

Figures 5-1 and 5-2 show that unemployment rates are negatively associated with the REITs' excess returns, holding other factors constant. On average, a one percentage point increase in the unemployment rate results in a 0.2 percentage point decrease in the REITs' excess return, with our five-year sample (Figure 5-1).

The negative impact from the unemployment shock becomes greater when we narrow down our sample period to the most recent six months (December 2019 – May 2020), with a one percentage point increase in the unemployment rate resulting in a 3.88 percentage point decrease in the REITs' excess return.

Figure 5-1. The Impact of Unemployment on the REIT's Excess Returns (2015.06-2020.05)

Variables	REITs' Excess Return
Stock market	0.83***
	(0.04)
SMB	0.03
	(0.07)
HML	0.14**
	(0.05)
Unemployment rate	-0.20**
	(0.10)
Constant	0.80
	(0.81)
Sector Fixed-effects	Yes
Observations	1,062
R-squared	0.35

Figure 5-2. The Impact of Unemployment on the REIT's Excess Returns (2019.09-2020.05)

Variables	REITs' Excess Return
Stock market	2.80***
	(0.55)
SMB	4.96***
	(1.55)
HML	-3.28***
	(1.17)
Unemployment rate	-3.88***
	(1.10)
Constant	9.05**
	(4.44)
Sector Fixed-effects	Yes
Observations	108
R-squared	0.71

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: The dependent variable is the excess return on the equity REIT total index in both Figures 5-1 and 5-2. The independent variables are listed in the main text. In Figure 5-1, the data are monthly from June 2015 to May 2020. In Figure 5-2, the data are monthly from December 2019 to May 2020.

Our results displayed in Figure 6 reveal that the impact of unemployment on the return is various by sector. We find that the economic shock negatively hits the office REITs at the highest level; a one percentage point increase in the unemployment rate decreases the excess return of the REITs in the office sector by 0.73 percentage point. Lodging/resort and industrial REITs also negatively associated with unemployment rates with coefficients of -0.52 and -0.37, respectively. In Panel 2, we focus on the most recent six-month sample period. The unemployment rate shows a greater negative impact on

REITs' excess returns in the office and industrial sectors, compared to the impacts shown in Panel 1.

Figure 6. Comparison of the Unemployment Betas for Selected REIT Sectors

Panel 1: June 2015 to May 2020

Sector	Emp. Beta	Standard Err.	t
Office	-0.73	0.24	-3.11
Lodging/Resorts	-0.52	0.15	-3.47
Industrial	-0.37	0.18	-2.07

Panel 2: December 2019 to May 2020

Sector	Emp. Beta	Standard Err.	t
Office	-1.73	1.96	-0.88
Lodging/Resorts	-0.45	0.68	-0.66
Industrial	-0.81	0.28	-2.82

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: The dependent variable is the excess return on the equity REIT index. The independent variables are listed in the main text. The *t*-statistics are computed using Newey–West standard errors with one lag. The data are monthly from June 2015 to May 2020 in Panel 1, and from December 2019 to May 2020 in Panel 2.

Conclusions

In this report, we examine the recent trends in both the U.S. housing market and public REIT sectors, mainly focusing on the impact of adverse unemployment shock on housing values and REITs' returns. We find that the real estate industry has been affected in different ways by region and property type. In the first part of our report, we show that the U.S. counties in which the housing values dropped more than 1.5 percent during the past five months are characterized by low median household incomes and high poverty rates. Those counties are also described by a high occupational concentration in the traveler accommodation, the automotive rental, and the retail industries.

Compared to the housing market, the public REITs sectors have been hit by the economic shock more noticeably, according to our analysis on the REITs' excess returns, particularly in regional malls, lodging/resorts, shopping centers, and retail REITs.

To examine the impact of unemployment shock on the REITs' performance by property type, we run a series of regression models for each REIT sector and find that the macroeconomic shock adversely hits the office REITs at the highest level, followed by lodging/resorts and industrial REITs.

Despite the unprecedented disruption in the real estate industry over the past few months, REIT properties showed a rapid recovery during the second quarter of 2020, particularly for the shopping center, retail, and regional mall REITs.

In the long-term, the market rebound will be contingent on various factors, such as the trends in the spread of Covid-19 over the second half of 2020 and federal agency policies, along with the real estate investors' expectation on the future returns. Furthermore, cultural changes caused by the recent pandemic, including working from home environments, increasing demand on online grocery shopping, and new travel patterns, will be critical aspects in analyzing the future real estate trends both in the residential and commercial sectors.