The Impact of Hurricanes on the Stock Market

Karthik Velvadapu

Introduction:

As soon as they land, hurricanes significantly impact the stock prices in the Southeast region of the United States. This study focuses on how hurricanes affect the stock prices of businesses in hurricane-affected areas. We collected stock prices of 20 significant US companies in the Southeast region following several hurricanes. The results demonstrated that stocks tend to decrease significantly following a hurricane and that some hurricanes were more challenging to recover from due to the severity of the hurricane and the state of the economy when they made landfall. A hurricane's impact on a business's stock resides in its ability to cause detrimental damage in many stock-impacting industries, such as tourism and agriculture.

This leads to a centralized question of how much financial or economic damage extreme weather can cause. By quantifying stock prices before and after hurricanes make landfall, we can get a detailed explanation of what hurricanes can do on an economic level and get a comprehensive answer to our core: how do hurricanes impact the stock prices of businesses in affected areas?

Literature Review:

The overriding question is: "How much damage can a hurricane cause on an economic level?" We can separate this question into some ideas or critical concepts. Stock prices, data sets, and property damage directly impact the economy, and indirect impacts on the economy are things we can highlight. Starting with stock prices, a general overview of the changes in stock prices is that a company's price will drop immediately as the hurricane lands, then increasingly go down, and only rise well after the storm has passed. According to C. Hill-Junke at segalmarco.com, Hurricane Irma 2017 was a known Category 5 hurricane predicted to land in Florida. However, the S&P 500 rose the day after the hurricane made devastating landfalls, and damage estimates came in at about $50 billion. However, the stock price didn't represent what happened to the landfall destinations. Many of the area's agricultural and hospitality industries were vastly affected.

Consequently, the S&P rebounded on the same day when loss estimates were evaluated at $19 billion. New York Fed President William Dudley said that since the labor markets were already tight, some construction wages would go up, and many economic sectors would be able to experience growth from that. Investors quickly started removing their protective investments, and the US dollar had risen for the first time in over a week. At the time, the VIX also had its

most significant single-day decline in three weeks. Later that day, the ratio of rising stocks to falling stocks was at a 3-month-high.

George Vlahakis (2024) found that hurricanes can generate spikes in uncertainty that can stay in financial markets for many months. The mispricing of these spikes can cause sudden sharp price changes, affecting stock prices. Vlahakis also worked with Mathias Kruttli and Sumudu Watugala and discussed their studies of business-level exposures to hurricanes over 24 years. They found that investors normally didn't overreact to uncertainty caused by hurricanes, but they couldn't update their knowledge entirely based on information available in real-time. Kruttli stated that the uncertainty caused by the storm typically comes after the fact since people are unsure of what to do when damage numbers become overwhelming. He also noted that the direct damage a hurricane will cause is never known. He provided the idea that some firms would be able to succeed in the time and some firms would be negatively affected by the extreme weather.

Josè Manuel Feria-Domínguez (2017) analyzed the financial impact of hurricanes that hit the US East Coast, used data sets to look at different hurricanes, and compared a few company's revenues to the hurricanes. They also mentioned hurricane impacts on insurance companies. They noted that hurricane damages can never be calculated beforehand, only estimates and hypothetical figures. They used this to say that reinsurers were forced to pay more if hurricane damages were more significant than anticipated. They used Hurricane Ike from 2008 as an example. Hurricane Ike resulted in 66% of the insurance claims. Therefore, this caused many reinsurers to go bankrupt, as they couldn't pay the money they owed.
Additionally, in Florida, the Florida Insurance Guarantee Association (FIGA) provides money to insurance companies that might have gone insolvent. If the FIGA runs out of money to give, it issues two types of assessments against insurance companies: regular and emergency assessments. FIGA has run out of cash before during hurricane recovery efforts, with notable hurricanes Katrina, Wilma, and Dennis.

Jeffrey D. Fisher & Sara R. Rutledge (2021) discussed the hurricane's influence on the commercial real estate market, specifically regarding property damages and values. They used experimental data to show that hurricanes can significantly devalue affected areas due to increased risk perception and potential damage. They also highlighted the resilience of some markets, in which property values may recover over time depending on the severity of the hurricane and how effective rebuilding efforts are. They were also able to discuss how investor behavior influences market recovery. They noted that some investors might withdraw from stocks due to higher risks, but some might dig deeper if they see an opportunity for wealthier property values. This research provided insight into how hurricanes affect economic assets beyond immediate physical damage.

Eric Strobl (2011) estimated the impact of hurricanes on local economic growth. He used a panel data set of US coastal countries' growth rates. He made a hurricane destruction index based on the monetary loss equation, local wind speed estimates derived from a wind field model, and exposure characteristics. His economic results suggested that a country's annual economic growth rate will drop by 0.45% on average during times of hurricanes. This drop is partially caused by more affluent people initially in the area who might have left due to the extreme weather pressures. He also found that the impact of hurricanes was written out at the state level in annual terms and didn't affect the national economic growth rates at all.

Tatyana Deryugina (2021) explored the economic impacts of natural disasters. She discussed how disasters can lead to immediate economic downturns and long-term shifts in economic growth. She also emphasized that the medium and long-term effects of an area affected by a catastrophe depend on the conditions of that area before landfall. For one of her studies, she took every hurricane that made landfall in the US from 1979-2002 and estimated how they affected country-level economics. She found that the fiscal costs for hurricanes were much higher than she previously thought and suggested that social safety nets could be an important factor in recovering. She also mentioned that even though a place might have had extreme declines in physical health in the short run, the same places seem to become more resistant in the long run for similar reasons. However, she said that another area that no one knows much about is the 'long-run health impacts.' She previously used administrative data from Medicare to look at long-term survival effects from Hurricane Katrina on elderly and disabled people who were directly affected by the storm. She compared the mortality of the individuals to Medicare beneficiaries from 10 cities that she had used in a previous study. In the short term, the Katrina victim's mortality was 10% above the average mortality rate in 2005. She also noted that concentrated increases in mortality were found in people above the age of 75 in 2004.

Methodology:

We are investigating how hurricanes impact the stock prices of businesses in affected areas. To precisely quantify the effect of hurricanes on stock market performance, we examined stock price values for 20 coastal companies, such as D.R. Horton and Lennar Corporation, that would have been affected by the hurricanes. All 20 companies we collected had been negatively affected by hurricanes.

For our data set, we looked at five different hurricanes for the time frames previously mentioned: Hurricane Sandy (2012), Hurricane Katrina (2005), Hurricane Wilma (2005), Hurricane Ike (2008), and Hurricane Andrew (1992). The stock prices of the same company could have a varied range in 2012 compared to 1992, so we used our timeframes—one month before landfall, one week after, one month after, three months after, and one year after—to get the stock prices

and analyze through percentage increases and decreases. We used Yahoo Finance and Macrotrends to provide accurate graphs and numbers for adequate market return data.

In summary, this methodology uses the stock prices of coastal construction-based companies in the Southeast region of the United States. It utilizes our time-frame event studies to analyze hurricanes' impact on stock market performance. The time frames ensure that the survey maintains a systematic and comprehensive approach to evaluate the economic damage of extreme weather events, which in turn gives us an answer to the financial consequences of hurricanes.

Results:

Hurricane Sandy

	Stock Price Change From 1 Week Before Landfall to:			
	1 Week After Landfall	**1 Month After Landfall**	**3 Months After Landfall**	**1 Year After Landfall**
Average Stock Price	-1.93%	-2.13%	-0.71%	28.29%
S&P 500 Performance	-1.62%	-0.08%	6.13%	17.90%

For Hurricane Sandy, the stock prices of the analyzed coastal companies experienced an initial decline similar to the broader market, as represented by the S&P 500. However, while the coastal companies showed slower recovery in the short term, their performance varied with the S&P's over the long term, eventually reflecting significant gains one year after landfall.

Hurricane Katrina

	Stock Price Change from Week 1 Before Landfall to:			
	1 Week After Landfall	**1 Month After Landfall**	**3 Months After Landfall**	**1 Year After Landfall**
Average Stock Price	1.01%	-0.16%	0.12%	2.15%
S&P 500 Performance	-1.25%	0.84%	2.21%	3.79%

For Hurricane Katrina, the stock prices of the analyzed companies fluctuated slightly in the short term, contrasting with the broader S&P 500, which experienced an initial decline followed by steadier growth. Over time, the coastal companies exhibited positive but modest gains, reflecting a slower recovery than the S&P's more consistent upward trend.

Hurricane Wilma

	Stock Price Change from Week 1 Before Landfall to:			
	1 Week After Landfall	**1 Month After Landfall**	**3 Months After Landfall**	**1 Year After Landfall**
Average Stock Price	-2.63%	-5.66%	-11.23%	-3.52%
S&P 500 Performance	-1.68%	4.55%	2.09%	-0.45%

For Hurricane Wilma, the analyzed companies experienced significant declines across most timeframes. This contrasts with the S&P 500, which showed initial losses but recovered with notable growth in the medium term. The coastal companies' performance lagged behind the broader market, highlighting a slower and less stable recovery trajectory.

Hurricane Ike

	Stock Price Change from Week 1 Before Landfall to:			
	1 Week After Landfall	**1 Month After Landfall**	**3 Months After Landfall**	**1 Year After Landfall**
Average Stock Price	-14.20%	-22.50%	-34.42%	-17.17%
S&P 500 Performance	-2.65%	-20.48%	-11.30%	17.79%

Hurricane Ike produced the most drastic stock price changes of all the hurricanes studied, with the coastal companies showing steep declines across all timeframes. These sharp drops align with the broader market's significant downturn, which was likely made worse by the national recession. Despite the severe losses in the short term, the S&P 500 showed a notable recovery by the one-year mark, contrasting with the more extended struggles of the coastal companies.

Hurricane Andrew

	Stock Price Change from Week 1 Before Landfall to:

	1 Week After Landfall	1 Month After Landfall	3 Months After Landfall	1 Year After Landfall
Average Stock Price	-4.22%	-7.15%	-12.30%	6.77%
S&P 500 Performance	-1.25%	0.85%	5.80%	5.41%

Hurricane Andrew resulted in moderate stock price declines for the coastal companies, with a more gradual recovery than the broader S&P 500. While the changes in the coastal companies' stock prices were generally more negative, the recovery by the one-year mark was notable, showing a positive shift. These patterns, though similar to those seen in other hurricanes, highlight the importance of considering different hurricanes to better understand overall trends in stock performance.

Discussion:

This analysis suggests that hurricanes lower the stock prices of businesses in affected areas. This finding, taken in context with the existing research presented in the literature review above, suggests that these stock prices decrease for the following reasons: investment uncertainty, rich people leaving the area, loss of jobs, property damage, and reduced tourism. The immediate decline following the first month after landfall shows that hurricanes generally cause a short-term value drop in stock prices, with varying recovery rates depending on the country's economic state. The volatility was prominent primarily at the initial time of landfall, but recovery rates did have an overall upward trend, while outliers still haven't recovered.

During the initial impact of landfall, stock prices in coastal areas declined, as Hurricane Sandy saw an average decline of -1.93% for the 20 coastal companies. Consequently, the S&P 500 dropped -1.62% during this timeframe. This could suggest that hurricanes can trigger marketwide reactions, but it could also indicate that there wasn't any devastating economic impact caused by the hurricane, as the S&P 500 was already declining. Hurricane Katrina also had similar numbers; the actual declines relatively matched the S&P's. These findings can also mean that investors are overreacting to projected damage numbers, which would lead to temporary dips in stock values.

Since we have data on the hurricane's immediate effects, we can begin to assess the recovery efforts. Hurricane Sandy saw a -2.13 % change in average stock prices, while the S&P rebounded into a +6.13% change. This ties into the earlier concept, as it gives an example of the hurricane's stock volatility not matching up with the overall market's volatility, which can cause declines that are separate from overall market trends. Additionally, after one year, the coastal companies affected by Sandy saw a significant recovery, with a +11.18% change in their prices. This introduces the idea that stocks can adjust to long-term impacts over time and reap the rewards of a healthy recovery. In contrast, storms like Wilma saw much weaker recoveries, which reminds us that we cannot ignore the variability of markets because they react to different storms during different times.

Comparing overall storm prices to S&P 500 prices gives valuable insights into specific impacts on stock markets. In the short run, the declines of the S&P and the prices of the 20 coastal companies were relatively similar. However, as time passed, these coastal companies made significant recoveries, which suggests that post-storm rebuilding efforts and regional resilience play a role in converting declines into positive shifts.

Additionally, Hurricane Ike occurred during a national recession, the harshest price changes of all the hurricanes we looked at. The 20 companies saw an average drop of -34.42% in the first month after landfall. The rapid decline can be partially blamed on the country's economic state before Ike's landfall. Furthermore, the natural recession had compounded Ike's impact on the coastal companies, further complicating recovery efforts. The S&P also got hit by the recession, with a -20.48 % change during the same timeframe, but the market, for a while, was able to have a very successful recovery after one year, seeing a 17.79% increase. This further supports the idea that external economic conditions, like recession, can amplify natural disasters' effects on stock prices.

While comparing the price changes for the hurricanes, we saw that the prices had varied considerably throughout the storms. Hurricane Ike caused the most dramatic declines, possibly connected to the economic recession when Ike made landfall. On the other hand, Andrew saw more moderate declines, with the average price drop being 4.22% a week after landfall. This also introduces the idea that the scale of the hurricane, the economic state, and its location play a role in determining a specific impact on stock prices. The varying recovery times and recovery success rates further emphasize the complexity of quantifying how natural disasters affect stock prices.

All of the varying data we've collected highlights the mixed nature of hurricanes. Although hurricanes cause short-term declines in stock prices, long-term effects are more complex, as they rely more on economic factors and the scale of the hurricanes. In societies where people are willing to help with recovery efforts and in places with resilient industries, the stock prices of

affected companies can rebound successfully. In contrast, locations without these things aren't able to recover fully. The data we've gathered offers insight into how markets react to natural disasters, with key takeaways for investors, policymakers, and businesses. It also shows that more research is needed to understand the long-term economic impacts of hurricanes across various sectors and how government and corporate actions can help reduce these effects.

Research Limitations:

Despite limitations like the small sample size and confounding variables like broader economic conditions, the findings emphasize that while hurricanes cause immediate stock market disruptions, external factors can mitigate or exacerbate the long-term financial impact.

This study provides a consensus on the fundamental economic impacts of hurricanes by quantifying stock price data from five major storms, and there are areas to explore in future work. First, incorporating a larger sample of hurricanes—including minor storms and tropical depressions—could offer a more inclusive understanding of how various storm intensities affect different sectors of the economy. An in-depth analysis tracking the same industries or geographic regions over multiple hurricane seasons may reveal long-term economic trends and growth patterns that single-event analysis might miss.

Conclusion:

This paper examines the economic impact of hurricanes on stock prices using five significant storms. It begins by discussing the extensive property damage caused by hurricanes and their effects on local economies. The literature review highlights how stock market volatility and uncertainty spike after such events, which are influenced by factors like insurance claims and investor behavior. The methodology involved analyzing stock prices of coastal companies across several timeframes, revealing varying amounts of increasing and decreasing prices.