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4-17-2024

### The Determinants of Housing Prices in Micropolitan Areas

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# RESEARCH COLLIQUOUM

## 2024

# PITTSBURG STATE UNIVERSITY



# Determining Factors of Housing Prices in Micropolitan Areas

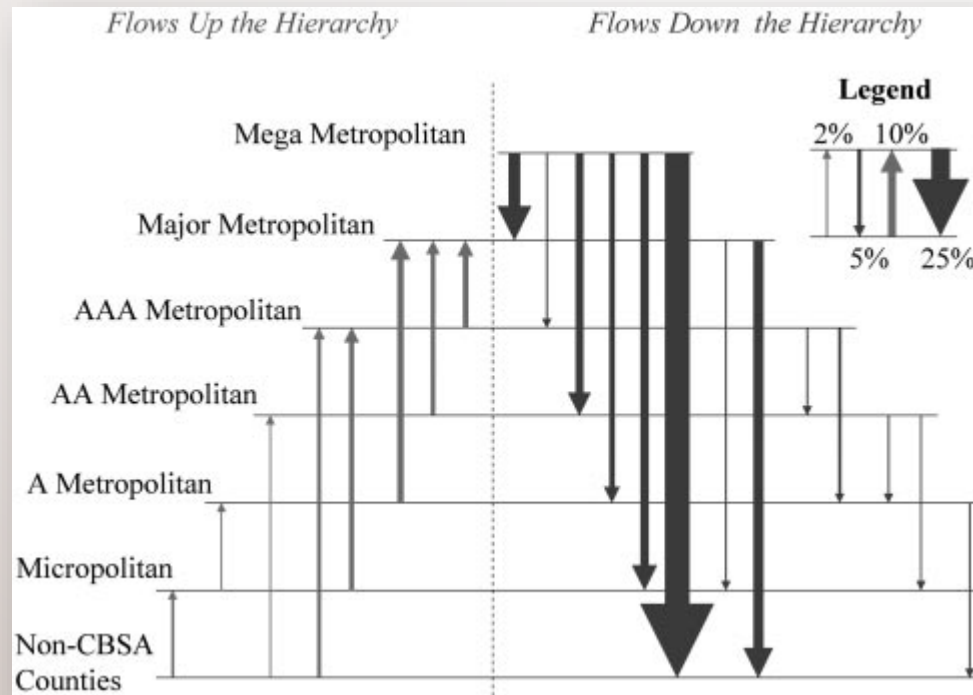
- Micropolitan: 10,000 to 50,000 residents
- Typical studies conducted in *metropolitan* areas
- Lots of recent interest given the newfound issues with urban living (COVID-19)

# MIGRATION TRENDS

## Demographic Effectiveness

Migration up and down the urban hierarchy and across the life course

D. A. Planea,<sup>b</sup> C. J. Henrie<sup>c</sup>, and M. J. Perry<sup>d</sup>



# PURPOSE AND CONTRIBUTION OF THE STUDY

- Initial goal was to help myself as a potential future real estate investor
- Positive byproduct of helping the city of Pittsburgh identify and validate the accuracy of housing in the area, as well as provide suggestions to make housing more affordable in the Pittsburgh area

# LITERATURE REVIEW

- Lang & Dhavale (2005)
  - Observations of average housing prices
- Zietz et al. (2008)
  - Intrinsic determinants of value of homes
- Lin et al. (2014)
  - Socioeconomic determinants of value of homes
- Beets (2017)
  - Previous student study of very similar nature
- Tardif (2020)
  - Determinant of recent interest in micropolitan housing studies

# THE EMPIRICAL MODEL

$$[\mathbf{Median\ Housing\ Value}] = \begin{bmatrix} \mathbf{Vector\ of\ Housing} \\ \mathbf{Characteristic} \\ \mathbf{Variables} \end{bmatrix} + \begin{bmatrix} \mathbf{Vector\ of} \\ \mathbf{Socioeconomic} \\ \mathbf{Variables} \end{bmatrix} + [\mathbf{Error\ Term}]$$



# DATA

- 2000 Census and Subsequent Census Estimates
  - 48 Contiguous US States
  - 554 Micropolitan Areas
  - 668 Counties
- 
- Mild issue with heteroskedasticity, HW HAS VCV Matrix
  - Mild issue with incorrect signs, corrected with log on the dependent variable





# THE EMPIRICAL MODEL

## Econometric Study

*Log(HouseValue) = f(Population, Asian, Unemployment, Income, Poverty, PropertyTax, VCrime, Elderly, MarriedHomes, HSEDU, AGE1-4, Vacant, ToNextCity)*

$$\begin{aligned} \text{Log(HouseValue}_i) = & c + \beta_1 \text{Population}_i + \beta_2 \text{Asian}_i + \beta_3 \text{Unemployment}_i + \beta_4 \text{Income}_i + \\ & \beta_5 \text{Poverty}_i + \beta_6 \text{PropertyTax}_i + \beta_7 \text{VCrime}_i + \beta_8 \text{Elderly}_i + \beta_9 \text{MarriedHomes}_i + \\ & \beta_{10} \text{HSEDU}_i + \beta_{11} \text{AGE1-4}_i + \beta_{12} \text{Vacant}_i + \beta_{13} \text{ToNextCity}_i + \varepsilon_i \end{aligned}$$

# Findings

Variable	Coefficient	T-Stat	P – Value
Elderly	0.029	0.107	0.91
Age1-4	1.09***	14.9	0
Asian	4.45***	3.38	0.0008
HSEDU	1.19***	7.79	0.0000
Income	2.32E-05***	8.81	0.00
MarriedHomes	-0.61***	-3.17	0.0016
Population	5.39E-07**	1.90	0.057
Poverty	-0.99***	-2.33	0.02
Propertytax	-1.90***	-2.87	0.0042
ToNextCity	-0.0002	-1.42	0.1559
Unemployment	1.57***	3.15	0.0017
Vcrime	-9.37E-05 (very small)	-0.81	0.4197
Vacancy	0.359***	2.62	0.0089
C	9.6682	38.24	0.0000

R<sup>2</sup> = 0.69

\*= p-value < .15, \*\*= p-value <.1, \*\*\*=p-value < .05

# THE EMPIRICAL MODEL

## Discussion of Results

- All anticipations occurred, besides:
  - Unemployment
    - Potentially coincides with population
  - Married Homes
    - 2 vs 1 income per home affecting demand?
    - Kids = less money for housing?
  - Vacancy
    - High vacancy because of old uninhabitable homes, meaning more new homes?
    - New homes being built but not yet purchased?

# Conclusions

## Significant and Relevant Variables:

- House Age (+)
  - Building new houses increases median housing value
  - Keeping older houses makes housing more affordable
- Population (+)
  - The greater the population of Pittsburg, the higher the median housing value.
- Highschool Education (+)
  - A more educated Pittsburg will increase the median housing value
- Vacancy (+)
  - Filling vacant housing makes the rest of housing more affordable
- Property Tax(-)
  - Less taxes will allow more money to be spent on housing, increasing the median value

# QUESTIONS

