

The 30th Anniversary of Hurricane Andrew: Evolution of the Florida HO Market

Abstract:

Hurricane Andrew made landfall in Homestead, Florida as a category 5 hurricane on August 24, 1992. This 30-year anniversary review examines the changes within the Florida and coastal United States homeowners insurance markets. We review market changes specifically related to market concentration, risk pricing, and volatility. We find that most states have become less concentrated since the early 1990's. We also find that risk pricing has changed since Hurricane Andrew with the creation of a new catastrophe market where insurers rely on catastrophe models to help price catastrophe-prone risks. Finally, we see that most states did not experience much volatility over the 30 years following Hurricane Andrew, with Florida being an exception. This is most likely due to the large population growth, increase in fraudulent claims, and high litigation costs. Overall, Hurricane Andrew changed how the insurance industry viewed catastrophic events and thus changed how they manage, model and price catastrophe-prone areas.

I. Introduction

Hurricane Andrew made landfall in Homestead Florida on August 24, 1992, as the first named storm in the 1992 hurricane season. Hurricane Andrew was a category 5 hurricane at landfall with 1-minute sustained winds of 165 mph (Landsea et al, 2004). This made Andrew only the 4th CAT 5 hurricane to make landfall in the United States.

It is difficult to overstate the impact of Hurricane Andrew. In 1992, the loss ratio in the homeowners line of business in Florida was 1,010%, meaning that homeowners insurers in the state of Florida paid \$10.10 in claims for every dollar of premium collected that year. The losses suffered were greater than the sum of the previous 10 years of Florida homeowners premiums. To generate a 1,010% loss ratio in Florida homeowners in 2021, insured losses would have to have been greater than \$97B.

Hurricane Andrew shifted the paradigm of the insurance industry. Homeowners insurance was previously believed to be a profitable and stable line with low volatility; however, after Hurricane Andrew, insurers began to think of property insurance in terms of catastrophe-prone and non-catastrophe-prone areas. Homeowners insurers in catastrophe-prone areas faced higher loss ratios with high volatility. To counteract this, insurers began relying on a new tool, catastrophe modeling, to better predict how a catastrophic event would impact their profitability.

As we have reached the 30th Anniversary of Hurricane Andrew, other catastrophe prone areas may learn some lessons from Hurricane Andrew and its aftermath. First, communities in catastrophe prone areas must focus on stronger building code enforcement to reduce future structural damage. Stronger building codes have been effective in reducing the severity of expected losses for future storms in Florida. Insurers must also rely on catastrophe models to better predict future losses. The catastrophe modeling industry which grew out of the Andrew experience has helped the entire industry across coastal and non-coastal states alike.

As we reflect on the evolution of the Florida market in the 30 years since Hurricane Andrew, there are some positives, but also a very strong cautionary tale for other catastrophe-prone states. Florida has experienced population growth in catastrophe exposed areas. Insurers practicing exposure management can leave some areas underserved by the private insurance market. Ineffective regulatory and legislative interventions can lead to market disruptions and long-term market instability. As experienced in Florida, fraud may become rampant as individuals and third parties look to capitalize on opportunities for fraud that may be present in contract language, court decisions, legislation, or regulatory oversight.

The literature surrounding catastrophic events has become expansive since Hurricane Andrew. We contribute to the strand of literature related to insurer profitability and solvency in catastrophe prone areas. As mentioned, Hurricane Andrew shifted the insurance industry and created a new focus on catastrophe areas. Cummins et al. (2002) posed the question “Can

insurers pay for the ‘big one’?” and find that if many insurers were to face large widespread mega catastrophes then they would become insolvent as losses would exceed reserves. This would cripple the entire insurance industry as the remaining solvent insurers would need to raise premiums and reduce exposures creating supply constraints. The current Florida market is struggling due to inadequate premiums and availability issues due to recent frequent and severe hurricanes, as well as and fraud. There has been a shift from reliance on a primary insurance market to reliance on the residual market (Citizens) for insurance in the state.

Prior literature has examined individual insurer response to catastrophic events. Born and Viscusi (2006) was one of the first papers to examine the response of homeowners insurers to unexpected and/or “blockbuster” catastrophes. They find that insurers respond with rate increases; however, if the event becomes too widespread within one specific state, then the insurer may respond by reducing coverage or exiting the state. We see this dynamic in the Florida homeowners insurance market. Homeowners insurers have faced widespread catastrophic property claims from hurricane and fraudulent activities. These events have become so widespread that some insurers are struggling to remain solvent, while others have decided to completely exit the Florida homeowners insurance market. This is documented in the analysis below as hundreds of insurers have entered and left the Florida market since Andrew.

Finally, the Florida market has become rampant with fraudulent claims activities. Boyer and Peter (2020) find that adverse selection increases insurance fraud in the economy. When insurers have access to less information it results in high levels of cross-subsidization between risk classes. This may be a reason that we see such high levels of fraudulent activity in Florida. Insurers are unable to charge actuarially fair premiums in high-risk areas and thus lower risk individuals are also facing higher premiums. If this is the case, it could be that the lower risks individuals are more willing to file fraudulent claims. This over time becomes a revolving cycle in which more fraudulent claims increases insurance premiums across the state resulting in higher premiums overall for all risk classes. We will further discuss this concept in our conclusion as an area for further research.

The remainder of our paper proceeds as follows. In Section II we provide information on how the homeowners insurance market has changed since Hurricane Andrew. Section III contains information on our data sources and important filters used for our analysis. In Section IV we compare changes in the homeowners insurance markets across the entire United States. In Section V we discuss the changes in the Florida homeowners market. We conclude in Section VI and describe further areas of research.

II. Market Changes Since Hurricane Andrew

The homeowners insurance market today has drastically evolved since Hurricane Andrew 30 years ago. In this section we review major changes in population concentration, insurance modeling, and global reinsurance supply. We discuss market changes since Hurricane Andrew

related to Florida insurers due to regulation, legislation, litigation, and fraud. We conclude this section discussing the insurance market in Florida compared to other coastal states.

i. Population Growth and Housing Values

There are a variety of external forces that have been acting on the Florida homeowners market for quite some time, one of the major forces being growth. Since Hurricane Andrew, the population in the state has grown from roughly 13.5 million to over 21.6 million Floridians.¹ Clearly, Florida's catastrophic risk exposure has not served as a major deterrent to population migration. That 59% increase is double the rate of increase in the US population in general.

Furthermore, that growth is not uniform throughout the state. Approximately 98% of that growth has occurred in coastal counties, which has led directly to the growth in insured coastal property values. AIR (2018)², now known as Verisk, estimates the coastal insured property values in Florida between \$3.9 and \$4.5 trillion. The only state that comes close to this coastal exposure is New York, with similar value estimates but far less risk of hurricane activity. Given the recent increases in construction costs, these estimates are likely understated.

On its own, this growing coastal exposure greatly increases hurricane risk in Florida. Unfortunately, hurricane activity has increased as well. Exhibit 1 is the graphical representation of the last 100 years of storm paths over Florida. Twenty-five major hurricanes (categories 3, 4, and 5) have made landfall in the last 100 years, with 44% of those hurricanes occurring within the last 25 years.³

Not only has Florida seen an increase in catastrophic hurricanes, but improvements in technology, building materials and methods, and building codes have increased the cost of construction. These changes have mitigated the severity of the potential storm damage, but have increased reconstruction costs, contributing to the overall increase in insured values in catastrophe prone areas.

Insert Exhibit 1

ii. Catastrophe Models

One of the most significant responses to Hurricane Andrew was the creation of the catastrophe modeling market. Catastrophe models have been around since the 1980's, but

¹ Source: US Census Bureau, accessed 7/15/2022

² The Coastline at Risk. *Verisk Analytics*. <https://www.air-worldwide.com/models/tropical-cyclones/The-Coastline-at-Risk/>, accessed 07/15/2022

³ 25 'major hurricanes' impacted Florida in the past 100 years. *News4Jax*. <https://www.news4jax.com/weather/2019/08/30/25-major-hurricanes-impacted-florida-in-past-100-years/>, accessed 07/15/2022

Hurricane Andrew revealed the need for a more stochastic approach to loss analysis, to arm insurers with better estimates of the potential financial impact of large storms.

In 1995, the Florida Legislature voted to create a group responsible for reviewing hurricane loss models to be used in the development of residential property insurance rates. The Florida Commission on Hurricane Loss Projection Methodology was launched in response. The Commission contains twelve members who vote to approve catastrophe models for use by insurers in the state.⁴ These twelve members include insurance consumer advocates, senior employees from the Florida Hurricane Catastrophe Fund (often referred to as the Cat Fund, which acts as a state-run reinsurer), the director of Citizens (the residual market insurer in Florida), as well as various experts in actuarial science, finance, statistics, meteorology, computer systems, and engineering. The latest legislation related to catastrophe models was passed in 2014 when the Florida Legislature voted to expand the catastrophe models to include flood loss models to estimate residential flood losses.

The key metrics provided by the catastrophe models include the Exceedance Probability Curve (EP), the Probable Maximum Loss (PML), and the Average Annual Loss (AAL). These specific outputs are used for underwriting and ratemaking when considering the catastrophic event load an insurer might face.

As the climate is evolving, the models are constantly being updated to predict losses due to hurricanes and other severe weather events. Since Hurricane Andrew the catastrophe modeling market has grown significantly, with new models being created for earthquakes, severe convective storms, and man-made disasters. Following Hurricane Katrina in 2005, the models were updated to include secondary events (such as flooding) which could result from these primary catastrophic events.⁵ While there is no sure way to predict when and where a catastrophic natural event will occur, the catastrophe models provide an insurer with insight into their prospective risk allowing them to set adequate rates and better manage their exposure and solvency risk.

⁴ At this time, the commission has approved seven catastrophe models which can be used to justify Florida rates. The accepted models include: AIR Worldwide Corporation, Applied Research Associates, Inc., Florida Public Hurricane Loss Model, Karen Clark & Company, Impact Forecasting, CoreLogic, Inc., and Risk Management Solutions, Inc.

⁵ As reported by the NAIC, catastrophe model vendors began using advanced technology to predict the probability of loss events in the early 2000's. Following Hurricane Katrina, the models included both primary and secondary events. <https://content.naic.org/cipr-topics/catastrophe-models-property> , accessed 07/07/2022

iii. Bermuda

Hurricane Andrew also transformed Bermuda, from an extension of the U.S. insurance market to a hub for global supply of reinsurance⁶. Less than two years after Andrew, eight new catastrophe reinsurers took up residency in Bermuda. These companies set a new bar regarding strength and quality of capitalization. Eventually, these companies and their successors contributed to the development and broad use of catastrophe modeling, which in turn opened the door to Insurance-Linked Securities (ILS) as an alternate form of catastrophe loss funding.

iv. Market Actions & Reactions

Hurricane Andrew and the series of seven storms to make landfall in Florida in 2004 and 2005 prompted several actions from insurers, regulators and legislators that led to drastic market changes in Florida.

a. Insurers

In the 1990's, the large national insurers which dominated the Florida homeowners market began to reduce their exposure in high-risk areas. They did this in two main ways. First, they reduced their exposure directly by reducing their portfolio of properties in Florida in general, and in coastal areas specifically. Second, they formed Florida specific "pup" companies. By forming and capitalizing pup companies, the national insurers could protect their parent company surplus from substantial losses in Florida. If a storm occurred and losses exceed the surplus of a pup, the parent company could choose to let that pup go insolvent. State Farm and Allstate are examples of national insurers who chose to form pups, creating State Farm Florida and Castle Key, respectively.

In addition to the national insurer pups, new insurers formed in Florida to provide the insurance that national insurers were no longer willing to write. These new insurers became known as Florida Domestic insurers. These insurers tended to be smaller, less diverse companies⁷ which relied more heavily on reinsurance and capital market solutions to bear the risk of storms in Florida.

All insurers writing in the state, both national and domestic became heavily reliant on catastrophe models to understand their risk exposure and properly manage their books of business. These models often indicated that rates needed to be materially higher and that additional capital was needed to support the exposure.

⁶ Andrew made Bermuda a global center for property reinsurance. *Business Insurance*. <https://www.businessinsurance.com/article/20220712/NEWS06/912350962/Hurricane-Andrew-made-Bermuda-a-global-center-for-property-reinsurance-Florida> , accessed 07/12/2022

⁷ Minimum capital requirements were in the \$10-\$15M range.

b. Regulators and Legislators

Following nearly \$35 billion in insured losses suffered during the 2004-2005 hurricane seasons, insurance rates in Florida increased due in part to reinsurance costs and increased expectations of the magnitude of potential future losses. In 2007, Governor Charlie Crist called a special session of the Legislature to address rising insurance costs. The result was HB 1A (2007), which rolled back the rates charged by Citizens, changed the requirements for policyholders to qualify for a Citizens policy, instituted mandatory discounts for mitigation features on homes in the private insurance market, and established a mitigation program, My Safe Florida Home (MSFH). Citizens was no longer the insurer of last resort, but a competitor in the primary homeowners insurance market.

The passage of HB 1A (2007) caused critical rate adequacy concerns, due at least in part to the mandatory discounts applied to homes which passed an inspection verifying a specified level of hurricane protection. These discounts effectively resulted in an overall reduction of rates. HB 1A (2007) also caused more policyholders to move to Citizens, driving a peak in volume in 2011 with nearly 1.5 million policyholders.

Since that time, most actions by regulators and legislators have been in support of protecting the solvency of the private insurance industry in Florida. The regulators and legislators have supported incentives for more domestic insurer formation which resulted in an overall supply boost. They have also made attempts to address market problems (e.g. SB 408 and sinkhole claims) and grant rate increases to gird solvency. Even with these changes, however, the lasting effects of HB 1A (and the Citizens "glidepath"⁸) can still be seen today as Citizens rates remain below actuarially adequate levels in many areas of the state.

v. Litigation & Fraud

The last market dynamic Florida faces is a significant increase in litigation and fraud. According to a recent report delivered to the Florida Legislature⁹, "In 2019 alone, Florida insurers paid almost \$3 billion in lawsuit costs that translated into higher premiums for insureds." That hidden litigation tax was about \$680 per family in 2020, according to that same report, which went on to say, "this represents an expense load of 17% (and rising) ...for insurers in Florida compared with other catastrophe-prone states."

⁸ Citizens was prevented from raising rates more than 10% a year to individual policyholders. A new law (SB 76) gradually increased that cap by 1% each year from 2022 to 2026 for an end total cap of 15%. <https://wusfnews.wusf.usf.edu/economy-business/2021-12-15/citizens-wants-to-raise-its-property-insurance-rates-by-double-digits-next-year> , accessed 07/07/2022

⁹ Florida's P&C Insurance Market: Spiraling Toward Collapse, Guy Fraker, cre8tfutures Advisory, 2020

Further, a report from the Florida Office of Insurance Regulation¹⁰ (OIR) found that while Florida homeowners claims represent just 8% of the national claims, Florida homeowners-related litigation represents 76% of all such litigation in the entire nation. Many of these litigated claims are fraudulent, and many of them serve to enrich others rather than indemnify the plaintiffs. According to the Florida OIR, \$51 billion in litigation settlements was paid by the Florida insurance industry over the latest 10-year period and “71 percent of the \$51 billion went to attorneys’ fees and public adjusters while only 8% went to claimants.”¹¹

The vast majority of fraudulent claims are taking place with respect to roof replacement. As such, legislative fraud mitigation efforts have been focused very specifically on some of the key enablers of this fraud activity. The most notable areas of fraud activity can be seen in Table 1.

In sum, the weight of catastrophic exposure, litigation, and fraud have caused Florida consumers to pay among the highest homeowners insurance rates in the country. According to the Insurance Information Institute (III), “an average Florida homeowners insurance policy will skyrocket to \$4,231 in 2022, nearly three times more than the U.S. annual average of \$1,544.”¹²

Insert Table 1

vi. Effects on Florida Homeowners Market

The effects of all of these forces acting on the Florida homeowners insurance market have been three-fold. First, the market has undergone a transformation. What once was a market dominated by a few large national insurers, is a market dominated by smaller, more thinly capitalized, less diverse insurers (geographically and in terms of product offerings) that are more reliant on reinsurance and capital markets to remain adequately capitalized for the amount of risk they assume. This transformation has led to an extremely fragile homeowners insurance market. Much of this fragility was hidden by a lack of storms from 2006-2016. It appears that private insurers in Florida were able to survive storms or fraud, but not both. These two combined forces have led to five insolvencies in 2021/2022 (as of 8/24/22) and numerous insurers refusing to write new business in Florida.¹³ This leads to substantial uncertainty going forward regarding the stability of the private property insurance market in Florida. One bad

¹⁰ Letter from Florida Insurance Commissioner David Altmaier to Florida House Commerce Committee Chair Blaise Ingoglia, April 2, 2021
<https://www.insurancejournal.com/app/uploads/2021/04/Florida-OIR-Report.pdf>

¹¹ Florida Lawmakers to Reconvene May 23 to Address Property Insurance Crisis, JDSupra, 5/2/22
<https://www.jdsupra.com/legalnews/florida-lawmakers-to-reconvene-may-23-4203530/>

¹² Triple-I: Extreme Fraud and Litigation Causing Florida’s Homeowners Insurance Market’s Demise, Insurance Information Institute, June 23, 2022
<https://www.iii.org/press-release/triple-i-extreme-fraud-and-litigation-causing-floridas-homeowners-insurance-markets-demise-062322>

¹³ St. Johns, Avatar, Lighthouse, Southern Fidelity, and Weston have all entered liquidation in 2022 (<https://figafacts.com/category/insolvency/>, accessed 8/24/22).

storm year could lead to significant insolvencies and further destabilization of the market. In the aggregate, Florida is a radically different homeowners market now than it was when Hurricane Andrew made landfall. While many of these changes have been unique to Florida, and Florida is unique in its exposure, the Florida market as it has come to be, represents a cautionary tale for other catastrophe prone states.

vii. Other Coastal State Responses to Catastrophic Hurricanes

Comparing other coastal states to Florida should be done cautiously. Relative to any other state, including other coastal states, Florida is uniquely exposed to hurricane risk. Due to its shape and location on the southeast corner of the United States, Florida has more hurricane exposure than any other state. According to the NOAA, the Florida coastline measures 8,436 miles which is 9% more than the next-largest hurricane-exposed state, Louisiana. After that, the coastlines of the other Atlantic and Gulf coast states drop to less than half of the top two states.¹⁴

Given its peninsula shape, the Florida populace is uniquely proximate to the coast from anywhere in the state. A recent study by the Insurance Information Institute (III) showed that Florida has the highest number of single-family homes at risk of hurricane damage¹⁵, as well as the highest value-at-risk for single family homes¹⁶. This holds for any magnitude of hurricane. Using a category 3 hurricane as an example, Florida has 1.8 million single-family homes at risk of damage should such a hurricane strike Florida. This is almost three times the next highest state of Louisiana with about 640,000. Similarly, in the event of a category 3 hurricane, the projected value-at-risk for single-family homes in Florida is over \$372 billion, whereas Louisiana is roughly 40% of that at just under \$158 billion.

While care needs to be taken with comparisons, there are lessons that can be learned from the varying responses. Mississippi, and Louisiana¹⁷ also have large hurricane exposures but did not follow Florida's regulatory approach of mandatory discounts in 2007's HB 1A. In Florida, the mandatory mitigation credits exacerbated the actuarially inadequate rate levels for better-mitigated homes. The unintended outcome was that providing coverage for the less mitigated homes was economically wiser for private insurance companies than insuring the wind-mitigated risks. In contrast, Mississippi and Louisiana deployed a risk-based pricing approach. Insurers were able to charge actuarially adequate rates, ordinate to the risk of each policy. This expanded the private market in those states, whereas Florida's HB 1A expanded the reliance on the state. This led to structural differences in the homeowners insurance markets in these states documented in section IV.

¹⁴ See Appendix 1 for additional information about state coastline size

¹⁵ Table: Number of single-family homes at risk by storm category. <https://www.iii.org/publications/a-firm-foundation-how-insurance-supports-the-economy/a-50-state-commitment/catastrophes-by-state>

¹⁶ Table: Reconstruction cost value of single-family homes at risk. <https://www.iii.org/publications/a-firm-foundation-how-insurance-supports-the-economy/a-50-state-commitment/catastrophes-by-state>

¹⁷ For more information about the responses of each state see Medders et al. (2015) and Ubert (2017)

III. Data

Section IV focuses on detailed analysis of the homeowners insurance market by comparing the Florida market to the rest of the United States. We utilize data from the NAIC statutory filings for years 1984-2021. We examine every insurance company which writes homeowners insurance premiums above \$1,000,000 in each state, in any given year.

Section V focuses solely on a detailed analysis of the Florida homeowners insurance market. We utilize a data set from the Quarterly and Supplemental Reporting System (QUASR)¹⁸ provided by the Florida Office of Insurance Regulation.¹⁹ Our data set contains reporting years 1996-2020 with direct premiums written of over \$5,000. From 1996-2007 Florida collected data from all insurance carriers operating in the state including exposures, direct premiums written, and policies written. Following 2008, QUASR began collecting data related to direct premiums written, exposures, and policies written, bifurcated by those with and without wind peril coverage. We provide detailed analysis of the wind exposure where necessary. It is important to note that starting in 2014, State Farm, one of the largest insurers by market share in the Florida homeowners insurance line, reported policy information to QUASR as “trade secret” citing concern that reporting that data revealed proprietary information. Since then, various insurers have followed suit, with a substantial number of insurers reporting as trade secret after 2018. The companies that report as trade secret are not included in the QUASR data made available. We have added a line demarcating 2018 on all figures using QUASR data, to identify where the data may be affected by the lack of reporting.

For both data sets we utilize the following insurer type definitions:

- i. *Domestics* – Insurers domiciled in the state where they are writing insurance coverage. For Florida analyses we use a more detailed definition of domestics:
 - a. *Florida Focused Domestics* – Insurers domiciled in the state of Florida, writing 75% of their total direct premiums written in the state of Florida.
 - b. *Florida Diversified Domestics* – Insurers domiciled in the state of Florida and part of a group which writes 75% or less of their total direct premiums written in the state of Florida.
- ii. *Pup* – Insurers who are part of a larger group, but are designed to operate in a specific state (For Florida analyses there must be over 75% of direct premiums written in the state of Florida).
- iii. *National* – Insurers not identified as domestics, pups or Citizens are considered national insurers.

¹⁸ QUASR data is available at <https://apps.fldfs.com/QSRNG/Reports/ReportCriteriaWizard.aspx>.

¹⁹ For Florida QUASR analysis we use HO-3 data, which contains only policy type “Homeowners (Excl Tenant and Condo)” for data years 1996-2008 and “Personal Residential – Homeowners (Excl Tenant and Condo) – Owner Occupied” for data years 2009-2020. QUASR reporting data changed policy type naming conventions in 2009.

- iv. *Citizens* – Florida’s FAIR plan which provides insurance for those who cannot find insurance in the primary market. Citizens was founded in August of 2002.

It is not uncommon for insurance companies to create subsidiaries to shield the parent company from excessive risk. Strategic reasons to create Pups include onerous regulatory environment as well as high levels of catastrophe risk. Similarly, state-specific Domestic may also be more common in cat risk areas. If there is reason to specialize in a specific peril-state combination, companies will set up as a single-state writing company (Domestic), with a strategic focus on that market and its unique perils. Given the rationales for their use, Pups and Domestic are somewhat more common in coastal states, largely due to the hurricane exposure, but also given regulatory conditions in several of those states.

IV. Private Homeowners Markets Comparisons across the United States

This section provides a detailed analysis of the homeowners insurance market across the United States as compared to Florida. This analysis allows us to better understand how Florida differs from other states. We will examine market structure and concentration, changes in premium, and insurer profitability.

i. Incentives to Mitigate

In this section, we offer a survey of the various coastal state responses to hurricane exposure. Each of the states has a residual market mechanism of some sort, structured to both mitigate hurricane risk and transfer it. The coastal states analyzed include: Texas, Louisiana, Mississippi, Alabama, Florida, Georgia, South Carolina, North Carolina, and Virginia. There are some characteristics across the states which are similar, and some unique. The categories of incentives include discounts, tax benefits, credits for building code compliance and certifications, and mitigation grants.

a. Discounts

A common discount is for hurricane risk mitigation features of homes and is generally only available for homes located in targeted coastal geographies within the state. In some states, such as Louisiana, the discounts are granted when a homeowner builds or retrofits their home to comply with contemporary coastal building codes. In other cases, roof characteristics and opening protections qualify. Following is a sampling of some of these characteristics:

- roof bracing
- secondary water barriers
- opening protection

- roof covering and roof covering performance
- window, door and skylight strength
- “other mitigation improvements and/or construction techniques that the insurer may determine to reduce the risk of loss due to wind”

These discounts can vary across qualifying counties, construction type, and policy form. The discounts range from as low as 3% to over 20%.

As previously discussed, the passing of Florida HB 1A (2007) created state mandated premium credits if an insured location passed the inspection. Other non-hurricane states have implemented similar programs to encourage individual mitigation efforts. California recently introduced “Wildfire Prepared Home”²⁰ in 2022 which requires homeowners to pass a wildfire inspection to get a “Wildfire Prepared Home” or “Wildfire Prepared Home Plus” designation. This information is shared with California insurers but, unlike Florida, there is no mandatory credit required on the policy.

b. Tax Offsets

Louisiana is the only state which offers tax benefits or offsets to homeowners who pay for mitigations to their home. There are two types of tax benefits available, the first of which is a state tax deduction for mitigation expenses. The homeowner can claim a deduction equal to 50% of the cost incurred, less any other tax incentives offered by other state, municipal or federal incentives, up to a maximum of \$5,000.

The second tax benefit in Louisiana, comes in the form of exclusions from state and local use taxes for the purchase of storm shutter devices for protection from hurricane damage.

c. Building Codes and Certifications

The Insurance Institute for Business & Home Safety (IBHS) promulgated and published building code characteristics which garner various levels of “Fortified” certification. These certification levels are used by the states to provide discounts to owners of qualifying homes. Utilization of IBHS certifications are used by most of the states in our study to provide discounts, with the exceptions of Texas and Florida.

The IBHS certification levels come with graduated discounts. In North Carolina, for example, the lowest discount is for a certified *existing* roof, with the base level certification for a *new* roof getting a slightly higher discount. There are silver and gold levels for each, with incrementally higher savings. The highest discounts go to the *Fortified for Safer Living* designation. All discounts in North Carolina also vary by coastal territory, peril and construction type.

²⁰ For additional information see <https://wildfireprepared.org/about/>

Not all states use such a discrete segmentation of discounts. Mississippi leverages the IBHS designation levels, but provides a flat discount based on those levels, with no variation across coastal territories, perils or construction.

d. Mitigation Grants

Alabama and South Carolina are the only two states which offer grants for wind mitigation on existing single-family homes.

Funding for the Alabama program comes from the insurance industry in Alabama; it does not draw from the state's general budget, and is not part of any federally funded program. Grants in Alabama pay all of the cost of mitigation, up to a maximum of \$10,000. The mitigation work must satisfy the FORTIFIED™ Roof or Silver standard ratings from IBHS to qualify.

In South Carolina, the *South Carolina Safe Home* program provides matching and non-matching mitigation grants. Eligibility is needs-based, and the program provides up to \$4,000 in matching grants, or \$5,000 in non-matching grants.

ii. Number of Companies and Their Structure²¹

Pup utilization, as shown in Table 2, has decreased across the U.S. since the era of hurricane Andrew (1992) from 5.7% to 3.5% of companies writing in the average state. Coastally, pup use dropped from 2.1% to 1.3% of companies writing in those states. However, there is a distribution around that change with some states increasing and others decreasing use. Uniquely, Florida stands out as a state which has seen an enormous increase in the use of pups – from 3.2% of companies operating in Florida in 1992, to 15%. This nearly 5-fold increase was higher than any other coastal state, and highest in the country. There is only one state with higher 2021 utilization (CA at 15.5%), but no other state increased pup use more in this period of time.

Insert Table 2

The use of domestic companies to write business in the U.S. has increased nominally from 1.7% of companies in an average state to 1.9%. The coastal states have hardly moved, from 0.4% of their writing companies in 1992 to 0.5% in 2021. Although the base is small, the distribution of domestic companies in Florida increased materially (166%) from 1992 to 2021. In 1992, at 1.1%, Florida had the 18th highest distribution of domestic companies of any state. By 2021 that figure

²¹ Unless otherwise noted in the text or chart, residual markets, including Citizens, are not included in this analysis. The comparison across states is for private insurers. Unlike Citizens, most residual markets do not file NAIC annual statements.

rose to 2.8%, representing the ninth highest in the country. Like pup use, the prevalence of Florida's domestic companies increased more than any other state.

Insert Table 3

iii. Market Concentration

The US homeowners insurance market has seen a material reduction in market concentration which manifests in the form of a contraction in the Herfindahl-Hirschman Index (HHI) over time. With the exception of a period in the 1990's, the HHI has generally decreased throughout the timeline of this study. In 1984, the median HHI was sitting at 0.10, which is the top of what is considered low concentration. The 3rd quartile of the states was comfortably within the moderate concentration range of 0.10 to 0.18. The fourth quartile, however spanned from moderate to fairly highly concentrated (above 0.35). This group tends to include the smaller states (e.g., AK, WY, UT, DE), which is perhaps more a reflection of market size than anything else. Meaning, Alaska does not attract a lot of competitors. In 1984, both the average coastal state as well as Florida specifically were around or slightly below the 2nd quartile.

Insert Figure 2

Beyond the mid-1990's, all states experienced a downward trend in HHI (decreasing concentration), as well as a contraction in the range of the HHI value, representing growing consistency across states. By 2021, the top of the range dropped from 0.374 (AK) to 0.163 (AK), the 3rd quartile had fallen below 0.10, and the bottom of the 2nd quartile was almost half of that. The coastal states have tended to oscillate around the median, while Florida plummeted to 0.035. Only CT (0.024) and MA (0.024) were lower.

In addition to the large number of Domestic, the dynamic in Florida is unique, in that Citizens, the state's "insurer of last resort", has historically had significant market shares²². Including Citizens in 2021 would increase Florida's HHI 37% to 0.048. Including Citizens in 2011, at the peak of volume for the company, would increase the HHI by almost 250%, from 0.0419 to 0.1039. That would place FL above the coastal state average and in the 3rd quartile nationally. While low concentration is generally a favorable competitive trait, the volume of business written by Citizens in any given year is a key part of the story.

In addition to the intermittent dominance of Citizens, the cast of companies writing in Florida has been a revolving door. From 1984 to 2021, 370 different companies have written

²² The comparisons in this section do not include Citizens data. While Citizens does report their data to the NAIC, no other state residual markets do so. Therefore, including Citizens would not be an "apples to apples" comparison across state markets.

homeowners business in Florida. On average in any given year 103 companies vie for Florida homeowners business, from a high of 126 in 1999 to a low of 90 in 1984. However, only 8 companies writing business in Florida in 1984 are still doing so in 2021. Many of the companies that have operated in Florida do not last long enough to build material market share. Thus, the low market concentration is due as much to market churn as it is to the intended *market of last resort* (Citizens) intermittently being a *market of first resort* in the state.

Insert Figure 3

It would be very reasonable to expect the Florida homeowners market behavior to be similar to other coastal markets. Consolidating the HHI view to coastal, non-coastal and Florida, illustrates how very differently the Florida competitive market has behaved since the early 1990's. The coastal states have not actually seen competitive environments materially different than non-coastal states, and since 2015 look comparable.

Insert Figure 4

Focusing solely on the coastal states (inclusive of Florida) shows that pre-1992 the Florida market behaved similarly to the other coastal states. Post-1992, Florida spiked and then began what has been a consistent decent to among the lowest market concentrations in the country.

iv. Premium

Insert Figure 5

Insert Table 4

Growth in year-over-year (YOY) direct premium written across most states is not particularly volatile. The ebb and flow of hard and soft markets, extreme events such as the 2001 terrorist attack, the Great Recession and wind/hail weather pattern changes mentioned earlier are the more notable dynamics and events causing some oscillation in premiums over time. Focusing on the coastal and non-coastal states above, the average annual increase in premium was 4.4% for coastal states and 3.3% for non-coastal states.

Florida, however, is in a small group of states with extreme levels of volatility. As can be seen by simple visual inspection in the graphic above, Florida's historical premium changes are very different relative to the coastal and non-coastal cohorts. The state's average annual change in premium was 6.3%, which is 42% higher than other coastal states, and 92% higher than non-coastal states. Florida ranks 2nd in highest average change per year, holds the 3rd highest YOY change out of any state in any year during the study, and is the 3rd most volatile, as measure by standard deviation of premiums YOY.

In most if not all other markets, the changes in premium are driven mostly by changes in rates charged, with exposure growth contributing over time. In Florida, the volatility in premium growth patterns is driven by increases in premium and exposure, but also by material numbers of

companies entering and leaving the state. As such, the extreme ends of the range (+38.6% in 1995, -15.3% in 2008) are an illustration of the churn in companies writing in Florida, rate increases and, in the case of 2008, the mandatory mitigation discounts and policyholders moving to Citizens.

Insert Figure 6

The net increases over time can be best seen by indexing the premium changes across all states to the initial year in the experience period (1984). As shown above, until roughly 1994, premium increases across states were fairly homogeneous. Coastal states started to diverge from non-coastal states in rate of increase around 1990, at roughly a 1-point/year clip. Starting in 1995, Florida saw materially different aggregate premium growth that not only continues but accelerates in the early 2000's and again recently. In total, since 1992, non-coastal states' premium has increased 1.7-fold. For coastal states it is 2.5-fold, and for Florida it is 4.7-fold.

Citizens data are not included in this dataset, thus when the market shifts and material premium flows to Citizens, it appears here as a decrease in premium. Contrarily, when Citizens depopulates that will look like an increase in premium volume.

v. Profitability

To evaluate insurer profitability, the combined ratio (loss ratio + expenses ratio) is usually the best measure, but expense ratios are not typically dynamic year-to-year. Thus, for relativity and volatility analyses loss ratios are a strong proxy for overall profitability.

Insert Figure 7

Insert Table 5

Aggregating loss experience across all states illustrates the power of spreading risk geographically. The mean and median loss ratios at the countrywide level are both 66%, and the standard deviation for U.S. loss ratios is 13.5 points.

Non-coastal states are less volatile, which is reflected in the Figure 7. Note, the difference between the mean and median loss ratios for non-coastal states is minimal, indicating fairly low relative volatility, and in fact the standard deviation of losses is only 9.4 points. The slightly longer lower "whisker" for the non-coastal states is due to more frequent, less severe weather events skewing the distribution downward.

Coastal states, by contrast, have a 4-point difference in mean and median, and a standard deviation of 21.8 points. The slightly longer upper whisker reflects the lower frequency but higher severity hurricane losses. Comparing this side-by-side to Florida is a bit misleading, as the coastal states appear less volatile. This illusion is a function of spread-of-risk. Meaning, a

hurricane which hits LA is necessarily not going to hit NC. So, the apparent lack of volatility is nothing more than the spreading of risk across otherwise fairly volatile states.

Insert Figure 8

Insert Table 6

Inspecting the more volatile coastal states individually provides a clearer view of the relative state volatility. Of these states, HI is actually the most volatile as measured by the standard deviation of 175 points. Florida is a close second with 162 points.

Insert Figure 9

Hurricanes are the driving force behind the volatility in these states. Earthquake is not a covered peril in homeowners, and while wildfires have increased in frequency and severity recently, hurricane remains the largest threat to property and insurer solvency. Figure 9 depicts loss ratios across all states for the period 1984–2021. It may be tempting to see only 12 unprofitable state-years in this exhibit. However, to assess profitability directly, the expense ratio must be added to the loss ratio. The industry expense ratio for the homeowners line is typically between 30% and 40%, so any loss ratio above 70% is necessarily unprofitable.

It is also important to note here the two elements of the loss ratio – earned premium and incurred losses. To the degree that there is substantial premium supporting high losses, the loss ratio will not necessarily highlight the largest amount of losses. Hurricane Iniki generated the largest homeowners industry loss ratio in this timeframe (1107%), generating \$1.6B in insured losses across all lines of business²³. Hurricane Andrew, which shows up in this graphic as the second largest homeowners loss ratio (1010%), generated over \$15 B in total insured losses²⁴.

V. Florida Homeowners Market

Section V provides a detailed analysis of the homeowners insurance market in Florida, providing a clear view of how the Florida homeowners insurance market has changed since Hurricane Andrew. We will examine market share and concentration, premiums, rates, solvency, and reinsurance.

i. Market Transition

When Hurricane Andrew made landfall in 1992, a majority of Florida homeowners policies were written by national insurers. Through the rest of the 1990's and into the early 2000's there were more Florida focused domestics (and pups) created in the state which tended to be smaller companies with a heavier reliance on reinsurance for wind exposures. During this time we see policies and premiums moving from national carriers to Florida domestics.

²³ www.fema.gov/case-study/hawaii-hurricane-relief-project

²⁴ <https://www.iii.org/fact-statistic/facts-statistics-hurricanes>

It is important to note there were large catastrophic hurricanes in 2004 and 2005 following relatively small hurricane years throughout the early 2000's. Due to this increase in hurricane activity and the passage of Florida HB 1A (2007), there is an increase in the number of policies moving into Citizens between 2005 and 2011. Citizens' policy count peaked in 2011 and through a variety of depopulation efforts, these policyholders were slowly returned to the private insurance market. Since the 2011 Citizens' peak and subsequent return to the private market, Florida domestics (both Florida-Focused and Florida-Diversified) have controlled nearly three-quarters of the private homeowners insurance market.

Insert Figure 10²⁵

Insert Figure 11

Figures 10 and 11 show market share by year. As mentioned, Florida focused domestics dominate in both policy count and premiums written throughout the entire sample period.

ii. Rates

Since Hurricane Andrew, the Florida homeowners market has seen large rate increases due to the volatility and unpredictability of catastrophic events. These catastrophic events open insurance companies to large claims payouts from property damage. In addition, fraudulent activities have contributed to large recent rate increases in the market.²⁶

Figure 12 shows the average Florida homeowners policy premium by year in Florida. The premium steadily increases across all types of carriers throughout our time period, except for 2006-2008 due to the mandatory mitigation discounts. On average, national carriers and Citizens charge higher premiums per policy when compared to the other types of insurers. This could be due to risk-type. Citizens and national carriers on average insure older homes than what we see in the Florida Domestics and Pup companies.

Insert Figure 12

Figure 13 shows the average rate per \$1000 of coverage by type of insurer. On average Citizens charges a higher rate than the other types of insurers examined because they do suffer higher losses on higher risk properties. Citizens insures higher risk homes which are not insurable in the private market. This explains the extreme (average \$2-\$4) rate difference between Citizens and all other types of insurers.

Insert Figure 13

²⁵ As a reminder, many insurers file QUASR data as trade secret starting in 2018. The vertical line on the graph delineates those that year. Data 2019 and newer is missing a significant number of insurers making up a large portion of market share. The drop in premium volume is a reflection of this data issue, not a reduction in premium volume.

²⁶ See prior discussion on fraudulent activity.

Figures 14 shows the average rate by county. On average the high-risk coastal counties (Miami-Dade and Hillsborough) charge higher rates than inland and low-risk coastal counties (Duval and Orange). This is not a surprise as these counties are most affected by hurricane activity.

Examining rates both with wind and ex-wind (Figures 15 and 16) you can see the effect the inclusion of wind has on rates. On average, when wind is included in the rates, the highest risk coastal county (Miami-Dade) charged roughly \$3-\$5 higher than the lower risk counties. It is interesting to note that even ex-wind, Miami-Dade and Hillsborough counties have higher rates though this difference shrinks to roughly \$1 difference per year between the high risk and low risk counties. One explanation for this is that Miami-Dade and Hillsborough are two of the most populated counties in Florida so they would be targeted for more fraudulent activity.

Insert Figure 14

Insert Figure 15

Insert Figure 16

iii. Surplus

One of the largest differences between Florida insurers and the balance of the market is volatility in surplus.

Figure 17 shows the YOY surplus change²⁷ for companies operating in Florida (FL), those only operating outside of Florida (Non), and those operating both in Florida and outside Florida (Both). Companies operating only in Florida experienced much more drastic changes in surplus over time, whereas the other two cohorts saw relatively stable surplus each year. As mentioned in the loss ratio section above, spreading risk across relatively uncorrelated combinations of geographies and perils, the companies writing more broadly (outside of Florida) have an advantage which smooths their surplus volatility. In the absence of the diversification, the Florida-only writers will naturally experience more volatility in losses over time, and thus more volatility in surplus. In addition, the entry and exit of insurers writing in the state will contribute to surplus volatility.

Insert Figure 17

iv. Premium-to-Surplus

The premium-to-surplus ratio is a metric used to evaluate an insurer's solvency risk. Surplus is there to pay claims if premiums collected for the year are inadequate to cover all claims and operational expenses. When there is a large catastrophic loss year, insurers need

²⁷ Value above 1 is a gain in surplus, values below 1 are a loss of surplus.

adequate surplus to remain solvent. Generally speaking, lower premium-to-surplus ratios reflect less solvency risk, as companies with lower ratios have proportionally more surplus set aside to support the risk they are adding. Typically, higher premium-to-surplus ratios indicate lower financial strength. A ratio under 2.0 is generally considered “healthy” and most regulators viewing anything under 3.0 “acceptable”.

Outside of Florida, carriers generally maintain very healthy premium-to-surplus ratios. Figure 18 shows the premium-to-surplus ratios for companies operating outside of Florida. Over 70% of all insurers each year have premium-to-surplus ratios between 0-1, and each year over 85% of all insurers have premium-to-surplus ratios between 0-2. This indicates that the firms are at a low risk for insolvency.

Insert Figure 18

Florida-only insurer premium-to-surplus ratios are much higher than those of non-Florida insurers. Prior to Hurricane Andrew, Florida insurers looked similar to non-Florida insurers in that they had strong premium-to-surplus ratios; however, after Andrew more Florida insurers rose to “unhealthy” premium-to-surplus ratios. By 1997, just 70% of companies had ratios under 2, and those under a ratio of 1 had dropped under 55%. The ratios continued to deteriorate (increase); by 2004, 27% of companies in Florida had ratios above 6. The worst point came in 2005 with less than 39% of companies under 2, almost 8% of companies above 10.

Insert Figure 19

Examining the premium-to-surplus ratio within the state, Florida domestic insurers (both focused and diversified) have the highest ratios. This indicates that they are collecting a higher amount of premiums in relation to their surplus amount, suggesting lower financial strength and a higher possibility of insolvency.

Insert Table 8

v. Reinsurance

In a hurricane-prone state such as Florida, insurers transfer a significant portion of their liability to reinsurers to protect themselves from the risk of a solvency-threatening event. They also transfer a significant portion of their liability to the Florida Hurricane Catastrophe Fund, essentially the state-run reinsurer.

Reinsurance transactions can be conducted with affiliates, indicating the insurer is controlled by or controls the insurer through which the transaction is completed. Alternatively, it can be conducted with non-affiliates, indicating that there is no corporate relationship between the two parties.

Across all types of insurers in Florida, ceding reinsurance is more common than assuming reinsurance. This indicates that the Florida homeowners insurers recognize the extreme

catastrophe risk, and are inclined to move some of the risk to reinsurers. Additionally, ceding reinsurance is more common through non-affiliates than affiliates indicating, regardless of company structure, Florida carriers feel it is imprudent to keep ceded risk within the group.

For Florida focused domestics, reinsurance was more commonly ceded to non-affiliates (often because the insurer is not a member of a group). While there was a drop in reinsurance ceded to non-affiliates between 2014 and 2018, it could have been caused by price reductions. One common driver is supply and/or affordability of reinsurance coverage. In recent years, the price of reinsurance has increased substantially and availability of reinsurance has been more restricted.

Nicholson et al. (2018) examine the vulnerabilities in the Florida homeowners market and find that following large catastrophic hurricane years such as 2006-2007, reinsurance premiums increase significantly. Florida faced large catastrophic hurricanes in 2016, 2017, and 2018, which in turn drove large reinsurance premium increases, which is evident by the spike for those years in Figure 20. In Figure 20, reinsurance ceded is measured as amount of premiums ceded to the reinsurer.

Insert Figure 20

As natural disasters increase across the world, reinsurers face escalating large-scale losses. This depletes reinsurance company surplus and causes reinsurers to raise premiums. This also causes reinsurers to become more selective about the risks they accept, which creates supply constraints.

Reinsurance utilization has been increasing since Hurricane Andrew. This reduction in risk appetite by primary carriers has not been easily absorbed by reinsurers, already stretched thin by increased catastrophic events worldwide, and rampant fraudulent activity within Florida specifically. This is not the first availability crisis the reinsurance market has faced. But this current market shift is negatively impacting the willingness of primary insurers to write in Florida, as many such insurers are at-risk of insolvency in the face of large hurricane losses. With increased reliance on reinsurance, the volatility in the reinsurance market directly contributes to the volatility we have seen in the primary insurance markets. With less regulatory oversight in the reinsurance markets, the primary insurers in catastrophe prone states are exposed to risk of reinsurance costs not being fully covered by regulator-suppressed rate changes in the primary markets.

vi. The Future of HO in Florida (predictions)

Hurricane Andrew had a seismic impact on the insurance ecosystem, not just in Florida. The impacts span the role of government and coastal exposure management, the birth of hurricane deductibles and sophisticated catastrophe modeling, creation of a worldwide reinsurance hub in

Bermuda, as well as impetus for stronger building codes and property mitigation²⁸. It is difficult to predict how the Florida market will continue to evolve. Based on recent trends however, a few major areas of change in the Florida homeowners insurance market can be expected.

Arguably the largest area of expected change is in the Florida homeowners insurance market share. There has already been a shift in the types of insurers writing business in Florida. When the market was stronger and there were long stretches of time without hurricanes (early 2000's to mid 2010's), the market shifted to more Florida Focused Domestics. More recently, there has been an increase in the severity and frequency of hurricanes, causing a reduced appetite on the part of primary insurers in Florida. Accordingly, the expectation is to see a large increase of homeowners policies moving out of the standard market and into Citizens.

Large changes in the availability and affordability of reinsurance will impact both insurers' willingness to continue writing homeowners coverage in Florida and their profitability within the state. A major trend in the industry is the lowering of reinsurance towers, meaning that reinsurers are no longer willing to write high layers of coverage.²⁹ Overall, this leads the primary insurer to either "roll the dice" and take on the extra risk, or find lower-rated reinsurers who are willing to write the coverage. Both of these options can lead to potential problems with insurer solvency should there be large hurricane losses. Again, this would lead to fewer primary insurers willing to write in Florida.

The final, and perhaps most extreme, prediction is that the entire Florida homeowners wind market could end up being controlled by Citizens due to primary market supply constraints. As hurricane frequency and severity increases, and regulation and legislation within the state fail to provide market solutions and fraud relief, insurers are going insolvent or have stopped writing new business in Florida. As a result, Citizens has been writing insurance for homeowners unable to find coverage, and thus their book of business has grown substantially within the last few years. Since hurricane wind coverage is difficult to insure profitably, it might be strategically and economically prudent to intentionally remove it from the primary market. With recent legislature (SB 76) allowing Citizens to increase rates gradually over the next few years and the ability to assess policyholders in the event of a deficit, Citizens may be in a better position to insure wind than the primary insurers.

Insert Figure 21

²⁸ "Hurricane Andrew and Insurance: The Enduring Impact of an Historic Storm", Insurance Information Institute August 2012

²⁹ "Florida flash point as Florida reinsurance market begins to throw in the towel: ALIRT". *Artemis*. <https://www.artemis.bm/news/florida-flash-point-as-reinsurance-market-begins-to-throw-in-the-towel-alirt/>

Conclusions and Directions for Future Research

Hurricane Andrew had an extreme impact on the homeowners insurance market. We discuss how Hurricane Andrew created a new insurance modeling industry and a new reinsurance hub in Bermuda. We also discuss market changes due to population concentration, regulation, legislation, litigation, and fraud. We find that the population has grown rapidly in Florida with a large percentage moving to high-risk coastal locations. We find that Florida has rampant fraudulent activity and litigation costs which are driving up insurance costs. Attempts are being made to combat the impact of these dynamics through regulation and legislation. It is yet to be determined how successful these measures have been.

We then move into discussing the homeowners market changes across the United States. We find that homeowners market has seen a reduction in market concentration since the early 1990's. We find that most states did not see particularly volatile year-over-year growth in direct premiums written. Florida was an outlier in this finding with extremely volatility driven by increases in premiums, exposures, and number of insurers operating in the state.

We conclude our review by examining the Florida homeowners insurance market. We find that the Florida market shifted from being largely written by national carriers to smaller Florida domestic companies. We also see that rates have increased across the state with the largest increases in high-risk coastal counties. The availability of reinsurance is another large concern in the Florida wind market as most primary insurers are struggling to find reinsurance for this catastrophic peril.

The homeowners market has seen many changes in the thirty years since Hurricane Andrew. The research into the homeowners market should continue with specific focus on market stability. Some areas we have identified for further review include structural market changes in relation to market stability, the public vs private financing of catastrophic risks and more specifically which market is better suited to handle the increased frequency and severity of catastrophic storms. There should also be specific research examining the large population growth in high-risk coastal areas and how this change impacts market stability.

One final area of research in Florida should be related to the large fraudulent claims and litigation. Florida is a unique environment with some of the highest homeowners insurance premiums in the country. It may be worth studying why fraudulent activity became so rampant in one specific state.

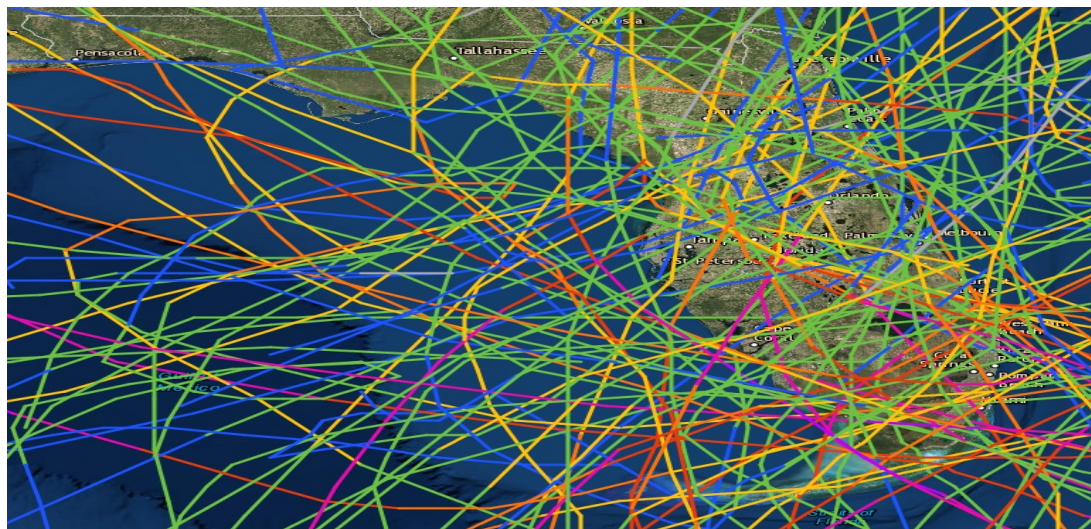
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EXHIBITS, TABLES, FIGURES

Exhibit 1: Florida Storm Activity (100 years)



The lines represent storm tracks between 1916 and 2016 of all tropical storms or higher near Florida

Source: The News-Press (<https://www.news-press.com/story/weather/hurricane/2016/10/05/florida-hurricane-tropical-storm-magnet-for-a-century/91597860/>) accessed 7/14/22.

Table 1: Legislative Reaction to Address Fraudulent Claims

Activity	Years	Legislative Response
Reopening hurricane claims (2004/2005 storms) up to 5 years after the events	2006-2010	Shortening the window of allowing reopening of claims to 3 years
Significant increase in sinkhole claims	2005-2011/2012	SB 408
Assignment of Benefits Claims	2011/2012 – 2017	AOB Reform Bill, SB 76
Roofing AOB and Litigation	2008 – 2022	SB 2-D and SB 4-D

Table 2: Coastal State Pup Distribution

	Key Coastal State PUP Distribution				
State	1992	Rank	2021	Rank	Chg
AL	4.9%	21	2.7%	16	-45%
FL	3.2%	30	15.0%	2	374%
GA	2.9%	31	4.3%	11	48%
LA	4.4%	26	6.3%	7	42%
MS	4.5%	22	1.7%	25	-62%
NC	5.1%	16	1.1%	32	-79%
SC	2.5%	33	0.9%	34	-63%
TX	26.1%	2	10.3%	5	-61%
VA	2.0%	34	5.1%	8	162%
Ave Coastal State	2.1%		1.3%		-38.9%
U.S. Average State	5.7%		3.5%		-39.0%

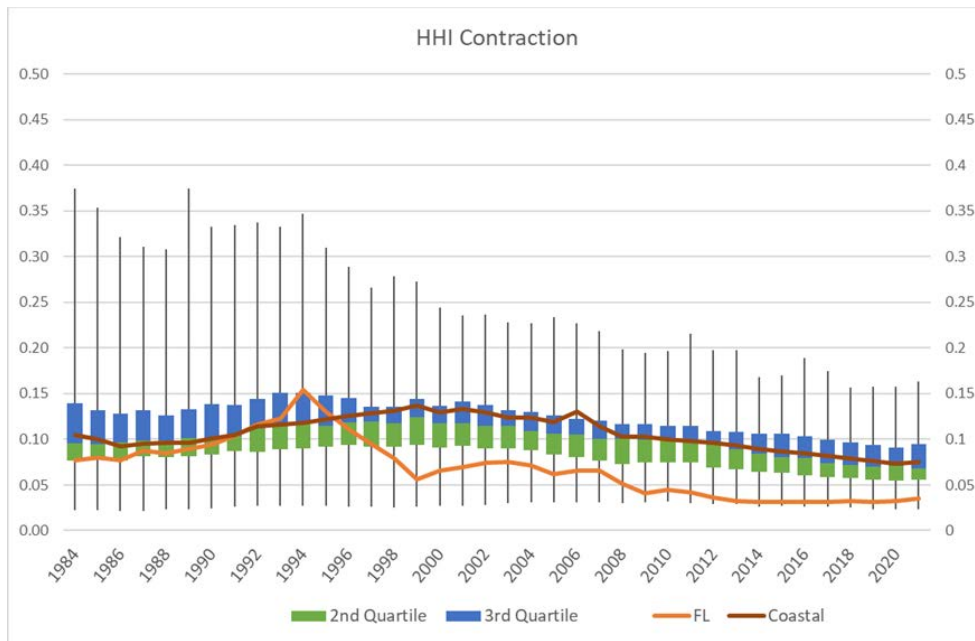
Source: Authors calculations, NAIC annual statements

Table 3: Coastal State Domestic Distribution

	Key Coastal State Domestic Distribution				
State	1992	Rank	2021	Rank	Chg
FL	1.1%	18	2.8%	9	166%
GA	2.9%	7	1.7%	17	-41%
LA	0.0%	20	0.0%	28	0%
MS	0.0%	20	1.7%	18	0%
NC	0.0%	20	1.1%	24	0%
SC	2.5%	11	1.9%	15	-25%
TX	3.4%	5	6.2%	2	83%
VA	0.0%	20	0.9%	27	0%
Ave Coastal State	0.4%		0.5%		31.2%
U.S. Average State	1.7%		1.9%		11.9%

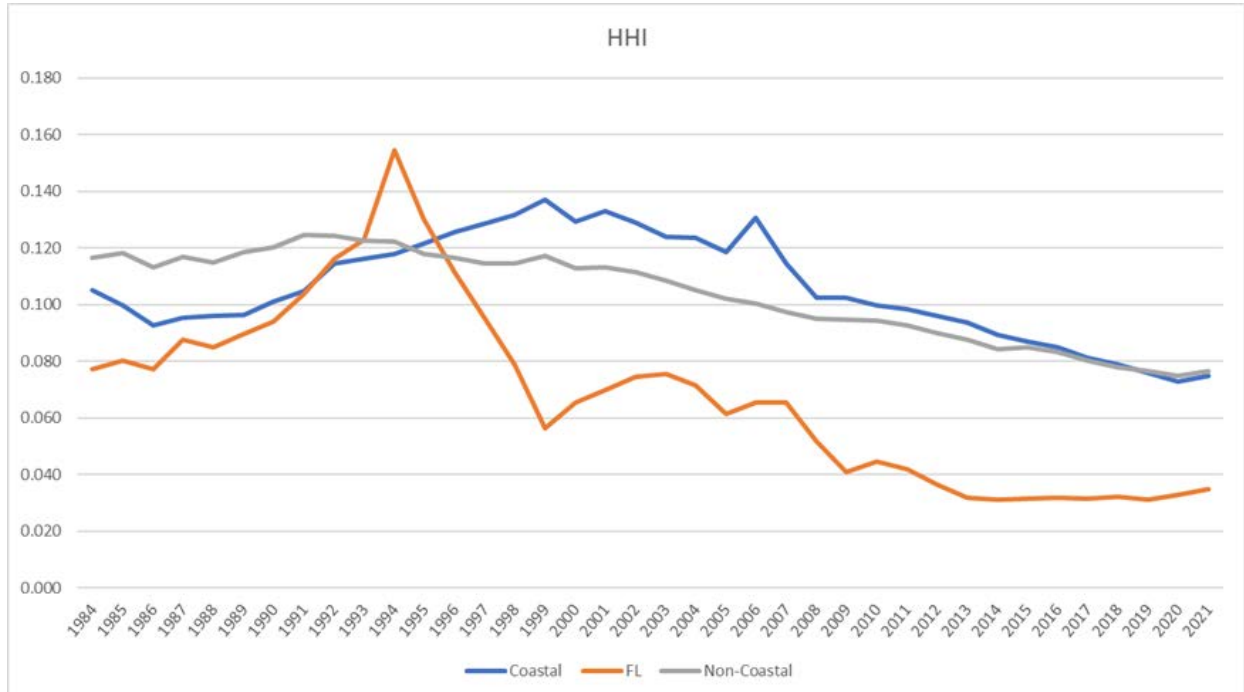
Source: Authors calculations, NAIC annual statements

Figure 2: HHI Contraction by Year



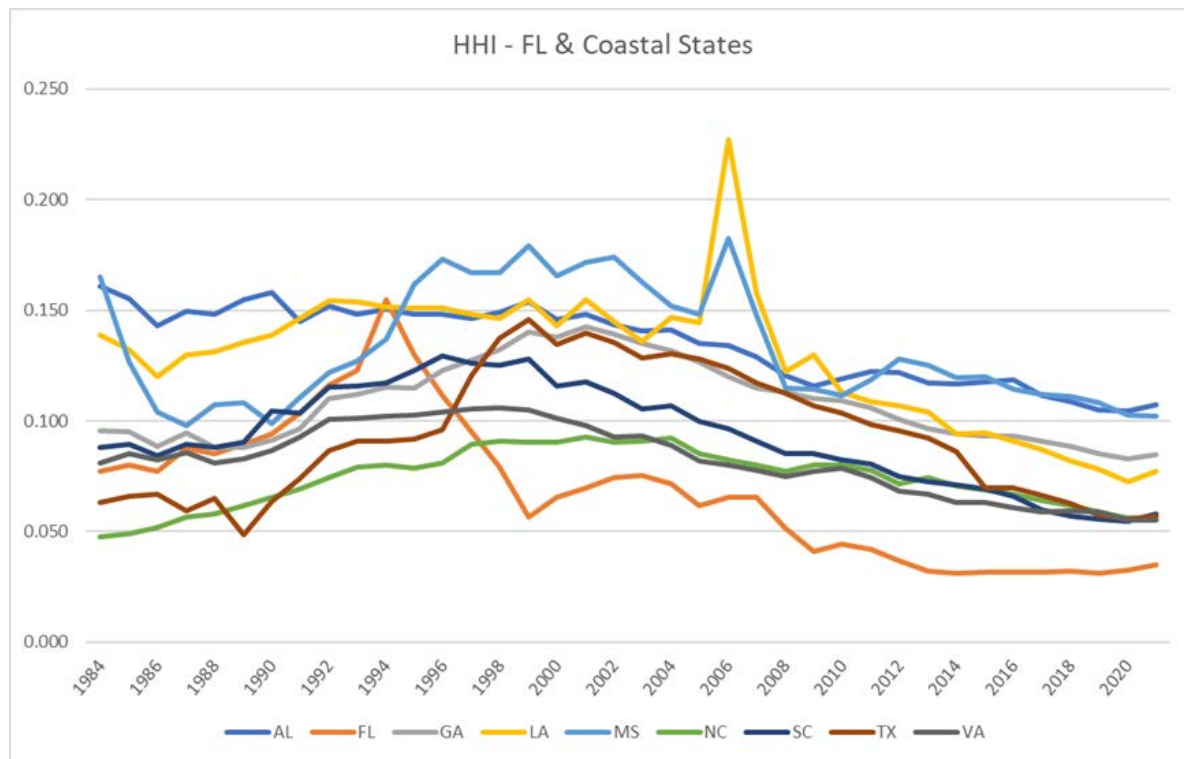
Source: Authors calculations, NAIC annual statements

Figure 3: HHI by Year



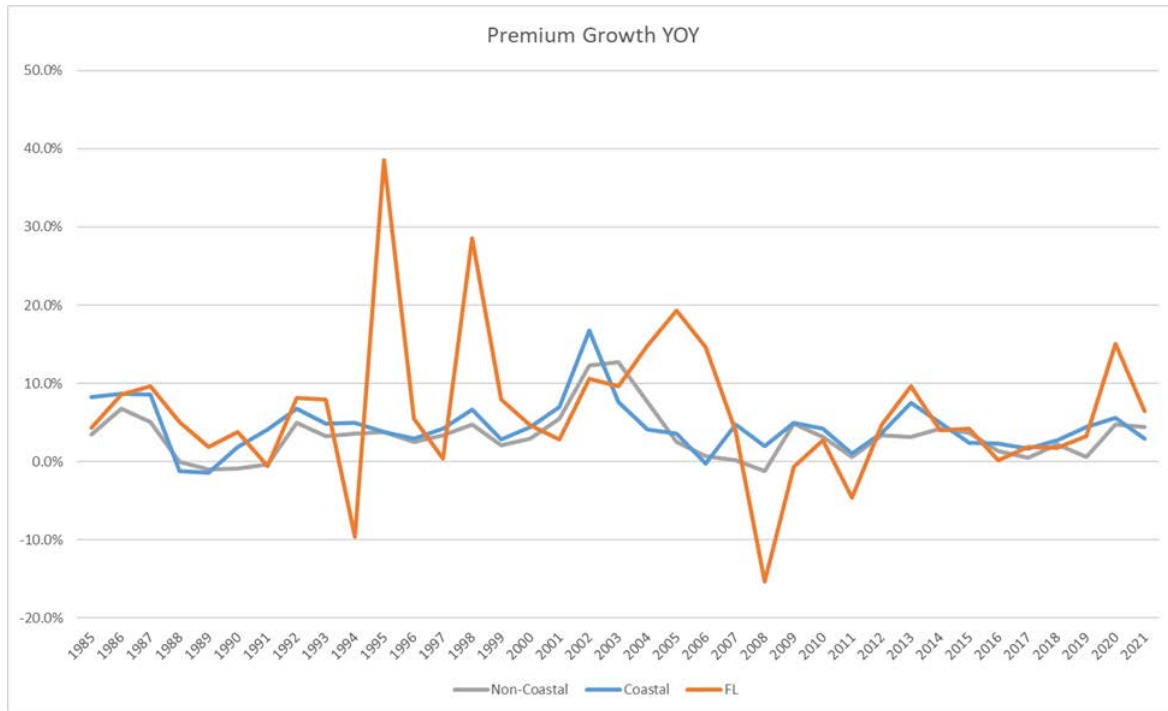
Source: Authors calculations, NAIC annual statements

Figure 4: HHI for FL and Other Coastal States by Year



Source: Authors calculations, NAIC annual statements

Figure 5: Premium Growth by Year



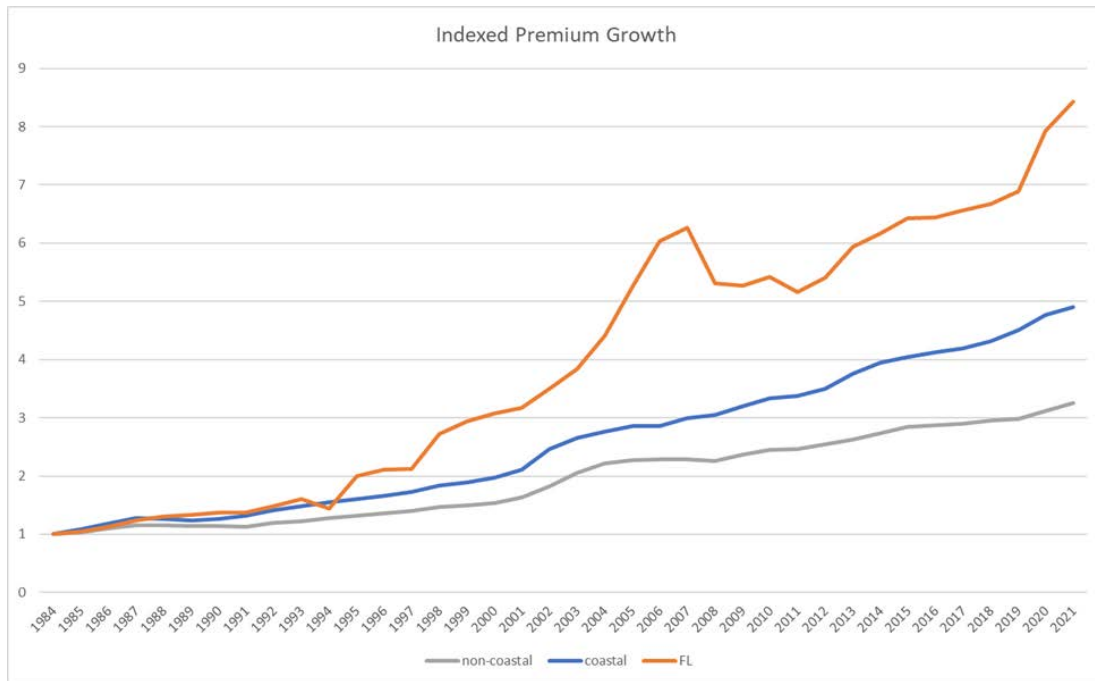
Source: Authors calculations, NAIC annual statements

Table 4: Premium Change Costal vs Non-Coastal

Premium Change 1984-2021				
Cohort	Ave	Max	Min	Std Dev
Coastal	4.4%	16.8%	-1.5%	0.033
FL	6.3%	38.6%	-15.3%	0.093
Non-Coastal	3.3%	12.8%	-1.2%	0.031

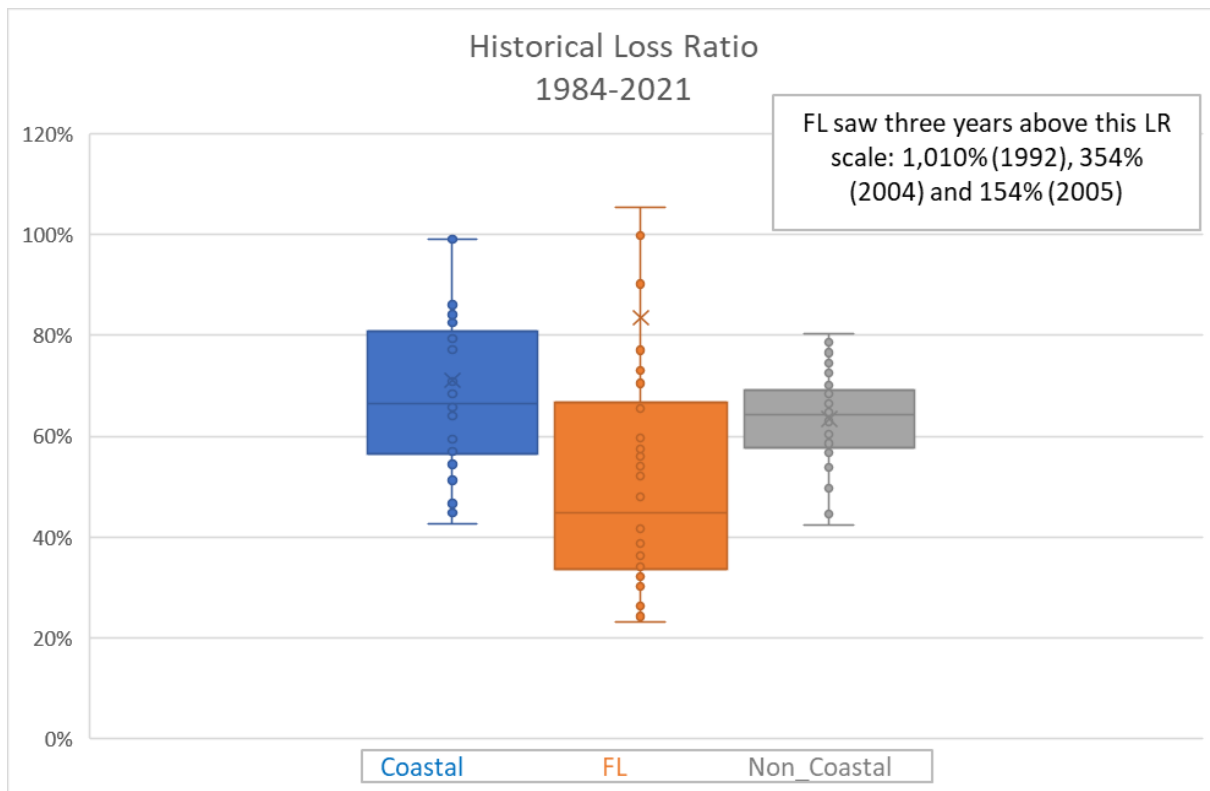
Source: Authors calculations, NAIC annual statements

Figure 6: Indexed Premium Growth by Year



Source: Authors calculations, NAIC annual statements

Figure 7: Historical Loss Ratios by Coastal vs Non-Coastal



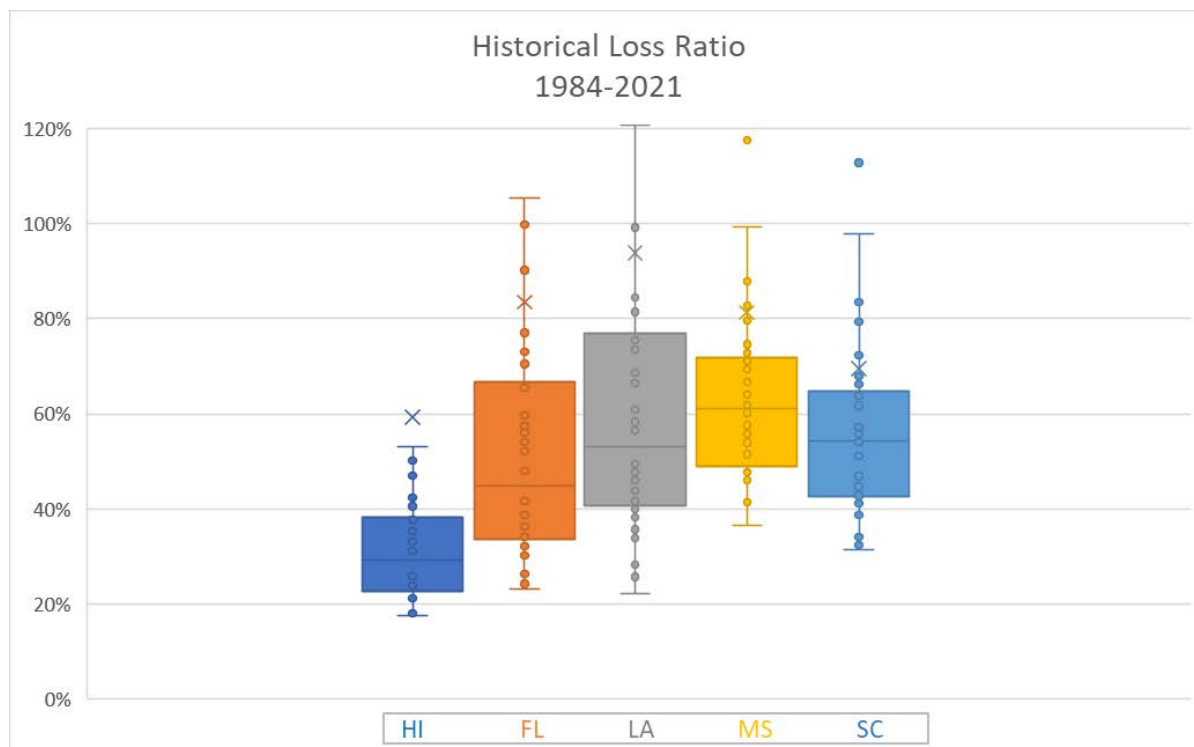
Source: Authors calculations, NAIC annual statements

Table 5: Loss Ratio by Coastal vs Non-Coastal

Loss Ratios	Coastal	FL	Non-Coastal	Total
<i>Minimum</i>	43%	23%	42%	47%
<i>Maximum</i>	145%	1010%	80%	128%
<i>Mean</i>	71%	83%	63%	66%
<i>Median</i>	67%	45%	64%	66%
<i>Std Deviation</i>	21.8%	161.8%	9.4%	13.5%

Source: Authors calculations, NAIC annual statements

Figure 8: Historical Loss Ratio for Select Coastal States



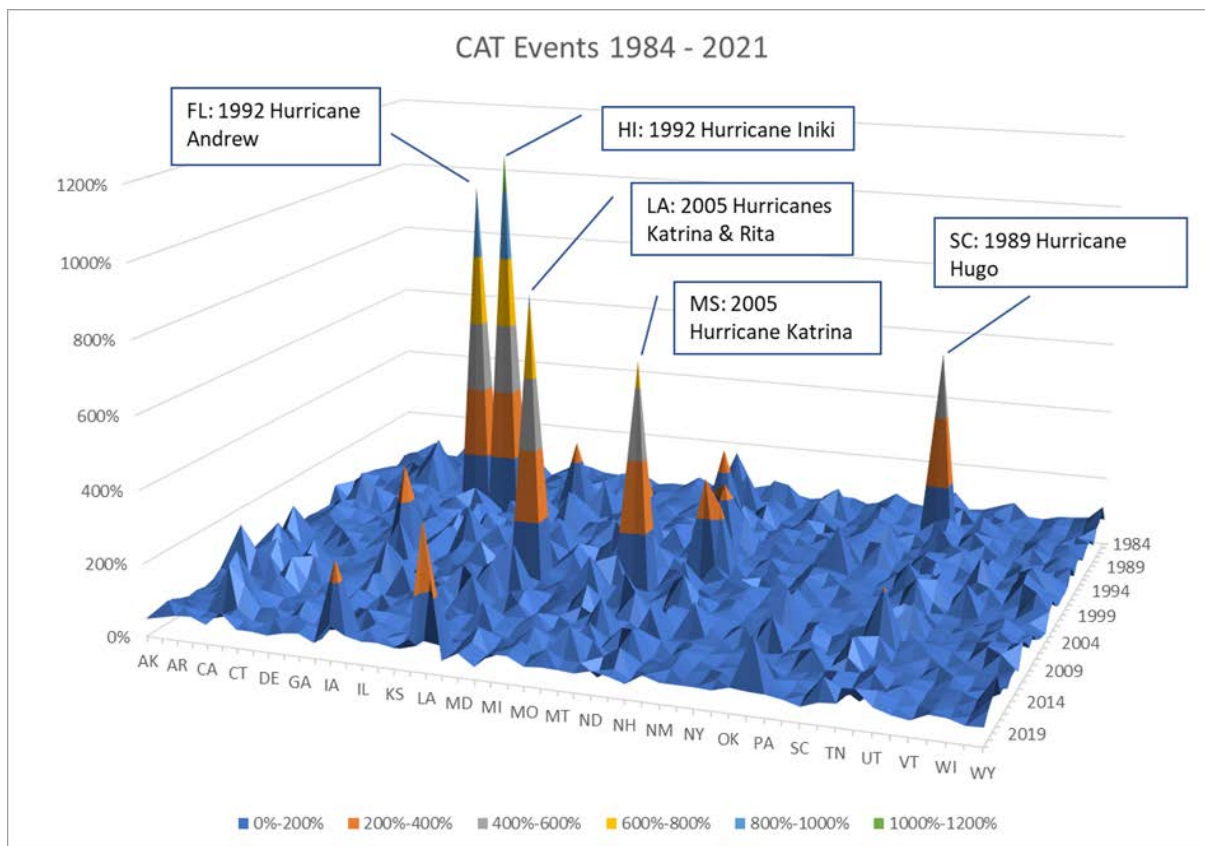
Source: Authors calculations, NAIC annual statements

Table 6: Loss Ratio for Coastal States

Loss Ratios	HI	FL	LA	MS	SC
Mininum	17%	23%	22%	37%	32%
Maximum	1107%	1010%	833%	674%	588%
Mean	59%	83%	94%	81%	69%
Median	29%	45%	53%	61%	54%
Std Deviation	175%	162%	142%	102%	88%

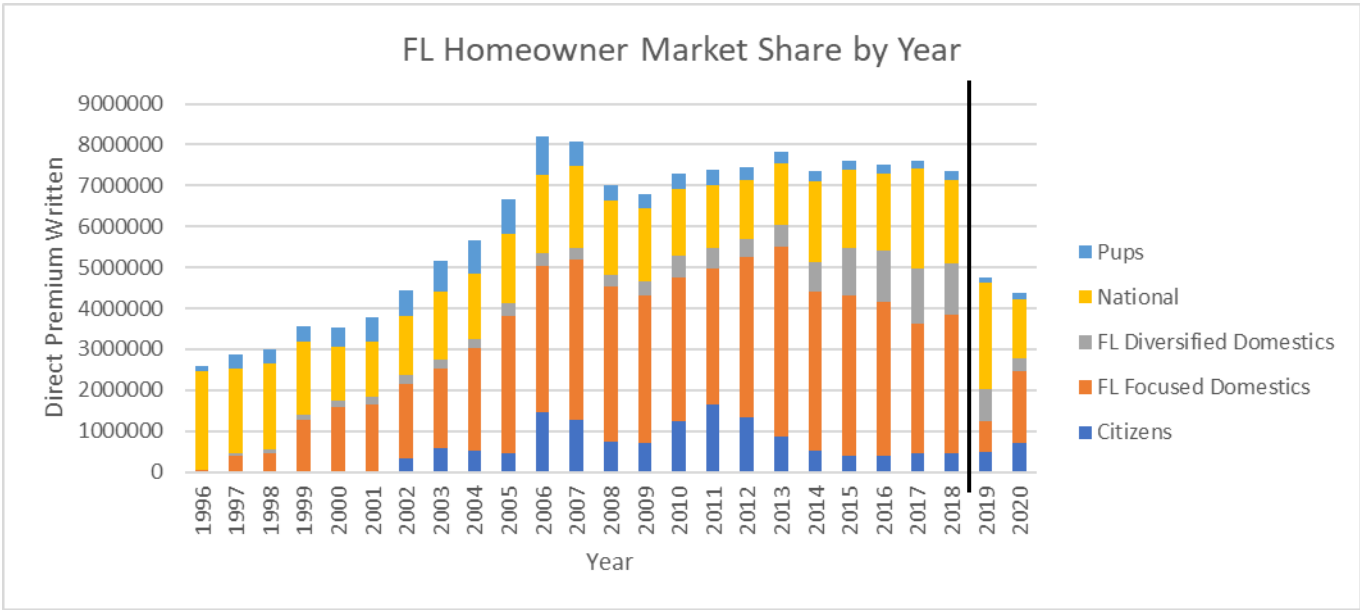
Source: Authors calculations, NAIC annual statements

Figure 9: Major Hurricane Events in United States



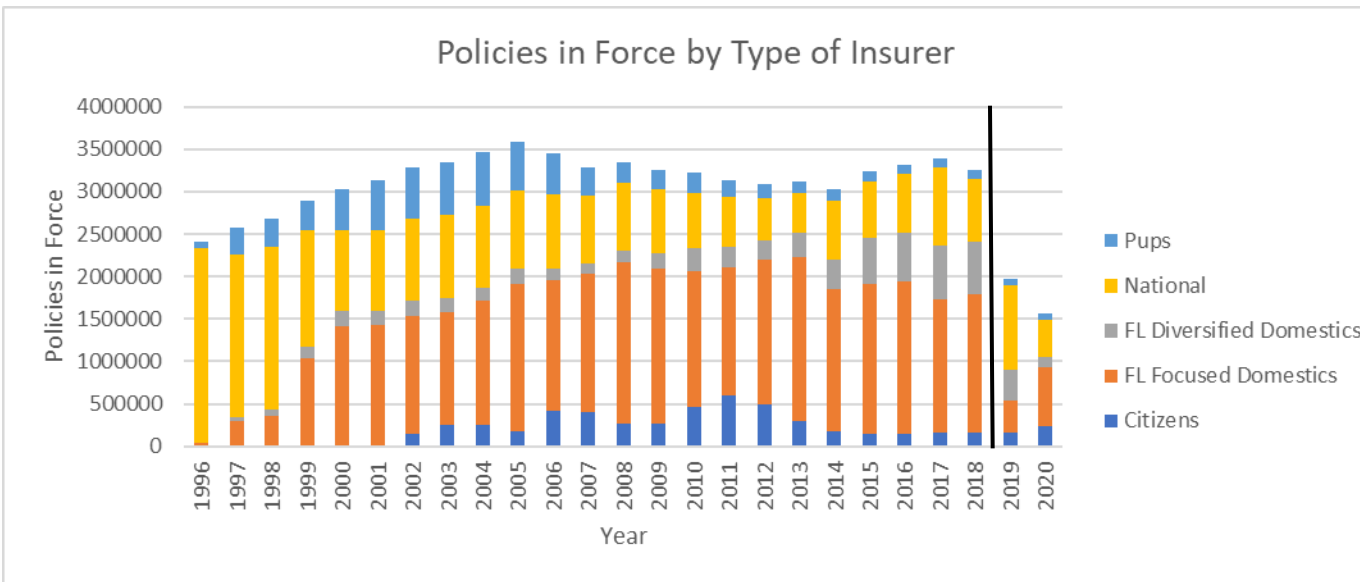
Source: Authors calculations, NAIC annual statements

Figure 10: FL Homeowners Market Share of Direct Written Premiums by Year



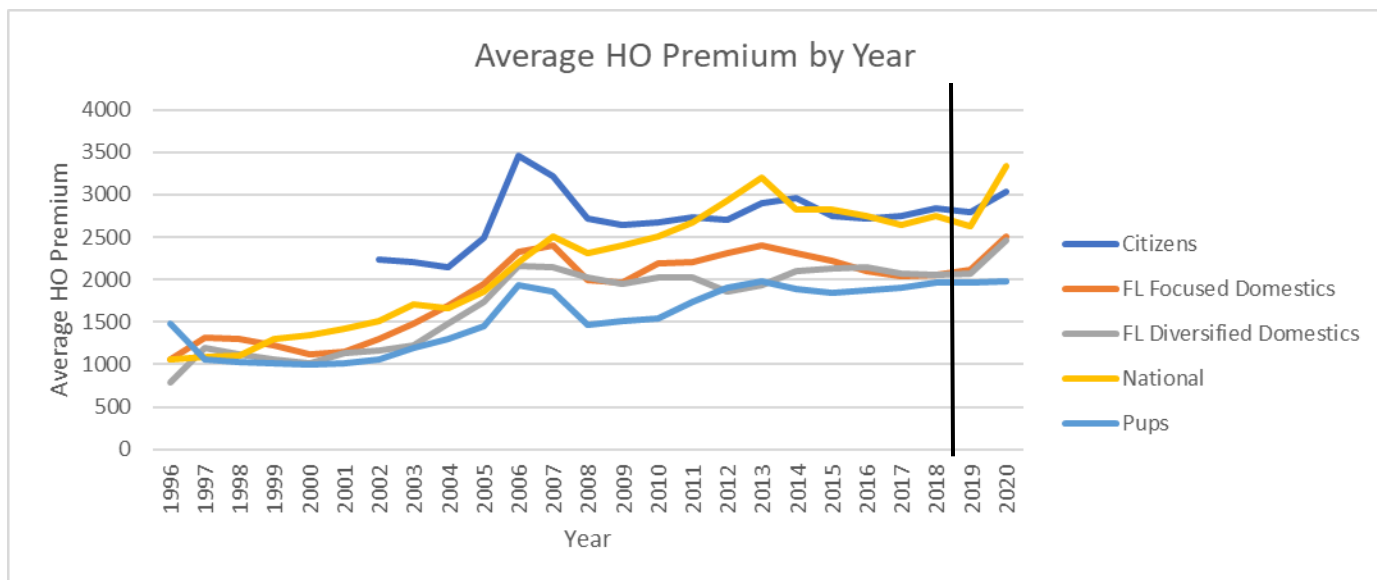
Source: Authors calculations, QUASR data

Figure 11: FL Homeowners Market Share by Policy Count by Year



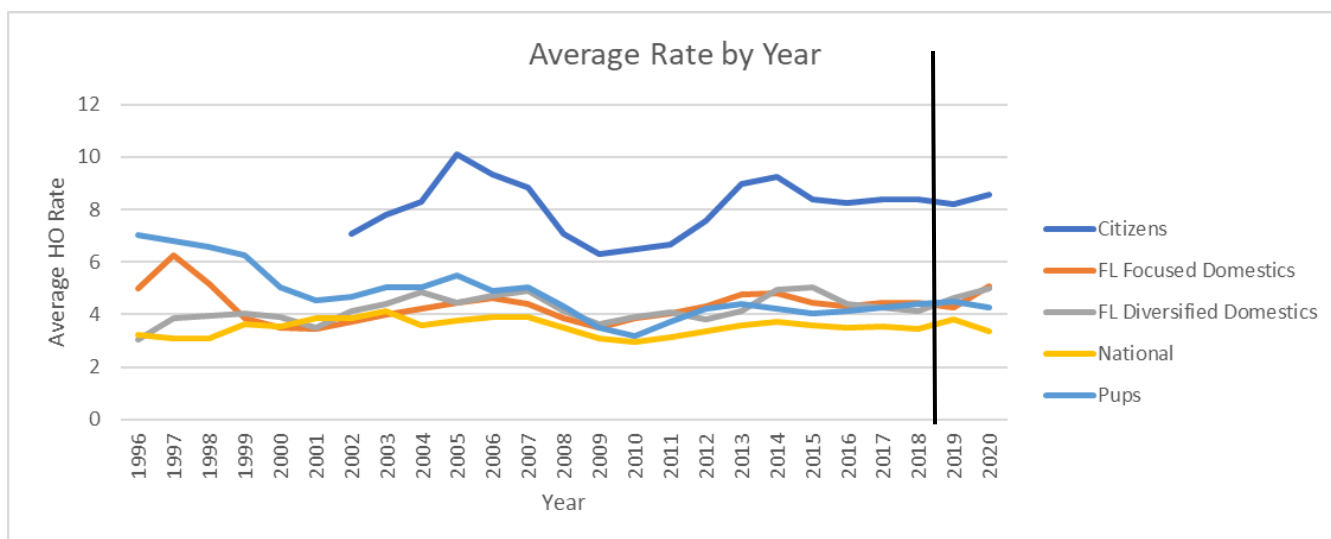
Source: Authors calculations, QUASR data

Figure 12: Average Florida Homeowners Policy Premium by Year



Source: Authors calculations, QUASR data

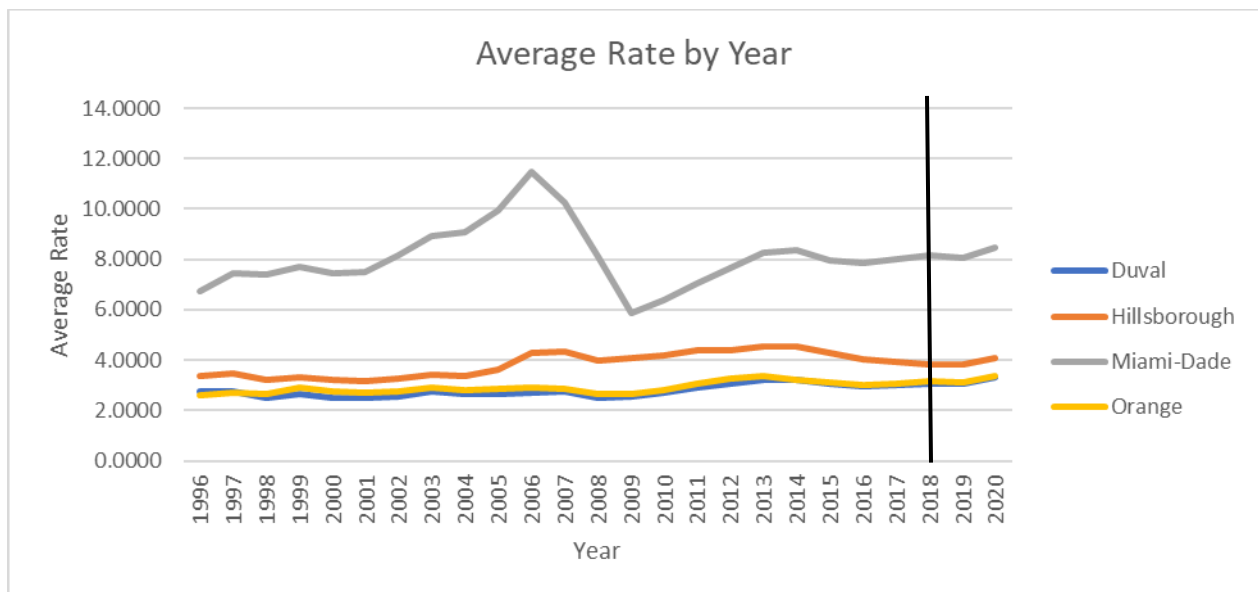
Figure 13: Average Florida Homeowners Policy Rates



Source: Authors calculations, QUASR data

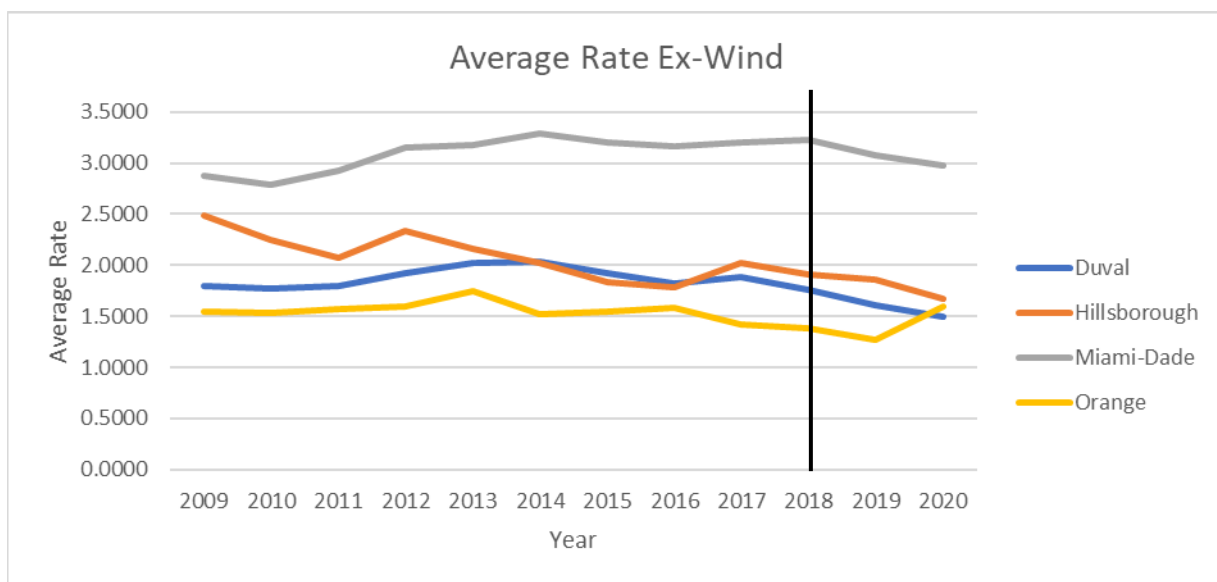
Figure 14: Average Rate by County³⁰

³⁰ Four Counties were examined (Duval, Hillsborough, Miami-Dade, and Orange) based on population size and location.



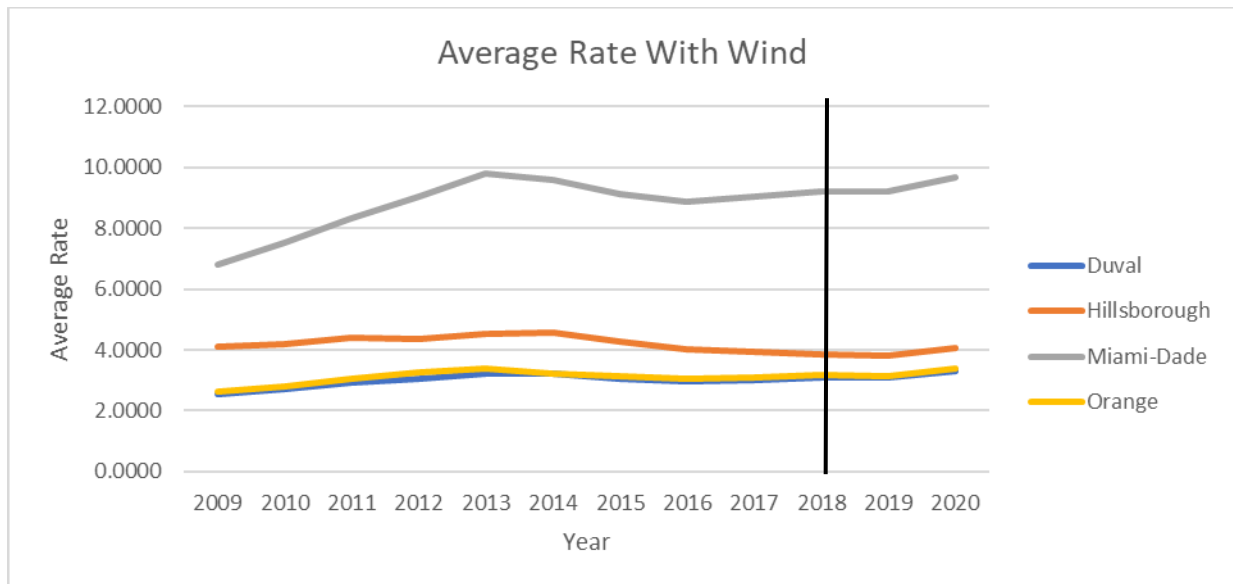
Source: Authors calculations, QUASR data

Figure 15: Average Rate Ex-Wind



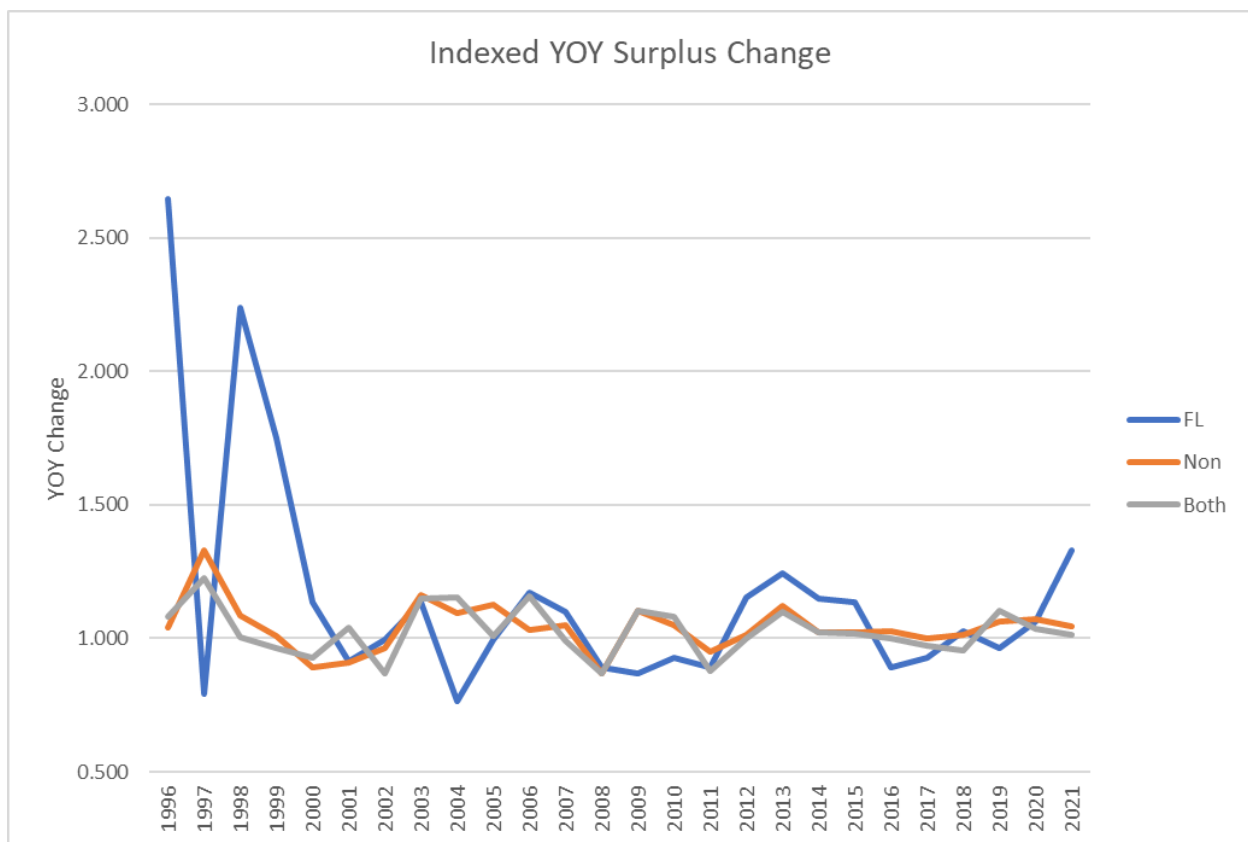
Source: Authors calculations, QUASR data

Figure 16: Average Rate With Wind



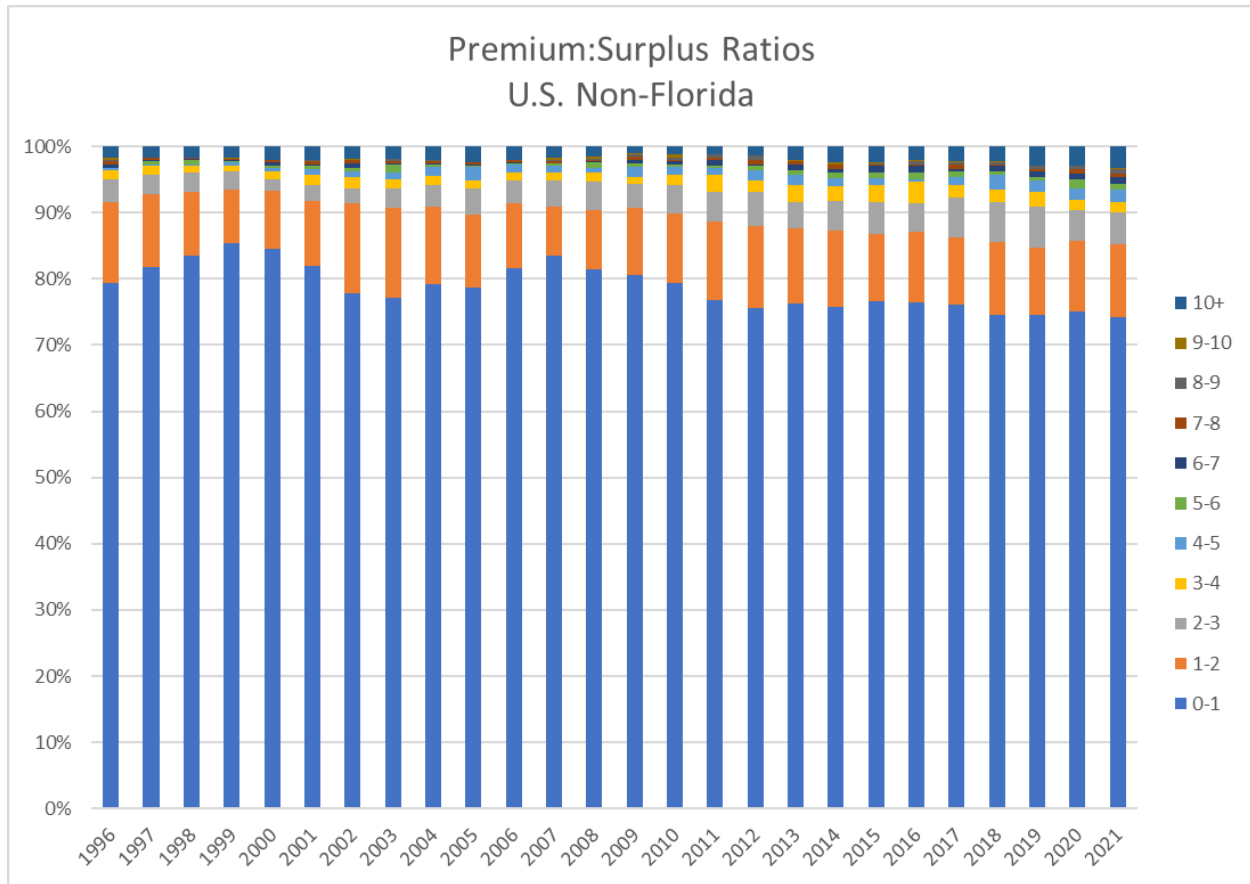
Source: Authors calculations, QUASR data

Figure 17: Year-to-Year Surplus



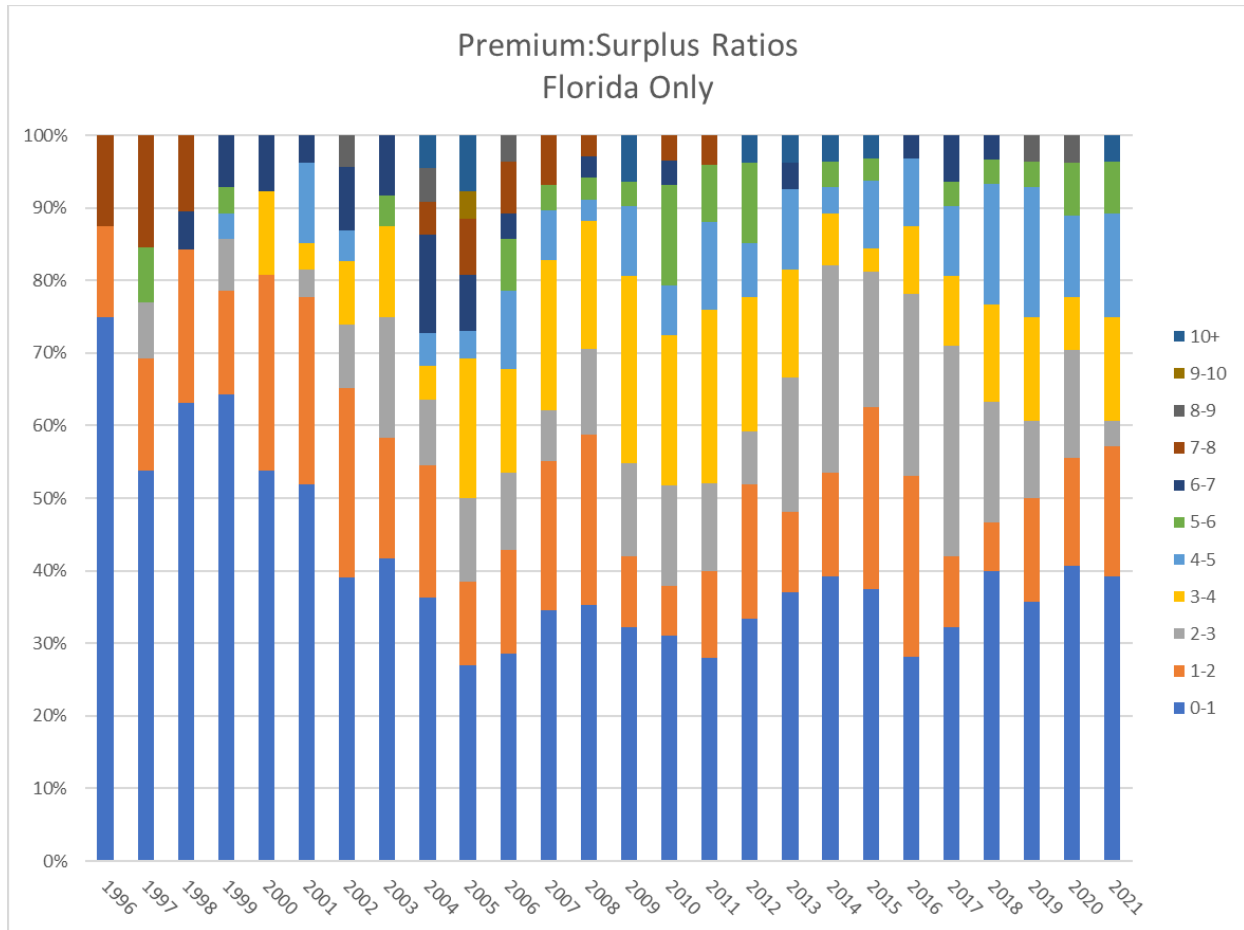
Source: Authors calculations, NAIC statements

Figure 18: Premium-to-Surplus Ratio for Insurers Operating Outside of Florida



Source: Authors calculations, NAIC annual statements, QUASR data

Figure 19: Premium-to-Surplus Ratio for Insurers Operating in Florida



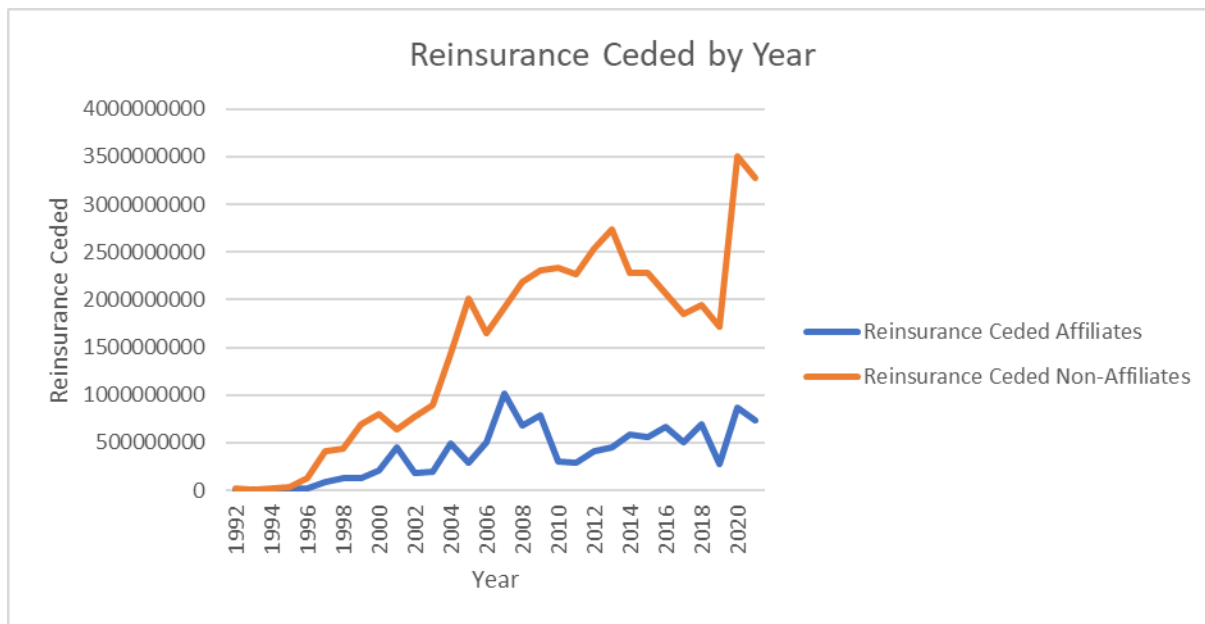
Source: Authors calculations, NAIC annual statements, QUASR data

Table 8: Premium-to-Surplus Ratio across all types of insurers

	Premium-to-Surplus
FL Focused Domestic	2.434783
Florida Diversified Domestic	2.666667
National	0.753289
Pup	0.837662

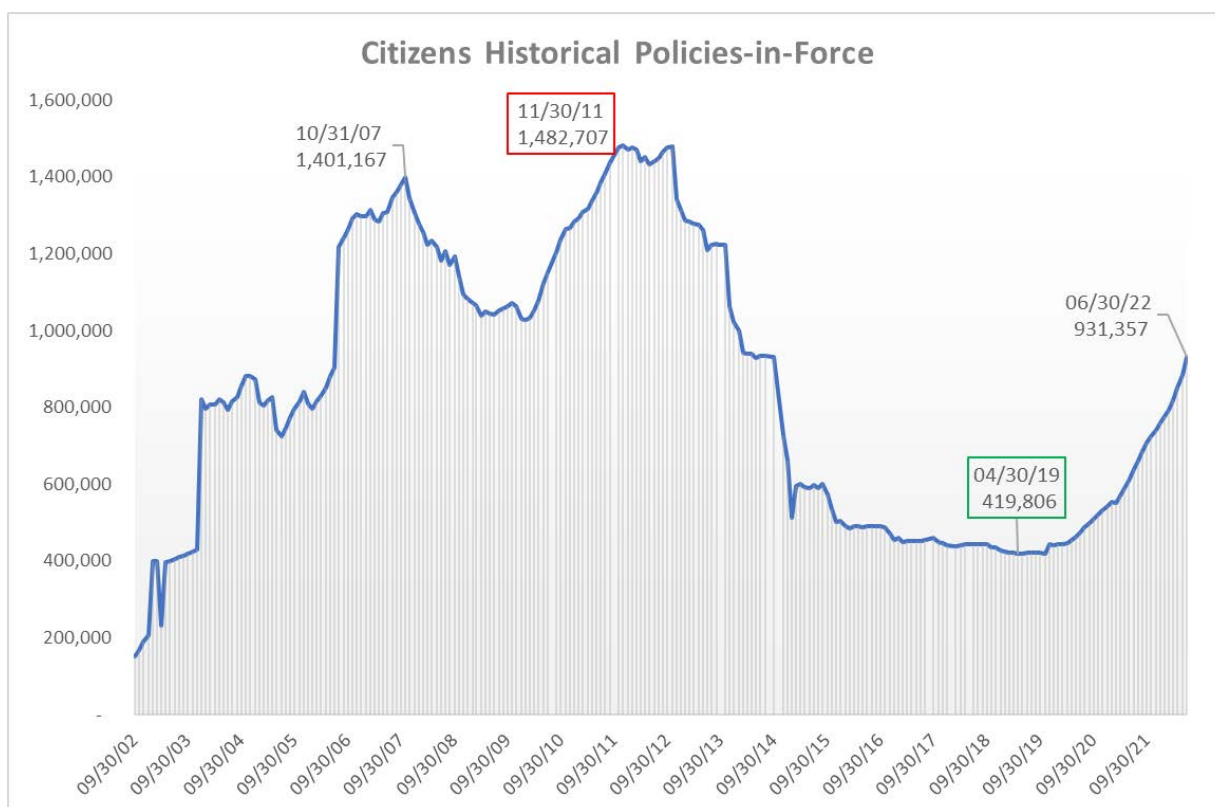
Source: Authors calculations, NAIC annual statements, QUASR data

Figure 20: Reinsurance Ceded by Year for Florida Focused Domestics



Source: Authors calculations, NAIC annual statements

Figure 21: Citizens Policies-in-Force



Source: <https://www.citizensfla.com/policies-in-force>

APPENDIX

[appendix table?]

State or territory	Coastline	Rank	Area (mi ²)	Coast/area ratio (ft/mi ²)
 Florida	8,436 mi	2	65,758	680
 Louisiana	7,721 mi	3	52,378	780
 Maine	3,478 mi	4	35,380	520
 North Carolina	3,375 mi	6	53,819	330
 Texas	3,359 mi	7	268,596	66
 Virginia	3,315 mi	8	42,775	410
 Maryland	3,190 mi	10	12,406	1,400
 South Carolina	2,876 mi	12	32,020	470
 New York	2,625 mi	13	54,555	250
 Georgia	2,344 mi	14	59,425	210
 New Jersey	1,792 mi	15	8,723	1,100
 Massachusetts	1,519 mi	16	10,554	760
 Connecticut	618 mi	21	5,543	590
 Alabama	607 mi	22	52,420	61
 Rhode Island	384 mi	23	1,545	1,300
 Delaware	381 mi	24	2,489	810
 Mississippi	359 mi	25	48,432	39

1 https://en.wikipedia.org/wiki/List_of_U.S._states_and_territories_by_coastline