

# HOUSE PRICE

## Determining Factors & Insights

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Presentation by Ivy Chang



# OBJECTIVES

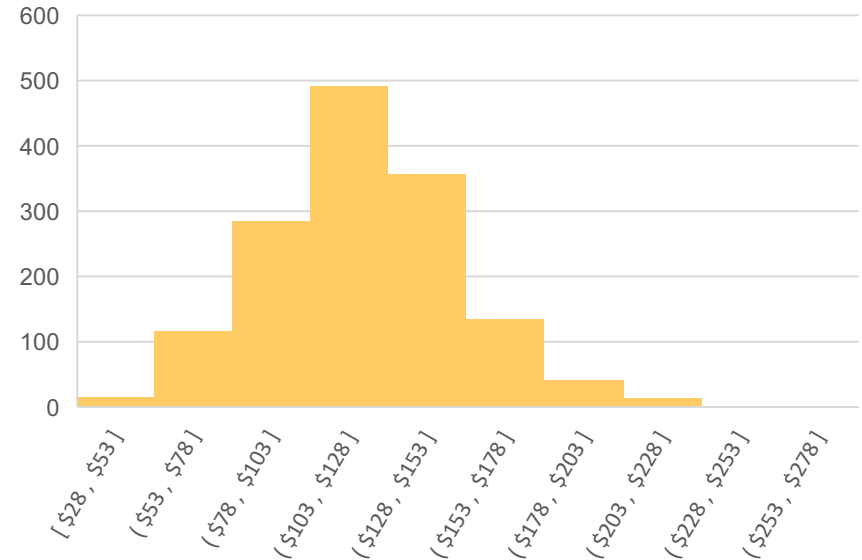
- Determine key factors that impact House Price/Sq ft
- Develop insights and recommendations for future mortgage-backed security investments



# DATA ANALYZED

- Data Analyzed:
  - Ames, IA
  - 1460 houses
  - Sold in 2006-2010
- House Price (per sq ft)
  - Average: \$120.6
  - Median: \$ 120.1

Number of Houses by Sales Price (per sq.ft)



# HYPOTHESES OVERVIEW

**Analyses in this presentation will cover 3 perspectives:**

## **Age and Condition**

- Year Built vs. Year Remodeled

## **Dwelling Features**

- Type: Single Family vs. Townhouse
- Style: 1 Story House vs. 2 Story House
- Structure: 0-2 Bedroom vs. 3+ Bedroom

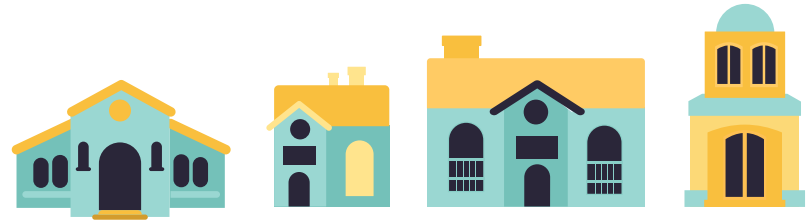
## **Add-On Features**

- Garage: 1-2 Garage vs. 3+ Garage
- Porch: Porch vs. No Porch



# AGE AND CONDITION

- Typically houses that are newer appraise at a higher value
- Trend in the data:  
Steady growth in price (sq ft) since 1990 for both new constructions and remodeled houses



# Built After 1990 VS. Remodeled After 1990

Statistically significant difference between houses built after 1990 and houses remodeled after 1990

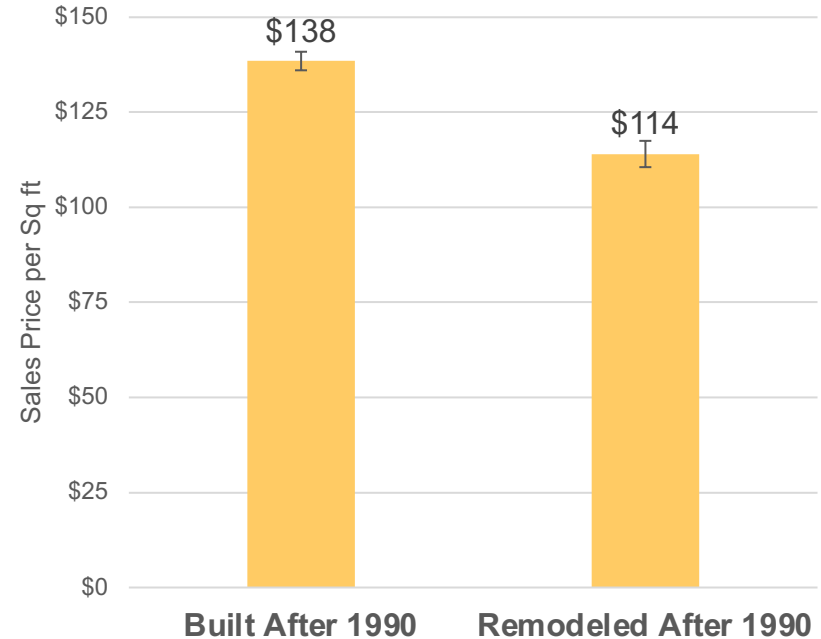
- Testing showed with 95% confidence, the average sales price/sq ft is between \$20.8 and \$28.7 higher for houses built after 1990 compared to the remodeled houses
- Price for 2,000 sq ft new constructions sell between 41.6K and 57.4k higher

$H_0: \mu_1 - \mu_2 = 0$

$H_a: \mu_1 - \mu_2 \neq 0$

$p\text{-value} = 1.086e^{-26}$

Reject the null



# DWELLING FEATURES

- **Type:** Single Family vs. Townhouse
- **Style:** 1 Story House vs. 2 Story House
- **Structure:** 0-2 Bedroom vs. 3+ Bedroom



# Single Family VS. Townhouse

Statistically significant difference between Single Family and Townhouse

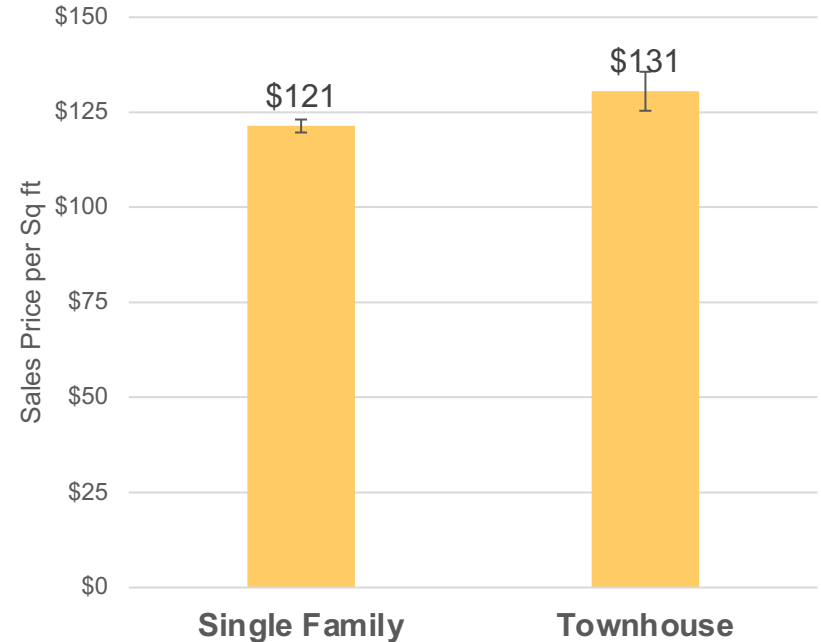
- Testing showed with 95% confidence, the average sales price/sq ft is between \$3.7 and \$14.5 higher for Townhouse
- Price for 2,000 sq ft Townhouse sell between 7.4K and 29k higher

$H_0: \mu_1 - \mu_2 = 0$

$H_a: \mu_1 - \mu_2 \neq 0$

p-value = 0.001

Reject the null





# 1 Story VS. 2 Story

Statistically significant difference between 1 Story house and 2 Story house

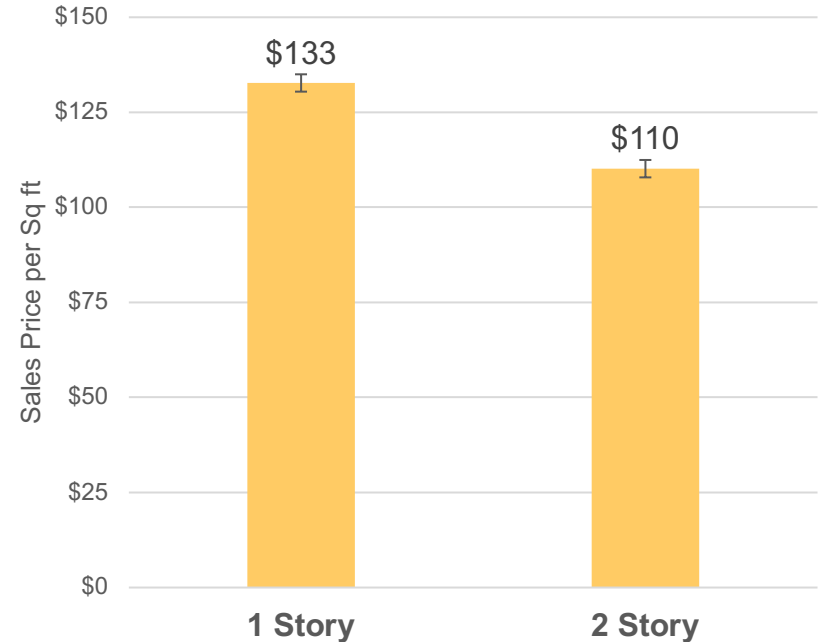
- Testing showed with 95% confidence, the average sales price/sq ft is between \$19.3 and \$25.7 higher for 1 Story house
- Price for 2,000 sq ft 1 Story house sell between 38.6K and 51.4k higher

$H_0: \mu_1 - \mu_2 = 0$

$H_a: \mu_1 - \mu_2 \neq 0$

p-value =  $1.642e^{-39}$

Reject the null



# 0-2 Bedroom VS. 3+ Bedroom

Statistically significant difference between 0-2 Bedroom and 3+ Bedroom house

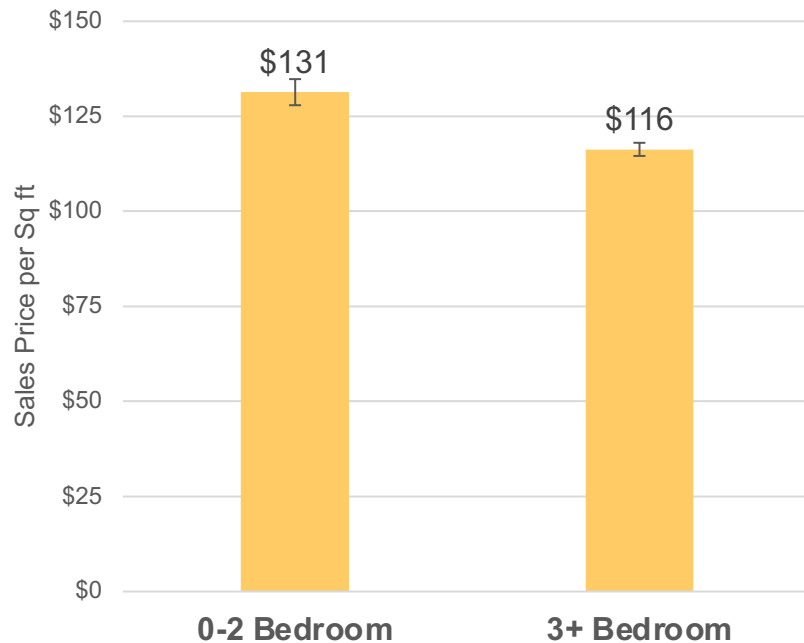
- Testing showed with 95% confidence, the average sales price/sq ft is between \$11.2 and \$18.9 higher for house with 0-2 Bedroom
- Price for 2,000 sq ft house with 0-2 bedrooms sell between 22.4K and 37.8k higher

$H_0: \mu_1 - \mu_2 = 0$

$H_a: \mu_1 - \mu_2 \neq 0$

p-value =  $5.914e^{-14}$

Reject the null



# ADD-ON FEATURES

- Functionality is one of the most important considerations that will potentially add value to the house
- Add-on features are those factors that do not count towards the living space in the house. They are built to add space, increase comfort, and improve the quality of life overall



# 1-2 Garage VS. 3+ Garage

Statistically significant difference between 1-2 Garage and 3+ Garage house

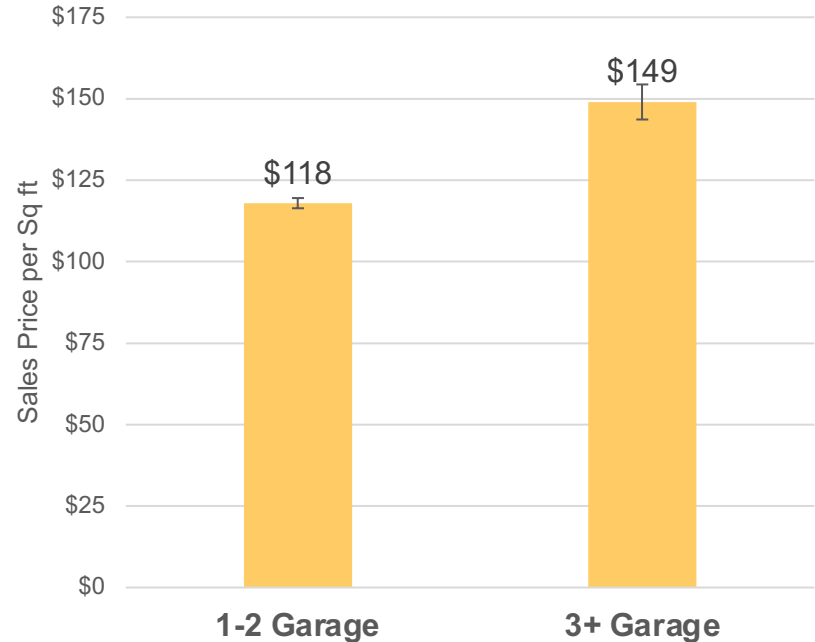
- Testing showed with 95% confidence, the average sales price/sq ft is between \$25.5 and \$36.7 higher for house with 3+ Garage
- Price for 2,000 sq ft house with 3+ Garage sell between 51K and 73.4k higher

$H_0: \mu_1 - \mu_2 = 0$

$H_a: \mu_1 - \mu_2 \neq 0$

p-value =  $2.024e^{-22}$

Reject the null



# Porch VS. No Porch

Statistically significant difference between house with Porch and house with No Porch

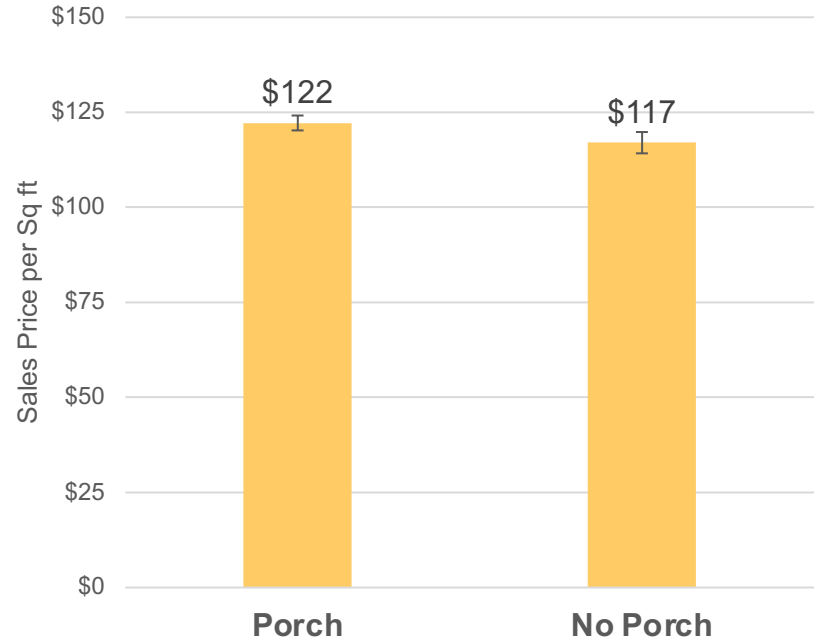
- Testing showed with 95% confidence, the average sales price/sq ft is between \$1.8 and \$8.6 higher for house with Porch
- Price for 2,000 sq ft house with Porch sells between 3.6K and 17.2k higher

$H_0: \mu_1 - \mu_2 = 0$

$H_a: \mu_1 - \mu_2 \neq 0$

p-value = 0.003

Reject the null





# RECOMMENDATIONS



**01**

**Built after 1990**

**02**

**Townhouse**

**03**

**1 Story**

**04**

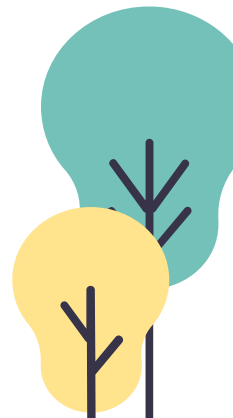
**0-2 Bedrooms**

**05**

**3+ Garage**

**06**

**Has Porch**



# More Analyses Support Smarter Decisions!

## Neighborhood

- Infrastructure
- Schools, hospitals, public transportation, etc.

## Climate

- Help determine if certain factors have key impact on house price





# THANKS

Does anyone have any questions?

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