DROWNING IN DEBT: THE ECONOMIC FAILURES OF THE NATIONAL FLOOD INSURANCE PROGRAM AND WHY IT WILL NEVER RISE ABOVE WATER[*]

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Abstract

The National Flood Insurance Program is currently drowning in $25 billion of debt. Although Congress created the NFIP in order to encourage participation in the flood insurance market, the NFIP has economically failed the country because it provides subsidized premiums that do not accurately reflect risk. Because of inaccurate pricing, the NFIP is structurally unsound. With catastrophic flooding from Hurricane Katrina and Superstorm Sandy, the recent disaster of Hurricane Harvey, and predictions of increased hurricane severity in the near future, the NFIP's economic inefficiencies will only exacerbate the debt. This note argues that the NFIP should be repealed and the federal government should leave flood insurance to the private sector in order to allow the insurance market to operate efficiently. By eliminating the NFIP, the government will no longer subsidize homes that should not have been built in the first place and premiums will match risk, resulting in an efficient insurance market.

Table of Contents

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I. Introduction

The National Flood Insurance Program (NFIP) is structurally unsound. It subsidizes wealthier households, distributes taxpayer money unevenly, and most importantly, inaccurately prices premiums.[1] It is currently $25 billion in debt, stemming in large part from the events of 2005 and 2012, Hurricane Katrina and Superstorm Sandy.[2]

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[1] Ike Brannon & Ari Blask, *Reforming the National Flood Insurance Program: Toward Private Flood Insurance*, 817 POL'Y ANALYSIS, 1, 4–8 (2017).

[2] *See* FED. EMERGENCY MGMT. AGENCY, LOSS DOLLARS PAID BY CALENDAR YEAR, https://www.fema.gov/loss-dollars-paid-calendar-year [https://perma.cc/5EAS-ERPJ]; FED. EMERGENCY MGMT. AGENCY, TOTAL EARNED

The recent 2017 disaster of Hurricane Harvey added to the worsening debt with the storm producing approximately $8.6 billion in total claims.[3] Moreover, several of the costliest hurricanes have occurred within the last decade[4] and scientists predict an increase in storm intensity and rainfall rates.[5] These past and potential disasters make it apparent that the NFIP needs to be reformed or else risk an ever-growing debt.

The Biggert-Waters Flood Insurance Reform Act of 2012 (Biggert-Waters) attempted to overcome the NFIP's structural problems.[6] Ultimately though, Biggert-Waters' premium rate increases provoked political backlash that ultimately resulted in its repeal in 2014.[7] However, the failure to reform the NFIP does not indicate that the program is satisfactory. In fact, the Government Accountability Office (GAO) has placed the NFIP on its High-Risk List since 2006 because of the program's "financial exposure and management and operations challenges."[8] Although the NFIP's goal is to encourage participation in the flood insurance market by households who may otherwise be priced out of the market, the belief that the federal government had to step in because private markets would not insure

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PREMIUM BY CALENDAR YEAR, 1978 – 2016, https://www.fema.gov/total-earned-premium-calendar-year] [https://perma.cc/9JZV-E4WY] [hereinafter TOTAL EARNED PREMIUM].

[3] Ray Lehmann, *Congress Let NFIP Off Hook for $16B Debt, Despite Less Than $10B in Claims*, INS. J. (July 9, 2018), https://www.insurancejournal.com/blogs/right-street/2018/07/09/494466.htm [https://perma.cc/MC4G-EVUH].

[4] National Hurricane Center, *Costliest U.S. Tropical Cyclones Tables Updated* (Jan. 26, 2018) https://www.nhc.noaa.gov/news/UpdatedCostliest.pdf [https://perma.cc/XZB3-W4U5].

[5] Nick Bradford, *Increased Hurricane Intensity*, NAT'L ENVTL. EDUC. FOUND. (Sept. 12, 2017), https://www.neefusa.org/nature/water/increased-hurricane-intensity [https://perma.cc/4UET-5VJN].

[6] Loren M. Vazquez*, Big Storms, Big Debt, and Biggert-Waters: Navigating Florida's Uncertain Flood Insurance Future*, 5 SEATTLE J. ENVTL. L. 109, 120 (2015) (discussing changes in mapping, grants, and management to address debt and actuarial soundness).

[7] Homeowner Flood Insurance Affordability Act of 2014, Pub. L. No. 113-89, 128 Stat. 1020.

[8] U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-17-317, HIGH-RISK SERIES: PROGRESS ON MANY HIGH-RISK AREAS, WHILE SUBSTANTIAL EFFORTS NEEDED ON OTHERS 619 (2017), https://www.gao.gov/assets/690/682765.pdf [https://perma.cc/24CD-WMBR].

the risk is incorrect.[9] The economic failures of the NFIP stem from the fact that it is inefficient to provide unsubsidized, and consequently more expensive, flood insurance for risky areas.[10]

In order to combat the structural weakness and burden on taxpayers, the cost of flood insurance should be shifted to the private sector, which would eliminate subsidized premium rates.[11] By pricing the premiums according to actual, individualized property risk, the rates will "reflect real risk."[12] Although private insurance may result in a higher average premium, this is not necessarily a negative, and some policyholders may actually pay lower rates because the pricing is not based on the average risk of the community.[13] Therefore, the NFIP should be repealed and the federal government should leave flood insurance to the private sector in order to allow the insurance market to operate efficiently.

This note will examine the economic failures of the NFIP that have become apparent from the recent hurricanes and will argue that flood insurance should be left to private insurers who can accurately price the risk of these flood-prone homes. By eliminating the NFIP, the government will no longer subsidize homes that should not have been built in the first place and premiums will match risk, resulting in an efficient insurance market. Part II of this note explores the historical background of flood insurance in the United States and the beginning of the NFIP. In particular, this section notes the resistance to government involvement in the flood insurance market from government actors themselves. However, as the section concludes, federal participation won out in the end. Part III describes the structure of the NFIP and how insurance premiums are priced. This section illustrates that these prices are inaccurate when compared to the risk and as a result,

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[9] *See* Brannon & Blask, *supra* note 1, at 10 ("The federal government's rationale for providing flood insurance stemmed from a belief that limited private-market flood insurance constituted a market failure, as well as from faith in government's own ability to centrally plan an optimal mix of development and conservation in flood-prone areas.").

[10] *Id.* ("Nothing, however, is inefficient about insurance being prohibitively expensive in a risky area. . . .").

[11] U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-14-127, FLOOD INSURANCE: STRATEGIES FOR INCREASING PRIVATE SECTOR INVOLVEMENT 1 (2014), http://www.gao.gov/assets/670/660309.pdf [https://perma.cc/E4DR-ZA9J].

[12] Brannon & Blask, *supra* note 1, at 14 ("Although private insurance might result in higher premium payments on average . . . premiums will more closely reflect real risk.").

[13] *Id*.

this section questions whether the NFIP is fulfilling its purpose as an insurance program or whether it should be left to private insurance companies. Part IV studies how the NFIP has been put into practice during recent disasters. Looking at Louisiana, the Eastern Coast, and Texas, this section highlights the lessons that the recent disasters of Katrina, Sandy, and Harvey have taught the country about the consequences of the NFIP. Part V argues that the failures of the NFIP cannot be reformed and instead, flood insurance should be left to private insurers. Part VI concludes that, in light of the debt in which the government finds itself drowning, the NFIP should be repealed.

II. History of Flood Insurance in the United States

A. The Rise of Government Intervention in the Flood Insurance Market

Prior to 1927, private insurers provided flood insurance.[14] During this time, the federal government's sole involvement in flood events was its efforts in constructing flood control projects, such as dams and levees, which actually encouraged development of flood zones.[15] But following the Great Flood of 1927, which caused major flooding through the Mississippi River Valley resulting in $236 million in property damage, private investors disappeared from the market because they did not view flood insurance as a profitable business and the public called for federal government intervention.[16] However, President Coolidge resisted, asserting:

> The government is not an insurer of its citizens against the hazard of the elements. We shall always have flood and drought, heat and cold, earthquake and

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[14] Scott Gabriel Knowles & Howard C. Kunreuther, *Troubled Waters: The National Flood Insurance Program in Historical Perspective*, 26 J. POL'Y HIST. 327, 332 (2014).

[15] Mark J. Brown & Martin Halek, *Managing Flood Risk: A Discussion of the National Insurance Program and Alternatives*, *in* PUBLIC INSURANCE AND PRIVATE MARKETS 143, 149 (Jeffrey R. Brown ed., 2010) ("[T]he government initiated various flood control projects, such as the construction of dams and levees, which arguably encouraged development in flood zones.").

[16] JAMES M. WRIGHT, THE NATION'S RESPONSES TO FLOOD DISASTER: A HISTORICAL ACCOUNT, A REPORT BY THE ASSOCIATION OF STATE FLOODPLAIN MANAGERS 9 (2000) ("Public opinion favored a program in which the federal government paid for flood control in the Mississippi Valley.").

> wind, lightning and tidal wave, which are all too constant in their afflictions. The Government does not undertake to reimburse its citizens for loss and damage incurred under such circumstances. It is chargeable, however, with the rebuilding of public works and the humanitarian duty of relieving its citizens of distress.[17]

President Coolidge continued his refusal of federal government assistance, but growing national pressure called for federal intervention.[18] Concern stemmed in part from the impact on the federal budget, but after a compromise between sharing the cost between state and local governments and the federal government, President Coolidge signed the Flood Control Act of 1928, which provided $325 million for a national flood control program.[19]

Ultimately, it "set a precedent of direct, comprehensive, and vastly expanded federal involvement in local affairs . . . [and a] major shift in what Americans considered the proper role and obligations of national government."[20] Congress continued to expand federal government involvement after flooding in New England and in the Ohio River basin[21] by enacting the Omnibus Flood Control Act of 1936,

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[17] 69 CONG. REC. S103, 107 (daily ed. Dec. 6, 1927). *See also Coolidge Orders Mississippi Survey*, N.Y. TIMES, May 4, 1927, at 1 ("President Coolidge today reiterated his opposition . . . to consider relief legislation for the flood sufferers and discuss plans to prevent future disasters."); *Coolidge Won't Call Congress for Flood*, N.Y. TIMES, May 18, 1927, at 2 ("President Coolidge today reiterated that there was no necessity for calling a special session of Congress to enact legislation for the relief of the Mississippi flood sufferers.").

[18] *See Congress to Act on Flood Perils*, N.Y. TIMES, May 1, 1927, § 9, at 13; *Hoover Flood Plan Asks $200,000,000*, N.Y. TIMES, June 21, 1927, at 1; *Urge Coolidge Call for Flood Parley*, N.Y. TIMES, June 5, 1927, at 24 (confirming unanimously adopted resolution to have President Coolidge call engineers and civilians to address flooding in Mississippi and its tributaries).

[19] Lawrence M. Friedman & Joseph Thompson, *Total Disaster and Total Justice: Responses to Man-made Tragedy*, 53 DEPAUL L. REV. 251, 275 (2003).

[20] *Id*. (quoting JOHN M. BARRY, RISING TIDE: THE GREAT MISSISSIPPI FLOOD OF 1927 AND HOW IT CHANGED AMERICA 407 (1997).

[21] WRIGHT, *supra* note 16, at 10 ("Early in 1936, the New England region suffered from its worst flood in at least 300 years. That same year, paralyzing floods occurred in the upper Ohio River basin, taking 184 lives and causing about $200 million in property damage. In the wake of the devastation, a

which assigned the United States Army Corps of Engineers to engineer and construct flood protection for 250 projects, provided $310 million the assignment's construction, and designated $10 million for examinations and surveys.[22]

A national flood insurance program was not considered until 1951 after major flooding in Kansas and Missouri led to $870 million in damage.[23] President Truman proposed that $50 million be set aside for a flood insurance program, but congressional opposition and insurance lobbying defeated it.[24] In 1952, he again proposed a national program, this time setting aside $1.5 billion, but it was again defeated.[25] In 1956, after more severe flooding in the eastern part of the country, President Eisenhower proposed a $2.9 billion flood insurance program, which would include a forty percent premiums subsidy by state and federal governments.[26] Although it was adopted in the Flood Insurance Act of 1956, no funds were ever provided because Congress feared the absence of effective flood controls.[27] Without any controls, Congress believed "the availability of subsidized insurance would stimulate further development of flood plains leading to even greater flood damage."[28]

The 1960s brought more natural disasters and more discussion of a flood insurance program.[29] After Hurricane Betsy flooded New Orleans, President Johnson signed the Southeast Hurricane Disaster Relief Act, which not only provided relief, but also created a study to investigate a financial assistance program for flood loss.[30] Gilbert

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flood relief bill already drawn up was expanded into a bill to establish a national policy of river development for flood control.").

[22] 33 U.S.C. § 701 (2012).

[23] WRIGHT, *supra* note 16, at 30.

[24] FED. EMERGENCY MGMT. AGENCY, BACKGROUND PAPER ON THE FEDERAL EMERGENCY MANAGEMENT AGENCY'S NATIONAL FLOOD INSURANCE PROGRAM 1, 2 (Nov. 30, 1981).

[25] *Id*.

[26] *Id*.

[27] *Id.*

[28] *Id*.

[29] *Id*. ("Again, it was a series of natural disasters which rekindled interest in flood insurance and which finally resulted in the implementation of a substantive program. Bills to recreate a flood insurance program were unsuccessfully introduced almost annually in the early 1960's.")

[30] Knowles & Kunreuther, *supra* note 14, at 332 ("In addition to the relief, the bill called for 'immediate initiation of a study . . . of alternative permanent

White chaired the Task Force on Federal Flood Policy that headed the study.[31] White warned that "[a] flood insurance program is a tool that should be used expertly or not at all. Correctly applied, it could promote wise use of floodplains. Incorrectly applied, it could exacerbate the whole problem of flood losses."[32] He cited the disparity between low premiums and high risk and how this problem would cause economic waste because it "would afford a windfall benefit to the owners of flood-prone lands and would impose additional demands on Federal and other resources for flood protection."[33] Therefore, flood insurance not only needed to offer relief, but also direct or restrict development of floodplains.[34]

B. The Beginning of the NFIP

In the end, this study encouraged a flood insurance program.[35] In 1968, the study resulted in the National Flood Insurance Act, which created the NFIP.[36] In explaining the need for federal participation, Congress cited the economic reasons that caused private insurers to leave the market and make flood insurance unavailable.[37] Many individuals, including White, suggested the NFIP as a pilot program because of the questions surrounding flood zones, insurance rates, and technical advice for floodplain management, but Congress proceeded with the NFIP on a nationwide basis.[38]

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programs which could be established to help provide financial assistance in the future . . . .'").

[31] *Id*.

[32] H.R. DOC. NO. 89-465, at 17 (1966).

[33] *Id* at 38.

[34] Knowles & Kunreuther, *supra* note 14, at 333 ("On the issue of flood insurance, White's report stressed its dual purpose: not only to offer financial relief but also to take some initiative in directing land use and development—or restriction on development—in the nation's floodplains.").

[35] H.R. DOC. NO. 89-465, at 39.

[36] 42 U.S.C. § 4001 (2012) ("[A] reasonable method of sharing the risk of flood losses is through a program of flood insurance . . . .").

[37] *Id*. ("The Congress also finds that (1) many factors have made it uneconomic for the private insurance industry alone to make flood insurance available to those in need of such protection on reasonable terms and conditions; but (2) a program of flood insurance with large-scale participation of the Federal government and carried out to the maximum extent practicable by the private insurance industry is feasible and can be initiated.").

[38] WRIGHT, *supra* note 16, at 33–34.

The NFIP is administered by the Federal Emergency Management Agency (FEMA) and is a "quid-pro-quo program,"[39] providing federal subsidies to areas deemed a Special Flood Hazard Area (SFHA), but only if communities take floodplain management measures to reduce flood loss in future developments.[40] The United States Army Corps of Engineers defines SFHAs as areas having a greater than one percent annual risk of serious flooding.[41] After the NFIP was enacted, Hurricane Camille hit the Gulf Coast in 1969, but at this time only two communities were participating in the NFI. Additionally, only two more communities would be deemed eligible at the end of the year because communities could only enter the program after mapping and rates were completed and they qualified.[42] As a result, Congress amended the NFIP to provide emergency insurance coverage at subsidized rates, even though the mapping and rates had not been completed and would take more time to do so.[43] This emergency provision caused over 5,500 policies to be issued.[44]

Congress once again amended the NFIP in 1973 after Hurricane Agnes hit the Northeast in 1972.[45] Because it was thought that mortgage lenders would require flood insurance, the program was not mandatory, but the 1972 flooding proved that many people had not purchased a policy.[46] The Flood Disaster Protection Act of 1973

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[39] *Id*. at 34, 37–38.

[40] FED. EMERGENCY MGMT. AGENCY, *supra* note 24, at 4 ("[T]he Act required flood-prone communities, as a strict condition of participation in the Program, to adopt local flood plain management measures to reduce or avoid flood damage in connection with all new construction.").

[41] Knowles & Kunreuther, *supra* note 14, at 337 (explaining that communities with greater than one percent chance of serious flooding per year were designated "special flood hazard areas").

[42] WRIGHT, *supra* note 16, at 35.

[43] *Id*. ("After the hurricane, Congress amended the National Flood Insurance Act of 1968 to provide an emergency program through which property owners in participating localities could obtain flood insurance coverage on existing structures at federally subsidized rates, even though the required studies and rate maps would not be completed for some time.").

[44] Dan R. Anderson, *The National Flood Insurance Program: Problems and Potential*, 41 J. RISK & INS. 579, 584 (1974).

[45] Erwann O. Michel-Kerjan, *Catastrophe Economics: The National Flood Insurance Program*, 24 J. ECON. PERSP. 165, 168 (2010).

[46] *Id*. ("Originally, the purchase of flood insurance in the United States was not mandatory by law, since it was thought that mortgage lenders would require this new flood insurance in order to protect their assets.").

required all properties receiving federally backed mortgages to purchase flood insurance.[47] By the 1980s, two million policies were issued.[48] Finally, in 1983, the Write-Your-Own (WYO) Program began, in which private flood insurers provided policies backed by the federal government as a guarantor and reinsurer.[49]

C. The NFIP Today

The problem today is that the NFIP is financially unstable and has accumulated $24.6 billion in debt.[50] The NFIP originally had a $1 billion borrowing cap, which was increased in 1996 to $1.5 billion.[51] But after the catastrophic 2005 hurricanes, Congress raised the borrowing limit several times, and after Superstorm Sandy in 2013, Congress raised it to $30.425 billion.[52] This debt stems in large part from the fact that the NFIP collects less in premiums than it pays out in claims, leaving the Treasury and taxpayers to fill the gap.[53] Most recently, the devastation from Hurricane Harvey resulted in a disaster relief bill in October 2017 that forgave $16 billion of program debt to ensure that the NFIP will be able to pay claims.[54]

Biggert-Waters attempted to eliminate underfunding of the NFIP by proposing a multi-year phase out of subsidies for commercial properties and vacation homes and for primary residences after owner-

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[47] *Id*.
[48] *Id*.
[49] *Id.* ("[I]n 1983, the arrangement was supplemented with a program known as the Write-Your-Own program (also called WYO). The Write-Your-Own program allows participating property/casualty insurance companies to write and service the standard National Flood Insurance Program policy in their own names . . . .").
[50] Michelle Cottle, *Can Congress Bring the National Flood Insurance Program Above Water?*, ATLANTIC (Aug. 5, 2017), https://www.theatlantic.com/politics/archive/2017/08/congress-flood-insurance/535731 [https://perma.cc/R4WC-ZCWR].
[51] AM. ACAD. OF ACTUARIES, THE NATIONAL FLOOD INSURANCE PROGRAM: CHALLENGES AND SOLUTIONS 19 (2017).
[52] *Id*.
[53] Cottle, *supra* note 50.
[54] Additional Supplemental Appropriations for Disaster Relief Requirements Act, Pub. L. No. 115-72, 131 Stat. 1224, 1228 (2017) (stating that notes or obligations issued pursuant to the National Flood Insurance Act of 1968 and the Federal Insurance Act of 1956 outstanding at the time of the enactment of this act, a total of $16 billion, will be cancelled).

ship changes.[55] The legislation also proposed raising the cap on annual premium increases from ten percent to twenty percent and the establishment of a technical mapping advisory council to modernize floodplain maps.[56] However, rates started to increase and political backlash began.[57] Critics reported that premiums would rise tenfold and drive Americans out of their homes because they would not be able to afford coverage.[58] Rep. Maxine Waters, one of the co-authors of Biggert-Waters even advocated for its repeal, citing that she did not intend that it would place such large costs on homeowners.[59] Ultimately many of Biggert-Waters' key reform provisions were repealed in the Homeowner Flood Insurance Affordability Act of 2014.[60]

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[55] *See* Diane Katz, *No Retreat on Flood Insurance Reform*, 4153 HERITAGE FOUND., 1, 1 (2014) ("The Biggert-Waters Flood Insurance Reform Act established a multi-year phase-out of premium subsidies for commercial properties and vacation homes, and for primary residences after ownership changes.").

[56] Andrew G. Simpson, *President Obama Signs Flood Insurance Reform Bill*, INS. J. (July 9, 2012), http://www.insurancejournal.com/news/national/2012/07/09/254797.htm [https://perma.cc/V7JJ-Q6DW] ("The legislation that will extend the NFIP for five years, until Sept. 30, 2017, It [sic] also calls for reforms including phasing out subsidies for many properties, raising the cap on annual premium increases from 10 percent to 20 percent, allowing multi-family properties to purchase NFIP policies, imposing minimum deductibles for flood claims, requiring the NFIP administrator to develop a plan for repaying the debt incurred from Hurricane Katrina, and establishing a technical mapping advisory council to deal with map modernization issues.").

[57] Cottle, *supra* note 50 ("The pace of change proved too aggressive. Rates started rising, people started freaking out, and less than three years later, Congress passed a bill delaying or reversing many of the changes [proposed by the Biggert-Waters Insurance Reform Act].").

[58] Thomas Ferraro, *U.S. Senate Passes Bill to Delay Hikes in Flood Insurance Rates*, REUTERS (Jan. 30, 2014), https://www.reuters.com/article/us-usa-insurance-flooding/u-s-senate-passes-bill-to-delay-hikes-in-flood-insurance-rates-idUSBREA0T1WK20140130 [https://perma.cc/6T5H-RXRS].

[59] *Rep. Waters, Author of Flood Reform Act, Calls for Delay in Implementation*, INS. J. (Sept. 30, 2013), https://www.insurancejournal.com/news/national/2013/09/30/306602.htm [https://perma.cc/T3GH-L4ZX] ("Rep. Maxine Waters released a statement saying she is 'outraged by the increased costs of flood insurance premiums that have resulted from the Biggert-Waters Act. I certainly did not intend for these types of outrageous premiums to occur for any homeowner.").

[60] Cottle, *supra* note 50.

Despite its repeal, "Biggert-Waters is an acknowledgement by Congress and the President that the NFIP is financially unsustainable."[61] The flaws of the NFIP include premiums that are too low for the risk involved, outdated flood-zone maps that make accurate risk assessment impossible, and repetitive loss properties that make up one percent of policies but account for thirty percent of payouts.[62] Ultimately, the problem is that the NFIP "is subsidizing people to live and develop in harm's way."[63]

III. The Structure of the NFIP

A. Rate Setting

Flood insurance is required for all federally mortgaged homes that are located in SFHAs.[64] If a home is not located in a SFHA, then flood insurance is not mandated by federal law, but a lender can still require it.[65] The NFIP is only available to communities that participate in the program, which requires the community to enact certain measures to mitigate flood risk.[66] FEMA cannot deny coverage to property located within an SFHA.[67]

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[61] Katz, *supra* note 55, at 2.
[62] Cottle, *supra* note 50.
[63] *Id*. (stating the end result to be: "An irrational system that encourages people to hunker down in areas where Mother Mature clearly does not want them.").
[64] *Flood Insurance Requirement*, FEMA, https://www.fema.gov/faq-details/Flood-Insurance-Requirement [https://perma.cc/N3Y6-W7UQ].
[65] *Id.*
[66] 42 U.S.C. § 4102(c) (2012) (encouraging state and local measures that will "constrict the development of land which is exposed to flood damage where appropriate . . . guide the development of proposed construction away from locations which are threatened by flood hazards . . . assist in reducing damage caused by floods . . . and otherwise improve the long-range land management and use of flood-prone areas"); 42 U.S.C. § 4022 (2012) ("[C]ommunities participate voluntarily to . . . provide incentives for measures that reduce the risk of flood or erosion damage that exceed the criteria set forth section 4102 of this title and evaluate such measures . . . to encourage adoption of more effective measures that protect natural and beneficial floodplain functions . . . to encourage floodplain and erosion management . . . and to promote the reduction of Federal flood insurance losses.").
[67] Brannon & Blask, *supra* note 1, at 3.

FEMA bases NFIP policy prices on flood insurance rate maps (FIRM) that estimate flood risk.[68] Specifically, FEMA considers property characteristics, property location in flood zones depicted on FIRM, elevation of the property relative to the community's base flood elevation, and structural characteristics.[69] However, these prices are based on a categorical system of the community, not individual properties.[70] Instead of using individual property information, FEMA surveyed floodplains and calculated an average annual loss for the community and based the insurance rates off of those averages.[71] Furthermore, these maps are often out of date.[72] As a result of climate change, these maps do not reflect the risk of flooding today because they do not take into account coastal erosion, increased sea levels, and land development.[73] Even if these maps were updated, it is unlikely that these updates would have much effect on the NFIP's debt because of the subsidized rates the organization offers.[74]

The NFIP provides two types of flood insurance premiums: full-risk rates, which charge rates that in the aggregate are sufficient to pay anticipated losses and expenses, and subsidized rates, which charge rates that, in the aggregate, are insufficient to pay anticipated losses and expenses.[75] Both premiums inadequately price the true risk

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[68] *Id.* at 3.

[69] U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-16-59, NATIONAL FLOOD INSURANCE PROGRAM: CONTINUED PROGRESS NEEDED TO FULLY ADDRESS PRIOR GAO RECOMMENDATIONS ON RATE-SETTING METHODS 4 (2016).

[70] Brannon & Blask, *supra* note 1, at 3.

[71] Mary Williams Walsh, *A Broke, and Broken, Flood Insurance Program*, N.Y. TIMES (Nov. 4, 2017), https://nyti.ms/2hEsXBi ("So the program was surveying floodplains, then calculating an "average annual loss" for all the houses there. Its insurance rates were based on those averages.").

[72] CONG. BUDGET OFFICE, PUB. NO. 4008, THE NATIONAL FLOOD INSURANCE PROGRAM: FACTORS AFFECTING ACTUARIAL SOUNDNESS 14 (2009), https://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/106xx/doc10620/11-04-floodinsurance.pdf [https://perma.cc/U98U-ZRW8] ("FEMA staff report that the majority of coastal maps are based on outdated analyses . . . .").

[73] *Id.* at 14–20.

[74] Omri Ben-Shahar & Kyle D. Logue, *The Perverse Effects of Subsidized Weather Insurance*, 68 STAN. L. REV. 571, 586 (2016) (lambasting the inadequacy of the financing structure of the NFIP and its inability to fulfill its founding mission).

[75] U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-16-59, *supra* note 69 (describing the NFIP's two types of insurance premiums and their shortcomings in calculating losses and expenses).

of flooding. The full-risk rates are based on a formulaic approach that uses historical claims data as a proxy for future risk.[76] The problem is that the NFIP was designed only to consider and compensate for the average flood event, not catastrophic events.[77] This is in opposition to private insurers who consider extreme events in their pricing.[78] However, floods occur randomly and the risk of flooding is not consistent across time.[79] As a result, the NFIP rates are not as accurate as a pricing system that uses probabilistic modeling, which bases risk on past events and the probability of future flooding, including catastrophic storms.[80] Moreover, although these premiums are called "full-risk," they are not capable of generating sufficient profits to compensate years with below-average flooding and years with above-average flooding.[81] This stems from the fact that the NFIP pricing does not include a catastrophe loading surcharge, which could be reserved during the below-average flooding years to cover losses in the above-average flooding years.[82]

A CBO report from 2017 reveals the problem with the NFIP's full-risk rates and subsidized rates.[83] The report estimated that the five million policies in force in August 2016 would cost the government roughly $5.7 billion in expected costs, not including the recent claims from Hurricane Harvey that occurred one week after the report was

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[76] Brannon & Blask, *supra* note 1, at 7 (criticizing the NFIP's premium pricing method as "maddeningly imprecise" largely due to its antiquated nature).

[77] Erwann Michel-Kerjan et al., *Could Flood Insurance be Privatised in the United States? A Primer*, 40 GENEVA PAPERS ON RISK & INS. 179, 185 (2015) (discussing how FEMA premiums depend on inaccurate NFIP probabilistic risk assessments, including the possibility of more catastrophic flooding).

[78] *Id.* at 184 ("Private insurers normally consider the entire spectrum of events because they are responsible for paying all the legitimate claims covered in the policy.").

[79] *Id*.

[80] Brannon & Blask, *supra* note 1, at 7 (concluding that individual policies are less accurate than they would be under a probabilistic modeling system).

[81] *Id.* at 4 ("Despite the name, their premiums are not high enough to allow for sufficient profits in years with below-average flood damage to compensate for years with flood damage that is well above average.").

[82] *Id*.

[83] CONG. BUDGET OFFICE, THE NATIONAL FLOOD INSURANCE PROGRAM: FINANCIAL SOUNDNESS AND AFFORDABILITY 8 (2017) (detailing the systemic insufficiencies in the NFIP's and government flood insurance risk evaluation).

published.[84] In order to determine whether NFIP premiums would be sufficient to cover these expected costs, the CBO considered full-risk rates and subsidized rates.[85] Under a subsidized rate regime that the NFIP currently uses, the costs of the program for 2017 would continue to exceed premiums by an estimated $1.4 billion.[86] However, even under a full-risk rate regime, the costs of the program for 2017 would still exceed premiums by an estimated $700 million.[87] Although this difference in rate regimes would cut the shortfall in half, the report illustrates that the NFIP would still be costlier for the government than it is worth and ultimately, the NFIP would continue to operate in the red as it has for a long time.

Subsidized premiums account for approximately twenty percent of all NFIP policies.[88] FEMA is required to subsidize properties constructed or substantially renovated before 1975 or before the date FEMA published the initial rate map for the community, whichever is later.[89] Congress expected these older properties to be replaced over time and eventually phase out this subsidy.[90] But the subsidy created an incentive to keep these properties as is and not engage in any mitigation efforts in order to retain the lower premiums.[91] FEMA also subsidizes rates for properties that are reclassified into a higher risk zone when FEMA issues new maps, which allows "grandfathered"

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[84] *Id.* at 1, 4 (specifying that $5.0 billion of the $5.7 billion expected costs is for claims and administrative expenses associated with writing and servicing NFIP policies).

[85] *Id.* at 7 (concluding that the difference between expected costs and premiums of the 5 million policies that CBO analyzed depends on which components of the two are considered).

[86] *Id.* at 1 ("CBO estimated that overall . . . the program had an expected one-year shortfall of $1.4 billion.").

[87] *Id.* at 9 (finding rate-based receipts would increase by the sum of subsidy costs and the amount needed to cover increased payments to companies that offer the policies minus RFA receipts totally an estimated $132 million).

[88] Brannon & Blask, *supra* note 1, at 3 (stating that about "20 percent of all NFIP policies receive an explicit subsidy").

[89] 42 U.S.C. § 4015(c) (2012) (requiring subsidies for "any property the construction or substantial improvement of which the Administrator determines has been started after December 31, 1974")

[90] Brannon & Blask, *supra* note 1, at 3 (observing Congress believed that old properties would ultimately be replaced by more structurally-sound buildings).

[91] *Id*. at 3–4.

properties to keep their previous lower rates.[92] These subsidized rates only generate premiums capable of covering thirty-five to forty percent of the full-risk rate.[93] Consequently, even when maps are updated, the new rates may not necessarily change to reflect the updated, higher risk. Additionally, for some buildings, redrawn flood maps actually move them into lower risk flood zones, which decreases their premiums and places the future financial burden on taxpayers, even when these buildings are oceanfront condominiums and million-dollar homes.[94]

B. Structural Unsoundness

Because of inaccurate pricing, the NFIP is structurally unsound. First, the non-actuarial pricing and subsidies have contributed to the NFIP's $25 billion debt.[95] Because the NFIP policies are subsidized, premiums collected do not adequately cover the number of claims received.[96] Therefore, the NFIP was "never designed to cover catastrophic loss years" because of these premium rates.[97] It is authorized to borrow from the Treasury during years when claims exceed revenues, and Congress has increased the borrowing limit continually following Hurricane Katrina and Superstorm Sandy.[98] The NFIP was

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[92] U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-09-12, FLOOD INSURANCE: FEMA'S RATE-SETTING PROCESS WARRANTS ATTENTION 18 (2008) ("[F]EMA does not require all properties remapped into higher-risk areas to pay rates based on the new designation. This policy, known as grandfathering, erodes NFIP's ability to charge rates that reflect the risk of flooding.").

[93] Browne & Halek, *supra* note 15, at 158–59.

[94] *See* Bill Dedman, *FBI Investigates FEMA Flood Map Changes After NBC News Report*, NBC NEWS (Mar. 27, 2014), https://www.nbcnews.com/news/investigations/fbi-investigates-fema-flood-map-changes-after-nbc-news-report-n62906 [https://perma.cc/3DAK-YHTD] ("The investigation follows a report by NBC News documenting more than 500 instances in which FEMA has remapped waterfront properties from the highest-risk flood zone, saving the owners as much as 97 percent on the premiums they pay into the financially strained [NFIP].").

[95] Brannon & Blask, *supra* note 1, at 4.

[96] Ben-Shahar & Logue, *supra* note 74, at 587.

[97] CAROLYN KOUSKY & LEONARD SHABMAN, PRICING FLOOD INSURANCE: HOW AND WHY THE NFIP DIFFERS FROM A PRIVATE INSURANCE COMPANY 4 (2014).

[98] U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-17-425, FLOOD INSURANCE: COMPREHENSIVE REFORM COULD IMPROVE SOLVENCY AND ENHANCE

nearly solvent before Hurricanes Katrina, Rita, and Wilma, but found itself in close to $18 billion of debt afterwards.[99] According to the GAO, "it likely will not generate sufficient revenues to repay the billions of dollars borrowed from the Department of the Treasury to cover claims from the 2005 and 2012 hurricanes or potential claims related to future catastrophic losses."[100] The GAO concluded "[s]ince the program offers rates that do not fully reflect the risk of flooding, NFIP's overall rate-setting structure was not designed to be actuarially sound in the aggregate, nor was it intended to generate sufficient funds to fully cover all losses."[101] In fact, because the Treasury covers the insufficient revenue from the subsidies, the burden falls on the taxpayers to shoulder the cost.[102] It can therefore be argued that "the U.S. taxpayer is currently the reinsurer of truly catastrophic flood risks."[103]

Second, the subsidies benefit the wealthy. A Congressional Budget Office (CBO) study found that "properties that carry flood insurance tend to be more valuable as a group."[104] Subsidized coastal properties had a median value of $403,000 in 2005, compared to the $165,344 median value of owner-occupied housing in the United States in 2005.[105] This stems, in part, from the fact that coastal properties have higher property values.[106] But this shifts the lower premiums to

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RESILIENCE 8 (2017) ("Congress authorized FEMA to borrow from Treasury when needed, up to a preset statutory limit. Originally, Congress authorized a borrowing limit of $1 billion and increased it to $1.5 billion in 1996. Following the catastrophic hurricanes of 2005, Congress amended FEMA's borrowing authority three more times to more than $20 billion. After Superstorm Sandy in 2012, Congress increased FEMA's borrowing authority to $30.425 billion.").

[99] *Id*. at 15 n.3.

[100] U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-17-317, *supra* note 8, at 619.

[101] *Id*.

[102] Ben-Shahar & Logue, *supra* note 74, at 587 (decrying the reassignment of NFIP's cost to the American public, instead of the government).

[103] *Id.*

[104] CONG. BUDGET OFFICE, VALUE OF PROPERTIES IN THE NATIONAL FLOOD INSURANCE PROGRAM 6 (2007).

[105] *Id*.

[106] *Id*. at 2 ("The properties covered under the NFIP tend to be more valuable than other properties nationwide. The median value of owner-occupied housing in the United States is about $160,000; across the four classes of property in the sample, median values for single-family principal residences range from about $220,000 to $400,000. Much of the difference is attributable to the higher property values in areas that are close to water.").

wealthier property owners. For example, of those properties that receive a NFIP subsidy, eighty percent are in the wealthiest quintile of counties.[107] In addition, forty percent of subsidized coastal properties are worth over $500,000 and twelve percent worth over $1 million, compared to twelve percent and three percent, respectively, of inland properties.[108]

Third, the NFIP is geographically concentrated.[109] Only four percent of households in the entire United States participate in the NFIP.[110] However, over fifty percent of households covered by the NFIP are located in Florida and Texas alone.[111] To illustrate the geographic disparity, compare Louisiana to Kentucky. In 2010, Louisiana had 483,000 policies in force, whereas Kentucky had 22,500.[112] Additionally, Louisiana and other Gulf states had a per capita rate of coverage over sixty dollars from 1978–2010, whereas Midwestern states had less than five dollars per capita coverage rate.[113] Consequently, "the largest benefit of the program—namely, access to below-market rate coverage—represents a significant shift in resources to the hurricane-vulnerable states."[114] As a result, the disparate concentration diverts taxpayer money to a select few states, particularly in the Gulf Coast.[115]

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[107] Eli Lehrer, *Doing the Wrong Thing*, WKLY. STANDARD (Dec. 16, 2013), https://www.weeklystandard.com/eli-lehrer/doing-the-wrong-thing [https://perma.cc/3W85-TPLF].

[108] CONG. BUDGET OFFICE., *supra* note 104, at 2 (surveying the difference in property values of NFIP claimants as an illustration of NFIP's effect across the wealth spectrum).

[109] J. SCOTT HOLLADAY & JASON A. SCHWARTZ, INST. FOR POLICY INTEGRITY, FLOODING THE MARKET: THE DISTRIBUTIONAL CONSEQUENCES OF THE NFIP 6 (2010).

[110] *Id.*

[111] *Id.*

[112] *Id*.

[113] *Id.*

[114] *Id*.

[115] *Id.* ("The benefits of the NFIP appear to accrue largely to wealthy households concentrated in a few highly-exposed states.").

IV. Economics of Insurance and the NFIP

A. Insurance Overview

"Insurance is a contract by which one party (the insurer), for a consideration that usually is paid in money, . . . promises to make a certain payment, usually money, upon the destruction or injury of 'something' in which the other party (the insured) has an interest."[116] Economics assumes that the contract between the parties will be efficient, meaning that the contract cannot be changed in any way that would make "one party better off without making the other worse off."[117] Accordingly, insurance must be priced at an actuarially fair rate,[118] and the premium charged is equal to this rate plus any fees for private insurers to cover expenses and make a profit.[119] This premium and additional fee in the private insurance market is subject to competition because insurance companies all seek to maximize profits while offering the lowest premium in the market.[120]

In order for private insurers to entice individuals to insure their property and generate a profit, an insurance contract must contain an insurable interest.[121] An insurable interest has two required components: one, that the interest is identifiable and quantifiable and two, that there is an ability to individualize premiums for customers or a class of customers to provide for market competition.[122] Insurable interests include risks that are numerous and homogenous, have deter-

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[116] 1 GEORGE J. COUCH, COUCH ON INSURANCE § 1:6 (Lee R. Russ & Thomas F. Segalla eds., 3d rev. ed. 2011).

[117] Samuel A. Rea, Jr., *The Economics of Insurance Law*, 13 INT'L REV. L. & ECON. 145, 145 (1993).

[118] Howard Kunreuther & Erwann Michel-Kerjan, *Economics of Natural Catastrophe Risk Insurance*, *in* 1 HANDBOOK OF THE ECONOMICS OF RISK AND UNCERTAINTY 651, 660 (W. Kip Viscusi & Mark J. Machina eds., 2014) ("Insurance is said to be at an actuarially fair rate when the premium charged covers a risk of losing L with a probability p equals the expected loss (i.e., pL).").

[119] *Id.*

[120] *Id.* at 661–62 ("Competition can also play a role in determining what premium can be charged.").

[121] Rea, *supra* note 117, at 146 ("A fundamental requirement for the enforcement of an insurance contract is that the insured have an 'insurable interest'; that is, the insured must have an expectation of a loss that is covered by the insurance.").

[122] Kunreuther & Michel-Kerjan, *supra* note 118, at 661.

minable losses, and are calculable, accidental, informationally symmetrical, independent, and unpredictable.[123] Without an insurable interest, the insurance contract is a wager and there is an incentive for the insured to cause the loss.[124]

Even if there is an insurable interest, an insurer must consider problems associated with information asymmetry (adverse selection and moral hazard) and correlation of risk.[125] First, for adverse selection, only homeowners who have the highest-risk properties will choose flood insurance, but insurers will unlikely have the same knowledge regarding the risk of these properties.[126] This in turn leads to insurance companies solely insuring the highest-risk individuals, resulting in premiums that are too low to cover expenses.[127] Second, moral hazard arises when purchasing insurance provides a false sense of security to the homeowner who then does not take any protective measures since the risk has been transferred to the insurance company.[128] Third, extreme events, like flooding, are highly correlated spatial risks.[129] This means that when an extreme event like a hurricane occurs, all claims are geographically concentrated, which causes a high loss all at once.[130] For example, Hurricane Andrew in 1992 resulted in

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[123] Browne & Halek, *supra* note 15, at 146–47 (listing several insurable characteristics).

[124] Rea, *supra* note 117, at 146 (finding that without an insurable interest, "the insurance contract is a wager and . . . the insured . . . will have an incentive to create the loss.").

[125] Kunreuther & Michel-Kerjan, *supra* note 118, at 662–64 (describing additional problems associated with asymmetry of information and degree of correlation of the risk in determining what premium to charge).

[126] *See id.* (explaining that adverse selection arises when an "insurer cannot differentiate the risks facing two groups of potential insurance buyers" while buyers know their risk).

[127] *Id.*

[128] Browne & Halek, *supra* note 15, at 143 ("It is important that any insurance program be designed to transfer the optimal amount of risk. If there is too little risk transfer, then society forgoes welfare gains that result from the efficient allocation of risk. On the other hand, too much risk transfer leads to a moral hazard.").

[129] Kunreuther & Michel-Kerjan, *supra* note 118, at 663.

[130] *Id. See* Ronen Avraham, *The Economics of Insurance Law – A Primer*, 19 CONN. INS. L.J., 29, 102 (1993) (discussing how correlated risks present a problem for insurers because "they affect a large portion of the insurance pool . . . and the timing of when the risk will occur is unpredictable").

State Farm and Allstate paying out $3.6 billion and $2.3 billion, respectively, to homeowners in Miami-Dade county in Florida.[131]

B. Insurance and Government Assistance in Disasters

The NFIP attempted to resolve these issues, specifically the largest impediment of correlation, for the public policy reason of aiding those in need when devastation occurs to an entire area.[132] However, this public policy reason does not necessarily result in a socially optimal policy in the long run.[133] For instance, individuals may not consider the possibility of an extreme event like a catastrophic hurricane occurring where they live and as a result, they do not take protective measures to decrease the likelihood of future damage or insure themselves at all.[134] When the catastrophe inevitably does occur, the government steps in and provides financial assistance to the unprotected and uninsured homeowners.[135] When this situation is considered along with the subsidized rates that insured homeowners have received, this additional government assistance increases the taxpayers' burden once again.

Moreover, the NFIP is an imperfect solution to the issues of insuring against flood damage.[136] In order to be an effective program, a government insurance program should fulfill eight criteria: administrative efficiency, transfer an optimal amount of risk, minimization of moral hazard, the party best able to control the risk should typically bear the risk, minimization of negative externalities, consideration of all parties in handling the loss, participation decision on the part of the insured, and premium determination should be risk-based.[137]

The NFIP does not fulfill all of these criteria. Although it does consider all parties at risk of flood damage and does transfer flood risk

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[131] Kunreuther & Michel-Kerjan, *supra* note 118, at 663.
[132] Howard Kunreuther & Mark Pauly, *Rules Rather Than Discretion: Lessons from Hurricane Katerina*, 33 J. RISK UNCERTAINTY, 101, 108 (2006).
[133] *Id.* at 103. *See* Finn E. Kydland & Edward C. Prescott, *Rules Rather than Discretion: The Inconsistency of Optimal Plans*, 85 J. POL. ECON. 473, 473–74 (1977) (arguing that a discretionary policy for the current situation may not be socially optimal in future situations).
[134] Kunreuther & Pauly, *supra* note 133 (highlighting that many Hurricane Katrina victims did not have flood insurance even though they were eligible for the NFIP).
[135] *Id.*
[136] Browne & Halek, *supra* note 15, at 148–49.
[137] *Id.* at 143–44.

to the federal government by paying the low premium rates in exchange for flood coverage,[138] even arguably an optimal amount, this is not necessarily a positive given the failures of the other criteria. The NFIP does not provide many options for homeowners and is not integrated with other disasters, so it does not decrease administrative costs.[139] Moral hazard still remains an issue.[140] Homeowners who choose to live in flood-prone areas are shifting the burden of risk onto the government instead of shouldering it themselves.[141] This in turn shifts the burden onto taxpayers, which imposes negative externalities on taxpayers.[142] Most importantly, although the NFIP does have mandatory participation requirements for certain areas, individuals can still voluntarily choose where to live and the rates are not risk-based leading to "significant loss control inefficiencies and uninformed decision making regarding flood insurance purchases."[143]

C. Does the NFIP Fulfill the Purpose of an Insurance Program?

In the private insurance industry, the transfer of risk from one party to another requires analysis of calculation, distribution, and profitability.[144] The risk must be calculated and compared to the potential gains, the distribution of the risk must be assessed, and profitability of premiums must be considered.[145] However, the struc-

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[138] *Id.* (assessing the full social costs of privately insuring flood risk that is imposed on all parties).
[139] *Id.*
[140] *See infra* Section IV.a.
[141] Browne & Halek, *supra* note 15, at 148–49 ("[R]ather than shifting the risk to third parties, they ensure through appropriate premiums those who have exposed themselves to risk (by owning property) bear that risk. In contrast, programs that transfer risk to the government are monopolistic and prone to political machinations; they often place the cost of the risk on those not in a position to accrue its benefits.").
[142] *Id.* An externality is an effect on "people not directly involved in the transactions." A negative externality occurs when the social, total costs are greater than the private costs. Thomas Helbling, *What Are Externalities? What Happens when Prices Do Not Fully Capture Costs*, 47 FIN. & DEV. 48, 48 (2010).
[143] Browne & Halek, *supra* note 15, at 160.
[144] Christine M. McMillan, *Federal Flood Insurance Policy: Making Matters Worse*, 44 HOUS. L. REV. 471, 483–84, 496 (2007).
[145] *Id*. at 484–88.

tural unsoundness discussed above highlights the inadequacy in the insurance model of the NFIP.

The GAO's Report sheds light on the key differences between the NFIP and private insurers. For example, whereas the NFIP focuses on the goal of encouraging participation in the insurance market by offering affordable premium rates, private insurers focus on maintaining solvency and capital adequacy.[146] In addition, the NFIP accepts anyone regardless of risk and offers discounted risk rates, whereas private insurers only accept insurance applicants based on the individual property risk and discounted rates are only available depending on any risk mitigation practices.[147] Moreover, the NFIP determines rates by averaging the risk of an overall area, but private insurers base each rate on the actual individual risk of an individual property.[148] Finally, because of the discounted rates the NFIP offers, it must recoup the difference, if any, between the amount it pays out and the amount it receives in premiums from the Treasury, whereas private insurers use capital and reinsurance to recoup the difference.[149]

Regarding calculation, FEMA uses flood maps to assess risk, but floods are not easily predictable.[150] Thus, flood risk is not easily quantifiable because of their low frequency, high-cost characteristic.[151] Additionally, the actuarial rates are not accurate, which does not provide an opportunity for precise premium calculations.[152] As for distribution, the NFIP only offers flood insurance, which means that it cannot distribute the risk among other insurance policies and, consequently, only focuses on insuring the same flood-prone communities.[153] This is unlike private insurance companies who can offer a variety of policies such as automobile or home insurance.[154] Offering more than one type of policy allows the companies to distribute the

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[146] U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-16-59, *supra* note 69, at 11.
[147] *Id.* at 11–12 ("NFIP generally accepts all applicants regardless of an individual's property risk and sets rates across a smaller number of broad rate classes. Private insurers generally insure applicants based on individual property risks and a larger number of more specific rate classes.").
[148] *Id.*
[149] *Id.*
[150] McMillan, *supra* note 144, at 490.
[151] *Id*.
[152] *Id*. at 491.
[153] *Id.* at 492 (explaining that the NFIP departs from industry standards for distributing risk because it only offers flood insurance, and further, it cannot reduce its risk through diversification).
[154] *Id.*

risk since these different policy risks are uncorrelated.[155] Lastly, the NFIP was enacted for public policy reasons, not for profitability, which results in lower premiums than those offered by private insurers.[156]

As a result, the NFIP does not fulfill the three requirements of insurance and is not a true insurance program.[157] A true insurance program would accurately price risk to signal to individuals how exposed they are, which in turn would efficiently signal the likelihood of financial loss to the insured. The NFIP does not provide this signal. Therefore, the NFIP is not an efficient program and should be repealed.

V. The NFIP in Action

A. Countrywide Statistics

The NFIP is currently $25 billion in debt, stemming mostly from recent major storms, beginning with Hurricane Katrina in 2005.[158] Figure 1 shows the debt incurred from 1995 through 2017, but does not include the damage from the 2017 Hurricanes Harvey, Irma, and Maria.[159] Strikingly, the NFIP was mostly solvent until the devastation of Hurricane Katrina and has not returned to solvency since 2005.[160]

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[155] *Id.* at 494.
[156] 42 U.S.C. § 4001(a) (2012) ("The Congress finds that from time to time flood disasters have created personal hardships and economic distress . . . as a matter of national policy, a reasonable method of sharing the risk of flood losses is through a program of flood insurance . . . .").
[157] McMillan, *supra* note 144, at 496.
[158] U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-17-425, *supra* note 98, at 1.
[159] *See id.*
[160] *Id.*

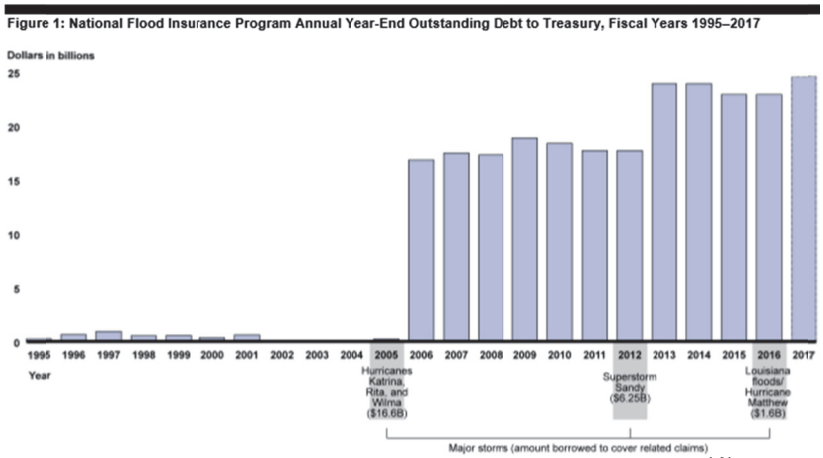

Figure 1: NFIP Outstanding Debt to Treasury, 1995–2017[161]

B. Louisiana

1. Prior to Hurricane Katrina

Even before Hurricane Katrina, Louisiana's largest parishes by population (Jefferson and Orleans) experienced nineteen flood events and eighteen hurricane events between 1978 and 2000.[162] The high risk resulted in federal assistance for the construction of levees in order to convert wetland to productive use.[163] Following Hurricane Betsy in 1965 and Hurricane Camille in 1969, Congress authorized the Hurricane Protection project, which included the construction of levees and was intended to prevent hurricane surges and waves to protect the lowlands in the Lake Pontchartrain and vicinity, where these two

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[161] *Id.*

[162] Raymond J. Burby, *Hurricane Katrina and the Paradoxes of Government Disaster Policy: Bringing about Wise Governmental Decisions for Hazardous Areas*, 604 ANNALS AM. ACAD. POL. & SOC. SCI. 171, 174 (2006) ("The New Orleans metropolitan area's two largest parishes (Jefferson and Orleans) . . .were exposed to nineteen damaging flood events and eighteen hurricane events [between 1978 and 2000].").

[163] *Id.* ("Given this high level of risk, Congress, following devastating hurricane losses in 1947, authorized federal assistance for levees that would make it possible to convert ninety-six hundred acres from wetland to 'productive use.'").

parishes lie.[164] In addition to protection, the project's benefits also included area development.[165] However, this risk-prone area was only estimated to protect twenty-one percent of existing developments, whereas the project would protect seventy-nine percent of future developments.[166] This future development would be possible because of the protection of the levees.[167]

But as a result of the project and the NFIP, "the metropolitan area . . . simply exploded into the swamps."[168] Jefferson Parish added 47,000 housing units and Orleans Parish added 29,000.[169] However, "most of the newly developed land [was] built on muck and [was] sinking at various rates. Much of the land [was] subject to extremely dangerous flooding."[170] The supposedly added flood protection and availability of flood insurance made it appear that the area was safe and it was built up accordingly.[171]

Consequently, the attempt to make the area safer actually facilitated development in hazardous areas.[172] Furthermore, "it had the *unintended effect* of contributing directly to the devastation of Hurricane Katrina . . . by increasing the amount of development possible in low-lying, flood-prone areas . . . and, some contend, by providing levee protection and new drainage works."[173]

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[164] COMPTROLLER OF THE CURRENCY, PSAD-76-161, COST, SCHEDULE, AND PERFORMANCE PROBLEMS OF THE LAKE PONTCHARTRAIN AND VICINITY, LOUISIANA, HURRICANE PROTECTION PROJECT 1–2 (1976) (reporting that "[t]he greatest natural threat to the New Orleans area is posed by flooding from hurricane-induced sea surges, waves, and rainfall").

[165] *Id.*

[166] *Id.*

[167] Burby, *supra* note 162, at 175.

[168] PIERCE F. LEWIS, NEW ORLEANS: THE MAKING OF AN URBAN LANDSCAPE 76 (2d ed. 2003).

[169] Burby, *supra* note 162, at 175.

[170] Lewis, *supra* note 168, at 77 (providing further detail on the potential flooding and other hazardous issues surrounding the modern post-war development in New Orleans).

[171] *Id.*

[172] Burby, *supra* note 162, at 176 (lamenting how the city's efforts to improve the safety of otherwise hazardous areas held a paradoxical effect of more widespread destruction in the aftermath of Hurricane Katrina).

[173] *Id.* (emphasis in original) (reinforcing the contention that the Hurricane Protection Project contributed to the widespread destruction caused by Hurricane Katrina).

The NFIP attempts to control losses from flood damage by requiring communities to adhere to certain construction requirements and engage in floodplain management before they can be eligible to receive federal assistance.[174] However, these requirements are inadequate.[175] Mapping communities to estimate flood risk has resulted in problems because of the infrequency of updating the maps and the decision not to map certain areas, such as areas with dams or subject to coastal erosion hazards, and areas that are at risk to future hazards, such as increases in watershed development and sea-level.[176] Moreover, the NFIP uses the one hundred year flood event standard, but eighty-five percent of damage was caused by intense hurricanes that occur less frequently.[177] As a result, these federal policies that promote safety of at-risk areas actually "facilitated the development of these areas . . . [and] increased the potential for catastrophic losses in large disasters," making Hurricane Katrina "an expected consequence of federal policy rather than an aberration that is unlikely to be repeated."[178]

2. Lessons from Hurricane Katrina

Hurricane Katrina caused over $200 billion in insured and uninsured economic damages.[179] The NFIP paid out $16,322,316,950 in losses.[180] However, the total amount of premiums received equaled $1,975,659,632 in 2005.[181] This devastating flooding exposes the problems with the NFIP.

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[174] *See* 42 U.S.C. § 4102(c) (2012).
[175] Raymond J. Burby, *Flood Insurance and Floodplain Management: The US Experience*, 3 ENVTL. HAZARDS 111, 114 (2001) (arguing that the current NFIP program needs to undergo significant reforms).
[176] *Id.* at 114–15 (explaining one area where the NFIP eligibility requirements have been less effective).
[177] Roger A. Pielke Jr. et al., *Normalized Hurricane Damage in the United States: 1900-2005*, 9 NAT. HAZARDS REV. 29, 29 (2008).
[178] Burby, *supra* note 162, at 178.
[179] RAWLE O. KING, NATIONAL FLOOD INSURANCE PROGRAM: BACKGROUND, CHALLENGES, AND FINANCIAL STATUS 4 (2011) (conveying the magnitude of the damage caused by Hurricane Katrina).
[180] FED. EMERGENCY MGMT. AGENCY, SIGNIFICANT FLOOD EVENTS, 1978 – OCTOBER 31, 2017, https://www.fema.gov/significant-flood-events [https://perma.cc/CEZ3-JM9F] [hereinafter SIGNIFICANT FLOOD EVENTS].
[181] TOTAL EARNED PREMIUM, *supra* note 2.

First, many of the affected homes did not have flood insurance at all.[182] Nationwide, only forty-nine percent of single-family homes in SFHA had flood insurance, and outside of the SFHA, only one percent had insurance.[183] Consequently, the cost of the damage is borne by either the homeowner or federal relief payments.[184] This low participation rate shows that the NFIP did not even achieve an optimal level that Congress intended with the program and thus, is not sustainable.

Second, Hurricane Katrina shows that there is inadequate floodplain management. As discussed above, the construction of levees and other flood control structures increased the risk of development and flooding and decreased public awareness of flood risk.[185] Similarly, inaccurate and outdated mapping did not allow for homeowners to make rational location choices since insurance rates did not reflect the true risk.[186]

Lastly, although many homeowners were uninsured, the availability of the NFIP encouraged people to live in risk-prone areas, regardless of whether they were insured or not because some homeowners believed that they would still receive some governmental compensation.[187] In addition, the NFIP simply "lower[ed] the incentives to avoid risk . . . [which] arguably counteracts one of the original objectives of the NFIP, namely to minimize future flood damages and the corresponding need for federal disaster relief."[188]

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[182] Quynh T. Pham, *The Future of the National Flood Insurance Program in the Aftermath of Hurricane Katrina*, 12 CONN. INS. L.J. 629, 640 (2005) (finding "[i]n Louisiana, the percentage of homes affected by Hurricane Katrina that had flood insurance ranged from 57.7% in St. Bernard County to 70% in St. James County").

[183] King, *supra* note 179, at 10–11 (identifying the proportion of households inside and outside of the SFHA with flood insurance).

[184] *Id.* at 10 ("In the absence of flood insurance, the cost of repairing flood damaged property is usually borne either by the property owner from their own financial resources, or by federal relief payments instead of by flood insurance payments.").

[185] *Id.*

[186] *Id.* at 11.

[187] *Id.*

[188] *Id.*

C. Eastern Coast: Lessons from Superstorm Sandy

In October 2012, Superstorm Sandy became the second-largest Atlantic storm on record.[189] The government payouts under the NFIP totaled $8,702,594, 207.[190] However, similar to Hurricane Katrina, the total amount of premiums received in 2012 only equaled $3,341,335,762.[191] As a result, in January 2013, Congress increased the NFIP's borrowing authority by $9.7 billion, specifically from $20.7 billion to $30.4 billion.[192] The extensive damage highlights not only the importance of protective measures prior to a disaster, but also the need for NFIP reform.[193]

One of the main problems that Superstorm Sandy illustrated with the large debt, that the government acknowledged would unlikely be repaid in full, was the inaccurate premium structure.[194] In addition, both Hurricane Katrina and Superstorm Sandy brought to light that the program "encourages people to return, remain, and rebuild in unsafe areas—leaving them open to the next disaster."[195] Biggert-Waters, which was introduced soon after Superstorm Sandy, would have addressed this problem of rebuilding in flood-prone areas by specifically phasing out the grandfather provisions in order to have all homes reflect the true risk.[196] However, as discussed above, this reform was repealed and the inaccurate risk pricing remains.[197]

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[189] Virgil Henry Storr, Stefanie Haeffele-Balch, & Laura E. Grube, *Social Capital and Social Learning After Hurricane Sandy*, 30 REV. AUSTRIAN ECON. 447, 448 (2017).

[190] SIGNIFICANT FLOOD EVENTS, *supra* note 180.

[191] TOTAL EARNED PREMIUMS, *supra* note 2.

[192] U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-13-283, HIGH RISK SERIES 261 (2013).

[193] Knowles & Kunreuther, *supra* note 14, at 347 ("[S]andy was not the cause of reforms at the NFIP—it merely underlined the need for the reforms to be enacted.").

[194] Ben Berkowitz & Roberta Rampton, *Superstorm Sandy Will Test Federal Flood Insurance Program*, INS. J. (Nov. 2, 2012), https://www.insurancejournal.com/news/national/2012/11/02/269253.htm [https://perma.cc/X87T-AVBN] (stating that the premium structure of the NFIP was "woefully" inaccurate).

[195] Nicholas S. Bryner, Marisa Garcia-Lozano, & Carl Bruch, *Washed Out: Policy and Practical Considerations Affecting Return After Hurricane Katrina and Superstorm Sandy*, 3 J. ASIAN DEV. 73, 85 (2017).

[196] *Id.* ("Congress enacted the Biggert-Waters Flood Insurance Reform Act of 2012 . . . designed to phase out the grandfathering provisions and bring NFIP

In regard to the protective measures, Superstorm Sandy did influence homeowners not to simply rebuild homes, but to make flooding less likely to occur in the future. For example, in New Jersey, new or rebuilt homes must be elevated to a certain level determined by FEMA.[198] This is not only to protect homes, but also to protect homeowners financially because elevation lowers insurance rates.[199] One homeowner in New Jersey went from paying $2,200 per year for flood insurance to $600 per year after elevating.[200]

D. Texas: Lessons from the Most Recent Devastation of Hurricane Harvey

The most recent flooding in Texas with Hurricane Harvey in 2017 caused $125 billion in losses, making it the second most devastating storm in recorded history behind Hurricane Katrina.[201] Yet, only twenty percent of homes in the affected areas were insured.[202] A striking example of one of the lessons from Hurricane Katrina, the idea that risk aversion is lowered with the federal assistance, is revealed in the case of particular Houston homeowners. They bought flood insurance in 2013, but when the area's flood maps were redrawn in 2014 and their home was just barely in the flood zone, they decided not to continue owning a policy because "they didn't think they were

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policies in line with actuarial risk—a move that would eventually encourage retreat from the most flood-prone areas and coastlines.").

[197] *See* Section II.C.

[198] Jill P. Capuzzo, *Not Your Mother's Jersey Shore*, N.Y. TIMES (June 16, 2017), https://www.nytimes.com/2017/06/16/realestate/hurricane-sandy-rebuilding-jersey-shore-towns.html ("[P]eople building new homes or rebuilding damaged homes in designated flood zones are required to raise their houses to the base flood elevation determined for each community by [FEMA], plus one extra foot, as set by the New Jersey Department of Environmental Protection.").

[199] *Id.*

[200] *Id.*

[201] National Hurricane Center, *supra* note 4 ("For all United States hurricanes, Katrina (2005) is the costliest storm on record. Hurricane Harvey (2017) ranks second . . . .").

[202] Miriam Cross & Kimberly Lankford, *Disaster Relief*, KIPLINGER, Dec. 2017, at 24, 25 ("In Houston and nearbyareas hit by Harvey, most of the damage was caused by flooding from up to 50 inches of rain that poured down on the region for five days—and only about 20% of the flooded homes were covered by flood insurance.").

at risk."[203] Even homes that are legally required to have flood insurance because they are located in SFHAs were not all insured because the rule is not highly enforced.[204]

Another problem with the NFIP is highlighted by the case of homeowners who have decided that after the repairs are finished with their property, they will "move to an area that's less likely to flood in the future."[205] However, they still plan to rent out their flood property, making it a candidate for a repetitive loss property.[206] This repetitive loss problem requires the federal government to spend billions of dollars to repair houses that have flooded repeatedly.[207] For example, one house in Spring, Texas was repaired nineteen times, totaling $912,732 in cost despite the fact that it is worth a mere $42,024.[208] Strikingly, although this seems like a large economic waste and would be better spent relocating homeowners to safer ground, "for every $100 FEMA has spent to rebuild properties through the NFIP, a paltry $1.72 has been spent to help move people to higher ground."[209]

For the homeowners who were not insured, many of whom were in zones that were not expected to flood for 100 years, they may have only been entitled up to $33,000 in federal grants to repair their homes and replace possessions.[210] Even if the homeowners have insurance, they will still likely incur out-of-pocket expenses because

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[203] *Id.* at 26 ("Their next-door neighbors, Douglas Gana and Diane Gallo, bought their house in 2013—before the area's flood maps were redrawn in 2014 and put their house just barely in the flood zone. They didn't buy a policy because they didn't think they were at risk.").

[204] Heather Long, *Where Harvey is Hitting Hardest, 80 Percent Lack Flood Insurance*, WASH. POST WONKBLOG (Aug. 29, 2017), https://www.washingtonpost.com/news/wonk/wp/2017/08/29/where-harvey-is-hitting-hardest-four-out-of-five-homeowners-lack-flood-insurance/?noredirect=on&utm_term=.5cfaf3589d59 ("Legally, homeowners in places that FEMA designates as "high-risk" flood areas are supposed to have the insurance, but the rule isn't tightly enforced. Across the country, only 12 percent of homeowners have flood insurance, according to the Insurance Information Institute.").

[205] Cross & Lankford, *supra* note 202, at 27.

[206] *Id.*

[207] Walsh, *supra* note 71.

[208] *Id.*

[209] ROB MOORE, NAT. RES. DEF. COUNCIL, SEEKING HIGHER GROUND: HOW TO BREAK THE CYCLE OF REPEATED FLOODING WITH CLIMATE-SMART FLOOD INSURANCE REFORMS 4 (2017).

[210] Cross & Lankford, *supra* note 202, at 29.

the NFIP does not cover living expenses and the damage may have exceeded insurance payouts.[211]

Finally, as noted in Section II.C, Hurricane Harvey brought about NFIP debt relief, but it did not bring about a change in NFIP law.[212] A report by A.M. Best Co. Inc. concluded that the disaster relief does not include changes that would make the NFIP more sustainable in the future.[213] In particular, the report stated that:

> With the NFIP already $26 billion in debt, the bill's erasure of the $16 billion the program owes provides a temporary reprieve for its rapidly depleting emergency disaster accounts and keeps it from running out of money to pay for the anticipated deluge of claims from Hurricanes Harvey, Irma, and Maria . . . The new law does not include broader changes to the program that would make it more sustainable; hence, it is viewed by those who opposed it as nothing more than another taxpayer bailout of a failing government program.[214]

VI. The Argument for Privatization of Flood Insurance

A. NFIP Has Led to Suboptimal Long-term Results

Flood insurance should be left to the private sector in order for the insurance market to operate efficiently. To begin, the federal government should never have been involved in flood insurance in the first place because "a discretionary policy for which policymakers select the best action, given the current situation, will not typically result in the social objective function being maximized."[215] This result arises because people act according to expectations of future policy actions.[216] This can be seen when the government becomes involved in

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[211] *Id.*
[212] Gloria Gonzalez, *NFIP Bill Offers Debt Relief, Not Sustainability: Best*, BUS. INS. (Nov. 6, 2017), http://www.businessinsurance.com/article/00010101/NEWS06/912317060/NFIP-bill-offers-debt-relief,-not-sustainability-Best [https://perma.cc/B9W7-4ARS].
[213] *Id.*
[214] *Id.*
[215] Kydland & Prescott, *supra* note 133, at 473–74.
[216] *Id*. at 474.

flood control measures in order to keep houses from being built in floodplains.[217] Without government action, people will choose not to build in these areas because the future expectation is that the government will not protect these properties.[218] But if the government instead protects existing properties in the floodplains, even with a policy of restricting, but not prohibiting, future development, people will choose to live and build in these areas, acting on the expectation that the government will protect future buildings, like they are currently doing.[219] This in turn leads to the suboptimal long-term result of encouraging more building in floodplains.[220]

The NFIP has led to the same suboptimal result. Although Congress enacted the NFIP to encourage flood risk mitigation, it has encouraged development in flood risk areas.[221] However, if private insurers controlled flood insurance, their focus on profitability for setting rate premiums operates as a Pigouvian tax, internalizing a negative externality, a desirable feature of insurance.[222] This would encourage the optimal result of managing risk without adding to development of risk areas.

B. NFIP Rates Versus Private Rates

The federal government became involved in the flood insurance market because it believed that private markets would not insure the risk.[223] If private markets only offered limited insurance, then it would be seen as a market failure.[224] But the question is whether it is inefficient to provide unsubsidized, meaning more expensive, flood insurance for risky areas. The answer is no because

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[217] *Id* at 477.
[218] *Id*.
[219] *Id*.
[220] *Id*.
[221] Brannon & Blask, *supra* note 1, at 9–10.
[222] Ben-Shahar & Logue, *supra* note 74, at 612.
[223] STAFF OF S. COMM. ON BANKING & CURRENCY, INS. & OTHER PROGRAMS FOR FIN. ASSISTANCE TO FLOOD VICTIMS, 89TH CONG., A REPORT FROM THE SECRETARY OF THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT TO THE PRESIDENT, AS REQUIRED BY THE SOUTHEAST HURRICANE DISASTER RELIEF ACT OF 1965 (PUB. L. NO. 89-339, 89TH CONG., H.R. 11539, NOV. 8, 1965) 8 (Comm. Print 1966).
[224] Brannon & Blask, *supra* note 1, at 10 (market failure being "instances where a condition inherent in the structure of a market for a given good or service results in an inefficient outcome").

the limited obtainability and expense of flood insurance would accurately reflect the cost of living in flood prone areas, which would result in an efficiently operating market.[225] If insurance was prohibitively expensive, then people would relocate to a less risky alternative.[226] This relocation would not make the market inefficient, but instead would be considered efficient because the people who chose to continue to live in the risky areas would be paying the price that reflects the true risk.[227]

Furthermore, private insurance can utilize its contractual incentives to induce individuals who do want to remain in the high risk areas to engage in behavior that will protect themselves from future harm.[228] By offering lower rates for behaviors such as elevating homes, homeowners will decrease the likelihood of a future damage and large financial consequences for both themselves and the insurer.[229] Although protective measures are not required, "in regions in which these installations are cost effective, the premium discounts would more than offset the cost."[230] Considering the structural problems of the NFIP that have resulted in costs to society, there is no justification for the federal government intervening in the market.[231]

Moreover, as discussed above, coastal properties are more valuable than the average American property and those with waterfront properties tend to be wealthy.[232] A study by Omir Ben-Shahar and Kyle D. Logue that looked at government provided insurance data in Florida confirms that there is a strong positive correlation between subsidies and wealth, showing that wealthier households receive higher subsidies.[233] In a similar vein, another reason the government claimed the need to intervene in flood insurance was to provide subsidies to low-income and working-class people.[234] But, given that these subsidies are primarily helping the wealthy,[235] this argument is in direct contradiction to the population the subsidies aid. For example,

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[225] *Id*.
[226] *Id.*
[227] *Id.* ("Exposure to flood risk depends on one's choice of where to live, which means there is no 'market failure' argument to justify intervention.").
[228] Ben-Shahar & Logue, *supra* note 74, at 580.
[229] *Id.*
[230] *Id.* at 581.
[231] Brannon & Blask, *supra* note 1, at 11.
[232] Ben-Shahar & Logue, *supra* note 74, at 578.
[233] *Id.* at 579.
[234] *Id*. at 578.
[235] *Id.* at 608.

Ben-Shahar and Logue's study found that "[p]oor households are more often located in the low- or no-subsidy territories."[236] Notably, these territories tended to be located inland where there was less risk of flooding.[237] Lastly, the study concluded that because the subsidies were provided disproportionately to wealthy individuals, the subsidies were actually regressive,[238] which is in opposition to the argument of aiding the poor.

This is especially telling when compared to tornado insurance, which is not insured by the federal government.[239] Like hurricanes, tornadoes are disasters, and cause similar amounts of property damage.[240] Private insurance companies face the same problems insuring against wind damage that plague them when insuring against flood damage, namely that the riskiest properties are subject to high rates and thus it may result in individuals not being able to afford these rates and pulling out of the insurance market.[241] What is interesting however, is that the effects of tornadoes are localized, and while "vast areas are vulnerable to tornadoes, only a small area and number of people will be severely affected each year."[242] The difficulty in predicting precisely where a tornado will make landfall makes insuring tornadoes particularly challenging,[243] and consequently, private insurers invest much less in tornado modelling than in hurricane modelling.[244] In addition, insured losses are increasing in the insurance market.[245] Most importantly, most tornado damage occurs to manufactured or mobile homes, which are generally owned by low-income individuals, where-

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[236] *Id.* at 601.

[237] *See id.* at 600–01 (mapping percentages of subsidies in Florida and focusing on southern Florida, finding that lower subsidies are in low-income communities).

[238] *Id.* at 608 ("[W]ind insurance subsidies . . . accrue disproportionately to affluent households, and the magnitude of this regressive distribution is substantial.").

[239] Brannon & Blask, *supra* note 1, at 11 (comparing government insurance coverage in connection with flood and tornado disasters).

[240] *Id*.

[241] *Id.*

[242] TREVOR MAYNARD, NEIL SMITH, & SANDRA GONZALEZ, LLOYD'S, TORNADOES: A RISING RISK? 4, 18, 23–24 (2013) (also highlighting that "[w]ind-speed measurements are often not available for the hundreds of tornadoes that occur annually").

[243] *Id.* at 18.

[244] *Id.*

[245] *Id.* at 27.

as hurricane damage occurs to coastal property that is usually owned by wealthy individuals.[246] Yet, the federal government does not intervene in the tornado insurance market.[247] Therefore, the justification for the NFIP regarding aiding low-income individuals in the insurance market also fails.

Finally, comparing NFIP rates to private rates reveals the more accurate pricing of private policies. Because the NFIP prices rates using average annual loss of communities and not individual properties, the program "'undercharges 50 percent of its risks, and it overcharges 50 percent of its risks.'"[248] A study that analyzed NFIP and private rates for two counties in Texas found that the highest risk flood zones under the NFIP had higher premiums than what risk assessments indicated and that many property owners were undercharged because of inaccurate flood maps and risk aggregation rather than individualization.[249] The study concluded that insurance cannot aggregate risk, but rather it must determine the premium according to the specific property in question, which is what private insurers do.[250] Private insurers are also better equipped with the technology that exists today to accurately price flood risk, using probabilistic modeling and correct mapping as well as possibly diversifying risk with other insurance policies.[251] As a result, the private sector is better equipped to handle flood insurance by accurately pricing premiums and risk.[252] Even if this does increase rates for the high-risk properties, this is not a negative consequence because the NFIP is subsidizing people to live "in areas where Mother Nature clearly does not want them."[253]

C. Solution: Leave the Flood Insurance Market to Private Insurers

Seeing as the private insurance market is capable of handling flood insurance, the federal government should stop intervening in the market and the NFIP should be repealed. Although this may lead to rate

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[246] Ben-Shahar & Logue, *supra* note 74, at 578.
[247] Brannon & Blask, *supra* note 1, at 11 (stating that "the federal government does not offer insurance for other natural disaster risks," including tornadoes).
[248] Walsh, *supra* note 71 (quoting Craig Poulton).
[249] Michel-Kerjan et al., *supra* note 77, at 184.
[250] *Id*. at 197.
[251] *Id*. at 198.
[252] *Id.* at 192–94.
[253] Cottle, *supra* note 50.

increases,[254] as discussed above, this increase should not be seen as a detriment, but rather a necessity for an efficiently operating market. Political backlash, such as the backlash that occurred with the rate increases with Biggert-Waters,[255] is inevitable. But homeowners can seize control of their premiums by taking advantage of protective measures that decrease their current rates and their future risk of damage. Considering the argument that the NFIP is not an efficient economic solution to the problems of insuring against flood damage, there is no reason to further increase the debt of the country. By leaving flood insurance to private companies, individuals can choose whether to pay higher rates or take protective measures to decrease the amount of future damage or simply move to higher and less risky ground.

VII. Conclusion

As Congress cautioned in 1966, "[a] flood insurance program is a tool that should be used expertly or not at all. Correctly applied, it could promote wise use of flood plains. Incorrectly applied, it could exacerbate the whole problem of flood losses."[256] By eliminating the NFIP, there will no longer be an incentive for homeowners to build and live in areas that are at a high risk of flooding. Private insurance will increase rates, which may make it politically difficult, but this is necessary in order to match premiums with risk. For an effective economy, these need to be equal, at least in the realm of flood insurance, otherwise taxpayers are subsidizing homes that should never have been built in the first place. American taxpayers across the country should not become drenched in the aftermath of a disaster in one particular flood-prone community because of the inefficiency of the NFIP.

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[254] Michel-Kerjan et al., *supra* note 77, at 192.
[255] *See generally* Vazquez, *supra* note 6 at 121–23 and accompanying text.
[256] H.R. DOC. NO. 465, at 17 (1966).