Proposal: [Samantha Miller]

DATA 450 Capstone

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1 Introduction

Insurance is a price that we all need to pay. Many people have noticed that property insurance prices, both for personal home and commercial businesses have continuously increased in the past years. This has become a topic of conversation for many and what people usually chalk it up to is inflation. However, there are multiple different factors that are likely contributing to the rise in insurance premiums. One significant possibility for the influx in prices is the increase in natural disasters and the damages they are causing. Insurance companies in areas most affected by natural disasters are then forced to raise prices in order to combat for losses and claims that occur in response to the events. So are property insurance prices increasing due to inflation or actually because of the higher risk of natural disasters?

2 Dataset

Inflation Rate Dataset

World Bank, Inflation, consumer prices for the United States [FPCPITOTLZGUSA], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/FPCPITOTLZGUSA, February 6, 2025.

Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly.

- observation_date: yyyy-mm-dd
- FPCPITOTLZGUSA: Inflation, consumer prices (annual %) - United States

Florida Hurricane Dataset

Dataset was obtained from NOAA- National Centers for Environmentl Information. Contains 269 Hurricane events reported in Florda between 01/01/2000 and 12/31/2024.

- County/Zone
- St: state
- Date
- Time
- T.Z: timezone
- Type: type of event- Hurricane (typhoon)
- Mag: Magnitude- not applicable to hurricanes
- Dth: Death count
- Inj: Injuries reported
- PrD: Property Damage estimate
- CrD: Crop Damage Estimate

New York Ice Storm Dataset

Dataset was obtained from NOAA- National Centers for Environmentl Information. Contains 270 Ice Storm events reported in New York between 01/01/2000 and 12/31/2024.

- County/Zone
- St: state
- Date
- Time
- T.Z: timezone
- Type: type of event- Ice Storm
- Mag: Magnitude- not applicable to ice storms
- Dth: Death count
- Inj: Injuries reported
- PrD: Property Damage estimate
- CrD: Crop Damage Estimate

Premiums for Homeowner's Insurance Dataset

U.S. Bureau of Labor Statistics, Producer Price Index by Industry: Premiums for Property and Casualty Insurance: Premiums for Homeowner's Insurance [PCU9241269241262], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/PCU9241269241262, February 6, 2025.

- observation_date: yyyy-mm-dd
- PCU9241269241262: Producer Price Index (PPI) for Premiums on Property and Casualty Insurance

Premiums for Commercial Insurance Dataset

U.S. Bureau of Labor Statistics, Producer Price Index by Industry: Premiums for Property and Casualty Insurance: Premiums for Commercial Multiple Peril Insurance [PCU9241269241265], retrieved from FRED, Federal Reserve Bank of St. Louis; https://fred.stlouisfed.org/series/PCU9241269241265, February 6, 2025.

- observation_date: yyyy-mm-dd
- PCU9241269241265: Producer Price Index (PPI) for Premiums on Property and Casualty Insurance

3 Data Acquisition and Processing

- Recode variables in multiple datasets that have the same variable names
- Impute missing values by deteting the row, as there is plenty of data that the value will not likely effect resulys
- Overall, the data is pretty tidy but will be thuroughly examined

4 Research Questions and Methodology

Main Question: Are property insurance rates rising due to inflation or higher risks of natural disasters?

[Using visualizations, I plan to answer if insurance rates are rising at the levels of inflation or levels of increased natural disasters. I will use linegraphs to compare the rates of increase. Histograms will also be used to track the cost of damages done by hurricanes in Florida and ice storms in New York to see if costly disasters are on the rise.]

5 Work plan

Week 4 (2/10 - 2/16):

- Data tidying and recoding (4 hours)
- Visualize and analyze inflation rates between 2000 and 2024 (3 hours)

Week 5 (2/17 - 2/23):

- Visualize and analyze New York Ice Storm Data (3.5 hours)
- Visualize and analyze Florida hurricane Data (3.5 hours) (lots of data in these datasets and areas to explore such as cost of damages and frequency of events)

Week 6 (2/24 - 3/2):

- Visualize and analyze Home Insurance Premiums Data (2 hours)
- Visualize and analyze Commercial Property Insurance Premiums Data (2 hours)
- Combine and compare rate of insurance price increase to inflation rates and natural disaster findings (2 hours)

Week 7 (3/3 - 3/9):

- Draw conclusions based on findings from data and visualizations to answer question (3 hours)
- Presentation prep and practice (4 hours)

Week 8 (3/10 - 3/16): *Presentations given on Wed-Thu 3/12-3/13.*

- Poster prep (4 hours)
- Presentation peer review (1.5 hours)

Week 9 (3/24 - 3/30): *Poster Draft 1 due Monday morning 3/24 at 9am. Poster Draft 2 due Sunday night 3/30.*

- Peer feedback (2 hours)
- Poster revisions (2 hours)

Week 10 (3/31 - 4/6): *Final Poster due Sunday 4/6.*

- Peer feedback (1.5 hours)
- Final Poster revisions (2 hours)

Week 11 (4/7 - 4/13):

Week 12 (4/14 - 4/20):

- Prepare for DMC fair- practice presenting (4 hours)

Week 13 (4/21 - 4/27): *Blog post draft 1 due Sunday night 4/28.* [All project work should be done by the end of this week. The remaining time will be used for writing up and presenting your results.]

- Draft blog post (5 hours).

Week 14 (4/28 - 5/4):

- Peer feedback (3 hours)
- Blog post revisions (4 hours)

Week 15 (5/5 - 5/8): *Final blog post due Tues 5/7. Blog post read-throughs during final exam slot, Thursday May 8th, 8:00-11:20am.*

- Blog post revisions (2 hours)
- Peer feedback (2 hours)

6 References

Here's an example of citing a source (see Phillips 1999, 33–35). Be sure the source information is entered in "BibTeX" form in the `references.bib` file.

[The bibliography will automatically get generated. Any sources you cite in the document will be included. Other entries in the `.bib` file will not be included.]

Phillips, T. P. 1999. "Possible Influence of the Magnetosphere on American History." *J. Oddball Res.* 98: 1000–1003.