

✓ Reason one

Construction hasn't kept up with the number of people who need a home.

Rising costs of construction is often the most common reason people give for rising house prices. Basic supply and demand tell us that if more people are looking to buy homes and fewer people are looking to sell, then prices will rise. A potential way to get an idea of housing supply is to examine the number of housing units (Building permit survey (BPS)), but it is a little bit more complicated to get housing demand

Demand calculation

To analyze demand I came up with an index that calculates changed in homes people are buying each year using the census data on the population, housing units occupied, and average household size.

✓ Supply and Demand Insight

We are building about 4 to 10 thousands new homes each year in Iowa. The population is growing and buying the newly supplied homes at about the same rate.

So there's no housing shortage?

We can't say that we aren't experiencing a housing shortage for a couple of reasons (1) less people could be living together and therefore the same population could be demanding more homes because people aren't living together as much. (2) We could be building homes, but they are being left vacant because the people buying the homes already own other homes. (3) Iowa homes could be falling apart at a high rate, so many previous home owners are now in search of a new home and their old home is no longer contributing to the housing supply.

note

I will go later into why I think it's mainly the third reason for why we are experiencing a housing shortage in my upcoming analysis

➤ Housing Supply and Demand Code

[Show code](#)

```
# Housing and Population change
housing_data['new_units_built'] = housing_data['total_units_built'].diff()
population_data['population_change'] = population_data['population'].diff()

# Divide population change by 2.4 to get household change
population_data['household_change'] = population_data['population_change'] / 2.4

# Merge
merged_data = pd.merge(housing_data[['year', 'new_units_built']],
                        population_data[['year', 'household_change']],
                        on='year')

# Remove the row where year is 2009
merged_data = merged_data[merged_data['year'] != 2009]

# Plot
plt.figure(figsize=(12, 6))
x = merged_data['year']
plt.plot(x, merged_data['new_units_built'], marker=',', linestyle='-', color='blue', linewidth=2.5, label='Built Homes')
plt.plot(x, merged_data['household_change'], marker=',', linestyle='-', color='orange', linewidth=2.5, label='Estimated Housing Demand')
plt.fill_between(x, merged_data['new_units_built'], merged_data['household_change'], where=merged_data['new_units_built'] > merged_data['household_change'],
                 interpolate=True)
plt.fill_between(x, merged_data['new_units_built'], merged_data['household_change'], where=merged_data['new_units_built'] <= merged_data['household_change'],
                 interpolate=True)
plt.xlabel("Year", fontsize=14)
plt.ylabel("Housing Units", fontsize=14)
title = "Iowa Housing Supply Vs. Demand"
plt.title(title, fontsize=16)
plt.xticks(x, rotation=45)
plt.yticks(fontsize=12)
plt.legend()
plt.grid(False)

# sources and formatting
plt.text(
    0.95, 0.01, 'Source: U.S. Census Bureau, Building Permit Survey',
    verticalalignment='bottom', horizontalalignment='right',
    transform=plt.gca().transAxes,
    color='gray', fontsize=8
)
ax = plt.gca() # Get the current axis
formatter = FuncFormatter(lambda x, _: f'{int(x):,}')
ax.yaxis.set_major_formatter(formatter)

plt.show()
```

