



# How Interest Rates Impact US. Housing Market

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**INTRODUCTION 01**

**DATA DESCRIPTION 02**

**REGRESSION  
MODELS 03**

# **TABLE OF CONTENTS**

**04 RESULTS**

**05 CONCLUSION**

**06 QUESTIONS**



A complex network diagram with numerous nodes and connecting lines, forming a web-like structure. The nodes are represented by small black dots, and the lines are thin grey lines. The diagram is positioned in the upper right and lower right areas of the page.A white icon on a black background, depicting a document with a magnifying glass over it, symbolizing search or investigation.

# 01

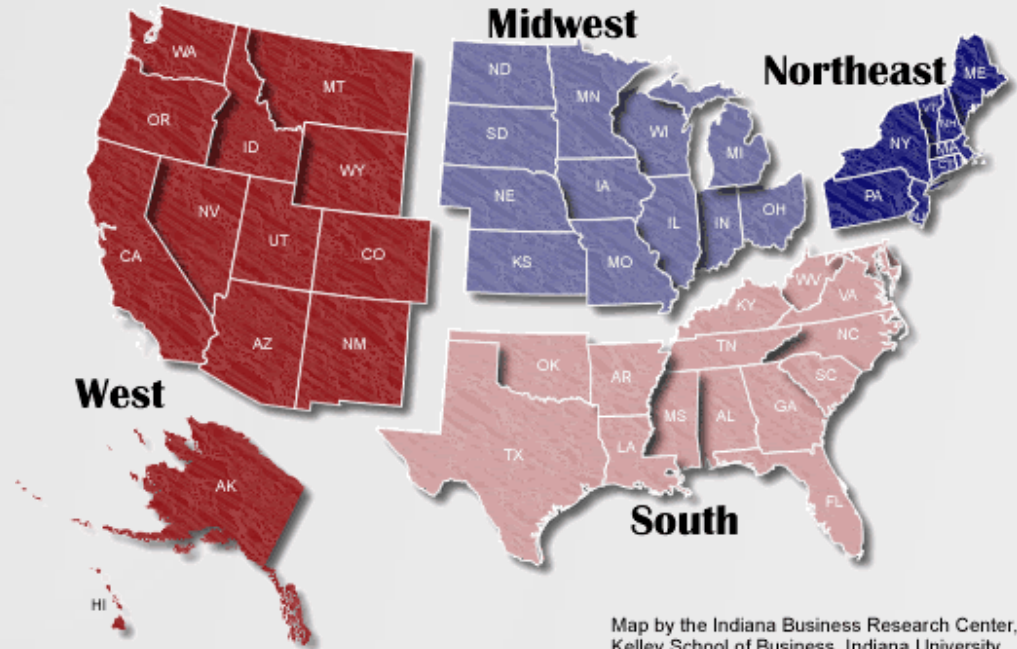
## INTRODUCTION

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# Data Selection

## U.S. Census Regions

Compared Each Region to 30 and 15 year mortgage rate



Map by the Indiana Business Research Center,  
Kelley School of Business, Indiana University



# Key Research Questions

1. Does a change in interest rates directly impact the housing market price?
2. Are there certain areas that are more or less affected by the rates?
3. If interest rates were to change now, what would that look like?





**02**

**Data Description**

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# Data Used

- 15 year Mortgage rates from 1995-2020
- 30 year Mortgage rates from 1995-2020
- Average Housing prices of new residential sales in the US and in four US regions from 1995-2020





# 03

## Regression Model

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# Simple Regression

OLS Single Variable Regression

Formula:  $Y_1 = B_0 + B_1 * X_1 + U_i$

Variables:

Y1: Housing Price of Home

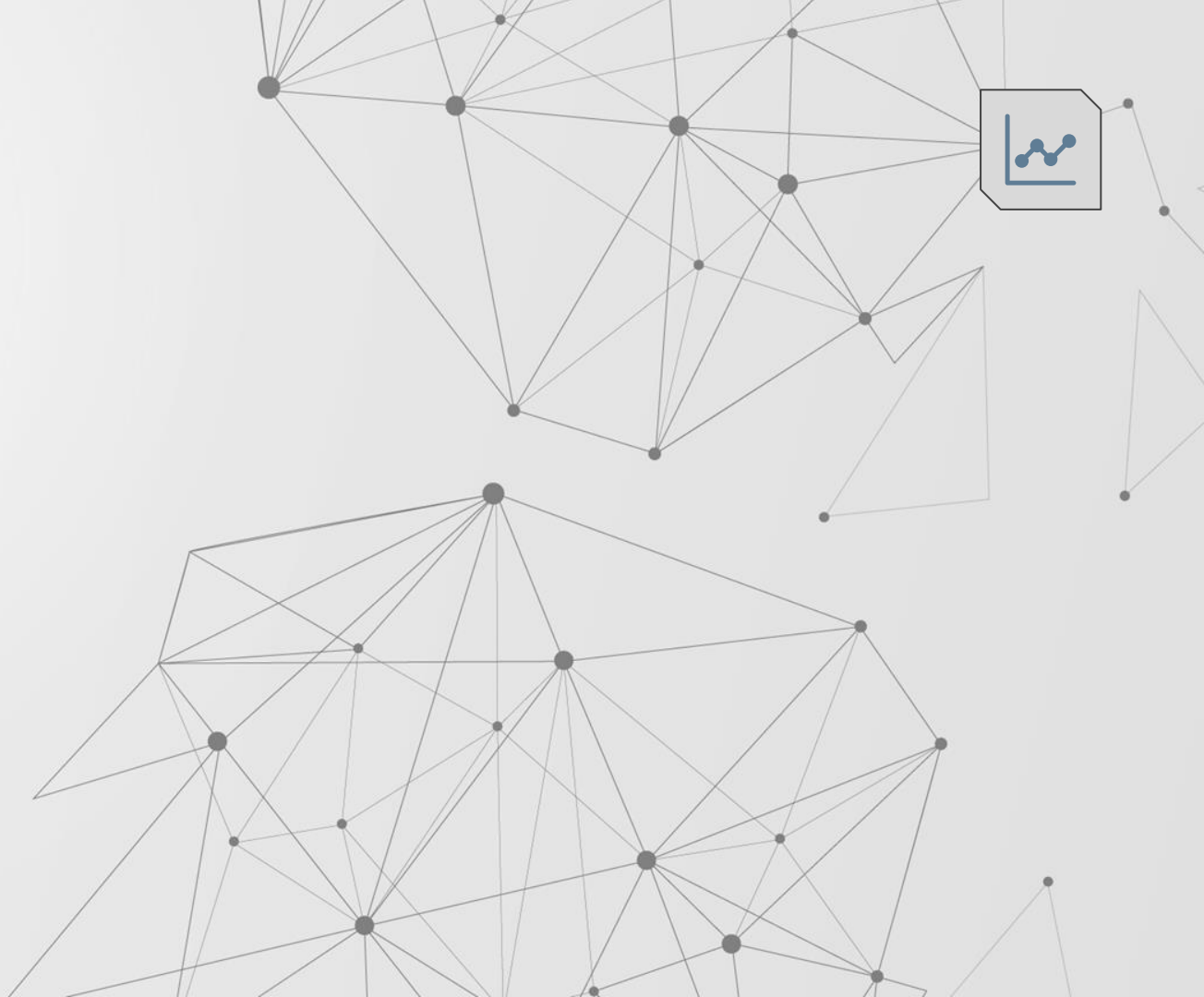
X1: Mortgage Rate (30/15)



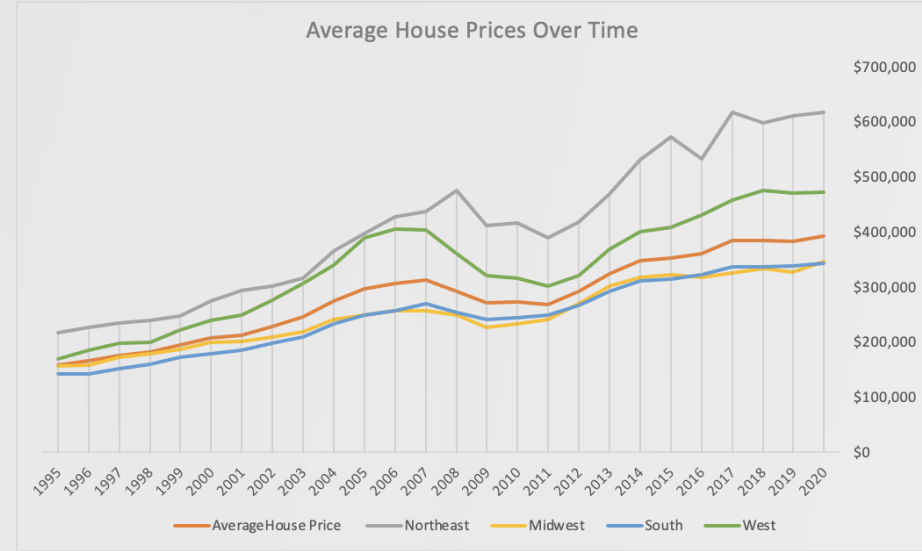
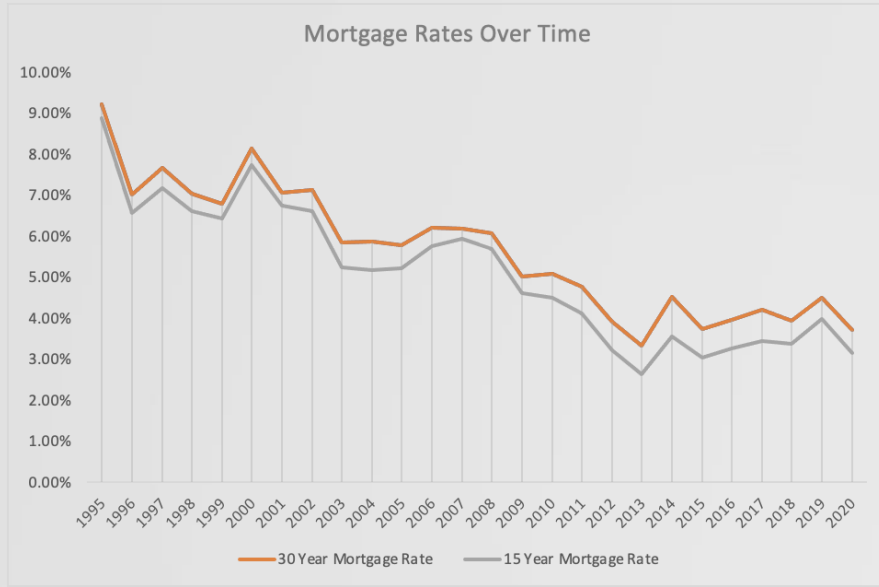
# 04

## Results

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# What We Expected



# 30 year Mortgage Data

Regressor	Average House Price	Average House Price Northeast United States	Average House Price Midwest United States	Average House price South United States	Average House Price West United States
30 Year mortgage X1	<b>-4058450</b> (456537)	<b>-7222640</b> (917974.3)	-3309966 (355427.2)	<b>-3738536</b> (398522.3)	<b>-4867858</b> (648168.6)
Intercept	\$158,700	\$216,600	\$157,200	\$142,000	\$169,800
<b>Summary Statistics</b>					
SER	38088	70889	28338	31083	58782
R2	.7424	.7249	.7759	.7859	.6351
n	20	20	20	20	20

# Change in Value - Effect on Current Home Prices

Area	1% Change in Mortgage Rate (.01 ▲)
Whole United States	(40584.50) 10.4% ▲ in Price
Northeast	(72226.40) 11.7% ▲ in Price
Midwest	(33099.66) 9.5% ▲ in Price
South	(37385.36) 10.8% ▲ in Price
West	(48678.58) 10.3% ▲ in Price



# 15 Year Mortgage Data

Regressor	Average House Price	Average House Price Northeast United States	Average House Price Midwest United States	Average House price South United States	Average House Price West United States
15 Year mortgage X1	-3763018 (423437.5)	-6684928 (843912.2)	-3087283 (323293.7)	-3469895 (365124.8)	-4489467 (61309.4)
Intercept	\$158,700	\$216,600	\$157,200	\$142,000	\$169,800
<b>Summary Statistics</b>					
SER	38791	72407	28394	31700	59968
R2	.7328	.7129	.7750	.7773	.6202
n	20	20	20	20	20

# Change in Value - Effect on Current Home Prices

Area	1% Change in Interest Rate (.01)
Whole United States	(37630.18) 9.6% ▲ in price
Northeast	(66849.28) 10.8% ▲ in price
Midwest	(30872.83) 8.9% ▲ in Price
South	(34698.95) 10.1% ▲ in Price
West	(44894.67) 9.5% in Price



# 05

## Conclusion





# Conclusion

Key Findings:

- Both the 30/15 models had high  $R^2$
- All coefficients are statistically significant
- Certain regions are more affected by rates





# 06

## Questions?



**THANKS!**

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# Work Cited

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2. <https://www.forbes.com/advisor/mortgages/low-mortgage-rates-high-home-prices/>
3. <https://www.investopedia.com/mortgage/mortgage-rates/housing-market/>

## Interest Rates

4. <http://www.freddiemac.com/pmms/pmms30.html>

## Housing Prices

5. <https://dqydj.com/historical-home-prices/>
6. <https://www.experian.com/blogs/ask-experian/research/median-home-values-by-state/>
7. <https://www.census.gov/>



```
. summarize
```

Variable	Obs	Mean	Std. dev.	Min	Max
thyr	26	.05645	.0156086	.0334	.0922
fifyr	26	.0510346	.0167249	.0264	.0887
averagehp	26	280500	73522.21	158700	391900
northeast	26	409242.3	132414	216600	617300
midwest	26	250061.5	58652.26	157200	346900
south	26	246280.8	65822.75	142000	343800
west	26	334450	95342.59	169800	475400



```
. correlate averagehp northeast midwest south west thyr  
(obs=26)
```

	averagehp	northeast	midwest	south	west	thyr
averagehp	1.0000					
northeast	0.9854	1.0000				
midwest	0.9860	0.9762	1.0000			
south	0.9957	0.9875	0.9903	1.0000		
west	0.9852	0.9571	0.9502	0.9669	1.0000	
thyr	-0.8616	-0.8514	-0.8809	-0.8865	-0.7969	1.0000

```
. correlate averagehp northeast midwest south west fifyr  
(obs=26)
```

	averagehp	northeast	midwest	south	west	fifyr
averagehp	1.0000					
northeast	0.9854	1.0000				
midwest	0.9860	0.9762	1.0000			
south	0.9957	0.9875	0.9903	1.0000		
west	0.9852	0.9571	0.9502	0.9669	1.0000	
fifyr	-0.8560	-0.8444	-0.8804	-0.8817	-0.7875	1.0000

