**Housing Supply and Homelessness in U.S.**

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**Introduction**

Does a lack of affordable housing drive increases in homeless populations? Over half a million Americans experienced homelessness in 2022 (HUD 2023). This number has steadily grown since 2016 and is likely to increase as housing prices and income inequality are among the notable catalysts for increased rates in homelessness (Byrne et al. 2021 and Harrison 2020). Although many personal factors may lead to someone becoming homeless, such as family history, mental trauma, and neighborhood demographics, (Bartelt et al. 2017) very little empirical research has been completed studying the macroeconomic factors that drive homeless populations (Corinth 2017). Some research has studied the effect of alleviation strategies such as the number of shelter beds on homeless populations (Moulton 2013), but only two major papers have studied macroeconomic conditions that may lead to homelessness: Quigley et al (2001) and Byrne et al (2021).

Quigley et al. (2001) concluded that vacancy rates were negatively correlated with homeless populations and rent to income ratios were positively correlated. Byrne et al. (2021) concluded that increases in income inequality, using Gini Coefficients, were correlated with an increase in homeless populations on the community level. Both these papers concluded their findings from Californian regional data, either by county or CoC district. CoC districts are a geographical area the Department of Housing and Urban Development disperses their funding by. Harrison (2020) suggests that income inequality pushes housing prices upward, pricing out at-risk individuals and ultimately leading to increased homelessness. All three of these studies relate to the availability of affordable housing, and its effects on homelessness. Although Evans, Phillips, and Ruffini (2021) found that a percent change in 1 bedroom rent wasn’t strongly correlated with an increase in the percent change of homelessness from 2010 to 2017, more research is needed on the subject.

Building off Quigley’s research, these effects need to be revisited for more clarity. At the time Quigley wrote his paper, the only data available was national PIT estimates conducted on one single night a few years apart. By examining the effects of these variables from 2007 to 2022 by each state, perhaps even more convincing evidence can be discovered. Evans et al. (2021) states that the homelessness is most notable in coastal cities who also have historically high rents.

**Data**

Data will be joined from several datasets; Annual Point-In-Time homeless counts and supportive housing (bed count) will be obtained through the Department of Housing and Urban Development. Total vacancy rate for homeowners and renters as well as population will be obtained from the Census Bureau. Unemployment will be gathered form the Bureau of Labor Statistics. All data will be joined by the state and year from 2007 to 2022, the limiting factor of HUD’s PIT count series beginning in 2007.

Summary Statistics

Variable | Obs. Mean Std. dev. Min Max

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Homeless 765 11547.5 21333.27 515 171521

Vac. Rate 765 8.17 2.88 2.4 17.8

Unemp. 765 5.8 2.29 2.07 13.73

Beds 765 8129.41 12445.4 560 89238

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\*Min and Max represent a single observation in a state on given year.

It is important to note the range of Vacancy Rate conditions in the data as well as the range in homelessness to emphasize the need for fixed effects. A graph of national data can better illustrate the two’s relationship over the time series. The two seem to be correlated up until about 2015. This is likely due to the high vacancy rates during the economic recovery period after the Great Financial crisis. A noticeable reversal of the trend in homelessness can be seen after 2016. This could be due to affordable housing, but it could also be due to funding cuts during the Trump era. From 2016 to 2020 the HUD budget was cut by nearly 7 billion dollars from the 25 billion in 2016 (HUD 2023). I attempt to control for this effect in the model by controlling for shelter beds. It should be noted that 2021 has been dropped from this data set due to inconsistent Covid restrictions effecting PIT counts of unsheltered homeless. The HUD only estimated sheltered homeless for that year.



**Model**

Log(hlpop)it = B0 + B*vacit* + B*vacit2 +* B*log(pop)it +* B*unempit +* B*bedsit +* a*i + Uit*

Collaborating the ideas from Quigley and the findings in Byrne et al. A fixed effects model will be used at the state level to research vacancy rate’s effect on homeless populations over time. Considering that different states: use different policies to counter homelessness, climate, stigmas and demographics, a fixed effect model is most appropriate to analyze the relationship in question. A cross sectional study would not suffice as many time-invariant factors in each state may bias the relationship of vacancy rates on homeless populations. Such an example would be average temperature, which has been shown by Quigley to be positively correlated with homeless populations and will be captured in the error term in the fixed effects model. Vacancy rates will serve as a means of measuring the relationship of affordable housing on homelessness, as assumed through Quigley (2001), Byrne et al. (2021), and Harrison’s (2020) findings, expecting the relationship to be negatively correlated with homelessness. As the relationship between homelessness and vacancy is expected to be nonlinear a quadratic variable is added. A change in vacancy rate between 2% and 3% is likely much different than from 12%-13%.

Population change, unemployment, and shelter beds will act as controls that could affect both homeless populations and vacancy rates. Population changes can put pressure on housing markets and need to be controlled for as they can impact vacancy rates and homelessness. Population changes are expected to be positive as is unemployment. Shelter beds are an important consideration in the fixed effects model as various states have dramatically different public housing policies. Moulton (2013) suggests the number of available beds is negatively correlated with homeless populations.

By studying the housing market effects at the state level over time, new insight can be gained from an improved data set compared to what Quigley originally studied. This model will also attempt to challenge findings in Evans et al. (2021), that an increase in housing prices is only loosely correlated with increasing homeless populations at best.

**Results**

The Models represent the data sets with and without 2021 dropped. For the datasets with 2021 included, the Fixed Effects model understates the negative correlation between vacancy rates and homelessness, because the data for that year represents only unsheltered homeless, around half the likely estimate. Distortions can also be seen in the estimated effect of population growth on homelessness. The Quadratic Fixed Effect model (model 1) shows a slightly higher adjusted R squared as well as finds a slight negative relationship over some values of Vacancy Rates, compared to the linear fixed effects model. It is unlikely that Vacancy Rate has a positive correlation with homeless populations at lower values. Lower vacancy rates are not correlated with lower costs in the real world.

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(1) (2) (3) (4) (5)

Log(Homeless) FE2 FE OLS OLS21 FE221

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Vac. Rate -0.0370\* 0.0241\*\*\* -0.0246\*\*\* -0.0389\* -0.0222\*\*\*

(-2.45) (5.72) (-3.92) (-2.39) (-3.61)

Vac. Rate2 0.00311\*\*\* 0.00340\*\*\*

(4.21) (4.23)

Log(Pop) -0.335 -0.182 0.734\*\*\* -0.616\*\* 0.720\*\*\*

(-1.92) (-1.05) (35.25) (-3.27) (35.39)

Unemp. 0.0160\*\*\* 0.0147\*\*\* 0.0650\*\*\* 0.0158\*\*\* 0.0692\*\*\*

(4.31) (3.93) (8.36) (3.79) (8.87)

Beds 0.0000253\*\*\* 0.0000261\*\*\* 0.0000278\*\*\* 0.0000241\*\*\* 0.0000281\*\*\*

(7.94) (8.13) (15.93) (6.97) (16.55)

Constant 13.37\*\*\* 10.82\*\*\* -2.723\*\*\* 17.54\*\*\* -2.582\*\*\*

(5.08) (4.18) (-9.25) (6.18) (-8.94)

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Observations 765 765 765 816 816

Adj. R-squared 0.194 0.175 0.842 0.196 0.835

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t statistics in parentheses

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Given that Vacancy rates are expected to effect homeless populations non-linearly an estimation of the marginal effect of Vacancy rates on homeless population can better show this relationship. In the graph below, swings away from the breakeven point of Vac. Rate = 5.75% are correlated with increasing populations. A healthy housing vacancy rate is traditionally thought to be between 4-8%, which offers some validity to the estimated relationship. If vacancy rates are particularly high, it could suggest that there is a lack of economic opportunity in the region which could also cause a rise in homelessness. This can also be observed in the estimated negative effect population change had on homelessness. It is likely that a state’s population would not grow unless there is economic opportunity and healthy housing supply there.

The marginal effects from 0% to 5% can be equated to very tight housing supply, which is also associated with a high cost of housing. As supply squeezes, people’s willingness to pay increases, pricing at risk individuals out of the market. Moving towards a healthy vacancy rate also moves a region towards lowering homeless populations.



Notes: The breakeven point for the prediction function of Vacancy Rates on homelessness is around 6%.

The findings from this graph suggest a strong effect of vacancy rates on homelessness at the lower limit moving towards 6%. A change in vacancy rate from 1%-2% is associated with 3.08 percentage point decrease in regional homeless populations, all else constant. Alternatively, moving away from the breakeven point towards complete market saturation (0%) can increase homeless populations by 12.38%, all else constant.

The main identification of this model is likely the correlation between economic opportunities in the time variant error term with both the independent and dependent variable. Given that the data only spans 15 years, the lack of market cycles could be distorting the effects of economic opportunity in each state-year the model attempted to control for.

**Conclusion**

By re-examining the findings from Quigley et al. (2001) and combining the effect of income inequality from Byrne et al (2021), these findings emphasize the importance of affordable housing as a key principle in the solution for homelessness. Considering a local economy that is facing a housing supply crisis for the near future and may also already have a prevalent homeless population, it would be more important for policy makers to fund preventative measures such as social housing than to expand alleviation measures. Preventative strategies are shown to be less expensive and more successful than alleviation strategies in the fight against homelessness (Corinth 2017). Alleviation measures such as soup kitchens and emergency shelter beds do not counter the drivers of increasing homeless populations. Providing shelter beds has shown significant, yet very small effects on homeless populations in the model and elsewhere in the literature. Yet, homelessness has been shown to be more sensitive to affordable housing supply as seen in the model and in others research. Social housing can offer both an empirically justified preventative effect as well as an alleviation measure for those already experiencing homelessness.­

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