The Effects of COVID-19 on the Change in Real Estate Prices

William Ladson & Brooks Murphy

Economics Department | The University of the South

Advisors: Aaron A Elrod & Katherine Theyson

Introduction

The Coronavirus Pandemic (COVID-19) was a global outbreak that disrupted entire economies as governments attempted to slow down the spread of the disease. Businesses temporarily laid off workers or used telecommunication to allow their workers to work from home as they were unable to operate normally. Additionally, the federal reserve adjusted monetary policy to ease the financial burden caused by the crisis. Furthermore, demand for separation from others decreased the desirability for close quarter living contributed to an increase in demand for less dense rural areas.

Housing prices is affected by factors such as unemployment, migration, and changes in monetary policy. Unemployment influences the size of the housing market given that it serves as a financial constraint and reduces the number of buyers as unemployment rises. Additionally, migration contributes to changes in housing prices as neighborhoods that gain attraction can see spikes in prices correlated an increase in popularity. On the other hand, any adverse shock to any variables that incentivizes individuals can spurt out migration (Plantinga, 2012). Furthermore, changes in monetary policy affect housing demand as lower interest rates attract homebuyers. Housing prices are strongly influenced by the business cycle and therefore "driven by fundamentals like income growth and industrial production" (Hwang and Quigley, 2006).

Hence, It is important to acknowledge that COVID-19 altered rural and urban areas differently as mandates and policies differed in rural and metropolitan areas. Comparing these effects of Coronavirus in densely populated vs. rural areas will give us insight on how COVID-19 has affected market behavior in the real estate market for different populations.

Model

To estimate the changes in housing prices for rural vs. Urban areas, we collected data from CDC, USDA, FreddieMac, Realtor.com, and Rural Development Data. The variables pulled from these datasets include percentage of COVID-19 cases, rural vs. urban classifications, median housing prices, mortgage rates, unemployment rates, poverty rates, and median family incomes for all US counties for 2019 and 2020.

We collected 9,959 observations in order to observe how COVID-19 affected rural and urban markets differently. Our regression includes monthly level data as the effects of COVID-19 varied over the year as the percentage of cases fluctuated. Lastly, it is important to note that we obtained our Housing Data from Realtor.com and smaller counties were omitted as they didn't find it worthwhile to sample the area.

The model includes a dummy variable, 'Rural' that is equal to "1" if the county is defined as rural by the USDA. Also included is an interaction variable 'rural * % COVID-19 cases' which shows the changes in real estate prices for each additional percentage increase in COVID-19 cases for rural counties. This interaction variable allows for a better understanding of how the change in housing prices have affected rural counties in comparison to larger urban areas.

To measure the changes in real estate prices for rural vs. urban areas, we ran five regressions. Each regression included different variables and measurement on county and monthly fixed effects. We use county and monthly fixed effects because we are examining the changes of housing prices on county levels and for the fifth regression, a monthly level too. Some variables are omitted when including these effects because they stay constant throughout county and monthly data.

Our model can be observed below.

Results

Table 1 reports the regression results for the effects of COVID-19 on the change in median housing prices for all US counties for 2019 and 2020. Regression 1 indicates that a one percent increase in COVID-19 cases causes a decrease in housing prices by .94%. However, in Regression 2, a one percent increase in COVID-19 cases saw a 1.12% decrease in the change in rural real estate prices. Additionally, Regression 3 includes additional variables that cause COVID-19 cases to have a less of an effect on real estate prices. For regression 4, we included a monthly fixed effect as we wanted to control for the monthly variables that impacted each county. Mortgage rate is omitted because it is measured on a yearly basis. The results from this regression show a .44% decrease in changes in housing prices in response to a one percent increase in COVID-19 cases.

Lastly, Regression 5 includes county and monthly fixed effects. County fixed effect controls for changes across counties, if factors outside of counties affect everything the same. The coefficients indicate that for a one percent increase in COVID-19 cases, there was a .52% decrease in the change in real estate prices for rural counties.

Conclusion

The results collected from the regressions during their experiment concluded that COVID-19 has contributed to significant price changes in urban and rural areas. Controlling for no other variables, an increase of infection rates of COVID-19 was statistically significant on the 1% level for having an impact on housing prices.

In addition, interpreting the results from Regression 4, areas that had greater infection rates saw drops in housing prices as individuals wanted to escape areas with the virus. Furthermore, rural areas with higher infection rates saw the greatest drop in monthly average housing prices as these counties saw -.28% greater monthly decrease compared to urban areas. Similarly, urban areas with higher infection rates also saw drops in housing prices.

Following that, rural and urban areas with small concentrations of COVID-19 saw slightly larger increases in housing prices as these areas became more attractive to escape from highly infected areas. Rural housing in counties with low COVID-19 saw the largest increase in housing prices as these locations were the greatest option to isolate from COVID-19.

Table 1: Impact of COVID-19 Cases on the Change in Real Estate Prices

	1	2	3	4	5
COVID-19 Cases (% of Pop)	-0.9407 ***	-0.8826 ***	-0.13629	-0.1532	-0.2105 *
	{.06122}	{.07079}	{.08731}	{.09733}	{.12203}
Rural		0.00385 ***	0.0041 ***	0.0040 ***	
		{.00140}	{.00139}	{.00140}	
COVID-19 Cases (%) * Rural		-0.2335 **	-0.30244 **	-0.2855 **	-0.3104 *
		{.1409}	{.13953}	{.1372}	{.17422}
Mortgage Rate			0.03743 ***		
			{.0029}		
Unemployment Percentage			0.00046 ***	0.00045 ***	0.00071 **
			{.0001}	{.0001}	{.00027}
Poverty Percentage			0.00004	0.00004	
			{.00029}	{.0003}	
Median Household Income			-5.8E-08 **	-6E-08 **	
			{2.85E-08}	{2.81e-08}	
Constant	-0.9407 ***	0.01106 ***	-0.08815 ***	0.0526 ***	0.05259 ***
	{.00059}	{.00665}	{.00776}	{.0182}	{.01222}
County Fixed Effect	N	N	N	N	Y
Monthly Fixed Effect	N	N	N	Y	Y
Number of Observations	9,959	9,959	9,959	9,959	9,959
R Squared	0.0232	0.0239	0.0452	0.0808	0.0787

Model

$$\Delta \text{Housing Prices}_{it} = \beta_0 + \beta_1(\%\text{Covid Cases})_{it} + \beta_2\ \text{Rural}_i + \beta_3\ (\%\text{Covid Cases} * \text{Rural})_{it} + \beta_4$$

$$\text{Median Listing Price}_{it} + \beta_5\ \text{Mortgage Rates}_{it} + \beta_6\ \text{Unemployment Rate}_{it} + \beta_7\ \text{Poverty Rate}_i +$$

$$\beta_8\ \text{Median Family Income}_i + u$$