Team #17506

A Tale of Two Crises: The Housing Shortage and Homelessness

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1. Executive Summary

The affordability crisis is in full force globally across the world as the population is reaching unprecedented levels of 8.1 billion globally. Effects can be seen especially clearly in the US where median house prices are rising to double what they were a decade ago. With people especially in lower income groups having to spend almost half of the majority of their incomes on housing. As the Housing Affordability Index continues to plummet yearly, we seek to examine the multiple variables that affect the housing market along with analyzing the root problems affecting homelessness.

Deciding to focus on the 2 cities, Seattle, Washington and Albuquerque, New Mexico: firstly, we found the different variables affecting the supply of houses in these 2 regions. The listed variables that we examined were 1. Population 2. Inequality 3. Median Real Income 4. Unemployment. Next, we found the exact correlations between these factors and the house prices in these regions to effectively isolate their effects on the housing market and obtain a more accurate prediction of how supply of houses is expected to change in the future. Utilizing a second correlation of house prices and house supply, we then find how much each variable is expected to change in the future and apply the data to a correlation between house pricing and house supply to effectively predict the change in supply of houses.

Also taking into account how homelessness might change in the future. We applied a similar model of variables and their correlations. In this model we addressed the following variables that are predicted to affect homelessness 1. Housing Cost Index 2. Cost of Living Index 3. Transportation Cost Index 4. Grocery Cost Index. Correlations between each variable and their effect on homelessness was analysed and when compiled with statistical analysis of how these variables might change in the future, we then are able to predict the severity of homelessness in the future.

Lastly, to obtain an optimal policy for what the governing body in these regions should do: we applied a model of calculating which areas are most affected by homelessness and put weightings according to the correlations for which variables would affect supply and homelessness the most. With these weightings, the government would be able to make educated decisions on which variable to fund with subsidies and governmental support first. To conclude our findings, we then offer certain ways and methods that governments may be able to raise fundings and different schemes they may use to solve the housing affordability crisis.

This section introduces the components of our problems and an overview of our proposed solutions along with objectives for each identified problem. Different assumptions and generalizations made are also included as part of each model.

1.1 Restatement of the Problem

The problem we were tasked with are as follows:

1. Model what the changes in housing supply in the two U.S. cities will be in the next 10, 20, and 50 years.
    a. While also listing out the limitations, strengths and weakness, as well as our level of confidence in this model
2. Model the changes in the homeless population in the next 10, 20, and 50 years

3. Using the results and data from the 1st and 2nd Model, derive a 3rd mathematical model that could be utilised to help a city determine a long-term plan to address homelessness
    a. Including how the model would be adaptable to unforeseen circumstances like natural disasters, economic recessions, or increased migrant population.

2. Part I: It Was The Best of Times

2.1: Restatement of the Problem

We define the term “housing supply” as “the total number of houses available at a given time”. This includes pre-existing houses and new properties.

2.2 Assumptions

1. No major event will cause a large difference in the price elasticity of supply in the market of housing for the foreseeable future.
   Unforeseen events like COVID-19 may affect the economical balances of Albuquerque and Seattle leaving many markets to suffer detrimental losses. This will likely include the housing market making predictions of the supply of houses in 10,20,50 years time to be inaccurate.
2. Unemployment is not a significant figure:
   When researching how different unemployment levels relate to the housing supply the data showed no significance.
3. Assume inequality is same for both:
   This assumption is made due to the lack of data regarding inequality in the specific region, therefore data from America is used instead.
4. Assume no substantial government policy changes that may impact the housing markets projected supply values:
   If the government changes policy it may positively or negatively affect the housing market.
5. Assuming there will not be an unprecedented governmental switch to majorly fund the housing sector at unparalleled levels compared to the past:
   If the housing sector was significantly funded the supply of houses would increase exponentially. And since we cannot predict the policies of the government and can only recommend a course of action we cannot take this into account in our report.
6. Inconsistencies in certain growth trends can be generalized into a single growth function of each variable factor (for the 1st and 2nd generalized model):
   Grouping two trends in a single growth function minimizes the inconsistencies and reduces inaccuracy due to anomalies.
7. Sudden surges in different economic events or population growth will be extremely uncommon and will not occur in the 1st and 2nd model, and will only be taken into account with a new adaptable model for those extreme events in the 3rd model
   Adapting the model to be volatile and effective in all scenarios produces a consistent, foolproof plan suitable for the cities to implement immediately.

2.3 Model

To predict a model of how the supply of houses is expected to change in the future, we first found the change of housing price. Afterwards, using the change of price, we can predict the supply of housing using information we found on the internet. There are multiple factors and variables that must be taken

into account as they affect the price of houses in the future. We model the price of houses in the future by taking into account the following variables:

1. Population
2. Inequality
3. Median Real Income

For each of the variables, we generated a line of best fit by plotting the data on a graph using Microsoft Excel. The equation of the line of best fit will be used as a function to predict future trends regarding the variable. As for acknowledging the fact that each variable has a different degree of impact on housing price, we found the impact of the variable secondary research, multiplied it by the expected increase in each variable to find the housing price at the given time period. This is the correlation coefficient in our model.

Variable (V)	**Definition**	**Unit**
$S_N(t)$	Predicted housing supply in N after t years	Houses
$Pr_N(t)$	Predicted percentage change in price of house	USD
$I_N(t)$	Predicted inequality in N after t years. (This is measured by the percentage of the America's income owned by the top 1% of its population)	%
$Po_N(t)$	Predicted population in N after t years	People
$R_N(t)$	Predicted median real income in N after t years	USD
t	Years after 2024	Years
C_V	Correlation coefficient between variable and expected increase in housing supply	None
N	Location of interest	N/A

For this question, we are employing the following model:

$$\mathbf{Pr_N(t) = (\Delta I_N(t) * C_I + \Delta Po_N(t) * C_P + \Delta R_N(t) * C_R)/5}$$

$$\mathbf{S_N(t) = Pr_N(t)*C_{Pr}}$$

2.4 Calculations

Here are the correlation coefficients that we found:

Variable	**Ratio of change in variable to change in housing price**	**C_V (3 d.p.)**
$I_N(t)$	1:4.1 (calculated through the average of the values found in the paper) (https://helda.helsinki.fi/server/api/core/bitstreams/80f0c8c6-fc0a-42bd-b512-20903cb5ba6d/content)	0.246
$Po_N(t)$	1:1.4 (https://www.cambridge.org/core/journals/journal-of-demographic-economics/article/abs/do-demographic-changes-affect-house-prices/EDCD6AA8D40A41F19D9D24B4AD4F053A)	0.714
$R_N(t)$	N/A (Since there is already statistical data online regarding housing price and median real income, we generated a regression line to find CR directly) (https://www.visualcapitalist.com/median-house-prices-vs-income-us/)	0.206
$Pr_N(t)$	N/A (the ratio is directly provided by the source)	0.168 (https://deliverypdf.ssrn.com/delivery.php?ID=732088024087094093121079092126105089026050064018017000018001115126008089069005106120099022017062023057007119023125019085084088051090012016041006116069121123112008068012087073013082122027123083071031000001024116011029024118029077005115069089074096031&EXT=pdf&INDEX=TRUE)

2.5 Results

Variable	**Equation**	**t=0**	**t=10**	**t=20**	**t=50**
$I_{Seattle}(t)$	$0.003t + 0.2405$	0.2405	0.2705	0.3005	0.3905
$Po_{Seattle}(t)$	$423.7t^2+60853t+4*10^6$	4000000	4650900	5386540	8101900
$R_{Seattle}(t)$	$22.629t^2+2758.6t+88858$	88858	118707	153082	283361
$Pr_{Seattle}(t)$	N/A	0	0.07202 3608	0.15258 6797	0.4455123
$S_{Seattle}(t)$	**N/A**	**368,000**	**394505**	**424152**	**531949**

Variable	**Equation**	**t=0**	**t=10**	**t=20**	**t=50**
$I_{Albuquerque}(t)$	$0.003t + 0.2405$	0.2405	0.2705	0.3005	0.3905
$Po_{Albuquerque}(t)$	$9097.5t + 976792$	976792	106776 7	1158742	1431667
$R_{Albuquerque}(t)$	$5.8069t^2 + 1205.2t + 51475$	51475	64108	77902	126252
$Pr_{Albuquerque}(t)$	N/A		0.04924 7361	0.10004 3473	0.26172699
$S_{Albuquerque}(t)$	**N/A**	**101,330**	**106320**	**111467**	**127850**

2.6 Discussion

Strength: We took into account various factors such as inequality, median income, and population which greatly affect the price of houses. This in turn plays a key role in influencing the supply of houses.

Weakness: We did not use different data for the variable inequality in Seattle and Albuquerque, and the model does not hold true if major events like natural disasters and global pandemic occur for the next 10, 20, 50 years. More variables can be taken into account like the growth of market share of the real estate industry, or government subsidies.

Asymptotic limit: The model we have here shows that with time the number of houses can increase semi-linearly. Although the amount of space in Seattle and Albuquerque is, in reality, limited. To counter this we will calculate a limit based on the space of land in the cities, and the average size of a house in those areas. Using the formula :

(**Total Land Space / Average size of household) - Number of current houses**

We can find the number of houses that can theoretically be built. This model has limitations though as the land space does not account for unbuildable zones, infrastructure, public services although it is a

theoretical limit.

Using the values from the internet (referenced below) we have get a theoretical limit of

Seattle: 665333 houses
Albuquerque:2605271 houses

That can be built…

Conclusion: The data shows that in 10 years there will be an increase of 7%, in 20 years it will be 15.5% and in 50 years 44.5% in Seattle. In Albuquerque the data shows that in 10 years there will be an increase of 4.9%, in 20 years 10% and in 50 years 0.26%. Our predictions show that the housing supply will increase in both cases in 50 years. Furthermore, both models also obey the theoretical limit meaning that in 50 years the housing supply is not limited and can continue to grow.

3. Part II: It Was The Worst of Times

3.1: Restatement of the Problem

We define the term "homeless population" as "the number of people in the region without any properties".

3.2 Assumptions

1. All variables for Seattle and Albuquerque are the same, except for the starting variables
   This assumption is made due to the limited availability of data on the internet
2. Assuming there will not be an unprecedented governmental switch to majorly fund the housing sector at unparalleled levels compared to the past

3. Inconsistencies in certain growth trends can be generalized into a single growth function of each variable factor (for the 1st and 2nd generalized model)

4. Sudden surges in different economic events or population growth will be extremely uncommon and will not occur in the 1st and 2nd model, and will only be taken into account with a new adaptable model for those extreme events in the 3rd model

3.3 Model

Similar to our first model, the second model will calculate the number of homeless individuals through various different factors such as:

1. Cost of living
2. Transport cost
3. Cost of groceries
4. Housing price

These factors are obtained from numbeo.com, and they all have a p-value of less than 0.001. This means they are all significant factors contributing to homelessness. The method that we used to obtain the best function remains unchanged from part I, where we plotted data into Microsoft Excel, then generated lines of best fit.

Variable (V)	**Definition**	**Unit**
A(t)	Percentage of homeless individuals at a given time	%
$H_N(t)$	Predicted number of homeless individuals	People
L(t)	Predicted cost of living after t years	USD
T(t)	Predicted price of transport	USD
G(t)	Predicted cost of groceries	USD
$Hp_N(t)$	Predicted price of housing	USD
t	Years after 2024	Years
C_V	Correlation coefficient between variable and expected increase in housing supply	None
P_N	Population of homeless individuals in N, year 2024 in N	N/A
Δ	The percentage increase compared to 2024	N/A

$$A(t) =(\Delta L(t) * C_L + \Delta T(t) * C_T + \Delta G(t) * C_G + \Delta Hp(t) * C_{Hp})/4$$

$$H_N(t) = (1 + A(t))*P_N$$

3.4 Calculations:

C_V	**Value (obtained from numbeo.com)**
C_L	0.683
C_T	0.628
C_G	0.618
C_{Hp}	0.721

Variable	**Equation**	**t=0**	**t=10**	**t=20**	**t=50**
L(t)	$0.0367x^2 + 6.5857x + 301.86$	301.86	371.387	448.254	722.895
T(t)	159.53x + 10984	10984	12579.3	14174.6	18960.5
G(t)	150.69t + 8633.2	8633.2	10140.1	11647	16167.7
Hp(t)	31.949t + 403.19	403.19	722.68	1042.17	2000.64
A(t)	$A(t) =(\Delta L(t) * C_L + \Delta T(t) * C_T + \Delta G(t) * C_G + \Delta Hp(t) *CHp) / 4$	**0**	**0.231929692**	**0.468011326**	**1.201167874**
$\mathbf{H_{Seattle}(t)}$	$(1 + A(t))*P_{Seattle}$	**28,000**	**34494**	**41104**	**61632**
$\mathbf{H_{Albuquerque}(t)}$	$(1 + A(t))*P_{Albuquerque}$	**2400**	**2957**	**3523**	**5281**

3.6 Discussion

Strength: The four most significant factors (according to https://www.numbeo.com/cost-of-living/city-history/in/Seattle) are selected to create the model. Therefore with its simplicity, the accuracy is maximized.

Weakness: We did not take into account the variables that can potentially decrease homelessness, like government subsidies, rate of change of employment, and population growth. Furthermore, the variables that we used are not specific to locations, which reduces the accuracy and reliability of our model. We also modeled many of our coefficients as having a linear relationship, which might not be the case and impact on the validity of our model.

Conclusion: Since we assume that the three variables be made the same across America. The two cities will both increase by 23% in 10 years, 47% in 20 years and 120% in 50 years. Leading to 61632 homeless in Seattle and 5281 homeless in Albuquerque.

4. Part III: Rising from this Abyss

4.1 Restatement of the Problem :

Using the results from the first two questions, we developed a long-term model for both cities, Seattle and Albuquerque. Unlike the previous models we will account for extreme major events. THis creates a moldable plan that can work even with unforeseen circumstances.

Considering your results from the first two questions for at least one of the cities, create a model that would help a city determine a long-term plan to address homelessness. How adaptable is your model to unforeseen circumstances like natural disasters, economic recessions, or increased migrant populations?

4.2 Assumptions :

1. Extreme events are generalized and effects are averaged to a mean
2. The effects of correlation and weighting for each variable factor is equally distributed across every population group

4.3 Model :

Combining the results from the 1st and 2nd model, we can derive a 3rd model which can predict policy recommendations for the specific city. We achieve this by firstly, modeling which part of the city should the government target most. This is done by finding the distribution of homeless people in the city of Seattle. Next, we rank the weightings in order with regards to their number of correlation. (With the highest correlation having the highest weight).
Moreover, by taking data from our previous models of correlations between homelessness and each factor, we can rank the importance of factors in the order: (House Prices, Cost Of Living, Transport, Groceries). Hence with this data we can figure out where the government should target their policy towards which is in these areas, and they should specifically target the distributions of homelessness by looking at the one with the largest proportion first, according to figure 1.

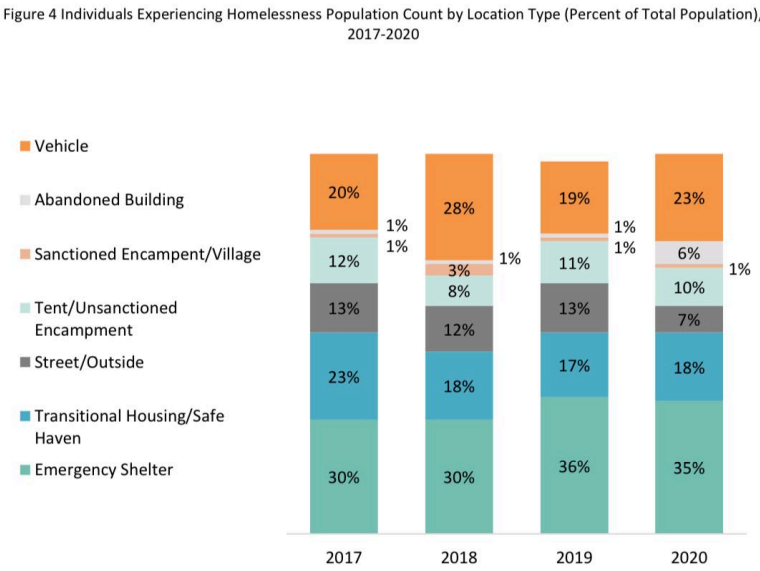


Figure 1 (Source: kcrha.org)
https://kcrha.org/wp-content/uploads/2020/07/Count-Us-In-2020-Final.pdf#page13

U.S. Recessions vs. Housing Prices

Start Date	End Date	Home Prices
Apr 1960	Feb 1961	0.2%
Dec 1969	Nov 1970	8.3%
Nov 1973	Mar 1975	13.9%
Jan 1980	July 1980	5.0%
July 1981	Nov 1982	1.8%
July 1990	Mar 1991	-3.1%
Mar 2001	Nov 2001	5.7%
Dec 2007	June 2009	-14.5%
Feb 2020	Apr 2020	2.3%

Figure 2:
https://awealthofcommonsense.com/2023/11/will-housing-prices-fall-during-the-next-recession/

We can predict the average effect each event has on supply of houses and homelessness, this is done by averaging out the mean effect from historical past events and applying it to this scenario.
Recession on average increases house prices by 2.18%
Natural disaster can decrease house prices from 5 to 40%
Each immigrant adds about 11.6 cents to the value of each house.

Recession increase homeless families by 32 to 40%

Each single natural disaster can increase homeless individuals by 765.
According to research, 5% of homeless individuals are immigrants.

The factor that impacts house prices the most is natural disasters and the factor that impacts homelessness is recession. The model for addressing homelessness is most susceptible to the change of these two factors.

4.4 Strength and Weakness

- **Strength**
  - Modeled and successfully taken into account average effects of extreme events
  - Targeted policy
  - Successful analysis on areas that would most benefit from government funding
- **Weaknesses**
  - Cannot factor into account the strength of each economic recession
  - Model is still generalized in the methods of predictions

4.5 Discussion

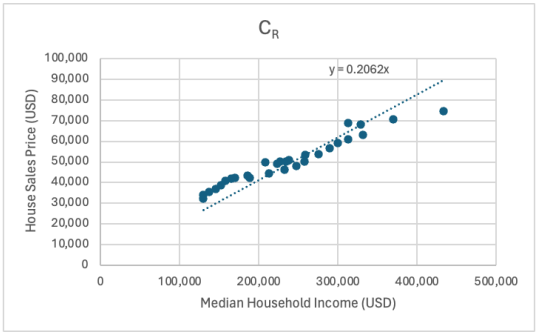
By inputting the variables and accurately calculating for the weighting that each variable would have on the final policy for what the government should do, we have constructed a final guideline for what the government should spend on. Governments should increase spending on subsidies for housing and increase tax rates. To increase incentives for the rich, governments can allocate them certain control rights, such as setting up partially privatized charities based on direct democracy for deciding redistribution policies. Policies to increase initial government grants for private charities can add increased philanthropy as yet another means of redistribution.

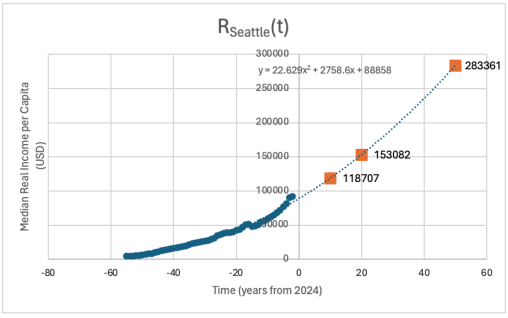
More focus should also be directed to reducing the 23% of homeless individuals living in vehicles by building more emergency shelters, the percentage of people that live in abandoned buildings has increased from 1% to 6%.

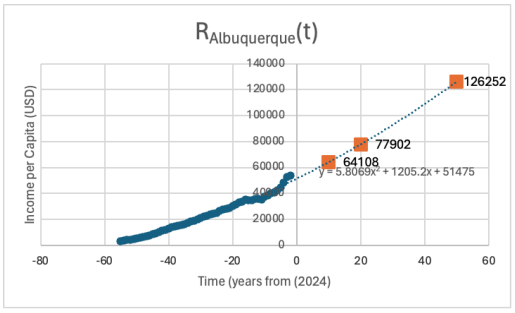
Lastly, most attention should be paid to the Seattle region and Southwest County, which is responsible for 71% and 16% of total homeless people in Seattle.

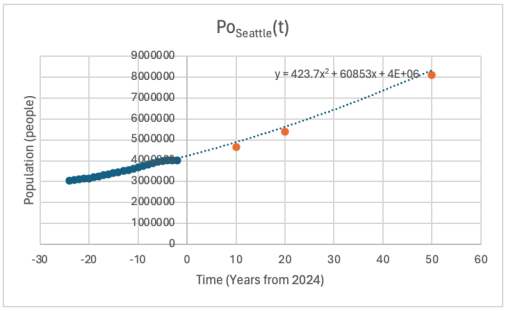
5. Appendix

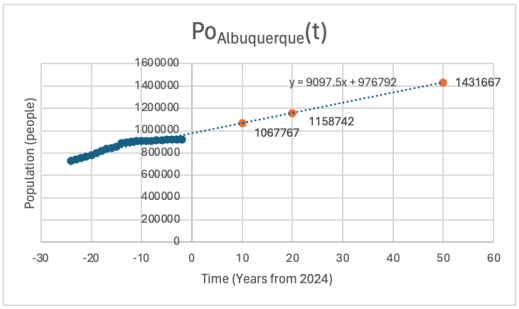
5.1 Part I Tables

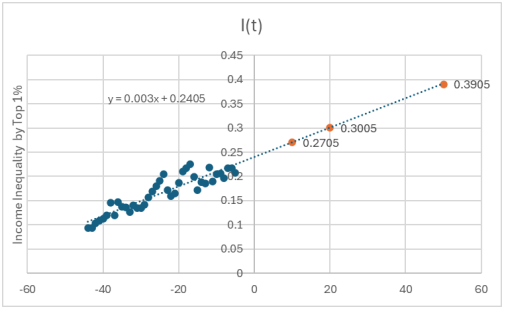






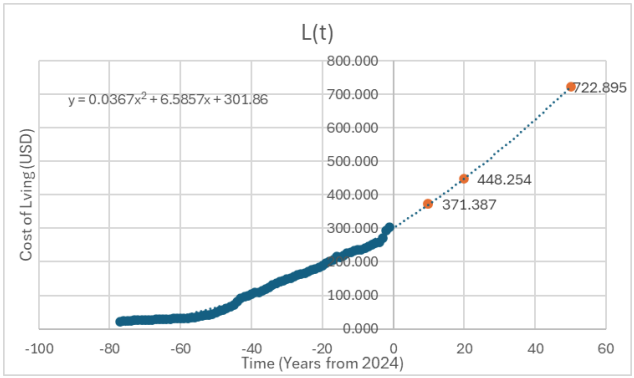


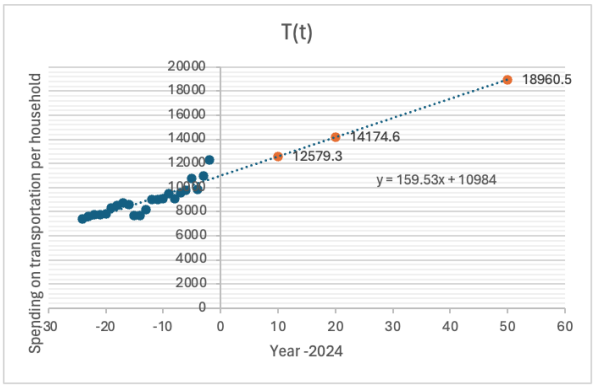


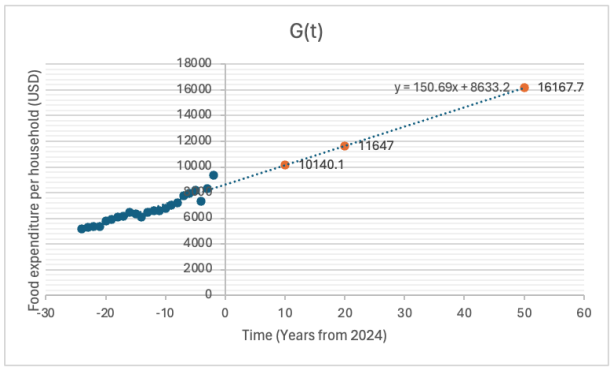


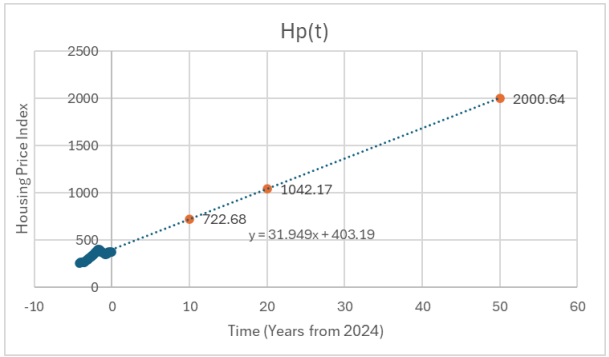
(All data on this page from fred.stlouisfed.org)

5.2 Part II Graphs









5.3 Statistics Cited:

Table 1

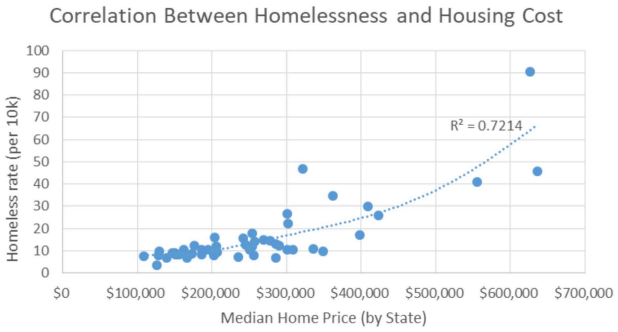
Correlation coefficients with homelessness

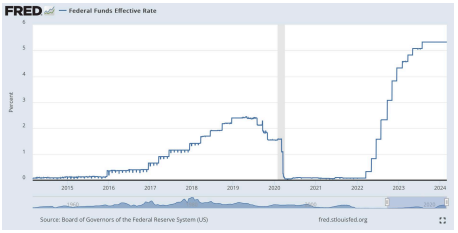
The most significant correlations with homelessness were related to financial strain.

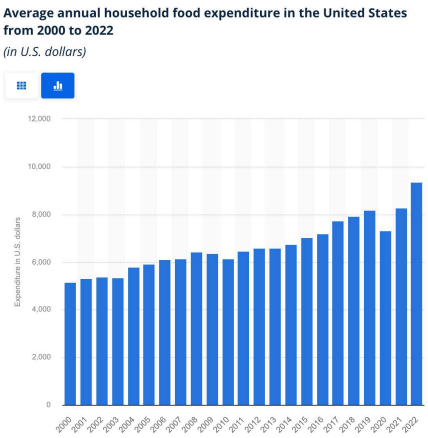
Variable	Coefficient	P-value	Bonferroni significance
Housing cost index	0.721	<0.001	Significant
Cost of living index	0.683	<0.001	Significant
Transportation cost index	0.628	<0.001	Significant
Grocery cost index	0.618	<0.001	Significant
Cigarette excise tax	0.499	<0.001	Significant
Opioid prescriptions per capita	-0.464	<0.001	Significant
Voted Republican last presidential election	-0.429	0.002	Nonsignificant
Overall tax burden	-0.391	0.004	Nonsignificant
Income	0.381	0.006	Nonsignificant
Healthcare cost index	0.333	0.017	Nonsignificant
Housing burden	0.317	0.023	Nonsignificant
State gross domestic product	0.209	0.027	Nonsignificant
Incarceration rate	-0.262	0.063	Nonsignificant

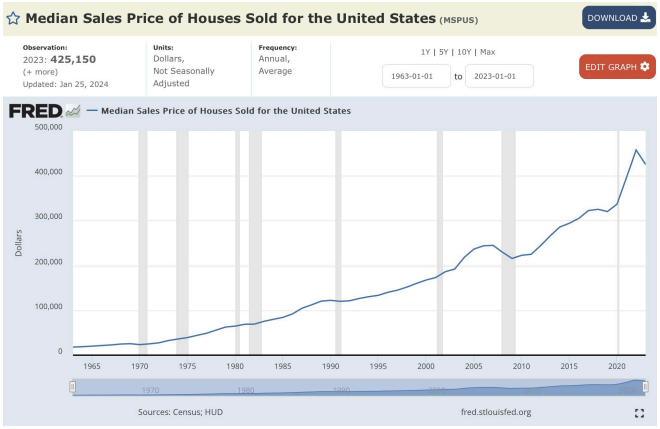
Albuquerque Population By Year

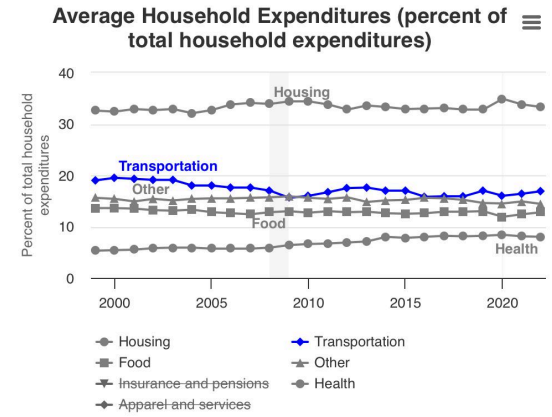
Year	Population	Rank in US	Growth Rate
2021	562,599	32	-0.4%
2020	564,648	32	0.3%
2010	545,852	32	1.9%
2000	450,557	36	1.5%
1990	386,988	40	1.6%
1980	331,767	44	3.1%
1970	243,751	58	1.9%
1960	201,189	60	–











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Show notes and source

Highlights

- I decompose total demand effects into those from new arrivals and relocated natives.
- I separately estimate these using Spanish provinces' data from 200–2012.
- A 1 p.p. increase in the immigration rate increases average house prices by 3.3%.
- Partial are smaller than total estimates because immigrants and natives co-locate.
- The impact of immigration on native location choices impacts net demand changes.

(The Center Square) – A new report from the U.S. Department of Housing and Urban Development reveals that the Seattle – King County region has the third largest number of homeless people in the country.

The report estimates that there are 14,149 homeless people living in the Seattle – King County region. That trails Los Angeles City and County, Calif. (71,320) and New York City, N.Y. (88,025).

Table 1b - ABQ - Individuals 2023

The total count of **persons** experiencing homelessness in Albuquerque on January 30, 2023.

	Emergency Shelters	Transitional Housing	Unsheltered	Total
Households with at least one Child	358	129	42	**529**
Households without children	742	148	933	**1,823**
Households with only Children	25	15	2	**42**
Total	**1,125**	**292**	**977**	**2,394**

Hurricane Harvey, 2017: Much of Texas, Particularly Houston

Following Hurricane Harvey in August 2017, the Houston real estate market experienced a drop in inventory, partly due to homes that could not be occupied due to flood damage. Because Houston was still an in-demand area, the lower inventory, combined with buyer demand, drove home values up for properties that were not directly impacted.

By August 2018, single-family home sales in Houston were up 40.3% from August 2017, and home values were up 2.1%.

Paradise Wildfires, 2018: Paradise, California

In 2018, the small town of Paradise, California, was decimated by wildfires. An estimated 95% of the town's structures were burned, leaving little real estate of value left.

Property sales in Paradise plummeted by 40%–50%. The Paradise residents who could afford to move relocated into adjoining Butte and Sonoma Counties, which were unaffected by the fires. In the three to six months following the disaster, Butte saw a 3% home value rise, and Sonoma saw a 6% rise.

Rising Sea Levels, Ongoing: Florida's Coastal Regions

The rising sea levels brought about by climate change are an example of a slow-burn natural disaster. Unlike most disasters which come suddenly and without warning, we've been watching sea levels rise for years.

Since 2018, real estate prices in tracts of land that are more exposed to rising sea levels have seen slower value growth than tracts that are less exposed. As of 2020, the value difference between more-exposed and less-exposed areas was 5%–10%.

But that doesn't mean people aren't buying! According to Erin at Coldwell Banker Schmitt Real Estate Co in Key West, the market is still hot as of March 2021.

2010	218.1	1.6%
2011	224.9	3.2%
2012	229.6	2.1%
2013	233.0	1.5%
2014	236.7	1.6%
2015	237.0	0.1%
2016	240.0	1.3%
2017	245.1	2.1%
2018	251.1	2.4%
2019	255.7	1.8%
2020	258.8	1.2%
2021	271.0	4.7%
2022	292.7	8.0%
2023	304.7	4.1%

Average annual consumer expenditures of consumer units in the United States from 1990 to 2022

(in U.S. dollars)

6. Works Cited

Income Distribution and Housing Prices: An Assignment Model Approach

Helsinki University Library. (2023). Income Distribution and Housing Prices: An Assignment Model Approach . Helsinki University Library. https://helda.helsinki.fi/server/api/core/bitstreams/80f0c8c6-fc0a-42bd-b512-20903cb5ba6d/content

Cambridge University Press. (n.d.). Do demographic changes affect house prices? Journal of Demographic Economics. Retrieved from https://www.cambridge.org/core/journals/journal-of-demographic-economics/article/abs/do-demographic-changes-affect-house-prices/EDCD6AA8D40A41F19D9D24B4AD4F053A

Visual Capitalist. (n.d.). Median house prices vs. income in the US. Visual Capitalist. Retrieved from https://www.visualcapitalist.com/median-house-prices-vs-income-us/

SSRN. (n.d.). Price-Volume Correlation in the Housing Market: Causality and Co-Movements . Retrieved from https://deliverypdf.ssrn.com/delivery.php?ID=732088024087094093121079092126105089026050064018017000018001115126008089069005106120099022017062023057007119023125019085084088051090012016041006116069121123112008068012087073013082122027123083071031000001024116011029024118029077005115069089074096031&EXT=pdf&INDEX=TRUE

Federal Reserve Bank of St. Louis. (n.d.). Real Median Household Income in Alabama [Data set]. FRED (Federal Reserve Economic Data). Retrieved from https://fred.stlouisfed.org/series/ALBU735PCPI#

Federal Reserve Bank of St. Louis. (n.d.). Population in Albuquerque, NM [Data set]. FRED (Federal Reserve Economic Data). Retrieved from https://fred.stlouisfed.org/series/ABQPOP/1000

Federal Reserve Bank of St. Louis. (n.d.). Population in Stillwater, OK [Data set]. FRED (Federal Reserve Economic Data). Retrieved from https://fred.stlouisfed.org/series/STWPOP

Statista. (n.d.). Average construction costs for single-family homes in the USA. Statista. Retrieved from https://www.statista.com/statistics/682358/average-construction-costs-for-single-family-homes-usa/

USAFacts. (n.d.). Which states have the most and least subsidized housing? USAFacts. Retrieved from https://usafacts.org/articles/which-states-have-the-most-and-least-subsidized-housing/#:~:text=Between%202004%20and%202022%2C%20the,in%202022%2C%20there%20were%2015.4

Peter G. Peterson Foundation. (2022, June 14). How does the federal government support housing for low-income households? Peter G. Peterson Foundation Blog. Retrieved from https://www.pgpf.org/blog/2022/06/how-does-the-federal-government-support-housing-for-low-income-households

MDPI. (2019). The spatial justice degree presented by weak housing affordability had relatively. Sustainability, 11(6), 1808. https://www.mdpi.com/2071-1050/11/6/1808

Statista. (n.d.). Number of households in the United States. Statista. Retrieved from https://www.statista.com/statistics/183635/number-of-households-in-the-us/

Redfin. (n.d.). US housing market. Redfin. Retrieved from https://www.redfin.com/us-housing-market

Redfin. (n.d.). Housing market loses value in 2023. Redfin News. Retrieved from https://www.redfin.com/news/housing-market-loses-value-2023/

National Bureau of Economic Research. (n.d.). Title of the paper [PDF file]. NBER Working Paper No. 9262. National Bureau of Economic Research. Retrieved from https://www.nber.org/system/files/working_papers/w9262/w9262.pdf

Cambridge University Press. (n.d.). Do demographic changes affect house prices? Journal of Demographic Economics. Retrieved from https://www.cambridge.org/core/journals/journal-of-demographic-economics/article/abs/do-demographic-changes-affect-house-prices/EDCD6AA8D40A41F19D9D24B4AD4F053A

BiggestUSCities. (n.d.). Albuquerque, New Mexico. BiggestUSCities. Retrieved from https://www.biggestuscities.com/city/albuquerque-new-mexico

Federal Reserve Bank of St. Louis. (n.d.). [DFF Data Series]. FRED (Federal Reserve Economic Data). Retrieved from https://fred.stlouisfed.org/series/DFF

Brown Political Review. (2021, December). Being poor alone does not make people homeless: Being poor where housing is unaffordable makes people homeless. Brown Political Review. Retrieved from https://brownpoliticalreview.org/2021/12/being-poor-alone-does-not-make-people-homeless-being-poor-where-housing-is-unaffordable-makes-people-homeless/

Federal Reserve Bank of St. Louis. (n.d.). [MSPUS Data Series]. FRED (Federal Reserve Economic Data). Retrieved from https://fred.stlouisfed.org/series/MSPUS

Federal Reserve Bank of Minneapolis. (n.d.). Consumer Price Index, 1913-. Retrieved from https://www.minneapolisfed.org/about-us/monetary-policy/inflation-calculator/consumer-price-index-1913-

Statista. (n.d.). Annual U.S. consumer expenditures. Statista. Retrieved from https://www.statista.com/statistics/247455/annual-us-consumer-expenditures/

Bureau of Transportation Statistics. (n.d.). Transportation Economic Trends: Transportation Spending and Its Drivers. Bureau of Transportation Statistics. Retrieved from https://data.bts.gov/stories/s/Transportation-Economic-Trends-Transportation-Spen/ida7-k95k/

Statista. (n.d.). Average food expenditures of United States households. Statista. Retrieved from https://www.statista.com/statistics/237211/average-food-expenditures-of-united-states-households/

DiVA. (n.d.). THE EFFECIncome Distribution and Housing Prices: An Assignment Model ApproachT OF INTEREST Income Distribution and Housing Prices: An Assignment Model ApproachRATES ON HOUSING PRICES IN SWEDEN . DiVA Portal. Retrieved from https://www.diva-portal.org/smash/get/diva2:503696/FULLTEXT01.pdf

Cambridge University Press. (n.d.). Do demographic changes affect house prices? Journal of Demographic Economics. Retrieved from https://www.cambridge.org/core/journals/journal-of-demographic-economics/article/abs/do-demographic-changes-affect-house-prices/EDCD6AA8D40A41F19D9D24B4AD4F053A

Helsinki University Library. (n.d.). Income Distribution and Housing Prices: An Assignment Model Approach. Retrieved from https://helda.helsinki.fi/server/api/core/bitstreams/80f0c8c6-fc0a-42bd-b512-20903cb5ba6d/content

Visual Capitalist. (n.d.). Median house prices vs. income in the US. Visual Capitalist. Retrieved from https://www.visualcapitalist.com/median-house-prices-vs-income-us/

Federal Reserve Bank of St. Louis. (n.d.). ALBU735PCPI. FRED (Federal Reserve Economic Data). Retrieved from https://fred.stlouisfed.org/series/ALBU735PCPI#

Federal Reserve Bank of St. Louis. (n.d.). ALBU735PCPI. FRED (FederaFederal Reserve Bank of St. Louis. (n.d.). SEAT653PCPI. FRED (Federal Reserve Economic Data). Retrieved from https://fred.stlouisfed.org/series/SEAT653PCPI# Reserve Economic Data). Retrieved from https://fred.stlouisfed.org/series/ALBU735PCPI#

StorageCafe. (n.d.). Seattle lot sizes drop to 20-year lows. StorageCafe Blog. Retrieved from https://www.storagecafe.com/blog/seattle-lot-sizes-drop-to-20-year-lows/

Encyclopædia Britannica. (n.d.). Albuquerque. Encyclopædia Britannica. Retrieved from https://www.britannica.com/place/Albuquerque

The Seattle Times. (n.d.). Central Seattle absorbed more than half the city's housing growth in the last decade. The Seattle Times. Retrieved from https://seattletimes.com/seattle-news/data/central-seattle-absorbed-more-than-half-the-citys-housing-growth-in-the-last-decade/

https://kcrha.org/wp-content/uploads/2020/07/Count-Us-In-2020-Final.pdf#page13