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An Examination of Government Involvement in Property & Casualty Insurance

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Abstract

For decades, both state and federal governments have taken a larger role in the property and casualty market. The National Flood Insurance Plan directly writes policies. In contrast, the California Fair Access to Insurance Requirement establishes a last-resort insurance pool for those unable to find certain types of coverage through conventional means. Finally, the Terrorism Risk Insurance Act establishes a federal reinsurance backstop in the event of a severe terror loss. While each program seeks to expand property and casualty coverage, some have been more successful than others. This thesis examines the efficacy of each program and provides reform suggestions.

TRNITY COLLEGE

An Examination of Government Involvement in Property & Casualty Insurance

BY

Samuel H. Spencer

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Chapter 1: Introduction

Since the agricultural revolution, individuals have sought to mitigate the risks found in everyday life. The first examples of insurance occurred in Babylon as early as 4,000 BCE and protected against maritime losses.[1] Insurance is a way for many parties to spread risk among a larger pool. Insurers do this by collecting premiums commensurate with the level of assumed risk. In addition to the revenue and profit generated from the collection of premiums, insurance firms also invest this money to fund operations and generate profits. Modern insurance has evolved in its complexity, but still operates on the same principles as it did in Babylon.

Today, this insurance market has expanded to cover everything from bond defaults to the haircuts of celebrities. In the United States, some of the earliest coverage was for protection from the fires that frequently ravaged cities.[2] As the nation industrialized, insurance firms grew to meet the needs of the expanding economy. Since the origin of the industry, firms have struggled to calculate the appropriate amount to charge insureds. While insurers can do this more effectively today, the underwriting profit margins are still quite small. Certain product lines such as flood, fire, and domestic terror have seen significant losses. Premiums have risen in the private sector to match. In certain circumstances, many consumers are being priced out of the market. In response to these rate increases, the federal as well as state governments have entered property and casualty markets. Each of these programs operate differently. Some adhere more closely to traditional underwriting standards while others disregard them. Some programs have operated more successfully than others.

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[1] "Insurance - Historical Development of Insurance," Encyclopedia Britannica, accessed April 22, 2021, https://www.britannica.com/topic/insurance.
[2] "Insurance - Historical Development of Insurance."

At both the federal and state level, the government has become more involved in subsidizing the property & casualty markets. In the 1960s, Congress established the National Flood Insurance Program (NFIP) to help provide flood coverage to those who live in flood prone areas. the NFIP behaves similarly to a traditional insurance firm as they collect premiums and pay claims directly. Millions of Americans protect their homes with these policies, yet this institution is in significant need of reform. As climate change is causing sea levels to rise globally, this will put even more Americans who live and work in coastal areas at risk.[3] Furthermore, there have been many severe floods inland as well. Most climate predictions indicate that these severe weather instances will continue. There has also been an upsurge in the power and frequency of hurricanes. This will likely lead to more losses. The Trump administration allocated more funding to relief programs such as the National Flood Insurance Program. However, organizations like the Federal Emergency Management Agency have not updated some flood maps in decades. Furthermore, if losses are too severe, there is the possibility that insurers will not be able to cover the losses.

Other experts in the field highlight the importance of quality risk management for flood insurance. In the United States, flood insurance is intertwined with federal policy as the federal government writes coverage for homes and businesses.[4] These have ramifications for both the insureds and the taxpayer; experts across the political spectrum recognize the need for reform.[5] The National Flood Insurance Program (NFIP) subsidizes flood insurance, thus keeping rates artificially low. This is problematic as the agency already runs a deficit, which is most likely

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[3] Timothy R. Homan, "Climate Change Poses Major Risk to Flood Insurance Program, Experts Warn," Text, The Hill, September 12, 2019, https://thehill.com/policy/energy-environment/461180-climate-change-poses-major-risk-to-flood-insurance-program-experts.

[4] Jim Hall, "Journal of Flood Risk Management," *Journal of Flood Risk Management* 3, no. 1 (March 2010): 1–2, https://doi.org/10.1111/j.1753-318X.2009.01059.x.

[5] "Overwhelming Risk: Rethinking Flood Insurance in a World of Rising Seas | Union of Concerned Scientists," accessed October 17, 2020, https://www.ucsusa.org/resources/overwhelming-risk-rethinking-flood-insurance-world-rising-seas.

going to continue to grow. Many future claims are expected to be paid out to the same properties repeatedly. While there are proposals to modify this program, much more change is needed.

As outlined in its foundational documents, the NFIP's objectives are to "i) identify areas of flood risk, ii) encourage communities to implement measures to mitigate against the risk of flood loss, iii) and provide financial assistance, through contracts of insurance, to help individuals and small businesses recover rapidly from flood disasters."[6] Until 1986, the NFIP was financially self-sufficient. However, a combination of below-market rates combined with an increase in catastrophic losses have put the program in peril. This is compounded by the fact that the NFIP "cannot charge rate-based premiums, hold loss reserve funds to offset unusually catastrophic losses, or purchase reinsurance, the program faces a constant risk of financial insolvency."[7] Insurance scholars have identified key reform areas such as, "(1) risk modeling and risk communication, (2) the roles of the public and private sector, (3) take-up rates, (4) incentives for risk reduction, and (5) rate setting and the financing of catastrophic flood events."[8] Even though these reform objectives may remedy many of the systemic issues facing the NFIP, achieving them will be difficult. Instead, the nation's flood risk can be better managed by the private sector.

State governments have also become directly involved in the property and casualty insurance market. The fire seasons of the past two decades have been particularly damaging, which has increased the cost of underwriting fire risk in California. As a result, many insureds struggle to

[6] Rawle King, "National Flood Insurance Program: Background, Challenges, and Financial Status," *Congressional Research Service*, July 1, 2011.
[7] King.
[8] Carolyn Kousky, "Financing Flood Losses: A Discussion of the National Flood Insurance Program: Financing Flood Losses," *Risk Management and Insurance Review* 21, no. 1 (March 2018): 11–32, https://doi.org/10.1111/rmir.12090.

find coverage.[9] As global weather patterns shift and forest fires become more of a risk, insurers are struggling to fairly determine appropriate premium amounts for those who live in wildfire-prone areas. In California, this has caused the state legislature to pass several laws regarding the transparency of the underwriting methods of insurance carriers operating in that state. While some insurers have been able to comply, some are leaving the state as they are no longer able to profitably do business there.

For decades, the California Fair Access to Insurance Requirements (FAIR) Plan has offered basic insurance policies to Californians who cannot purchase a plan through a conventional insurance market. Every property and casualty insurer who operates in the state must contribute to this pool. There are many regulations governing its operation and these policies only provide basic coverage up to a predefined dollar amount. Increased fire losses have put financial strain on the FAIR plan as well as the California property and casualty market as a whole. Unlike, the National Flood Insurance Program (NFIP), the Fair Access to Insurance Requirement (FAIR) plan does not use government subsidies and therefore cannot rely on tax revenue to augment its balance sheet. However, the FAIR plan must ensure that it is financially stable, or insurers will be forced to leave the California Property and Casualty Market completely.[10]

Like the NFIP, the FAIR plan interferes with the insurance market in California operating at maximum efficiency. However, the most severe policy issues are not directly insurance related. Overly restrictive zoning policies, and poor forestry management exacerbate the risks from wildfires. Addressing these problems will help reduce the annual damage from fires in

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[9] Michael Hiltzik, "Column: California's Fire Insurance Market Reaches a Crisis," Los Angeles Times, August 29, 2019, https://www.latimes.com/business/story/2019-08-28/hiltzik-california-fire-insurance-crisis.

[10] Daniel Veroff, "What Is the California FAIR Plan? | Property Insurance Coverage Law Blog | Merlin Law Group," Property Insurance Coverage Law Blog, October 11, 2019, https://www.propertyinsurancecoveragelaw.com/2019/10/articles/insurance/what-is-the-california-fair-plan/.

California. Additionally, the State of California could require that those covered by the FAIR plan take additional steps to mitigate their risk. In areas where wildfires pose a more serious risk, some insurers are requiring fire retardant landscaping. While it is true that climate change has had a significant impact on the severity of forest fires, there are many preventative measures that homeowners can do to protect their residences. Defensive measures like fire resistant landscaping can reduce the damage of a fire when it does occur.[11] However, repealing overly restrictive zoning laws and improving forestry management techniques will be the most impactful policy changes.

The United States government has also entered the reinsurance market. Since the terrorist attacks of September 11th, 2001, the federal government has created the Terrorism Risk Insurance Act (TRIA) to help mitigate terror losses by acting as a reinsurance backstop.[12] Terror events are infrequent and can drastically vary in severity. As a result, it is incredibly difficult to create actuarial data for these events. Many insurers are hesitant to offer these products if the scope of potential damages cannot be assessed. The Terrorism Risk Insurance Act (TRIA) has sought to remedy this. Unlike the National Flood Insurance Program (NFIP), policies cannot be directly purchased through it. In practice, it functions more like a reinsurer. It differs from the California Fair Access to Insurance Requirement (FAIR) plan in that the private insurers are not obligated to participate. Even though the threat of traditional terror attacks still exists, cyberterrorism now poses an equal threat. Going forward, the considerations for severe cyber terror events will need to be incorporated into TRIA decision-making.

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[11] F.C Dennis, "Fire-Resistant Landscaping - 6.303," *Extension* (blog), accessed October 17, 2020, https://extension.colostate.edu/topic-areas/natural-resources/fire-resistant-landscaping-6-303/.
[12] "Terrorism and Insurance," Rocky Mountain Insurance Information Association, accessed March 31, 2021, http://www.rmiia.org/catastrophes_and_statistics/terrorism_insurance.asp.

The level of reimbursement under the Terrorism Risk Insurance Act (TRIA) varies by the scope of the terror attack. In the case of a small loss, the insurer is responsible for covering the full amount. Only events that reach a certain threshold are eligible for reimbursement. To date, no terror event has met this threshold. Theoretically, the largest losses would be borne completely by the government. Currently, "the specifics of the current program are as follows: (1) a terrorist act must cause $5 million in insured losses to be certified for TRIA coverage; (2) the aggregate insured losses from certified acts of terrorism must be $180 million in a year for the government coverage to begin (this amount increases to $200 million in 2020); and (3) an individual insurer must meet a deductible of 20% of its annual premiums for the government coverage to begin. Once these thresholds are met, the government covers 81% of insured losses due to terrorism (this amount decreases to 80% in 2020). If the insured losses are less than $37.5 billion, the Secretary of the Treasury is required to recoup 140% of government outlays through surcharges on TRIA-eligible property and casualty insurance policies. As insured losses rise above $37.5 billion, the Secretary is required to recoup a progressively reduced amount of the outlays. At some high insured loss level, which will depend on the exact distribution of losses, the Secretary would no longer be required to recoup outlays."[13] Fortunately, there have not been any major terror attacks since 2001 in the United States. To date, this program has achieved its goals. However, it is unclear as to whether it would be able to withstand a large-scale attack or the heightened cyberterrorism risk.

Despite attempting to achieve the same goal of risk mitigation, these aforementioned policies all operate differently. Certain ones, such as the National Flood Insurance Program (NFIP) and the Fair Access to Insurance Requirement (FAIR) plan deal directly with retail

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[13] Baird Webel, "Terrorism Risk Insurance: Overview and Issue Analysis for the 116th Congress" (Congressional Research Service, December 27, 2019).

consumers. However, only the NFIP directly collects premiums from insureds. The Terrorism Risk Insurance Act (TRIA) differs from both the FAIR plan and the NFIP as it primarily functions as a reinsurer. None of these programs function as effectively as private sector solutions. There are many reforms that would improve each program but doing so is a lengthy and expensive process. Shifting the risk managed by the NFIP, FAIR plan, and TRIA to the private sector will improve outcomes for insureds as private firms are better able to adapt to the changing demands of the property and casualty market.

Chapter 2: Overview of the National Flood Insurance Program

In the United States, flooding is one of the most common and costly natural disasters. Some of the most common flood types come from heavy rainfall. Hurricane-prone coastal regions are often prone to seasonal flooding. However, other regions in the country are at risk as well. Heavy rainfall can occur in most places in the United States, which can cause waterways to overflow. While hurricanes do not threaten northern latitudes with the same severity, snow melt can cause severe flooding in these regions. From 1972 to 2006, the property losses from flooding have costed over $94 billion.[14] The past two decades have seen more severe losses for a myriad of reasons, including climate change and development in flood prone areas.

Given the national concern over flood risk, the National Flood Insurance Program (NFIP) was established in 1968. For 18 years, this program did not require subsidy from the government as the premiums collected covered all expenses. However, several factors have changed, thus making the NFIP no longer financially sustainable. According to the Congressional Research Service, "the policy objectives of the NFIP [are] to (1) identify and map the nation's regulated floodplains to make the public aware of flood hazards; (2) address the escalating cost of federal disaster assistance for flood damaged buildings and their contents; (3) allow property owners within communities that adopted and enforced a Federal Emergency Management Agency (FEMA) approved floodplain management ordinance to purchase insurance as a protection against flood losses; and (4) guide development and building practices to save lives and reduce future property damage."[15] The National Flood Insurance Program (NFIP) has operated with a

[14] Stanley A. Changnon, "Assessment of Flood Losses in the United States," *Journal of Contemporary Water Research & Education* 138, no. 1 (April 17, 2008): 38–44, https://doi.org/10.1111/j.1936-704X.2008.00007.x.
[15] King, "National Flood Insurance Program: Background, Challenges, and Financial Status."

deficit for decades and will continue to do so unless changes are made to its organizational structure.

The NFIP offers three main types of coverage. The coverage for dwellings is intended to "insure one to four family residential buildings and single-family dwelling units in a condominium building." General Property insurance "is used to insure five or more family residential buildings and non-residential buildings." Residential Condominium Building Association policies "insure residential condominium association buildings."[16] Under the National Flood Insurance Program, the Dwelling insurance insures the building value up to $250,000 and the contents of the property up to $100,000. Commercial coverage increases these limits to $500,000, respectively.[17] Many insureds who purchase policies through the NFIP do not fully understand the limited nature of the coverage of which they are purchasing. Unlike a valued policy, which pays "the limit of liability in the event of a total loss," the NFIP only pays the replacement cost of the damages. The policy also does not guarantee the replacement of the residence if the replacement cost is greater than the policy limit. Given the limited nature of these policies, homeowners are encouraged to purchase additional coverage in the private market.

To do its job, the NFIP must have accurate data. However, many of the flood maps used to make decisions are outdated. Recent floods have brought attention to these issues, yet there is still much that needs to be done.[18] In addition to the monetary costs of updating the flood maps, the government has many stakeholders who may not universally support these efforts. Property owners may be resistant to paying increased premiums. Recently, FEMA has incorporated the

[16] "National Flood Insurance Program Summary of Coverage" (FEMA, n.d.).
[17] "National Flood Insurance Program Summary of Coverage for Commercial Property" (FEMA, n.d.).
[18] "Flood Mapping for the Nation: A Cost Analysis for Completing and Maintaining the Nation's NFIP Flood Map Inventory," *Association of State Floodplain Managers*, 2020.

"residual flood risk behind levees" into recent flood maps. Residents who now live in areas designated as a flood risk are required to purchase flood insurance if their mortgage is federally backed. Even though this may provide a financial hardship for some, ignoring the issue does not eradicate it. Increased flood risk has put more properties at risk as seen over the past three decades. Individuals who are uninsured or underinsured for their flood risk may be left without recourse if their home or business is destroyed by flooding. Often these individuals will require emergency funds from FEMA. Since accurate flood data could inform better underwriting and building practices, updating flood maps will provide significantly more benefits than issues.[19]

One of the primary benefits of updating flood maps is providing accurate information for new development. As of 2020, FEMA's flood maps only cover "one-third of the nation's 3.5 million miles of streams and 46% of shoreline."[20] FEMA argues that the majority of unmapped areas are in sparsely populated rural locations. However, many of these areas may be at risk. Furthermore, the rise in remote work that has resulted from the policy response to COVID-19 may cause a migration away from densely populated urban areas. According to the Pew Research Center, twenty-two percent of adults in the United States have relocated due to COVID-19 or know people who have. Reasons listed include job losses, concern over health, change of working environment, and military deployment.[21] While some of these circumstances may be temporary, others are not. It is likely that populations will increase in areas with inadequate flood risk assessments. In 2020, some of the states with the highest migration rates

[19] King, "National Flood Insurance Program: Background, Challenges, and Financial Status."

[20] Thomas Frank, "Studies Sound Alarm on Badly Out-of-Date FEMA Flood Maps," Scientific American, February 27, 2020, https://www.scientificamerican.com/article/studies-sound-alarm-on-badly-out-of-date-fema-flood-maps/.

[21] D'vera Cohn, "About a Fifth of U.S. Adults Moved Due to COVID-19 or Know Someone Who Did," *Pew Research Center* (blog), July 6, 2020, https://www.pewresearch.org/fact-tank/2020/07/06/about-a-fifth-of-u-s-adults-moved-due-to-covid-19-or-know-someone-who-did/.

included Florida, Texas, North Carolina, and South Carolina.[22] These states are also some of the most likely to be flooded.[23] If up-to-date flood maps are kept of all inhabitable areas, better decisions can be made about new development and zoning.

It would be remiss to imply that updating the flood maps for the United States would be an easy task. Estimates for comprehensive flood mapping run from $3.2 billion to $11.8 billion. After the initial cost outlay, it can cost anywhere from $107 million to $480 million per year to maintain accurate flood maps. There are many reasons for the large discrepancies in costs. The speed at which these maps are to be developed has a significant impact on overall cost. There is no clear answer as to the appropriate balance between cost efficiency and rate of mapping as flood severity varies yearly.[24]

One of the largest logistical hurdles to overcome in developing accurate flood maps is the vast geographical size of the United States. "Based on the National Hydrology Dataset, there are approximately 3.5 million miles of streams in the nation. Currently, about 1.14 million stream miles have flood maps…For coastal or shoreline mapping, NOAA's official value for total length 95,471 miles. Currently, about 44,158 miles of shoreline have flood maps."[25] Historically, FEMA has targeted their efforts on mapping the areas of the United States with the highest population density. This becomes problematic if unmapped areas of the nation become developed, builders will not be able to accurately assess risk. The National Flood Insurance Program will not be able to charge fair premiums for these regions either, further exacerbating

[22] Janelle Cammenga, "Where Are Americans Moving?," *Tax Foundation* (blog), January 13, 2021, https://taxfoundation.org/state-migration-trends/.
[23] Jason Koebler, "10 States Most at Risk of Flooding," US News & World Report, March 14, 2012, https://www.usnews.com/news/slideshows/10-states-most-at-risk-of-flooding.
[24] "Flood Mapping for the Nation: A Cost Analysis for Completing and Maintaining the Nation's NFIP Flood Map Inventory."
[25] "Flood Mapping for the Nation: A Cost Analysis for Completing and Maintaining the Nation's NFIP Flood Map Inventory."

budgetary shortfalls. While there are numerous benefits in having a comprehensive flood map of the entire United States, prioritizing areas that are habitable is still prudent. State owned land often has restrictions that limit development. Prioritizing other areas where people may live is far more prudent. Additionally, technological advances in mapping technology now allows for higher quality maps to be made at a lower cost. FEMA should be sure to incorporate these considerations when allocating funding for new maps. Even though developing flood maps for the majority of the United States will be a costly endeavor, it will prove worthwhile as improved maps will help reduce exposure to flood risk.[26]

Another challenge facing the National Flood Insurance Program (NFIP), as well as the property and casualty insurance market as a whole, are the increasing costs associated with flood risks. On average, the profit margins for the property and casualty insurance industry are quite narrow; many insurance firms have years where they either post losses or only generate profit via their investment portfolio. In the insurance industry, underwriting profit is measured by the Combined Ratio. This defined as "the sum of two ratios, one calculated by dividing incurred losses plus loss adjustment expense by earned premiums (the calendar year loss ratio), and the other calculated by dividing all other expenses by either written or earned premiums (i.e., trade basis or statutory basis expense ratio)…A combined ratio below 100 percent is indicative of an underwriting profit."[27] In recent decades, increases in devastating floods have put pressure on the balance sheets of the NFIP and private insurers alike.

[26] "Flood Mapping for the Nation: A Cost Analysis for Completing and Maintaining the Nation's NFIP Flood Map Inventory."
[27] "Combined Ratio | Insurance Glossary Definition | IRMI.Com," accessed February 18, 2021, https://www.irmi.com/term/insurance-definitions/combined-ratio.

In the past decade, the average combined ratio for the property and casualty insurance market saw average combined ratios above 100 percent during four different years.[28] These high losses have been, in part, driven by increased flood losses.[29] As private insurers take on more flood risk, this may provide some relief to the balance sheets of the NFIP. However, this is not likely. Even if total exposure decreases, overexposure to flood risk will prevent solvency.

It is essential that all property and casualty actuarial models include increased flood risk from climate change. Currently, the NFIP "covers more than 5 million flood insurance policies and collects approximately $4.75 billion in premiums, fees and surcharges each year."[30] Increases in the frequency of extreme weather events and a rise in the average sea level will likely increase the risk of flooding. Improved flood maps will help create more accurate assessments regarding flood risk. In addition to mapping land that does not have updated flood risk data, the National Flood Insurance Program (NFIP) will need to account for the residual risk of communities protected by potentially inadequate flood protection.

When inadequate flood protection fails, the impact can be devastating. In 2005, the levees protecting New Orleans breeched during hurricane Katrina. This resulted in devastating fatalities as well as extensive property damage; this storm cost homeowner insurers eight billion dollars.[31] The causes of the failure of the levees in New Orleans, and the response to it, are complex issues with many causes. However, there is evidence that the effects of this tragedy were exacerbated by levee designs that were "not appropriate for the purpose, the storm

[28] Brian Briggs and Erika Cosey, "U.S Property & Casualty and Title Insurance Industries," *National Association of Insurance Commissioners*, no. 2019 First Half Results (2019).
[29] Ray Lehmann, "Private Flood Insurance Market Is Getting Bigger, More Competitive, Less Profitable," *Insurance Journal* (blog), March 18, 2018, https://www.insurancejournal.com/blogs/right-street/2018/03/18/483689.htm.
[30] Homan, "Climate Change Poses Major Risk to Flood Insurance Program, Experts Warn."
[31] Stephanie Jones, "Hurricane Katrina: The Numbers Tell Their Own Story," Insurance Journal, August 26, 2015, https://www.insurancejournal.com/news/southcentral/2015/08/26/379650.htm.

exceeded levee design standards, the levees were not actually built to the original design standards, the levees were not properly maintained, or a combination of these and other factors."[32] Accurate flood maps that include assessments of flood protection infrastructure would help provide information that can allow for improved disaster response.

In the City of Mandeville, Louisiana, such flood mitigation strategies have proven to be quite effective. In comparison to the surrounding towns and parishes, Mandeville faired better than average due to the comprehensive flood mitigation efforts taken.

The NFIP "standards state that all new construction must be built at or above the Base Flood Elevation (BFE) shown on the city's flood maps. The BFE represents the average floodwater elevation for a 100-year flood event, meaning that floors of buildings constructed to this standard will sit above the floodwater and avoid damage during all but the most severe flood events.

Since the town has been in the program for more than 25 years, they've had ample opportunity to bring many buildings up to these standards. In 1993, the city voted to go one step further than the NFIP requirements to raise their elevation standard to one foot above the BFE. Thus, their newest buildings have added protection, and their owners enjoy a 30 percent reduction in the cost of their flood insurance…Mandeville's mitigation efforts proved their worth during Hurricane Katrina. This storm was the first real test of the city's floodplain building standards. Lakeshore Drive, which runs along Lake Ponchatrain in Mandeville, presents some pretty clear evidence of the effectiveness of home elevation. Along Lakeshore Drive, virtually every elevated home suffered little or no flood damage. The homes that were not elevated were substantially damaged. Some are completely gone."[33] When properly implemented, these flood mitigation strategies can drastically reduce flood damages.

Updating flood maps, while initially costly, may pay for itself in the long run if flood losses are minimized. In 1997, "FEMA conducted a benefit-cost analysis of its proposed flood mapping program (at the time it was call Map Modernization). Based on that analysis, floodplain mapping showed a benefit to the taxpayer of over $2 for every $1 invested in flood mapping. In 2008, the State of North Carolina used the same methodology as FEMA, and calculated a benefit-cost ratio of 2.3 to 1."[34]

[32] "A Failure of Initiative- Final Report of the Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina," House Report (Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina, February 15, 2006).

[33] "Strong Building Code Protects Louisiana Town | FEMA.Gov," accessed February 28, 2021, https://www.fema.gov/case-study/strong-building-code-protects-louisiana-town.

[34] "Flood Mapping for the Nation: A Cost Analysis for Completing and Maintaining the Nation's NFIP Flood Map Inventory."

Given the broad range of stakeholders impacted by flooding, sources of funds for updated flood maps need not solely come from the National Flood Insurance Program (NFIP). Local, state, and other funding sources are willing to contribute to the cost as all involved benefit. In North Carolina, the state mapped 29,733 miles of streams, which returned an average of "$3,400 per year per mile and clearly shows significantly higher benefits of having more detailed flood studies." This is logical as these aforementioned flood maps are the basis for local building and zoning decisions. In addition to location, these decisions can help influence building codes to ensure that structures in flood prone areas are as resilient as possible. "In fact, buildings constructed in compliance with NFIP building standards suffer approximately 80 percent less damage annually that those not built in compliance. Lower damage amounts can be a proxy for lower impacts and demands on disaster assistance."[35]

Flood Study Type[36]	**Range of Losses Avoided (per stream mile)**
Detailed Study	$5,482 - $6,166
Limited Detailed Study	$1,713 - $2,539
Approximate Study	$721

Fig. 2.1

Recently, there has been a federal initiative to update the nation's flood maps in an initiative called Risk Rating 2.0. "This new change…is part of a grand plan to bring the NFIP out of its $20 billion debt caused by paying out more than it collects. Devastation from Category 5 Hurricane Katrina and several other storms in 2005 threw the program into what has been

[35] "Flood Mapping for the Nation: A Cost Analysis for Completing and Maintaining the Nation's NFIP Flood Map Inventory."
[36] "Flood Mapping for the Nation: A Cost Analysis for Completing and Maintaining the Nation's NFIP Flood Map Inventory."

perpetual red ink ever since."[37] This new metric will update the probabilistic models used to assess flood insurance risk. Not only will this data be able to inform policy decisions about zoning, but it will also give the National Flood Insurance Program (NFIP) the information needed to charge appropriate premiums.[38] Even though charging higher premiums is necessary, those required to pay higher premiums may not be pleased with these changes. However, the director of the NFIP has not made any definitive statements about rate changes. "Any entity claiming that they can provide insight or comparison to the Risk Rating 2.0 initiative, including premium amounts, is misinformed and setting public expectations that are not based in fact. While entities are free to suggest or estimate their opinion of what flood insurance premiums should be, they are offering exactly that — an opinion — and they do not have insight into the Risk Rating 2.0 initiative."[39] Since these new changes are in their nascency at the writing of this thesis, it is not possible to comment on their success. Nonetheless, this policy decision is a positive step in the reformation of the National Flood Insurance Program (NFIP).

Perhaps one of the most beneficial outcomes of improved flood mapping is a set of better construction and zoning guidelines. According to the Federal Emergency Management Agency (FEMA), "the primary objective of the Severe Repetitive Loss (SRL) properties strategy is to eliminate or reduce the damage to residential property and the disruption to life caused by repeated flooding. Approximately 9,000 insured properties have been identified with a high frequency of losses or a high value of claims." Properties are rated as Severe Repetitive Loss (SRL) if "any NFIP-insured residential property that has met at least 1 of the following paid flood loss criteria since 1978, regardless of ownership: 4 or more separate claim payments of

[37] Alex Harris, "Floridians Are Underpaying for Flood Insurance, Study Finds. Get Ready for Costs to Rise," *Miami Herald*, February 22, 2021.
[38] Mike Amodeo and Saman Armal, "The Cost of Climate: America's Growing Flood Risk," *First Street Foundation*, 2021.
[39] Harris, "Floridians Are Underpaying for Flood Insurance, Study Finds. Get Ready for Costs to Rise."

more than $5,000 each (including building and contents payments); *or* 2 more separate claim payments (building payments only) where the total of the payments exceeds the current value of the property."[40] SRL properties are a significant burden on the National Flood Insurance Program's (NFIP) balance sheet.

As climate change and increase land development activities continue to exacerbate SRL events, it is essential that the NFIP develop policies and strategies to mitigate these losses. In an attempt to help rectify these issues, the United States Congress instructed the NFIP to create a program to help reduce the cost of SRL events. Under the SRL Grant Program, "FEMA provides funds to state and local governments to make offers of assistance to NFIP-insured SRL residential property owners for mitigation projects that reduce future flood losses through acquisition or relocation of at-risk structures and conversion of the property to open space; elevation of existing structures; *or* dry floodproofing of historic properties."[41]

While the SRL policy that the NFIP has adopted is certainly an improvement, it is far from a complete solution. According to research by the Pew Charitable Trusts, one percent of NFIP-insured properties are properties with a history of repeated floods. However, these account for twenty-five to thirty percent of the claims. These properties account for approximately half of the NFIP's twenty-three billion dollar debt.[42] An audit by the Office of the Inspector General of The Department of Homeland Security found two major problems with the organizational structure of the National Flood Insurance Program's Severe Repeated Loss program. "Firstly, FEMA does not have reliable, accurate information about SRL properties. This deficiency occurred because of ambiguous FEMA forms to request removal of SRL designation, poor

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[40] "Guidance for Severe Repetitive Loss Properties" (Federal Emergency Management Agency, May 1, 2011).
[41] "Guidance for Severe Repetitive Loss Properties."
[42] Phyllis Cuttino, "Repeatedly Flooded Properties Cost Billions."

organizational structure, and unassigned roles for ensuring SRL data integrity. As a result, FEMA is using inaccurate information to make funding-related decisions, including requesting appropriations from Congress, deciding where to implement large-scale mitigation projects, and determining which residential mitigation projects to fund through its Flood Mitigation Assistance grant program (FMA). Additionally, not all NFIP policyholders who have mitigated their SRL property have benefited from reduced policy premiums. Second, FEMA's FMA, which aims to mitigate flood damage for NFIP policyholders, provides neither equitable nor timely relief to SRL applicants. We attribute this inefficiency to decentralized FMA grant application requirements and inadequate enforcement of grant requirements."[43] Despite the best intentions of the directors of the NFIP, this program is not on a path to financial solvency.

While there are many reform possibilities, it is unlikely that any will result in success. Reform attempts will prove costly and will take years to implement. Furthermore, the NFIP is backed by the federal government, so it does not have the market incentives to become financially solvent. Even though the NFIP does collect premiums, any budget overages can be covered by the federal government. In practice, neither Democrats nor Republican federal lawmakers have shown any interest in reducing deficit spending. Instead, the nation's flood risk can be handled better by the private insurance sector.

[43] Cynthia Spishak, "FEMA Is Not Effectively Administering a Program to Reduce or Eliminate Damage Of Severe Repetitive Loss Properties," Memorandum (Office of the Inspector General, July 29, 2020).

Chapter 3: Analysis of the National Flood Insurance Program

As established, flooding in the United States is one of the most damaging forms of natural disasters that occur. While the National Flood Insurance Program (NFIP) was intended to combat this, its results have been mediocre. Financially, this program is no longer self-sustaining. Considering the high frequency of severe repetitive damages to a small percentage of properties, the NFIP has not been successful at incentivizing responsible building practices either. This problem extends beyond financial solvency; severe flooding also results in a loss of life as well.

Another problem with the NFIP is that the entire country subsidizes a small subset of regions, many of which are predominantly wealthy. As of 2020, the counties with the highest Severe Repeated Losses from flooding are Harris County, Texas, Jefferson Parish, Louisiana, Orleans Parish, Louisiana, St. Tammany Parish, Louisiana, Passaic County, New Jersey, Galveston County, Texas, Nassau County, New York, Suffolk County, New York, St. Charles County, Missouri, and Cape May County, New Jersey. Half of the aforementioned counties have a median household income above the national median household income of 68,704 dollars; Nassau County is one of the wealthiest counties in the entire country.[44] [45] Furthermore, approximately twenty-five percent of policies written by the NFIP insure vacation properties.[46] It is unfair to expect taxpayers across the United States to subsidize vacation homes in the Hamptons. It would be remiss to pretend as if all NFIP payouts go to the wealthy; several of the

[44] "Median Household Income (County): SAGE Stats," 2018, https://data.sagepub.com/sagestats/document.php?id=4638.

[45] Jessica Semega et al., "Income and Poverty in the United States: 2019," The United States Census Bureau, September 15, 2020, https://www.census.gov/library/publications/2020/demo/p60-270.html.

[46] Ike Brannon and Ari Blask, "The Government's Hidden Housing Subsidy for the Rich," Politico, August 8, 2017, https://www.politico.com/agenda/story/2017/08/08/hidden-subsidy-rich-flood-insurance-000495.

most impacted counties have median household incomes well below the average. It is highly debatable whether subsidized insurance is ultimately beneficial to any demographic.

According to many property and casualty insurance experts, the National Flood Insurance Program (NFIP) undercharges for many of its policies.[47] Subsidizing the flood insurance market for wealthy communities and vacation houses with taxpayer dollars is a poor allocation of these resources. However, even subsidizing flood insurance for middle and low income individuals is also not effective in the long term. The coverage provided by the NFIP is very limited in scope.[48] Many insureds would need private market policies to be adequately covered in a flood event. Furthermore, this artificial price reduction creates a form of moral hazard. This is defined as "a situation in which one party gets involved in a risky event knowing that it is protected against the risk and the other party will incur the cost. It arises when both the parties have incomplete information about each other."[49]

When the government artificially lowers the cost of property ownership in certain areas, it hides the true cost of living in a flood prone area. While this may be good for property owners as it augments real estate prices, it incentivizes poor decision-making. Below-market flood insurance rates hide the true long-term cost and risk of property ownership in a certain area. Individuals and businesses with higher risk tolerances can still inhabit these areas but will be charged an adequate market rate for doing so. Individuals and businesses who do not find such a benefit at the margin will seek real estate elsewhere. In the long term, this leaves everyone involved better off.

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[47] Paolo Taruc, "NFIP Undercharging, Incentivizing People to Take Risks - CEO," August 14, 2018, https://www.insurancebusinessmag.com/us/news/catastrophe/nfip-undercharging-incentivizing-people-to-take-risks--ceo-108697.aspx.
[48] "National Flood Insurance Program Summary of Coverage."
[49] "What Is Moral Hazard? Definition of Moral Hazard, Moral Hazard Meaning," The Economic Times, accessed February 22, 2021, https://economictimes.indiatimes.com/definition/moral-hazard.

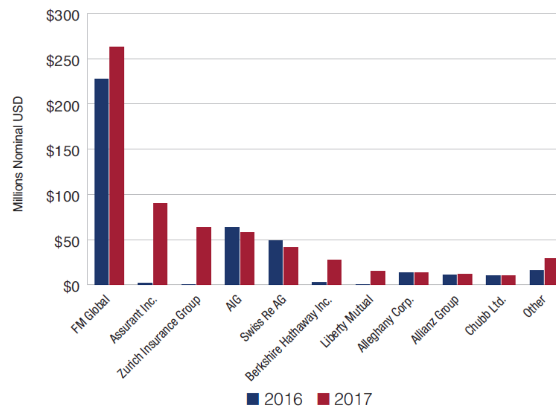
Currently in the United States, private insurers only write a small number of the flood policies in force. The National Flood Insurance Program (NFIP) writes the majority of these policies. The popularity of NFIP policies is in large part due to the lower-than-average market premiums charged. If the NFIP were to stop writing policies all together, the private insurance market would be able to underwrite these risks much more effectively. The private sector already has a sophisticated risk mitigation system for managing flood losses. Managing General Agents and Managing General Underwriters "identified were underwritten by a surplus lines carrier. Some offer a range of flood products underwritten by different carriers. For example, Orchid Underwriters offers primary and excess flood products backed by multiple carriers… Surplus lines companies tend to write standalone policies rather than endorsements to homeowners insurance; admitted companies generally lean in the other direction. To offer an endorsement, companies must first offer standard homeowners insurance policies. Because homeowners insurance is widely available in the admitted market, fewer surplus lines insurers offer homeowners coverage and associated flood endorsements."[50] Reinsurers also play a large role private sector flood insurance. This complex network of risk pooling is far better for the insured as more accurate prices will be charged and better insurance products will be offered.

As previously discussed, neither the commercial nor residential coverage offered through the NFIP is particularly comprehensive. In order to be comprehensively protected, many insureds may seek coverage from the private market as well. This additional policy is necessary when the value of the property or its contents exceed the coverage limit. Since many insureds in high cost of living areas will need supplemental coverage as well, it raises the question as to

[50] Carolyn Kousky et al., "The Emerging Private Residential Flood Insurance Market in the United States" (Risk Management and Decision Processes Center, July 2018).

whether seeking coverage through the National Flood Insurance Program (NFIP) is even necessary. According to research from the Wharton Risk Management and Decision Processes Center, the private flood insurance market has grown significantly since 2015. This growth is not just limited to insurers who write policies for High-Net-Worth Individuals either. Insurers across the price spectrum have sold more policies.[51]

Figure 1. Top 10 writers of private flood insurance by direct premiums written, 2016 and 2017



Source: S&P Global Market Intelligence. The table includes both residential and commercial flood insurance, stand-alone, and excess policies. It excludes sewer and water backup and agriculture coverage for crops.

[52]

Figure 3.1

In the commercial flood insurance market, FM Global is a leader in this sector.[53] Unlike the NFIP, their product offerings and services are far more comprehensive. Before development begins, FM Global offers risk consulting services to identify issues before they arise. While the NFIP's initiative to improve flood maps is prudent, risk consulting services from private insurers are far more comprehensive. FM Global, like many insurance firms, offers risk consulting

[51] Kousky et al.
[52] Kousky et al.
[53] Kousky et al.

services that are comprehensive.[54] Many firms, including the aforementioned, also develop proprietary flood maps to augment actuarial models.[55] Both the insurer and the insured benefit from these services. The insured reduces the likelihood of a loss occurring and the expenses that accompany it. Many insurers offer lower premiums for taking adequate steps to mitigate risk. Risk management also benefits insurers as they pay fewer claims.

The flood insurance products offered by private sector to individuals is far superior to the products offered by the National Flood Insurance Program (NFIP). The premium offerings from firms such as Chubb Limited offer significantly more coverage. Primary coverage offered through Chubb Limited covers up to fifteen million dollars of losses; excess coverage can be purchased for more valuable properties. They also give special consideration to valuable and unique items. The standard policy also covers living expenses while the damaged residence is being rebuilt or repaired. While risk consulting is not traditionally offered to residential properties, Chubb offers up to five thousand dollars for renovations to mitigate flood risk.[56] In the private sector, there is a stronger market incentive to prevent damage before it occurs as it impacts ultimate profitability.

The offerings from firms like Chubb Limited, while comprehensive, are out of reach from average Americans. Nonetheless, there are many private sector firms that offer coverage at a lower price point that still offers better protection than the policies offered through the NFIP. The Liberty Mutual Group offers flood coverage for residential properties under the NFIP's

[54] "Business Risk Consulting," FM Global, accessed February 25, 2021, https://www.fmglobal.com/products-and-services/services/business-risk-consulting-and-bia.

[55] "Flood," FM Global, accessed February 25, 2021, https://www.fmglobal.com/research-and-resources/nathaz-toolkit/flood.

[56] "Flood Insurance | Chubb," accessed February 25, 2021, https://www.chubb.com/us-en/individuals-families/products/natural-disasters/flood.html.

Write Your Own Program (WYO).[57] For those who do not wish to purchase flood protection directly through the NFIP, Write Your Own insurers act as intermediaries by "issu[ing] SFIPs [Standard Flood Insurance Policies] in their own name and handle claims adjustments. Because of their role in this system, WYO companies are fiscal agents of the federal government. WYO companies deposit premiums in separate bank accounts from which they disburse claims and make refunds. After a deduction for a WYO company's operating costs, SFIP premiums are deposited in the National Flood Insurance Fund in the U.S. Treasury. If a WYO company lacks sufficient funds to pay a claim or make a refund, it can draw on FEMA's letters of credit from the U.S. Treasury."[58] While the National Flood Insurance Program (NFIP) does underwrite the majority of risk in this scenario, there is no reason why an insurer such as the Liberty Mutual Group could not underwrite such a risk if the Federal Emergency Management Agency (FEMA) stopped underwriting flood risk. Instead, flood risk can be more effectively managed by the private sector.

One of the most important, yet least implemented, flood management methods available is involving homeowners in flood management. It is historically been difficult to encourage homeowners to take preventive measures before experiencing a flood loss event. Those that do encounter better results. Investigating the property to determine flood risk before purchase is one important step. Another is engaging in flood proofing measures. At the time of publication, research found that flood mitigation methods can cost anywhere from 1,000 dollars to 10,000 dollars per residence. These methods can include purchasing flood mitigating devices such as sandbags and pumps. Other more permanent strategies can include renovations to raise the

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[57] "Flood Insurance | Flood Insurance Quotes | Liberty Mutual," accessed February 27, 2021, https://www.libertymutual.com/property-insurance/flood.

[58] Shaun Marker, "What Is The Write-Your-Own Insurance Policy Program?," Property Insurance Coverage Law Blog, July 9, 2012, https://www.propertyinsurancecoveragelaw.com/2012/07/articles/insurance/what-is-the-writeyourown-insurance-policy-program/.

property out of harm's way. More extreme solutions can include the construction of flood control devices, such as levees, on one's property or building a pier.[59] For those that choose to live in flood-prone areas, this type of mitigation is crucial for long-term reduction in flood damage to both property and person.

Ultimately, private sector insurers must take a larger role in mitigating flood damage. Even though the National Flood Insurance Program (NFIP) has attempted to encourage preventive and defensive flood management systems, the success of these interventions has been minimal.[60] If the nation's flood risk were transferred from the public to private sector, it is likely that private insurance firms would be more successful at compelling better flood management behavior from the insured. This could be accomplished in two primary ways. Firstly, insurers could offer financial incentives to insureds for taking defensive action to protect flood-prone properties. Examples can range from rainwater management to raising the structure. Secondly, insurers can mitigate flood risk by charging appropriate premiums for the risk involved. Undercharging simply hides the true underlying flood risk.

Private sectors can also take actions at the macro level to combat climate change, which contributes to increased flood risk. In the United States, electricity generation accounts for approximately twenty seven percent of total carbon emissions; burning coal to generate electricity is the most environmentally damaging. Despite coal electricity production accounting for only twenty eight percent of electricity generated in the United States, it accounts for sixty six percent of the carbon dioxide emissions from power generation.[61] One of the most important

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[59] Shirley Bradway Laska, "Involving Homeowners in Flood Mitigation," *Journal of the American Planning Association* 52, no. 4 (December 31, 1986): 452–66, https://doi.org/10.1080/01944368608977119.
[60] Laska.
[61] "Sources of Greenhouse Gas Emissions," Overviews and Factsheets, US EPA, accessed February 27, 2021, https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions.

actions that can be taken against climate change is abandoning coal power for more ecologically friendly alternatives. Not only would this reduce greenhouse gas emissions but save lives as well. Coal and natural gas are responsible for the most deaths related to energy production, while renewable sources of energy are the least. Nuclear power is the safest globally, even when accounting for the Chernobyl and Fukushima Daiichi disasters.[62]

Energy Source[63]	**Mortality Rate (deaths/trillion kWhr)**
Coal – global average	100,000 (41% global electricity)
Coal – China	170,000 (75% China's electricity)
Coal – U.S.	10,000 (32% U.S. electricity)
Oil	36,000 (33% of energy, 8% of electricity)
Natural Gas	4,000 (22% global electricity)
Biofuel/Biomass	24,000 (21% global energy)
Solar (rooftop)	440 (< 1% global electricity)
Wind	150 (2% global electricity)
Hydro – global average	1,400 (16% global electricity)
Hydro – U.S.	5 (6% U.S. electricity)
Nuclear – global average (w/ Chernobyl & Fukushima Daiichi	90 (11% global electricity)
Nuclear – U.S.	0.1 (19% U.S. electricity)

Figure 3.2

Even though energy policy is not directly controlled by insurers, property and casualty insurers can nonetheless have an impact on reducing emissions from energy production. In July of 2019, Chubb Limited announced that they "will no longer sell insurance to or invest in companies that make more than 30% of their revenue from coal mining. Chubb will also stop underwriting the construction of new coal-fired power plants. The company said for existing coal plants, insurance coverage for risks that exceed the 30% threshold will be phased out by 2022, and for utilities beginning in 2022. Additionally, it will also not invest in companies that generate more than 30% of revenue from thermal coal mining or energy production from coal."[64]

[62] James Conca, "How Deadly Is Your Kilowatt? We Rank The Killer Energy Sources," Forbes, June 10, 2012, https://www.forbes.com/sites/jamesconca/2012/06/10/energys-deathprint-a-price-always-paid/.
[63] Conca.
[64] Shanti Nair and Valerie Volcovici, "U.S. Insurer Chubb Pulls Back from Coal," *Reuters*, July 1, 2019, https://www.reuters.com/article/us-chubb-ltd-ch-coal-policy-idUSKCN1TW3I2.

In addition to helping the environment, this decision also reflects a shift in the economics of power generation. By the year 2030, a drop in the price of renewable energy will make fifty two percent of coal plants unprofitable. Furthermore, "Nearly 60% of China's existing coal plant fleet is running at an underlying loss… [As] Institutional investors are increasingly divesting from fossil fuel companies due to the risk their assets will become stranded as tougher emissions cut targets discourage their use and renewable energy becomes even cheaper."[65] Many of the very same insurers that underwrite energy production are also exposed to flood risk.[66] By no longer underwriting the unprofitable and environmentally destructive coal industry, insurers can reduce their risk of flood losses by influencing global energy policy.

One concern that many may raise over completely privatizing the nation's flood risk is that insureds may be left without recourse in the event of a severe flood event that bankrupts an insurer. This concern is unfounded as all fifty states, Washington D.C., and Puerto Rico have insurance guaranty associations that protect the insured in the event of insolvency. "Insurance guaranty associations provide protection to insurance policyholders and beneficiaries of policies issued by an insurance company that has become insolvent and is no longer able to meet its obligations… Insurance companies are required by law to be members of the guaranty association in states in which they are licensed to do business… If an insurance company has insufficient assets to pay policyholder claims, a guaranty association will obtain funds by assessing member insurers that write the same kind of business as the insolvent insurer. These assessments (together with the assets of the insurer) are then used to pay, up to statutory limits, the covered claims of policyholders of the insolvent company. An association may also provide

[65] Nina Chestney, "Nearly Half of Global Coal Plants Will Be Unprofitable This Year: Carbon Tracker," *Reuters*, April 7, 2020, https://www.reuters.com/article/us-global-coal-idUSKBN21P3HM.
[66] Roxanne Libatique, "These Are the Top 25 Property/Casualty Insurance Companies in the US," November 20, 2020, https://www.insurancebusinessmag.com/us/guides/these-are-the-top-25-propertycasualty-insurance-companies-in-the-us-32630.aspx.

continued coverage for the policyholder or transfer policies to healthy insurers."[67] If a certain insurer is unable to cover the flood losses, then these associations can protect insureds. However, avoiding an insurer with a poor financial track record is the best course of action as many states limit payouts from guaranty associations; the average cap for property and casualty claims is 300,000 dollars. There are many rating agencies that investigate the financial strength of various insurance firms. These agencies give the consumer the information needed to assess the risk of a given carrier.[68]

Another solution to reducing flood risk that incorporates both the public and private sector is a system of tradeable flood mitigation permits. This idea is nothing new; firms often trade carbon credits to reduce their overall carbon footprint.[69] These flood permits could function in a similar fashion. There are three ways these permits could function. The first way is through a series of Tradeable Development Rights. In order to be successful, there need to be predefined flood sensitive areas and counterpart development areas. The local zoning authorities determine the flood threshold for a specific region and then allocates credits based on flood risk. These credits could either be grandfathered in or auctioned away. There are limits to this type of flood credit system. This only is viable in regions with development potential and non-governmental organizations which own significant amounts of conservation land. Farmers can also benefit from selling these flood permits. These Tradeable Development Rights also have

[67] "Guaranty Associations | ACLI.Com," American Council of Life Insurers, accessed March 1, 2021, https://www.acli.com/Industry-Facts/Guaranty-Associations#q1.
[68] Cameron Huddleston, "What Happens If Your Insurance Company Goes Out Of Business?," Forbes Advisor, May 11, 2020, https://www.forbes.com/advisor/life-insurance/company-out-of-business/.
[69] Yusho Cho, "China's National Carbon Trading Market Eyes June Debut in Shanghai," Nikkei Asia, March 28, 2021, https://asia.nikkei.com/Spotlight/Environment/Climate-Change/China-s-national-carbon-trading-market-eyes-June-debut-in-Shanghai.

limitations as they do not necessarily account for flood mitigation measures taken by the developer.[70]

Another form flood permitting that accounts for flood reduction are Tradeable Flood Reduction Permits. Like the aforementioned Tradeable Development Rights, these can also incorporate land development proposals. To develop such a system, policymakers in an area also must identify the current and target flood risk for a certain region. However, these permits will also account for defensive flood mitigation strategies such as water retention construction projects and flood-safe landscaping. However, this form of flood mitigation permit system is not without flaws. Flood mitigation structures and zones can simply be traded without the creation of beneficial new flood mitigation structures. These Tradeable Flood Reduction Permits function best in areas where these structures do not already exist.[71]

Finally, Tradeable Risk Neutral Permits help to remedy the issues of the other forms of flood mitigation. These function similarly to Tradeable Flood Reduction Permits, but require the developer to take flood reduction measures to reduce flood risk before constructing a new project. An example of this would be constructing a series of retention basins to accompany a new business park that is proposed to be constructed on vacant land.[72]

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[70] Chiung-Ting Chang, "Introduction of a Tradeable Flood Mitigation Permit System," *Environmental Science & Policy* 11, no. 4 (June 2008): 329–35, https://doi.org/10.1016/j.envsci.2007.11.002.

[71] Chang.

[72] Chang.

Type	Institutional condition	Potential buyer	Potential seller	Externality
TDR	Only land use is concerned	1. Those who demand development 2. Those who support flood risk reduction 3. Those who support other environmental purposes, e.g., ecological conservation	Land users or owners in sending areas	Adverse externality is mainly confined in receiving areas
TFR	1. Not only land use is concerned 2. The adverse externality generated accordingly is not substantial	1. Flood manager 2. Those who can benefit from flood risk reduction 3. Adopters of less efficient mitigation	Those who can offer mitigation measures, especially more efficient ones	Adverse externality is likely resulted from structural measures
TRiNe	1. Both structural & non-structural measures are crucial 2. The adverse externality generated accordingly is substantial	1. Those who wish to invest in hard engineering structural measures 2. Those who demand development	Farmers and other land owners who might be in a position to retain more flood water on their land; some might even benefit from flood	Adverse externality free

Table 2 – Summary of the three types of TFMP

[73]

Figure 3.3

Despite their limited application, Tradable Flood Management Permits have significant potential in the developing regions of the United States. Land development needs can change more rapidly than zoning laws can be altered. These systems also can incentivize sound building practices as well as concentrate risk mitigation from the government and insurance firms.

It is true that shifting flood risk to the private sector will place a financial burden on some insureds. One example of this is the surge in demand for Florida's state-backed flood insurer of last resort, called Citizens Property Insurance Corporation. "While Citizens has a 10 percent cap on annual rate increases, excluding coverage changes and surcharges, private companies have been seeking rate increases of 12 percent to 30 percent. The Florida Office of Insurance Regulation held a public hearing Tuesday on a proposal by First Community Insurance Co. to raise rates by an average of 24.5 percent."[74] As previously discussed, policy action to reduce

[73] Chang.

[74] Jim Turner, "Florida's Insurer of Last Resort Grows as Private Market Hits Capacity," *Tampa Bay Times*, September 24, 2020, https://www.tampabay.com/news/business/2020/09/24/floridas-insurer-of-last-resort-grows-as-private-market-hits-capacity/.

insurance premiums only exacerbates flood losses in the long term. Charging a fair premium is essential for accurate planning from the consumer.

Ultimately, the private insurance market is best suited to handle the nation's flood risk. Even though the National Flood Insurance Program (NFIP) was founded with the best intentions, the program has produced significant negative externalities. Shifting the risk on to the private sector is completely feasible. Given that the NFIP undercharges for flood coverage, it can be difficult for the private sector to compete in this space. According to the CEO of Chubb Limited, "The government under the NFIP charges an inadequate rate in most instances. It underprices the cost of risk. It incents people to live in places they otherwise wouldn't because they don't pay the right price to live with that risk. And it disincents government from putting money toward infrastructure to mitigate exposure to floods."[75] Even though it can be tempting to coerce insurance premiums via political action, this only generates issues in the long term. Undercharging for flood risk simply distorts the underlying risk of inhabiting a certain area. Not only does this exacerbate long term economic losses, but it also puts lives at risk as well. Undercharging also prevents private insurers from charging a rate based on actuarial models. If flood risk is to be borne by the insured instead of the taxpayer, insurers must be able to charge economically viable rates. Rates between insurer will vary due to coverage level, risk tolerance, actuarial data, as well as other factors. However, no insurer can compete with a program continually undercharges. Consumers will also enjoy superior outcomes from improved insurance offerings that better compensate for losses. Ultimately, transitioning the nation's flood risk to the private sector will reduce the burden on the taxpayer while reducing flood risk to communities.

[75] Taruc, "NFIP Undercharging, Incentivizing People to Take Risks - CEO."

Chapter 4: Overview of the Fair Access to Insurance Requirement

In addition to the federal government, state governments have also entered the property and casualty markets. One of the most prominent examples has been the Fair Access to Insurance Requirement (FAIR) plan in the State of California, which is another way governments attempt to mitigate the costs of natural disasters. This policy differs from the National Flood Insurance Program (NFIP) as the state government is not collecting premiums and writing policies. Instead, this law mandates that insurers themselves contribute to a pool where Californians with no other recourse can purchase insurance. This form of government involvement in property and casualty insurance markets avoids some of the aforementioned issues associated with state-run insurance carriers. However, like the NFIP, the FAIR plan simply addresses a symptom of a greater issue in the marketplace. While both private insurers and the FAIR plan itself need to reform their business practices, these reforms will not be sufficient until the State of California adopts a new, cohesive strategy for managing wildfires.

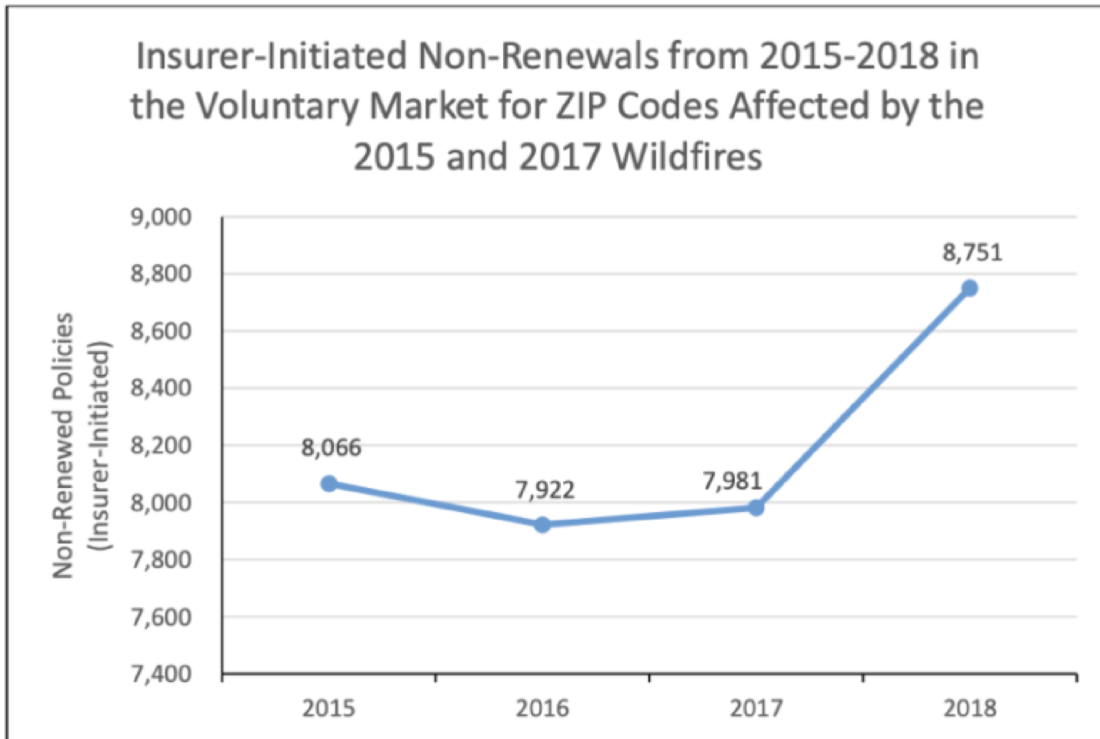
Even though the FAIR plan has been in effect for decades, this policy is unique. “The California Fair Access to Insurance Requirements Plan was created in July 1968 following the 1960’s brush fires and riots. It is an insurance pool established to assure the availability of basic property insurance to people who own insurable property in the State of California and who, beyond their control, have been unable to obtain insurance in the voluntary insurance market. There is no public funding, or taxpayers’ monies involved. The FAIR Plan is not a state agency.”[76] Much of California’s forested areas are prone to wildfire risk. This risk, in part due to climate change, has increased over the years. As a result, many Californians who live in areas

[76] “California FAIR Plan Association,” accessed March 3, 2021, https://www.cfpnet.com/.

with a high risk of forest fires struggle to purchase insurance. Like the National Flood Insurance Program (NFIP), the FAIR plan also struggles to adequately cover its financial obligations and adequately manage risk.

The issue of accessible fire insurance is indeed a problem in the State of California. Much of this is driven by the rising costs of underwriting fire risk in this region. In addition to increased premiums, insurers may decide to completely withdraw from the California marketplace. When this occurs, insureds are forced to purchase coverage through the FAIR plan or through a niche brokerage like Lloyd's of London. These firms command much higher premiums than traditional insurers. Furthermore, insureds may find that their insured home value will not cover the total cost of rebuilding. Another issue that insureds face is the lack of rate adjustments for taking fire mitigation measures.[77] "Insurers say they'd like to give customers credit for making their homes fire-resistant, but they don't currently have enough data to establish discounts for any particular measures. 'It's clear that homeowners and communities can do a lot to mitigate the risk,' says Victor Joseph, chief underwriting officer at Mercury Insurance (and a son of its founder, George Joseph), 'but the data is not well-structured to filter into pricing.' Mercury uses the data to decide whether to accept new business in a given community, but not to set rates."[78] The graph below represents the increase in policy non-renewals initiated by the insurer. This creates a serious issue for insurers, insureds, and policymakers alike.

[77] Hiltzik, "Column: California's Fire Insurance Market Reaches a Crisis."
[78] Hiltzik.



Insurer refusals to renew homeowner insurance spiked after the 2017 fire season. (California Dept. of Insurance)

[79]

Figure 4.1

The FAIR plan functions differently from other state-run property and casualty systems. Every property and casualty insurer that does business in the State of California is required to contribute to this pool. Both businesses and residential properties can be covered. Like the flood coverage provided by the NFIP (National Flood Insurance Program), the coverage is much less comprehensive than the policy offerings directly purchased through a private insurer. Coverage purchased through the FAIR plan is capped at 1.5 million dollars. Given the high housing prices in many areas of California, this is not sufficient.[80]

[79] Hiltzik.
[80] Veroff, "What Is the California FAIR Plan?"

There are many policy options for both businesses and homeowners alike. Dwelling policies are intended for personal residences. These policies cover "[one to four] family unit dwellings with no more than five roomers or boarders in total, including trailer homes, mobile/manufactured homes, or floating homes used exclusively for dwelling purposes at a fixed location. Owner occupancy is defined as a building in which at least one unit is occupied by the owner. As an example, in a four unit building, if three units are occupied by tenants and one unit is occupied by the owner, then the building is considered "owner occupied." Tenant occupancy is defined as a building in which every unit is occupied by tenants. 1-4 family dwelling unit properties that are rented in part or in whole for a term of less than one year (e.g. through a vacation rental site such as Airbnb) should be submitted under a dwelling application."[81] They also cover seasonal residences, vacant homes in certain circumstances, "personal property for renters, [and] personal property and improvements, alterations, and additions for condominium unit owner[s]."[82]

The FAIR plan also offers coverage for commercial residences and cost of construction. Structures that fall into this category are "buildings with five or more habitational units (e.g. apartment buildings, hotels, motels), retail mercantile, manufacturing risks, office buildings, [and] residential or commercial buildings under course of construction (COC)."[83] Small and medium sized businesses can obtain coverage through the FAIR plan as well. "BOP policies may be written for eligible retail, apartment, office, service, and processing risks and are available for owners of buildings and tenants of retail, service, and processing operations. In addition to the type of business for which coverage is being sought, the building height, area

[81] "Dwelling Policy," accessed March 3, 2021, https://www.cfpnet.com/index.php/consumers/dwelling-policy/.
[82] "Dwelling Policy."
[83] "Commercial Policy," accessed March 4, 2021, https://www.cfpnet.com/index.php/consumers/commercial-policy/.

square footage, number of units and annual gross sales are determining factors for eligibility under the BOP program."[84] Finally, the Fair Access to Insurance Requirement (FAIR) plan also offers earthquake coverage that can be purchased in conjunction with certain types of fire coverage.[85]

In recent years, the FAIR plan has sought to expand coverage offerings to offer insureds more coverage options. The Insurance Commissioner of California wanted to expand coverage to offer comprehensive insurance to save insureds money as they would no longer need to purchase multiple policies. However, this was struck down in the court system as the judge involved said that this measure would put undue strain on the private sector insurance market.[86]

While these policy options are comprehensive, there are financial issues with the current FAIR plan. Since September 1st, 2020, "the FAIR Plan incurred wildfire claims totaling $350 million…That's a considerable sum for a company that took only $400 million in total premium revenue."[87] The main goal of the FAIR plan is to make affordable fire insurance available for those without other recourse. Charging market rates negates the mission of the program. Yet, insurers involved in the risk pool may soon find themselves unable to continue to operate in the State of California. If the fire losses both from their direct policies, as well as the ones written through the FAIR plan, exceed the profits generated from other lines, it will make financial sense for that insurer to no longer offer any insurance products in the state.[88]

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[84] "Businessowners Policy," accessed March 4, 2021, https://www.cfpnet.com/index.php/consumers/businessowners-policy/.

[85] "CEA-Earthquake," accessed March 4, 2021, https://www.cfpnet.com/index.php/consumers/cea-earthquake/.

[86] "California FAIR Plan Can Offer Only Fire Insurance, Judge Says," Insurance Journal, February 21, 2020, https://www.insurancejournal.com/news/west/2020/02/21/559030.htm.

[87] Dale Kasler, "'Last Resort' Insurance Plan Raising Rates for Rural California Homeowners — Again," *The Sacramento Bee*, December 8, 2020, https://www.sacbee.com/news/california/fires/article247680725.html.

[88] Christopher Flavelle, "California Bars Insurers From Dropping Policies in Wildfire Areas," *The New York Times*, November 5, 2020, sec. Climate, https://www.nytimes.com/2020/11/05/climate/california-wildfire-insurance.html.

In California, the state government has the authority to regulate insurance premium increases. "But raising premiums, which are often closely regulated, can create a headache for officials. California and other states have the authority to reject or reduce rate increases, and they often face pressure from voters to do so. The result is a dilemma for governments. Either let rates rise, squeezing homeowners, or take the chance that more insurers will pull back from vulnerable areas, as many across the West are doing already. Without insurance, banks won't issue mortgages, making homes harder to buy or sell. The challenges are especially pronounced in California, where regulations lean toward consumer protection. The state forbids insurance companies from setting rates based on what they expect in future damages. Insurers are allowed to set rates only based on prior losses. Regulators also forbid insurers from passing along the costs of buying their own insurance, which they do to soften the blow of unexpectedly big losses. As wildfires get worse, those costs for insurers are going up as well. Both rules were designed to guard against higher rates. But in the age of climate change, insurers say those rules have prevented them from keeping up with wildfire damage."[89] In the aftermath of one particularly damaging fire season, the Insurance Commissioner of California prohibited insurers from canceling coverage in severely impacted regions.[90] These actions are ultimately ineffective as the most detrimental policies are not directly insurance related. Even though the Insurance Commissioner may have been attempting to act in the best interest of his constituents, these types of actions make it increasingly unappealing to offer property and casualty insurance in the State of California.

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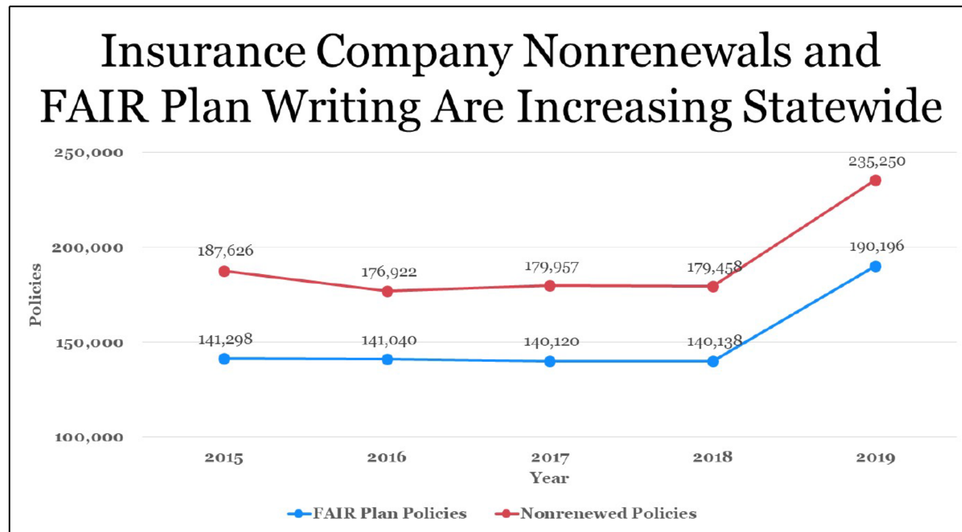
[89] Christopher Flavelle, "Wildfires Hasten Another Climate Crisis: Homeowners Who Can't Get Insurance," *The New York Times*, September 2, 2020, sec. Climate, https://www.nytimes.com/2020/09/02/climate/wildfires-insurance.html.
[90] Flavelle.

It is essential for the long-term health of the FAIR plan to encourage as many insurers as possible to continue to write policies in fire prone areas. The FAIR plan becomes weaker with fewer members. Californians will suffer from losing property and casualty insurance options for other coverage areas than fire protection. "California's Department of Insurance issued a report quantifying that pullback. For the ZIP codes most affected by the wildfires in 2015 and 2017, the number of homeowners dropped by their insurance companies jumped 10 percent between 2017 and 2018. In the 10 California counties with the most homes in high-risk areas, the number of homeowners' policies written by major insurers, whose rate increases must be approved by state regulators, fell by 5 percent between 2015 and 2018, the department said. Another way of measuring the growing reluctance of insurers is the increase in demand for the state's FAIR plan, which is effectively prohibited from turning away customers but typically charges higher premiums as a result. In those same 10 highest-risk counties, the number of homeowners getting coverage through that plan increased 177 percent while staying flat statewide. 'By not being able to find insurance, you then in turn can't sell your home. If you can't sell your home, then it affects the local property taxes,' said Ricardo Lara, California's insurance commissioner. 'This is really creating chaos.' The trade group representing insurers said the fires of the past two years had compelled companies to reduce their exposure. Whether that pullback is temporary or permanent depends on what the state does next, according to Rex Frazier, president of the Personal Insurance Federation of California. Mr. Frazier said the state should allow insurers to raise rates to better reflect the full cost of wildfire risk. He also called for more aggressive forest management, such as controlled burns to remove trees, brush and other fuel for wildfires, as well as requiring homeowners to keep more space between their houses and the vegetation around them. The alternative — continuing to build homes in dangerous areas, combined with

worsening fire conditions and premiums that don't reflect the true risk of wildfires — is 'not the recipe for a healthy market,' Mr. Frazier said."[91] This alarming withdraw is heavily impacted by restrictive regulations.

One indicator of the difficulty of writing insurance in the State of California are the growing number of non-renewals for fire coverage. This places additional strain on the insurers involved with the FAIR plan as insureds migrate to the insurer of last resort when they are no longer covered under their private plan. "Residential non-renewals by insurance companies increased statewide by 31% and FAIR Plan policies increased statewide by 36% from the end of 2018 to 2019. New FAIR Plan policies increased by 225% while renewed FAIR [Fair Access to Insurance Requirement] Plan policies fell by 1% (an overall 36% increase for new and renewed policies). Most of the growth in insurance company non-renewals and FAIR Plan writing happened in areas with higher wildfire risk."[92] If these trends continue, even more pressure will be put on the members of the FAIR plan insurance pool.

[91] Christopher Flavelle, "As Wildfires Get Worse, Insurers Pull Back From Riskiest Areas," *The New York Times*, August 20, 2019.
[92] "Data on Insurance Non-Renewals, FAIR Plan, and Surplus Lines (2015-2019)" (California Department of Insurance, October 19, 2020).



Source: California Department of Insurance presentation at Virtual Homeowners Investigatory Hearing, October 20, 2020

[93]

Figure 4.2

Ultimately, serious reform efforts must be taken to ensure the viability of the FAIR (Fair Access to Insurance Requirement) plan as increased pressure on this insurer of last resort challenges its solvency. Since the government does not financially subsidize its balance sheet, its biggest financial challenge would arise from its member firms no longer operating within the state. While it is impossible to eliminate fire risk, much of the risk can be managed by changes in practices of private sector insurance firms. However, to achieve a significant reduction in wildfire damages, FAIR plan reforms must occur in conjunction with larger policy changes in the State of California. Currently, wildfire control in California focuses on eradication instead of management. Implementing prescribed burns to reduce the severity of wildfire risk would dramatically reduce the severity of wildfires.[94] Additionally, strict zoning laws in the state prevent new construction in areas where housing demand is high. These housing policies create

[93] "Data on Insurance Non-Renewals, FAIR Plan, and Surplus Lines (2015-2019)."

[94] Elizabeth Weil, "Prescribed Burns Prevent Megafires. Why Don't We Use Them in California?," Massive Science, September 15, 2020, https://massivesci.com/articles/megafire-california-climate-change-wildfire-controlled-burns-fire-management/.

a myriad of problems, including forcing Californians to build in fire-prone areas.[95] If these changes were to occur, it is likely that the need for a state-sponsored insurer of last resort would disappear.

[95] Michael Willemsen and Gail Phillips, "Down-Zoning and Exclusionary Zoning in California Law," *Hastings Law Journal* 31, no. 1 (January 1979).

Chapter 5: Analysis of the Fair Access to Insurance Requirement

Even though climate change is a key factor in the severity of natural disasters, addressing climate change in a meaningful way is beyond the scope of a state legislature. Instead, increasing the State of California's wildfire preparedness can be addressed through public policy reform and improving insurance practices in the State of California. Unlike the National Flood Insurance Program, the policies that create issues with the FAIR (Fair Access to Insurance Requirement) plan arise from policies that do not directly address fire protection. The two policy areas that need to be addressed are the use of prescribed fires and zoning restrictions that prohibit new construction in areas with high housing demand. Similarly, private property and casualty insurers need to improve fire risk modelling and incentivize safer building behavior.

One of the best solutions to reducing the severity of the damage from wildfires is to prevent them from occurring in the first place. It would be remiss to claim that severe wildfires can be completely prevented. However, the use of prescribed fires can significantly reduce the severity of naturally occurring wildfires. "[A] prescribed fire is a planned fire; it is also sometimes called a 'controlled burn' or 'prescribed burn' and is used to meet management objectives. A prescription is a set of conditions that considers the safety of the public and fire staff, weather, and probability of meeting the burn objectives. Prescribed fire is one of the most important tools used to manage fire today. A scientific prescription for each fire, prepared in advance, describes its objectives, fuels, size, the precise environmental conditions under which it will burn, and conditions under which it may be suppressed. The fire may be designed to create a mosaic of diverse habitats for plants and animals, to help endangered species recover, or to reduce fuels and thereby prevent a destructive fire…In most parks, management-ignited prescribed fires are used instead of lightning-caused fires to manage vegetation. Prescribed burns

have been ignited to reduce hazardous fuel loads near developed areas, manage landscapes, restore natural woodlands, and for research purposes."[96] Yet despite the benefits of controlled burns, land management policy in the State of California takes a different approach.

Currently, fire management methods in the State of California focus heavily on fire suppression. However, there is much criticism of this policy from fire experts within the state. They argue that California's natural climate lends itself to natural wildfires, unlike other regions of the United States. Academic research indicates that over 1,000 square miles of land burned yearly in prehistoric California. Current fire suppression strategies extinguish small, naturally occurring fires that do not pose a threat. This strategy, in conjunction with a lack of prescribed fires, increases the buildup of biomass that fuel dangerous fires. Some research indicates that approximately 31,000 square miles of land would need to burn in order to restabilize fire risk.[97]

New policy that implements controlled burns would be costly. Fire management experts recommend burning approximately 1,700 square miles of land per year. Controlled burns can cost from 200 dollars per acre to over 1,000 dollars per acre depending on the location and terrain. This could cost hundreds of millions of dollars per year. However, this is significantly cheaper than trying to fight a wildfire in the first place; on average, this costs 800 dollars an acre. Just one series of severe fires in 2017 created over seven billion dollars of damage in one month alone.[98] The chart below illustrates the effectiveness of various prescribed burn methods.

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[96] "Wildland Fire: What Is a Prescribed Fire? (U.S. National Park Service)," March 19, 2020, https://www.nps.gov/articles/what-is-a-prescribed-fire.htm.
[97] Weil, "Prescribed Burns Prevent Megafires. Why Don't We Use Them in California?"
[98] James Temple, "This Is What California Needs to Do about Its Fires," MIT Technology Review, September 17, 2020, https://www.technologyreview.com/2020/09/17/1008473/wildfires-california-prescribed-burns-climate-change-forests/.

Table 1. Classification of prescribed fire effectiveness based on visual estimates of fine fuel reduction percentages
Adapted from Buckley and Corkish (1991)

Effectiveness class	Reduction (%)		
	Litter	Slash	Shrub
Very good	>50	>75	>75
Good	25–50	>75	25–75
Fair	<25	25–75	<25
Poor	Unburned	<25	Unburned

[99]

Figure 5.1

Clearly prescribed burns must be used to help mitigate wildfire risk in California as the benefits outweigh the costs. However, implementing this effectively and safely will be challenging.

One of the leading contributors to fire risk is the buildup of natural biomass that contributes to fire severity. In the Sierra Nevada mountains, trees are dying at an alarming rate. Over the past decade, over 129 million trees in the region have died. There are several causes for this. As previously discussed, excessive fire suppression has led to overcrowded forest with little biological diversity.[100] Researchers have found that "A century-old policy of putting out all fires, known as fire suppression, has created overcrowded forests. Before European settlement, naturally-ignited fires and those lit by Native Americans cleared the forest of debris that could cause severe fires. These events and practices also checked the growth of new trees that would compete with older, bigger trees. The result, said Jim Branham, executive director for the Sierra Nevada Conservancy, a state agency that works to improve the well-being of the Sierra Nevada

[99] Paulo Fernandes and Herminio Botelho, "A Review of Prescribed Burning Effectiveness in Fire Hazard Reduction" (International Journal of Wildland Fire, 2003).
[100] Terry Hardy et al., "Fire on the Mountain: Rethinking Forest Management in the Sierra Nevada" (Little Hoover Commission, February 2018).

region, was a 'very diverse landscape of open, closed, young, and old forests.' This diversity is essential to forest resiliency and helps forests survive a variety of threats."[101]

While damaging, the current policy of fire suppression is not the only reason for this buildup of dead trees. Historic droughts have damaged the region as well. These two conditions have made it easier for bark beetles to cause excessive damage to unhealthy trees. Under normal circumstances, these trees may be able to recover. However, these beetles can kill struggling trees. While the bark beetles are essential for the health of the ecosystem in the Sierra Nevada mountain range, the current conditions have tipped the natural balance. Officials in the state have known about the risks of overgrown forests for decades but have failed to address them. Fortunately, policymakers are beginning to adopt a more wholistic approach to forest management. A task force was created in 2018 to "consider how forest management can reduce the threat of wild-fires and increase forest resiliency and carbon storage."[102]

While better fire management methods would have a profound impact on wildfires in California, improved zoning policies would allow people to move out of harm's way. Zoning laws in the United States can serve many purposes and are often quite controversial. In the United States, zoning is defined as "the separation or division of a municipality into districts, the regulation of buildings and structures in such districts in accordance with their construction and the nature and extent of their use, and the dedication of such districts to particular uses designed to serve the General Welfare. Zoning, the regulation of the use of real property by local government, restricts a particular territory to residential, commercial, industrial, or other uses."[103]

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[101] Hardy et al.
[102] Hardy et al.
[103] "Zoning Law," in *West's Encyclopedia of American Law*, n.d., https://legal-dictionary.thefreedictionary.com/Zoning+law.

Zoning regulations often occur at a municipal level, but state and federal mandates can also impact the legal restrictions around land use.

Proponents of strict land use restrictions support these measures for reasons such as preventing overdevelopment, environmental protection, and for historical preservation. However, these types of zoning protections can have significant negative externalities. This debate is occurring throughout the country. One of the more restrictively zoned states is Connecticut. Many move to the state to escape New York City and do not wish to remove zoning policies that keep towns rural.[104] However, opponents claim that these policies are overly restrictive and only benefit the wealthy who already own property in the state.[105]

In reality, most economic research indicates that unaffordable housing in the United States is a result of restrictive zoning. In general, "America does not uniformly face a housing affordability crisis. In the majority of places, land costs are low (or at least reasonable) and housing prices are close to (or below) the costs of new construction. In the places where housing is quite expensive, zoning restrictions appear to have created these high prices… Difficult zoning seems to be ubiquitous in high cost areas… Only in particular areas, especially New York City and California, do housing prices diverge substantially from the costs of new construction."[106] While Los Angeles has been making strides to rectify their restrictive zoning laws, much of the city is zoned for single family occupancy.[107] San Francisco has equally restrictive zoning

[104] "Connecticut's Zoning Laws a Focus in Racial Equity Debate," Text.Article, Associated Press (Fox Business, March 16, 2021), https://www.foxbusiness.com/real-estate/connecticuts-zoning-laws-a-focus-in-racial-equity-debate.
[105] "Connecticut's Zoning Laws a Focus in Racial Equity Debate."
[106] Edward Glaeser and Joseph Gyourko, "The Impact of Zoning on Housing Affordability," *Harvard Institute of Economic Research*, no. 1948 (March 2002).
[107] Elijah Chiland, "Single-Family Homes Cover Almost Half of Los Angeles," Curbed LA, September 10, 2018, https://la.curbed.com/2018/9/10/17827982/single-family-houses-los-angeles-zoning-rules-explained.

policies.[108] These overly restrictive land use policies have many negative effects, including economic ones that hinder growth.

In addition to the negative externalities previously discussed, California's strict zoning laws also increases its exposure to wildfires. "For many years virtually every community in California endorsed the philosophy of growth. Zoning ordinances in this milieu served merely to guide growth and eliminate nuisances. Within the past two decades, however, opposition to largely unrestrained growth has arisen and attained political power. In many communities the opponents of growth, seeking to preserve the natural and social environment and to reduce the burden on local government that accompanies growth, have succeeded in enacting zoning ordinances designed to severely limit future development. Similar restrictive provisions enacted by the state government have limited development along the Pacific Coast and in the Lake Tahoe Basin… Restrictive zoning ordinances give rise to two distinct yet related issues. The first issue is one of 'down-zoning': by limiting the landowner's use of property, the ordinance may invade constitutionally protected rights, either by restricting the use of property to uses less valuable than those previously permitted, or by threatening to deny any reasonable use whatsoever. The second issue is one of "exclusionary zoning": by limiting the construction of housing, a restrictive zoning ordinance may deny prospective immigrants the opportunity to live in the community."[109] By artificially restricting the housing supply, Californians who are not wealthy are forced to look for housing far away from expensive cities and move into fire prone areas.

In areas with high economic growth, the demand for housing remains relatively fixed. This is especially true for those who are renting in an area before prices increase. Many housing

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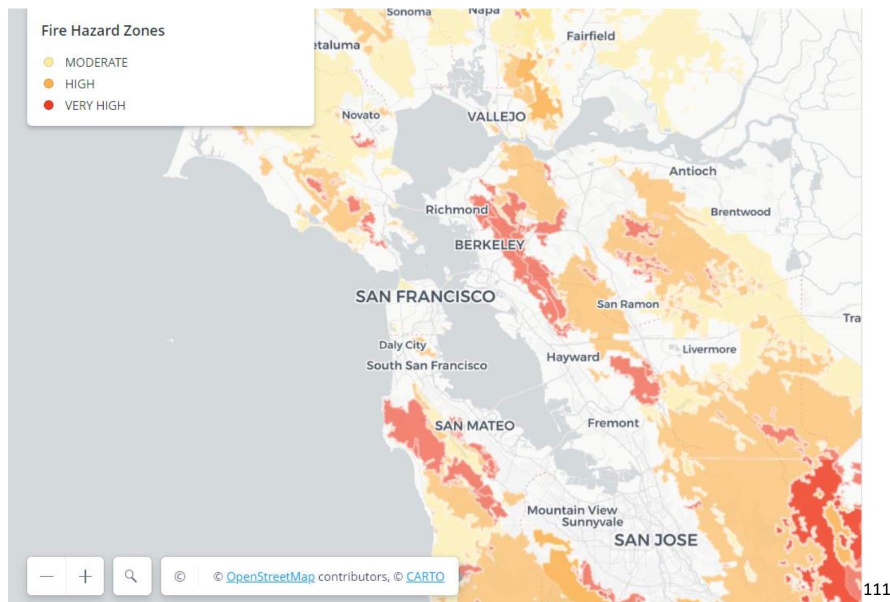
[108] Kriston Capps, "What's Really to Blame for San Francisco's Housing Crisis," *Bloomberg.Com*, March 11, 2016, https://www.bloomberg.com/news/articles/2016-03-11/zoning-plays-a-big-role-in-san-francisco-s-housing-crisis-gentrification-and-wealth-disparity.

[109] Willemsen and Phillips, "Down-Zoning and Exclusionary Zoning in California Law."

advocates rightly criticize this issue. Finding a different job in a lower cost of living region with better housing policies is not always an option for individuals. However easing zoning restrictions in cities like San Francisco would allow for more efficient land use that reflects the wants of those who live there. Many who cannot conveniently relocate are forced to live further away in fire prone areas. While not immune, the City of San Francisco has a significantly lower wildfire risk profile than the surrounding communities. The fire inspector for San Francisco's Division of Fire Prevention and Investigation said "San Francisco is considered very low-risk. We do have wildland areas, but not what it's like up north."[110] Allowing more construction within the city limits would reduce the need to live in higher risk areas.



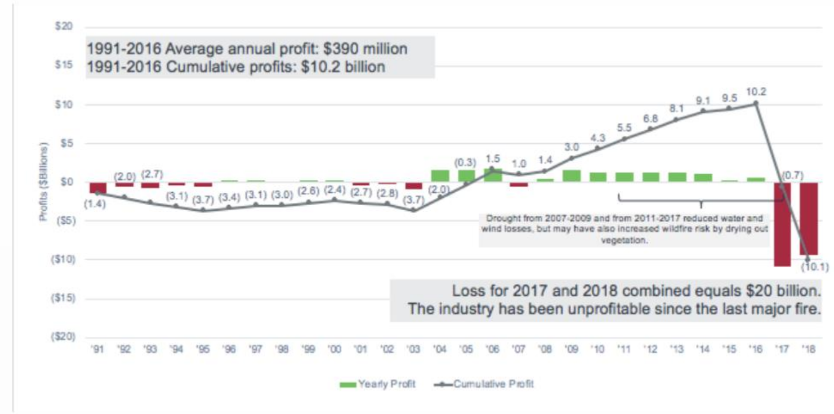
[111]

Figure 5.2

As with the National Flood Insurance Program (NFIP), the private insurance market will need to adopt to the increased fire risk both within the State of California and beyond. For a

[110] Trisha Thadani, "Could a Wildfire Sweep into San Francisco? Residents Seek Assurance as State Burns," San Francisco Chronicle, September 6, 2018, https://www.sfchronicle.com/politics/article/Could-a-wildfire-sweep-into-San-Francisco-13210803.php.
[111] Ryan Sabalow, Philip Reese, and Dale Kasler, "10 California Communities at Serious Risk From Wildfires," KQED, April 11, 2019, https://www.kqed.org/science/1940016/10-california-communities-that-are-at-serious-risk-from-wildfire.

myriad of reasons, the severity of wildfires is increasing in fire prone areas. Where insurers could once dismiss these severe fires as anomalies, actuarial data must be updated to incorporate the prevalence of these events. Historically, underwriting wildfire risk was a profitable line of business. However, that has not been the case since 2017.



[112]

Figure 5.3

Insurers are beginning to realize the severity of the problem by petitioning the government to let them raise rates or cancelling coverage all together. However, insurers must update their actuarial models to reflect future risk. While it is impossible to predict the future, insurers can improve their models by updating them to "reflect current underlying conditions, such as dry vegetation from recent drought, increased housing units built in the wildland urban interface (WUI), or any other changes to the insurer's risk exposures over time. With the further complicating factor that insurers are not permitted to reflect net reinsurance costs in their overall rates, current regulations could potentially cause a material gap between insurers' estimates of losses and expenses and the corresponding rates that they charge." [113] Without making these

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[112] David Evans, Cody Webb, and Eric Xu, "Wildfire Catastrophe Models Could Spark the Changes California Needs" (Milliman, October 28, 2019), https://www.milliman.com/en/insight/wildfire-catastrophe-models-could-spark-the-changes-california-needs.
[113] Evans, Webb, and Xu.

changes, it is likely that insurers will need to continue to pay out billions in claims over the next decade.[114]

Ironically, these restrictions raise prices for insurance as fewer insurers will choose to write policies in California. As previously stated, when faced with regulations that force unprofitability, it is simply easier to withdraw from the market completely. Nonetheless, insurers would prefer to have access to the California insurance market. Better risk management practices benefit both the insurer and insured.

Insureds also can incentivize safe building and landscaping practices to help reduce the damage from wildfires. Historically these practices have been quite successful at both reducing risk and lowering underwriting costs. For example, the Hartford Steam Boiler Inspection and Insurance Company mandated that insureds install an anti-siphon loop to their boilers to reduce catastrophic failures. This program was so successful, anti-siphon loops were often called "Hartford Loops."[115] Property and casualty insurers who underwrite fire risk in the State of California should implement similar policies to reduce their fire risk.

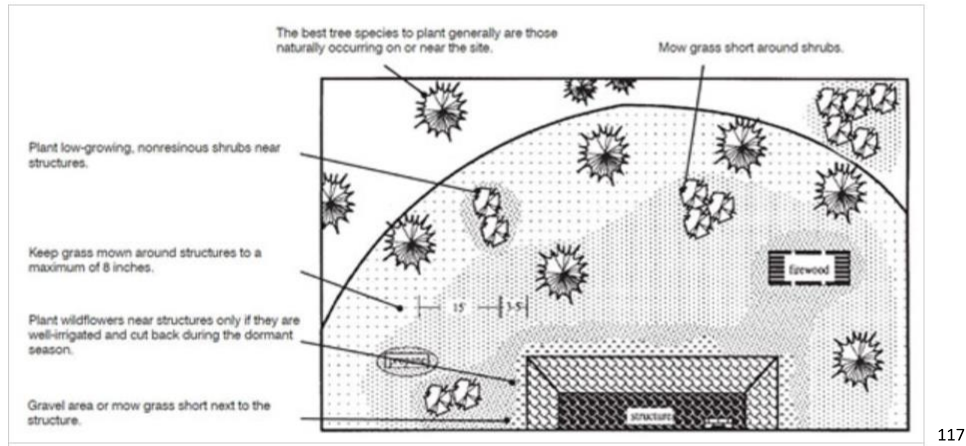
The implementation of fire-resistant landscaping has proven to be incredibly effective at mitigating wildfire damage. There are many facets of effective fire-retardant landscaping. The most important method is planting vegetation away from structures that is adequately dispersed. It is also essential to keep the insured property clear of debris, such as sticks and leaves. Planting indigenous species also helps with both fire safety and ecological health. The incorporation of stones and gravel can act as an aesthetically pleasing fire break. If more insurers reduced

[114] Luca Weber et al., "Rethinking California Wildfire Risk" (Partner Re, June 2019).

[115] "The Hartford Loop," *Certified Commercial Property Inspectors Association* (blog), September 11, 2018, https://ccpia.org/hartford-loop/.

premiums when insureds incorporated defensive landscaping practices, all parties involved would benefit.[116]

Defensive Landscaping



[117]

Figure 5.4

Solving the issues that plague the FAIR (Fair Access to Insurance Requirement) plan is complicated as the most harmful policies are not insurance related. The most effective policy change would be to address forestry management. The current method of fighting all fires, regardless of risk, does not reduce the fuel buildup that contributes to the more dangerous infernos that can sweep the state. Prescribed burns, when used appropriately, effectively clear out accumulated biomass that increases the severity of the wildfires. These burns also improve overall forest health by clearing the way for new growth. Improved land use restrictions would also allow for more development in areas which are less prone to deadly fires.

[116] Dennis, "Fire-Resistant Landscaping - 6.303."
[117] Dennis.

Even though the aforementioned changes would reduce the cost of underwriting fire insurance in California, the existence of the program is not necessary. By artificially lowering the price of insurance, the true costs and risks are hidden from the insured. This forced insurance pool also restricts the offerings available to Californians as many firms may simply decide that offering any form of property and casualty insurance is too costly. Insurers must also acknowledge that climate change will increase the severity and prevalence of wildfires. Improved risk modeling and premium-based firescaping incentives will help address the increased risk. By implementing mandatory defensive landscaping and construction, insurers would reduce the damage to insureds. If the FAIR plan no longer hid the true cost of insuring property in a fire prone area, insurers could more adequately price policies for all budgets.

Chapter 6: Overview of the Terrorism Risk Insurance Act

The terrorist attacks of September 11, 2001 profoundly impacted the way property and casualty insurers underwrote policies; indeed, these attacks were the single most expensive loss in the United States to date. As a result, many insurers decided to exclude terrorism from policies due to the difficulty of assessing the risk of these events happening in the future.[118] To help combat this problem, the federal government created the Terrorism Risk Insurance Act (TRIA) in 2002. "The Terrorism Risk Insurance Act (TRIA) created a temporary federal program that provides for a transparent system of shared public and private compensation for certain insured losses resulting from a certified act of terrorism. The Secretary of the Treasury administers the program with the assistance of the Federal Insurance Office."[119] Despite its temporary nature, it has been reauthorized through 2027 and will likely be extended beyond.[120]

TRIA manages risk by providing reinsurance through the federal government. To date, the program has been successful as "premiums have fallen in price, and the federal government's cost for the program has been relatively small so far…Without a TRIA backstop, insurance rates or contract exclusions for terrorist events would likely be higher. And although government officials have worked to reduce the potential for a major terrorist attack in the United States, the possibility has not been eliminated. If the program were not in place, terrorism risk insurance rates would be expected to rise unpredictably or might not be offered in some regions or to specific properties."[121] Unlike the National Flood Insurance Program (NFIP) or California Fair

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[118] "Terrorism Risk Insurance," American Academy of Actuaries, accessed March 23, 2021, https://www.actuary.org/node/13795.

[119] "Terrorism Risk Insurance Program," U.S. Department of the Treasury, accessed March 23, 2021, https://home.treasury.gov/policy-issues/financial-markets-financial-institutions-and-fiscal-service/federal-insurance-office/terrorism-risk-insurance-program.

[120] "Terrorism Risk Insurance Program."

[121] "Terrorism Risk Insurance."

Access to Insurance Requirement (FAIR) plan, the Terrorism Risk Insurance Act (TRIA) does not directly interact with insureds as it offers reinsurance. Also, TRIA is not under financial pressure as terror attacks are far less prevalent than wildfires or floods. Nonetheless, it is worth examining whether it is prudent to continue to reauthorize TRIA past 2027.

Traditionally, most reinsurance is offered through the private sector. "Reinsurance is insurance for insurance companies. It's a way of transferring or 'ceding' some of the financial risk insurance companies assume in insuring cars, homes and businesses to another insurance company, the reinsurer. Reinsurance is a highly complex global business. U.S. professional reinsurers (companies that are formed specifically to provide reinsurance) accounted for about 7 percent of total U.S. property/casualty insurance industry premiums written in 2010, according to the Reinsurance Association of America.

The reinsurance business is evolving. Traditionally, reinsurance transactions were between two insurance entities: the primary insurer that sold the original insurance policies and the reinsurer. Most still are. Primary insurers and reinsurers can share both the premiums and losses, or reinsurers may assume the primary company's losses above a certain dollar limit in return for a fee. However, risks of various kinds, particularly of natural disasters, are now being sold by insurers and reinsurers to institutional investors in the form of catastrophe bonds and other alternative risk-spreading mechanisms."[122] TRIA authorizes the government to take on this role.

Like most-government backed insurance, rates are predetermined through legislative mandate. As of the 2015 renewal, the deductible has been set at "20% of an insurer's direct earned premium of the preceding calendar year and the federal share of compensation was set at

[122] "Reinsurance," Insurance Information Institute, 2004, https://www.iii.org/publications/insurance-handbook/regulatory-and-financial-environment/reinsurance.

85% of insured losses that exceed insurer deductibles until January 1, 2016. Then the federal share is decreased by 1 percentage point per calendar year until it reaches 80%."[123] Like many reinsurers, the Terrorism Risk Insurance Act does not pay the first dollar of a loss. "The program trigger was amended to apply to certified acts with insured losses exceeding $100 million for calendar year 2015, $120 million for calendar year 2016, $140 million for calendar year 2017, $160 million for calendar year 2018, $180 million for calendar year 2019, and $200 million for calendar year 2020 and any calendar year thereafter…The insurance marketplace aggregate retention amount was established at the lesser of $27.5 billion, increasing annually by $2 billion until it equals $37.5 billion, and the aggregate amount of insured losses for the calendar year for all insurers. In the calendar year following the calendar year in which the marketplace retention amount equals $37.5 billion, and beginning in calendar year 2020 it is revised to be the lesser of the annual average of the sum of insurer deductibles for all insurers participating in the Program for the prior three calendar years as such sum is determined by the Secretary of the Treasury by regulation."[124] If a terrorist attack occurs, the federal government must determine if the event qualifies for a payout.

TRIA also provides some coverage for nuclear, biological, chemical, and radiological terrorist attacks. "The current TRIA statute does not specifically include or exclude [Nuclear, Biological, Chemical, and Radiological] NBCR events; thus, the TRIA program in general would cover insured losses from terrorist actions due to NCBR as it would for an attack by conventional means. The term insured losses, however, is a meaningful distinction. Except for workers' compensation insurance, most insurance policies that would fall under the TRIA

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[123] "Terrorism Risk Insurance Act (TRIA)," The Center for Insurance Policy and Research, July 21, 2020, https://content.naic.org/cipr_topics/topic_terrorism_risk_insurance_act_tria.htm.
[124] "Terrorism Risk Insurance Act (TRIA)."

umbrella include exclusions that would likely limit insurer coverage of an NCBR event, whether it was due to terrorism or to some sort of accident, although these exclusions have never been legally tested in the United States after a terrorist event."[125] However, experts in terrorism claim that an NCBR event is increasingly likely.[126]

One of the primary arguments in favor of TRIA is that terrorist attacks could exceed the risk appetite for the current insurance market. "The potential damage from a single terrorist attack, particularly in large cities, could be sufficiently large that it would bankrupt one or a group of insurers. Damage from a large chemical, nuclear, or biological attack could cost as much as $42.2 billion in a city the size of Des Moines, Iowa, or $778 billion in New York, according to a 2006 report from the Academy's Terrorism Risk Insurance Subcommittee."[127] Since other insurable events occur with a degree of randomness, events like flood losses and automobile accidents are easier to cost effectively underwrite. "As a general matter, insurance succeeds by spreading the random cost of losses across a large number of insured. But terrorist attacks are designed to maximize economic and psychological impact, and consequently do not occur at random times or places. Historically, they are more likely to occur in large cities, at specific targets, and perhaps even on specific dates. Because they are not random, terrorist attacks make insuring specific types of properties or locations much riskier than insuring against other risks."[128] Given that terror attacks are completely random and infrequent, maintaining the adequate reserves to cover a loss becomes increasingly difficult.

The modern risk of cyber terrorism is another form of terrorism that was not as prevalent when the policy was originally enacted. It is debatable as to whether a cyber attack would be

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[125] Webel, "Terrorism Risk Insurance: Overview and Issue Analysis for the 116th Congress."
[126] Webel.
[127] "Terrorism Risk Insurance."
[128] "Terrorism Risk Insurance."

covered by the Terrorism Risk Insurance Act (TRIA). Given the high dollar threshold for a payout, few cyber attacks would qualify. Furthermore, an event would need to be certified by the government as a terrorist attack that puts lives or infrastructure at physical risk. Breaches, such as a ransomware attack, would most likely not qualify. However, a cyber-attack against the control systems for critical infrastructure, such as water treatment or air traffic would meet the necessary criteria.[129]

Furthermore, insurers struggle to accurately develop actuarial models that can accurately account for risk. Insureds living on a fault line or a floodplain will obviously be a greater insurance liability than those who live in less risky areas. Densely populated urban locations are at a greater risk because terrorists intend for their attack to inflict maximum harm. However, that is not always the case. Many terror attacks in the United States have taken place in smaller cities. Victims of terror attacks can do very little to lessen their risk exposure, unlike with other forms of property and casualty losses.[130] Given the uncertain, and potentially catastrophic, nature of terror attacks, the demand for terrorism protection in insurance clauses has risen since the inception of the Terrorism Risk Insurance Act (TRIA).[131]

Fortunately, there have not been many terror attacks domestically in the United States since the 2001 destruction of the World Trade Center Complex. There is some ambiguity as to exactly what constitutes a terror attack. According to the FBI, domestic terrorism is constituted by "violent, criminal acts committed by individuals and/or groups to further ideological goals stemming from domestic influences, such as those of a political, religious, social, racial, or

[129] Nehal Patel, "Cyber and TRIA: Expanding the Definition of and 'Act of Terrorism' to Include Cyber Attacks," *Duke Law & Technology Review*, no. 1 (March 2, 2021): 23–42.
[130] "Terrorism Risk Insurance."
[131] Webel, "Terrorism Risk Insurance: Overview and Issue Analysis for the 116th Congress."

environmental nature."[132] Even though there have been examples that fit into this category since the attacks of September 11th, 2001, none have resulted in the same levels of property damage and destruction.[133] Since the passage of TRIA in 2002, the capacity of insurers to handle insurance risk has increased. The "Treasury found that the total premium amount paid for terrorism coverage in 2017 was approximately $3.65 billion, or 1.75%, of the $209.15 billion in total premiums for TRIA-eligible lines of insurance. Since the passage of TRIA, Treasury estimates that a total of approximately $38 billion was earned for terrorism coverage by non-related insurers, with another $7.4 billion earned by captive insurers (i.e., insurers who are owned by the insureds)."[134] However, the increase of catastrophic weather events could deplete these reserves.[135]

To date, there have been no terror attacks that have triggered the cost threshold outlined in the Terrorism Risk Insurance Act (TRIA).[136] As a result, it is difficult to judge the effectiveness of TRIA as it has not been tested. In the event of another severe terror attack, it is likely that there would be some legal challenges raised. Given the general stability of the property and casualty insurance market and lack of severe terror claims, it is unclear whether TRIA needs to be reauthorized again in the future. Certain experts argue that TRIA allows for the existence of comprehensive terrorism insurance. "On the whole, insurance and reinsurance pricing has been surprisingly stable despite two extraordinary years for hurricane losses (2005 and 2017) and a global financial crisis in 2008. The relative market calm has, however, been underpinned by the existence of TRIA. Insurers are required to offer terrorism coverage under

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[132] "Terrorism," Federal Bureau of Investigation, accessed March 25, 2021, https://www.fbi.gov/investigate/terrorism.

[133] CNN Editorial Research, "US Terrorist Attacks Fast Facts," CNN, October 4, 2020, https://www.cnn.com/2013/04/18/us/u-s-terrorist-attacks-fast-facts/index.html.

[134] Webel, "Terrorism Risk Insurance: Overview and Issue Analysis for the 116th Congress."

[135] Webel.

[136] Baird Webel, "Protecting America: The Reauthorization of the Terrorism Risk Insurance Program," Pub. L. No. 7–5700, § Committee on Financial Services (2019).

the act and it seems possible, if not likely, that insurers would again seek to exclude terrorism losses if this requirement were to be removed. For example, when the Terrorism Risk Insurance Act (TRIA) briefly lapsed at the end of 2014, conditional terrorism exclusions that had been included in insurance filings with state insurance regulators were activated. Exactly how widespread these exclusions would be applied if TRIA were completely removed, however, is unclear. It is possible that competitive pressure might cause insurers to cover terrorism risk even without TRIA. The latest Treasury report found that 30% of terrorism coverage that is provided in conjunction with other property and casualty insurance is offered without specific premiums being charged, which suggests that the perceived terrorism risk is low for some of the insureds."[137] While the necessity of TRIA is debatable, it would be remiss to downplay its role in modern property and casualty markets. The construction and use of high-rise office space would become significantly less appealing if the proprietors and renters would not be compensated in the event of a costly terror attack.

In addition to the rarity of terror attacks that meet the TRIA thresholds, recent demographic shifts may further reduce the demand for terrorism insurance in major cities. As with the National Flood Insurance Program (NFIP), the demographic shifts brought about by the COVID-19 pandemic may permanently reduce the demand for dense urban real estate. Since March of 2020, the demand for many types of commercial real estate has decreased. Office space leases have decreased as more people are working remotely. The hospitality industry has been drastically impacted as travel and dining have significantly slowed. It is likely that the hospitality industry will eventually rebound in some form once the public health restrictions limiting their accessibility are lifted. Although population shifts away from cities may change

[137] Webel.

where hospitality services operate. Even after the public health restrictions are lifted, it is unclear as to whether demand for urban office space will return to previous levels.[138]

Leasing, purchasing, and maintaining office space in cities is very expensive. Furthermore, many workers prefer to do some or all their work from home. 62 percent of employees with a bachelor's degree or higher say that they can telework effectively. However, only 23 percent of those without a four-year degree can do so. Furthermore, over 60 percent of those teleworking report similar or increased levels of job satisfaction and productivity. However, the shift towards remote work has not been exclusively positive. Workers under the age of 50 report a decrease in motivation. Working parents, regardless of gender, also struggle to manage childcare and vocational responsibilities.[139] Given these trends, it is likely that there will be a permanent reduction in demand for commercial office space. Organizations that return to in-person work may adopt an open floor plan without permanently assigned desks and bring their workers in as needed. This arrangement may prove to be satisfactory for all involved as employees can choose between in-person and remote work. Organizations will also enjoy a reduced real estate expenditure.

Unlike the National Flood Insurance Program (NFIP) and the California Fair Access to Insurance Requirement (FAIR) plan, the Terrorism Risk Insurance Act (TRIA) has not needed to pay out claims as there has yet to be a terrorist attack costly enough to qualify for compensation. As a result, reauthorization of TRIA is never particularly contentious. There are also not

[138] Alexa Doiron, "As the Coronavirus Creates Social Distance, Commercial Real Estate Is Feeling the Impact," *Williamsburg Yorktown Daily* (blog), August 28, 2020, https://wydaily.com/local-news/2020/08/28/as-the-coronavirus-creates-social-distance-commercial-real-estate-is-feeling-the-impact/.

[139] Kim Parker, Juliana Menasce-Horowitz, and Rachel Minkin, "How Coronavirus Has Changed the Way Americans Work," *Pew Research Center's Social & Demographic Trends Project* (blog), December 9, 2020, https://www.pewresearch.org/social-trends/2020/12/09/how-the-coronavirus-outbreak-has-and-hasnt-changed-the-way-americans-work/.

significant reform proposals. However, it is worth examining the impacts of the program to avoid negative externalities.

Chapter 7: Analysis of the Terrorism Risk Insurance Act

Unlike other government backed insurance schemes, the Terrorism Risk Insurance Act (TRIA) differs from the National Flood Insurance Program (NFIP) and the California Fair Access to Insurance Requirement (FAIR) plan because it has never been needed and acts a form of reinsurance. As a result, reform is seldom discussed and its reapproval is not particularly controversial. The 116th Congress reapproved TRIA through the year 2027 in a 71 to 23 vote.[140] Unlike the NFIP or the California Fair Access to Insurance Requirement (FAIR) plan, budgetary issues are not threatening the member institutions, governments, or the insureds. Given the relative infrequency of terror attacks in comparison to natural disasters and the high limit, it is possible that no claims will ever be paid under TRIA. Nonetheless, it is important to examine the function of TRIA as its relative success could influence reforms of other policies. Additionally, it is worth discussing whether TRIA is needed at all.

While vitally important, reinsurance is not directly visible to the end user, so it gains less attention than other insurance vehicles. Reinsurers are paid by insurers to assume a portion of their risk. This distribution of risk helps insurers reduce their exposure to catastrophic losses and keep premiums affordable.[141] "Under a reinsurance agreement, a reinsurer takes on part of the risk that an insurer has written. Reinsurers deal therefore with professional corporate counterparties, such as primary insurers, reinsurance brokers or multinational corporations and their own insurance companies, so-called captive insurers. The party transferring the risk, for example a primary insurer, is known as a cedant. The original policyholder,

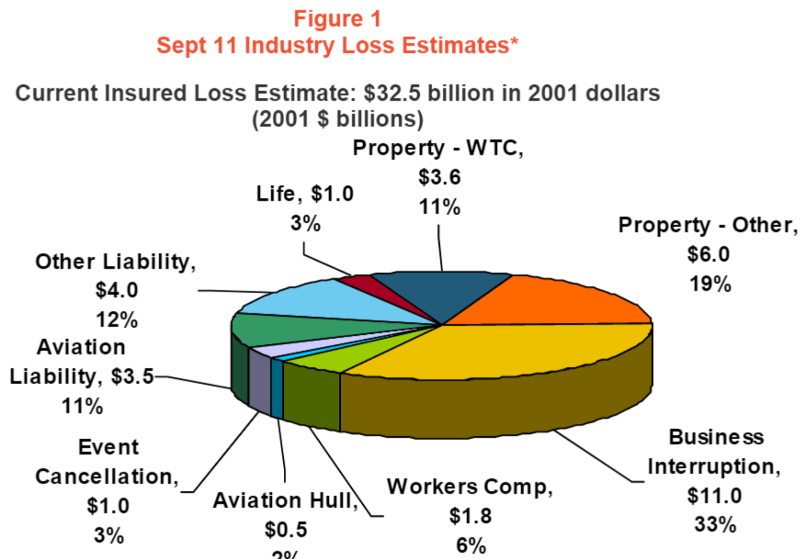
[140] "Actions - H.R.1865 - 116th Congress (2019-2020): Further Consolidated Appropriations Act, 2020," webpage, December 20, 2019, 2019/2020, https://www.congress.gov/bill/116th-congress/house-bill/1865/actions.
[141] Philippe Brahin et al., "The Essential Guide to Reinsurance" (Swiss Re, 2015).

for example the home owner or airline operator, is not involved in the transaction. There are many different forms and types of reinsurance contracts: They either cover entire insurance portfolios or just relate to single risks; they may involve a sharing of all premiums and losses or they may just cover losses exceeding a certain threshold. Whatever the differences between the various contracts, they all have the same ultimate goal: Reinsurance contracts help provide capital relief, they smooth the volatility in an insurance company's earnings and protect their balance sheet."[142] The Terrorism Risk Insurance Act (TRIA) acts as a reinsurer for catastrophic property losses resulting from terrorism.

Prior to the September 11th terrorist attacks, the United States Federal Government did not offer any form of insurance against terror attacks. However, these attacks proved to be the costliest in United States history. In 2001, the total cost of the September 11th attacks was approximately 18.8 billion dollars. The second most costly was the 1993 bombing of the World Trade Center, which caused 510 million dollars of damage.[143] Given the abnormally high cost, the Federal Government implemented TRIA as a temporary measure to address the high losses from the September 11th terrorist attacks. The primary justifications for the continued renewal of TRIA are the potential for future costly terrorist attacks and low cost to the federal government. Furthermore, some argue that if TRIA would cease to exist, it is possible that insurers would no longer provide coverage for terror attacks.[144] However, it is possible that the private insurance market could completely cover the risk of terrorist attacks in the future through improved underwriting practices and reinsurance modeling.

[142] Brahin et al.
[143] "Terrorism and Insurance."
[144] Webel, Protecting America: The Reauthorization of the Terrorism Risk Insurance Program.

Terrorist attacks, such as the ones that occurred on September 11th, 2001, impact the property and casualty marketplace in a myriad of ways. The graph below illustrates the types of losses triggered by this event.



*Loss total does not include NYC March 2010 settlement of up to $657.5 million to compensate about 10,000 Ground Zero workers. [145]

Figure 7.1

Increased insurance premiums across these product lines can have wide-reaching impacts in various industries. For example, increased aviation related insurance premiums can cause the price of airline tickets to increase. Similarly, insurance premiums for high rise office space may increase, forcing certain businesses to less expensive regions. There is some evidence that terrorist-prone businesses can continue to operate because of the Terrorism Risk Insurance Act (TRIA). Without the federal backstop for catastrophic terror losses, some estimate that up to 80 percent of property casualty insurers would exclude terrorism coverage from their policies.[146] If the terrorism risk is so great that the insurance market cannot adequately underwrite the risks

[145] Claire Wilkinson and Robert Hartwig, "Terrorism Risk: A Reemergent Threat" (Insurance Information Institute, April 2010).
[146] Wilkinson and Hartwig.

involved, it raises the question as to whether the end consumer benefits from this arrangement. Often when governments subsidize insurance markets, the true risk of a behavior is obfuscated. This perverse incentive occurs frequently with the National Flood Insurance Program (NFIP). Insureds are not charged an adequate premium for the risk involved, which incentivizes risky construction habits. If high rise building construction in large cities can occur only if the federal government is protecting against terrorism losses, then consumers may determine the risk is not worth the benefits. However, this is unlikely. Costly terrorist attacks, while tragic, are incredibly rare. "More Americans die in animal attacks than in terrorist attacks."[147] Sufficient pressures exist from a myriad of industries that private sector product offerings would most likely take their place, absent of harmful regulation.

Certain specialty insurers offer products that can help protect against terrorism damages. Data analytics firms, such as Verisk, are "collecting, aggregating, and helping analyze terrorism data this year for the U.S. Department of the Treasury, the federal agency charged with gauging the effectiveness of the federal Terrorism Risk Insurance Program."[148] Accurate risk modelling is essential for successful underwriting. Given the infrequency of terrorism losses, the challenge of building quality actuarial models will always exist. However, these product offerings will help reduce this issue.

Certain insurers have also launched products that directly address terrorism risk. Startup insurer, Mosaic Insurance, is now offering globally available products to protect against "war, terrorism, and political violence…Tailored coverage will span commercial, industrial, and residential property risks associated with acts of terror and sabotage, malicious damage, strikes,

[147] Alex Nowrasteh, "More Americans Die in Animal Attacks than in Terrorist Attacks," Cato Institute, March 8, 2018, https://www.cato.org/blog/more-americans-die-animal-attacks-terrorist-attacks.
[148] "TRIA | Terrorism Insurance Resource Center," Verisk, accessed March 25, 2021, https://www.verisk.com/insurance/insights/emerging-risks/tria/.

riots, civil commotion, and war perils worldwide…Mosaic said its broad range of stand-alone terrorism products can be written as primary, excess, or quota-share coverage to mitigate damage, business disruption costs, or lost sales revenues in the event of attacks or threats…Mosaic will act as a lead market, with maximum capacity of $50 million for any one risk, and through its US operation, will offer up to $250 million through syndicated capacity."[149] Since Mosaic only began writing policies several months ago, it is difficult to determine its effectiveness. Nonetheless, it is encouraging to see private insurers willing to enter this space as these risks have traditionally been difficult to insure.

Certain insurers, such as Chubb Limited, also offer political risk insurance. These policies cover a wide range of political instabilities, including Political Violence & Forced Abandonment. "When political violence erupts, it can manifest itself in a variety of ways that standalone terrorism insurance does not always respond to, for example when companies are forced to leave a country due to physical danger."[150] These policies cover unique situations such as "damage to, or destruction of, physical assets as a result of physical violence. [They also cover] abandonment of the assets or the foreign enterprise, or the abandonment of the operations of the foreign enterprise, as a result of political violence."[151] While limited, there are many private offerings that seek to address the risk of terrorism.

In recent years, the threat of cyber terrorism has increased as society has become more interconnected. While the definition of cyber terrorism is open to interpretation, experts generally agree that "Cyberterrorism is the convergence of cyberspace and terrorism. It refers to unlawful attacks and threats of attacks against computers, networks and the information stored

[149] Terry Gangcuangco, "Mosaic Insurance Enters War and Terrorism Insurance Market," March 11, 2021, https://www.insurancebusinessmag.com/us/news/breaking-news/mosaic-insurance-enters-war-and-terrorism-insurance-market-248952.aspx.
[150] "Political Risk and Credit in the U.S. - Chubb," accessed April 3, 2021, https://www.chubb.com/us-en/business-insurance/political-risk.html.
[151] "Political Risk and Credit in the U.S. - Chubb."

therein when done to intimidate or coerce a government or its people in furtherance of political or social objectives. Further, to qualify as cyberterrorism, an attack should result in violence against persons or property, or at least cause enough harm to generate fear. Attacks that lead to death or bodily injury, explosions, or severe economic loss would be examples. Serious attacks against critical infrastructures could be acts of cyberterrorism, depending on their impact. Attacks that disrupt nonessential services or that are mainly a costly nuisance would not."[152] Many notable cyber attacks on private businesses and government entities in recent years have demonstrated the vulnerability of the nation's cyber infrastructure.

Cyber-attacks are not just limited to breaches of personal information. Lives can be put at immediate danger as critical infrastructure is increasingly controlled by networked computers. A recent cyber-attack targeted a water treatment facility where "the hacker was able to use remote access software to raise the levels of sodium hydroxide in the water from about 100 parts per million to 11,100 parts per million for a few minutes, according to investigators. Sodium hydroxide is used in liquid drain cleaners and used, in small doses, to remove metals from water."[153] Fortunately, a plant manager noticed the issue and rectified it before anyone was harmed. However, this potentially fatal attack was largely avoidable. "The cyber actors likely accessed the system by exploiting cybersecurity weaknesses, including poor password security and an outdated Windows 7 operating system to compromise software used to remotely manage water treatment…The actor also likely used the desktop sharing software TeamViewer to gain

[152] Gabriel Weimann, "Cyberterrorrism: How Real Is the Threat?" (Washington, D.C.: United States Institute of Peace, December 2004).
[153] Josh Margolin and Ivan Pereira, "Outdated Computer System Exploited in Florida Water Treatment Plant Hack," ABC News, February 11, 2021, https://abcnews.go.com/US/outdated-computer-system-exploited-florida-water-treatment-plant/story?id=75805550.

unauthorized access to the system."[154] Worryingly, this is not an isolated instance; the potential for these threats exists throughout utility infrastructure in the United States.[155]

A recent report from McKinsey & Company has observed three main severe vulnerabilities in utility infrastructure that poses a serious threat for cyber terrorism. "First is an increased number of threats and actors targeting utilities: nation-state actors seeking to cause security and economic dislocation, cybercriminals who understand the economic value represented by this sector, and hacktivists out to publicly register their opposition to utilities' projects or broad agendas. The second vulnerability is utilities' expansive and increasing attack surface, arising from their geographic and organizational complexity, including the decentralized nature of many organizations' cybersecurity leadership. Finally the electric-power and gas sector's unique interdependencies between physical and cyber infrastructure make companies vulnerable to exploitation, including billing fraud with wireless "smart meters," the commandeering of operational-technology (OT) systems to stop multiple wind turbines, and even physical destruction."[156] It is essential that utility operators address these faults as a successful cyber-attack against critical infrastructure would be catastrophic.

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[154] Margolin and Pereira.
[155] Tucker Bailey, Adam Maruyama, and Daniel Wallance, "The Energy Sector Threat: How to Address Cybersecurity Vulnerabilities," McKinsey & Company, November 3, 2020, https://www.mckinsey.com/business-functions/risk/our-insights/the-energy-sector-threat-how-to-address-cybersecurity-vulnerabilities.
[156] Bailey, Maruyama, and Wallance.

Electric utilities can be affected by cyberattacks across the whole value chain.

Potential threat impacts

Generation
Disruption of service and ransomware attacks against power plants and clean-energy generators

Root cause: Legacy generation systems and clean-energy infrastructure designed without security in mind

Transmission
Large-scale disruption of power to customers through remotely disconnecting services

Root cause: Physical security weaknesses allow access to grid control systems

Distribution
Disruption of substations that leads to regional loss of service and disruption of service to customers

Root cause: Distributed power systems and limited security built into SCADA[1] systems

Network
Theft of customer information, fraud, and disruption of services

Root cause: Large attack surface of IoT devices, including smart meters and electric vehicles

[1]Supervisory control and data acquisition.

McKinsey & Company [157]

Figure 7.2

Perhaps the most important defensive measures are proactive ones. Utility operators must address known security flaws, of which there are many, to reduce the likelihood of successful cyber breaches.[158] It would be remiss to claim that the aforementioned attack on the Florida water treatment facility would not have occurred if proper data security measures were implemented. However, the poor security practices significantly increased the likelihood of it occurring.[159] Cyber security cannot only be the responsibility of the information technology department either. All employees need to be involved in cyber security and given proper training for their role. While these data practices may be inconvenient at times, they can significantly reduce cyber vulnerabilities. Industry-wide collaboration can also help reduce security flaws. If utility providers across the country were to communicate about potential breaches and cyber

[157] Bailey, Maruyama, and Wallance.
[158] Bailey, Maruyama, and Wallance.
[159] Margolin and Pereira, "Outdated Computer System Exploited in Florida Water Treatment Plant Hack."

security best practices, then avoidable mistakes are less likely to be repeated.[160] As the risk of cyber terrorism increases, so must the investment in cyber security.

In recent decades, both the public and private sector have taken an interest in addressing the weaknesses in the infrastructure in the United States. The Biden Administration has proposed an infrastructure improvement plan they claim will cost approximately 2.3 trillion dollars, called The American Jobs Plan. Even though more investment in infrastructure is needed, the Biden Administration's proposal is unlikely to achieve its goal. The proposal seeks to raise taxes to fund the cost of federal investment in infrastructure. However, much of the infrastructure in the United States is, at least partially, controlled by the private sector. Some estimates claim that the accompanying "tax increases would reduce private investment by more than $1 trillion. Biden's proposed green and labor union regulations would further undermine infrastructure investment."[161] Instead, incentivizing private sector innovation will yield better outcomes.

One private sector solution to cyber attacks is cyber liability insurance. This type of policy "helps protect organizations from the fallout from cyberattacks and hacking threats. Having a cyber insurance policy can help minimize business disruption during a cyber incident and its aftermath, as well as potentially covering the financial cost of some elements of dealing with the attack and recovering from it."[162] Like many niche insurance product offerings, the cyber security insurance industry is facing many challenges. The cost and severity of these attacks has been increasing yearly. There were 1.8 billion dollars of cyber losses in 2019.[163]

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[160] Bailey, Maruyama, and Wallance, "The Energy Sector Threat: How to Address Cybersecurity Vulnerabilities."
[161] Chris Edwards, "Biden Infrastructure Plan: Wrong Direction," Cato Institute, April 1, 2021, https://www.cato.org/blog/biden-infrastructure-plan-wrong-direction.
[162] Danny Palmer, "What Is Cyber Insurance? Everything You Need to Know about What It Covers and How It Works," ZDNet, accessed April 5, 2021, https://www.zdnet.com/article/what-is-cyber-insurance-everything-you-need-to-know-about-what-it-covers-and-how-it-works/.
[163] Tom Johansmeyer, "Cybersecurity Insurance Has a Big Problem," *Harvard Business Review*, January 11, 2021, https://hbr.org/2021/01/cybersecurity-insurance-has-a-big-problem.

Despite the obvious risk, many organizations struggle to determine “how much cyber insurance they need. But, it’s difficult for insurers to understand demand when the buyers themselves are still trying to figure out both their exposure and their buying appetites. The years where cyber insurance enjoyed significant growth weren’t enough to establish a reliable sense of how much protection companies should actually buy. In fact, most either don’t have enough cyber insurance or any at all. Companies with at least $200 million in cyber insurance account for a bit more than 20% of what is believed to be $5 billion in global cyber insurance premium, according to internal research conducted by PCS — amounting to roughly $1.1 billion in premium. With around 250 companies buying at least $200 million in protection, it would only take five insured losses of a bit more than that amount to wipe out an entire year’s premium.”[164] If cyber risk becomes too costly to insure, then insurers will no longer offer these products.

Perhaps the greatest challenge facing the cybersecurity insurance market are new regulations that would make resolving cyber-attacks far more complicated. Ransomware is an increasingly common type of cyber-attack where the victim’s computers are encrypted, “holding a company’s data hostage until a payment is made. Organizations have often ponied up ransoms to liberate their data.”[165] Increased scrutiny around these transactions from the United States Treasury will severely limit the ability of firms to pay ransoms if the attacker is restricted by sanctions.[166] Ultimately this defense against cyber-attacks may become unavailable.

Attempts to assess the effectiveness of the Terrorism Risk Insurance Act (TRIA) is very difficult as the program has never been implemented. However, its operational structure has merits. As seen with the National Flood Insurance Program (NFIP), serious problems arise when

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[164] Johansmeyer.
[165] Raphael Satter, “Companies May Be Punished for Paying Ransoms to Sanctioned Hackers,” *Reuters*, October 1, 2020, https://www.reuters.com/article/us-treasury-cyber-idUSKBN26M77U.
[166] Satter.

the government attempts to directly write insurance policies. By acting as a reinsurer only for severe losses, the federal government avoids the issues presented with the NFIP. In practice, insurers and businesses alike share much of the burden of reducing terrorism risk. It is very difficult to prevent conventional acts of terror, like the ones that destroyed the World Trade Centers. However, builders can use better construction techniques to reduce the severity of an attack.[167] Fortunately, acts of cyber terrorism are more preventable. Private insurers and organizations alike also must turn their attention to cybersecurity issues to mitigate or prevent them before they occur.

[167] Mark Shwartz, "Structural Engineer Describes What Went Wrong inside the World Trade Center on Sept. 11: 12/01," Stanford News Service, December 3, 2001, https://news.stanford.edu/pr/01/wtcpostmortem125.html.

Chapter 8: Conclusion

While the aforementioned state-sponsored property and casualty offerings are by no means an exhaustive list, they each represent a unique public policy solution to the problem of property and casualty insurance accessibility. Yet all these policies are similar in that they are government solutions to issues within the insurance market. Devastating property losses severely impact the well-being and economic capacity of the populace. As a result, the federal and state governments have sought to rectify these issues. These types of policies are underpinned by the belief that the government is capable of solving problems that are beyond the reach of the private sector. Much like the Greek playwrights who relied on a higher power to resolve difficult problems within the play, state-sponsored property and casualty insurance plans like the National Flood Insurance Program (NFIP), the California Fair Access to Insurance Requirement (FAIR) plan, and the Terrorism Risk Insurance Act are a form of political Deus Ex Machina.[168] In other words, "the issue is security property rights or facilitating exchange, the idea is that government can and will fix problems. [The property law scholar], Ellickson, uses 'the phrase of legal centralism to describe the belief that governments are the chief sources of rules and enforcement efforts.' Legal centralism takes various forms, but all forms assume that markets would not be able to fully function without government rules and regulations…The strongest forms of legal centralism consider legal rules or regulation to be costless…while weaker forms of legal centralism recognize some costs of legal rules or regulations but still consider them absolutely necessary."[169] Neither assumption about the role of government correctly applies to government involvement in property and casualty insurance markets.

[168] Edward Stringham, *Private Governance: Creating Order in Economic and Social Life* (Oxford; New York: Oxford University Press, 2015).
[169] Stringham.

However, it would be remiss to exclusively blame the shortcomings of these programs on their management and structure. While these policies are well intentioned, their negative externalities outweigh the benefits. Instead, the federal and state governments that operate these programs should gradually transfer the risk completely to the private sector and dissolve the programs.

Of the discussed programs, the NFIP (National Flood Insurance Program) is the most fraught with issues. The most obvious issue with the NFIP are its financially unstable underwriting practices. The Congressional Research Service outlines three main objectives of the program, which are “to (1) identify and map the nation’s regulated floodplains to make the public aware of flood hazards; (2) address the escalating cost of federal disaster assistance for flood damaged buildings and their contents; (3) allow property owners within communities that adopted and enforced a Federal Emergency Management Agency (FEMA) approved floodplain management ordinance to purchase insurance as a protection against flood losses; and (4) guide development and building practices to save lives and reduce future property damage.”[170] The NFIP fails to adequately achieve any of these goals.

The primary reason for this failure is because the underlying premise is fundamentally flawed. Addressing the rising costs of flood insurance by offering below-market insurance premiums is inherently unsustainable. If a private insurer overcharges or undercharges for insurance, they will quickly go out of business. Overcharging for insurance gives other competitors the opportunity to write the risk profitably while earning the business of a segment of customers unwilling to pay higher rates, forcing the legacy firm to lower rates or cease operations. Similarly, if an insurer undercharges, then the repeated underwriting losses would force insolvency. Given that the NFIP is backed by the federal government, the incentive to

[170] King, “National Flood Insurance Program: Background, Challenges, and Financial Status.”

innovate and charge appropriate premiums disappears since losses are absorbed by the government. If policymakers desire to stop the continual losses, then the NFIP would need to charge higher premiums in line with the rates the private market charges. However, doing so completely negates the purpose of the NFIP. Subsidies do not lower the cost of a good or service, but merely shift it elsewhere. In the case of the National Flood Insurance Program (NFIP), the cost is shifted to the taxpayer.

Supporters of the NFIP argue that providing affordable insurance to the nation outweighs the budget overages. However, a significant number of recipients who receive coverage through the program do not need financial assistance. Half of the counties with the costliest losses for the NFIP have a median household income above the national average; [171] Nassau County, New York has one of the highest median household incomes in the country.[172] Additionally, approximately a quarter of the properties insured by the NFIP are vacation homes.[173] Even though many insured properties belong to low-income homeowners, these subsidies ultimately harm these homeowners as they lack the incentive to relocate to a safer area.

Another, arguably more problematic issue with subsidizing insurance premiums is that it hides the true cost from the consumer. Insurance premiums represent the cost of hedging against a certain risk. While not infallible, the actuarial models used to underwrite risk are incredibly comprehensive. If insureds would not be willing to pay an insurance premium commensurate with the level of risk of living in a flood prone area, then hiding that true cost helps no one. Instead, it is better to allow natural market prices to communicate risk information to insureds. Those who do not wish to deal with the true risk of living in a flood prone area would be

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[171] "Median Household Income (County): SAGE Stats."
[172] Semega et al., "Income and Poverty in the United States."
[173] Brannon and Blask, "The Government's Hidden Housing Subsidy for the Rich."

incentivized to live in a location that better aligns with their risk tolerances. Even if the NFIP were to update flood maps in conjunction with the Federal Emergency Management Agency (FEMA), it would not necessarily fix the aforementioned issues. Updated flood maps will not guarantee that premiums will reflect true risk. Since the NFIP is ultimately accountable to elected politicians, necessary rate increases may cause elected officials to lose popularity with their constituents.

Like the National Flood Insurance Program (NFIP), the California Fair Access to Insurance Requirement (FAIR) plan is also structurally flawed and should be repealed. Instead of directly collecting premiums, the FAIR plan establishes a pool into which all property and casualty insurers in the State of California must contribute. FAIR is intended to provide last resort basic property insurance coverage to Californians who cannot obtain insurance normally. Primarily, insureds seek out protection from wildfire damages. The insurers in the pool offer policies with premiums controlled by the state. Unlike the NFIP, the FAIR plan does not require the taxpayer to directly subsidize losses from poor underwriting discipline. However, the same issues that arise price distortion also harm the citizens of California. In one form or another, someone must pay for the true cost of writing insurance in a region frequently ravaged by wildfires. Since all property and casualty insurers must contribute to this pool, the costs are dispersed across their product lines. If they are not permitted to charge a market rate for policies written by FAIR, then they must increase premiums elsewhere to account for these losses. If the losses are severe enough, an insurer may decide that it is not worth the expense of writing any policy in California. This outcome would be particularly devastating for FAIR as it can only operate if its costs are distributed across many insurers.

The biggest policy challenges that face both the property and casualty insurance market and the FAIR plan are poor forestry management and land use rules. The most populated regions in the state also have strict zoning policies that force development away from cities in areas that are threatened by severe wildfires. If state and local policymakers would reverse harmful zoning problems, development could occur in cities where wildfire risk is minimal.

Similarly, poor forestry management policies increase the risk of severe fires in the State. When a wildfire breaks out in California, firefighters seek to extinguish the blaze as quickly as possible. However, this behavior does not naturally replicate the cyclical nature of wildfires in the region. The use of prescribed burns can ensure the safety of these natural fires, which also reduce the severity of random wildfires by reducing the fuel that would otherwise burn. Since climate change has extended the fire season in California, properly implementing controlled burns has become an even more essential part of forestry management.

Another way that governments become involved in property and casualty markets is by acting as a reinsurer. The Terrorism Risk Insurance Act (TRIA) allows the Federal Government to act as a reinsurer for severe losses from terrorism. Reinsurance firms are paid by insurers to assume the risk that the insurer does not wish to hold. TRIA functions similarly. This law was enacted after the devastating attacks of September 11th, 2001. In comparison to the FAIR plan and the National Flood Insurance Program (NFIP), TRIA has been a success. In the years following the 2001 terrorist attacks, property and casualty insurers were willing to include terrorism in their policies. It is possible that without TRIA, property and casualty insurers would no longer be willing to do so. However, it is difficult to fully assess the success of TRIA since there have not been any terrorist attacks that have qualified for a payout.

The excessively burdensome regulation that many insurers face prevents necessary investment in actuarial and underwriting tools. Recent regulatory initiatives both in the United States and abroad have only added to this burden. One of the most drastic global regulatory measures have been restrictions on the handling of personal data. All insurers operating within the European Union must comply with the General Data Protection Regulation (GDPR). This bill sets forth strict data privacy and handling rules. As expensive as compliance may be, noncompliance is even costlier. Companies that fail to comply with GDPR may face fines of over 20 million dollars.[174] In the United States, the State of California has enacted a similar law called the California Consumer Privacy Act (CCPA). Like the GDPR requirements, the CCPA mandates that consumers have "[1] The right to know about the personal information a business collects about them and how it is used and shared; [2] the right to delete personal information collected from them (with some exceptions); [3] the right to opt-out of the sale of their personal information; [4] and the right to non-discrimination for exercising their CCPA rights."[175] As a result of these strict stipulations both domestically and abroad, insurers must spend millions annually to be in compliance.[176] Despite the positive intentions of these policies, their complexity diverts resources away from product development and investment. Furthermore, their complexity and cost will prevent innovative, start-up insurers from competing against legacy firms. In addition to the negatives associated with decreased market competition in existing marketplaces, these regulations may prevent start-ups from offering new insurance products as well.

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[174] Hanna Schieve, "Underspending on Compliance? You'll Pay the Price," February 9, 2018, https://www.insurancebusinessmag.com/us/risk-management/cyber/underspending-on-compliance-youll-pay-the-price-91905.aspx.
[175] "California Consumer Privacy Act (CCPA)," State of California - Department of Justice - Office of the Attorney General, October 15, 2018, https://oag.ca.gov/privacy/ccpa.
[176] Schieve, "Underspending on Compliance?"

In addition to new guidelines governing user data, domestic and foreign regulatory bodies are increasing restrictions in other areas as well. The International Association of Insurance Supervisors (IAIS) and the domestic Own Risk and Solvency Assessment (ORSA) has outlined financial resiliency standards to assess financial strength throughout the business cycle.[177] "President Biden's new administration may potentially reverse certain aspects of the prior administration's aggressive deregulation, meaning the insurance industry might once again find itself challenged by what had been an evolving 'dual' regulatory system. It could also lead to friction with state regulators and possibly reignite the dual regulatory dynamic, at least for large and global insurers."[178] State regulatory boards also heavily monitor the insurance industry. Heads of state regulators have expressed interest in introducing more restrictions addressing climate issues, racial justice, digital and data usage, among others.[179]

It is most likely that state regulators will tackle climate issues most aggressively. Given the threat that climate change poses to the property and casualty insurance market, many may view this as a beneficial shift. In 2020, the New York State insurance regulatory body outlined climate change guidance for insurers that operate within the State. Insurers must incorporate "climate-related financial risks into their governance frameworks, risk management processes, and business strategies. In a similar expectations letter to all New York–regulated domestic and foreign insurance companies, NYDFS expects all insurers under its supervision to 'designate a board member or a committee of the board, as well as a senior management function" to be accountable for the firm's assessment and management of climate-related financial risks. At an enterprise level, NYDFS expects that each insurer 'should take a proportionate approach that

[177] Monica O'Reilly et al., "2021 Insurance Regulatory Outlook" (Center for Regulatory Strategy, 2020).
[178] O'Reilly et al.
[179] O'Reilly et al.

reflects its exposure to the financial risks from climate change and the nature, scale, and complexity of its business.'"[180] For insurers that operate within the United States, state regulatory bodies impact the insurance industry as much as federal regulatory bodies.

Given the importance of insurance to societal function, it is reasonable that the Federal and state governments would seek to ensure access to those who need it. Yet, ironically, these protections make it more difficult for potential insureds to get the coverage they need. Both the National Flood Insurance Program (NFIP) and California Fair Access to Insurance Requirement (FAIR) plan made it more difficult for insurers to offer flood and fire policies. Given the rarity of terror attacks, the ill effects of the other programs are less evident. Nonetheless, the private sector is still better equipped to deal with terrorism risk, especially as cyber terrorism is becoming more prevalent. Many insurance regulations intended to help the consumer do not achieve this goal. Various data protection acts, while well intentioned, outline extremely difficult compliance standards. The high costs of these compliance measures prevent smaller firms from competing with established ones. Additional taxes on corporate earning and investment income would also be damaging for the insurance industry as these taxes would limit the accumulation of necessary reserves to pay out severe losses. In the presence of market competition free from unnecessary barriers, insurers are still incentivized to address serious issues such as climate change and equal access to insurance, independent of government action. This market freedom also allows for start-ups to offer insurance products that otherwise would not exist at a reasonable price. The best solutions to property and casualty insurance problems come not from the state, but from lassiez-faire innovations.

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[180] O'Reilly et al.

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