Analysis of the factors that affect homeowners being denied flood insurance coverage

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction

Water is a fundamental component of everything relating to humankind. It is an essential component in human bodies, underlying human consumption, and required in processing human activities. It also strongly impacts economic growth, such as agriculture and food production. By the beginning of the twentieth century, there were at least four different agricultural production profiles in the USA (Trampusch & Spies, 2014). By then, much water is required for agriculture and essential in goods transportation. At that time, the water transport system into people's homes, not using rivers and canals to ship goods to market, was not invented. Therefore, people are eager to settle near waterbody to access water easily (Afzal et al., 2022). Due to the topographic variation, the different places experienced different hazard levels. People who live near waterbody can perceive the flood from water surges. While people in flood-prone areas, areas with a high risk of flooding, floods can come more frequent and hazardous compared to other regions. As a result, flooding has been a historical problem for humans for several hundred years.

After the pipe system is introduced to communities, it allows water to be transported directly to people's homes, reducing the demand for waterfront residency. Even though people settle further away from a waterbody, a hurricane or a big flooding event such as a 100-year flood can devastate their home within a few days (Demir & Kisi, 2016). Since flooding can cause many losses, several methods have been developed to solve the water problem. Beginning with physical infrastructure such as dams and weirs, they are deliberately constructed to prohibit and control the water allowed to enter the land. Analyzing tools such as water sensors and geographic information are developed as flood prevention preparation tools. Also, policies and decision-

making, such as flooding insurance, can be an option to help reduce losses due to unintended circumstances occurring.

Nowadays, as climate change has risen, it drives natural disasters to come often and high hazards. Therefore, more than some flood prevention mitigation methods, such as flood control infrastructure and analyzing tools, are required to endure the losses. The natural disaster has impacted several houses, then property losses due to the impact are a large amount of money. As a result, a mitigation method such as flood insurance can be an option to ensure that every household gets aid to repair the house in case a big flooding event occurs.

Due to the recent Hurricane Ian, 1.8 million households in nine counties of Florida, only 29 percent have federal flood insurance. Therefore, after President Joe Biden declared disaster areas to make residents eligible for federal aid to pay for minor home repairs, it left 1.3 million households without federal flood coverage. In addition, they found out that most high-risk regions have yet to have coverage. Also, people in the low coverage percentage area have high incomes (Frank, 2022).

From this recent news, we can see that flood insurance is still not a majority choice for people who live in the United States. Then, having a better comprehensive from all flood insurance sellers, buyers, and official sector perspectives will be helpful.

Typically, standard home insurance policies do not cover any flooding that originates outside of a home. Then, the residents choose to purchase a flood insurance plan. The majority of flood insurance options can purchase through the Federal Emergency Management Agency's National Flood Insurance Program (Collier et al., 2022)

The Federal Emergency Management Agency (FEMA) is providing FEMA's National Flood Insurance Program (NFIP), a federal program allowing homeowners in the program's

participant communities to buy their available flood insurance options. Their main goal is to increase the number of participants and reduce loss due to flood damage (Frimpong et al., 2020). The program is created due to the National Flood Insurance Act of 1998 to deal with an inefficient available private insurance option and provide federal assistance due to floods (Flood Insurance/National Flood Insurance Program (NFIP), n.d.).

Method

As mentioned, this paper will first investigate the existing flooding insurance premiums that US homeowners can purchase. In which the conditions, cost, and coverage will be specified in this part. There are two main options for buyers: insurance provided by public or private sections. To get data about a public sector NFIP, the data from FEMA's official site containing its programs, statistic, and studies can be gathered. Also, several studies on NFIP programs from academic research can be accessed through UVA's resources. The details about private insurance conditions take more work to obtain. However, it is accessible through the insurance company's online platform. Next, I will move to perceptions of people on risk, global climate change, and flood insurance. First, it is crucial to know what people thoughts about risk. In addition, people behave differently at a higher, medium, and low risk. Therefore, I will find studies and insight theories about risk and human behavior. Next, the trends of people's concern about global climate change can be a factor to consider. Again, studies from reliable sources will be the primary resources in this part. Lastly, the perception of people on flood insurance is essential. This topic can be explored by choosing case studies from research. For the next issue, I will work more on categorizing people in different factors such as geographic, educational, house

price, and cultural background and believe to see what factors here impact people's decisions more than others.

Existing US flood insurance

Since NFIP was established in 1970, it has been the majority choice for buyers in the flood insurance market (Kunreuther, 2021). It initially set up insurance rates due to the property's elevation and zone on a Flood Insurance Rate Map (FIRM). However, recently NFIP has been trying to improve its map and policy to attract more people. Therefore, it is changing to Risk Rating 2.0 system to ensure that the rate increases and decreases are acceptable and appropriate. The average flood claim in the US is around $42000 for each household. This compensation includes the money covering the losses and compensating the salary losses when people cannot go to work. Initially, the average cost of flood insurance was around $874 per year per household. To purchase NFIP flood insurance, policyholders can contact any insurance company or agent participating in FEMA (Risk Rating 2.0: Equity in Action | FEMA.Gov, n.d.).

Focusing only private flood insurance market, it usually provides coverage in commercial sectors above the NFIP maximums. According to the National Association of Insurance Commissioners (NAIC), while NFIP has a $3.5 billion total amount, the 2017 premiums for private flood insurance totaled $589 million, up from $376 million in 2016. Therefore, private flood insurance company occupies a small market compared to the NFIP market. Private insurance tends to focus more on the high-cost properties market, allowing them to set the insurance price at a higher premium rate. Few insurance companies are trying to compete with NFIP in selling residential flood insurance premiums (US Congressional Documents Private Flood Insurance and the National Flood Insurance Program, n.d.). These represent how the flood

insurance market has fewer competitors than other types, such as medical insurance. Therefore, it asks whether more private companies should be allowed to have roles in the residential flood insurance market. Since in the less competitive market, they can set a higher rate on the price. However, they still do not gain a high profit because of the pool number of participants. So, the negative impact is on both sides; the flood insurance providers and buyers.

People's perception of risk, global climate change, and flood insurance

People's internal though can be studied before analyzing external factors that prevent homeowners from seeking flood insurance. Beginning with a concept of risk, the risk is a future uncertainty that the outcome differs from the expectation. Usually, people have both positive and negative opinions about risk. A group of people can accept the higher risk if it leads to higher compensation. People generally tend to have different thoughts and actions when coping with risk. It varies according to how rare it is, the size, and the event's outcome. Emotion has some roles in judging risk as a combination of nature versus human actions. Experts defined risk perception of the public as strongly relying on probabilities and concern about the consequences of the event. It is also relevant to technical and scientific danger and more complex than that. Various psychological and social factors influence it. From a research conclusion, the influence due to human-made risk has a more substantial impact on emotions than nature.

The perception of risk from human-caused risky situations causes more harm and suffering as being more unfair because only some groups of people face it. Therefore, the breaking of levees by water is considered to have more impact on people than the flooding

caused by nature. However, an interesting result they have recovered is that fear does not influence risk perception. It can be because the scenario in the experiment that interviews people several months after a flood event impacts the result. The negative result from the flood event that causes risk perception has already been presented, but anxiety occurs right after the event. In comparison, anger or hatred can become a more critical factor than fear (Tyszka & Zielonka, 2017). It shows that people in a flood-prone area, even those with more flood prevention structures preventing them from flood, still perceive risk more than people from other areas. An individual's emotional stability also plays a vital role in risk perception. This variation can result from the cultural background (Lo, 2013).

However, considering climate change, there is a study by Hoogendoorn et al. about the perceptions of humans on it. The study discusses the people's belief on the cause of climate change that has affected their thought about the consequences of the natural disaster event. Even though there is a consensus on the anthropogenic cause of climate change, however in society, there are commonly two separate groups of beliefs. The bigger group believes climate change results from human activity, while the smaller group believes climate change results from natural processes. The results indicate that people from different group behaves differently depending on their beliefs on the source of climate change. This belief will also apply to the enthusiastic for their demand for risk reduction and mitigation methods (2020). Another study indicates that people can change their beliefs from various factors, such as education, income, ethnicity, gender, and political party side, which are more impactful than other factors (Hornsey et al., 2016). Furthermore, people can change their beliefs over time depending on their experiences and interests. As a result, this climate change perception can shift back and forth between the two distinguished groups, but the situation should happen infrequently.

The last topic is about the general perception of people on flood insurance. It becomes a difficult time for them when people think about purchasing flood insurance. There is less probability of a flood becoming devastating, but if it happens, it causes a massive loss for homeowners. In this case, uncertainty has become a significant factor for people to consider. The insurance demand relates to the insurance price and income (Jerolmack, 2022). Also, individual experience and the number of properties positively correlate with people's willingness. While the results unexpectedly indicated that people who live in a higher-risk area have a lower incentive to purchase insurance than those in lower-risk areas (Hung, 2009). This finding contrasts our traditional beliefs about human behavior, but it corresponds to another research conclusion which will be investigated more in the next section.

Factors impact people on purchasing flood insurance

The personal experience of flooding causes adaptative prevention. A study by Valois et al. suggested that people who experienced past flooding events have more adaptation than those who have never experienced flooding. It emphasizes a hypothesis that an extreme event has a link to an increase in preventive behavior. For those who have never experienced flood events, the awareness rate of people living in a flood-prone area is almost equal to people living outside a high-risk area. The result also represents a concern that people in a high flood-risk area who have never experienced any flooding event have low awareness and engage in few floods preventive behaviors (Valois et al., 2020). Raising awareness can be a tool to help cope with the concern, which is likely to have a small impact in the very long term. However, other economic

factors, such as the flood insurance price or policy, can be combined with raising awareness to attract more people in flood-prone areas to purchase flood insurance.

Another external factor, personal background, is critical in making the decision. According to a study by Brody et al., results from his analysis state that people living outside the FEMA 100-year floodplain, which have voluntarily purchased flood insurance, can be commonly categorized as more highly educated. They also have a relatively expensive home and are long-time residents with previous family experience with flooding and believe that flood insurance cost is relatively affordable. He also found that the proximity distance from their home to flood hazard areas has little or no difference in the decision to obtain flood insurance. His claim is supported by the overall survey he made, in which 42% of people need to recognize whether they are inside or outside of a 100-year floodplain boundary. In addition, among respondents living 75 miles from the border on average, 60% of them need clarification about whether they are less than 0.25 miles or more than 3 miles from the FEMA designation floodplain boundary (Brody et al., 2017). As can be perceived from the study, socioeconomic characteristics play a significant role in this part. When the risk has less impact on the decision, socioeconomic factors such as education, salary, and property cost greatly influence the people (Lo, 2013).

Mutual Shaping of flood insurance and society

There is a case study by Ando and Reeser (2022) about estimating homeowner willingness to pay (WTP) on a possible new kind of insurance policy: a pre-flood buyout

agreement between flood management agencies and homeowners. On the agreement, the homeowners can remain living in their homes until a flood event causes damage more significant than 50% of the home value. After the event occurred, they had to move out of their home. The home will be razed, and the land will be restored to a public space. The homeowner will get compensation at the pre-flood market value rate. They found that the research participants tend to agree favorably on the policy, with an average WTP of about $600 (Landry et al., 2021). The new kind of policy provides a favorable sum option to the buyer. The idea is compensation and an opportunity to buy a new place no longer on a floodplain. This case study shows us the mutual shaping between flood insurance and society, as the insurance policy significantly influences the homeowner's decision. Also, the participants shape how the new insurance policy will be designed and introduced. Instead of using the old kind of policy, this policy tends to provide better satisfaction to the buyer.

Conclusion

Flood insurance usually is not included in a regular home contract. Therefore, the homeowner has to purchase additional flood insurance by themselves. Personal beliefs have internally influenced the demand for flood insurance. The people who believe that flood results from the natural process have less emotion about flood risk leads to less preparation for flood prevention. External factors such as experience, income, and socioeconomic characteristics also play an essential role in human decisions. This idea becomes a mutual shaping between the flood insurance policy and human demand. It requires future study and effort from public and private sections on policy adjustment to increase the number of people purchasing insurance.

Citation

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