

WEBINAR

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The Economic Impact of Hurricane Harvey - Q&A

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There is a federal flood insurance program, was that included in the insurance or the government aid estimate?

The federal flood insurance program is treated as insurance in the economic aid calculation.

Can you provide us a list of the counties in the light to moderate list? Will the list of impacted counties be included when you send out the updated presentation?

[Here is a list](#) of all counties that were affected in some manner, broken down by severe versus light to moderate.

What percent of the commercial real estate does Moody's estimate was insured against flood losses?

Moody's Analytics does not have information on the share of commercial real estate that was insured against flood losses. Data from the Insurance Information Institute indicate that only 15% of Harris County homeowners are insured against flood losses. While we believe this number to be significantly higher for businesses, we do not have any precise estimates.

On slide 5, would auto sales be included in "retail"?

The retail category is based on the Moody's Analytics estimates of retail output in the affected area. Assuming that the question is asking about a pickup in auto sales, this should be a net neutral in terms of output as increased auto sales are offset by the value of damaged or destroyed vehicles. Ultimately, either consumers (more likely) or insurers are paying to restore conditions to what they were prior to the storm, making this a net loss for the economy.

Do your property value declines just reflect repair costs?

Property value declines are based on the lost value associated with damage and destruction to homes, using house prices and housing stock as our starting points. If a home is destroyed, its value is assumed to be lost; for damaged homes, there is a decline in value that should be equivalent to repair costs.

What effects does the recovery process have on employment? Would there be a positive shock? Specifically, in the construction industry?

The recovery process will result in employment growth that is roughly flat in the coming months. Workers generally do not lose their jobs following a disaster like Harvey unless they were temporary to begin with, but firms will be hesitant to hire as many cope with lost output and a need to rebuild. By the beginning of next year, job growth will be stronger than it would have been absent Harvey due to pent-up demand for workers. This will be especially pronounced in the construction industry, as the need for rebuilding drives a surge in construction hiring. This will be offset to some extent, however, by the fact that construction is already a huge part of the Houston economy, meaning that the forecast was already optimistic. Further, worker shortages plaguing the industry will keep a lid on growth.

Are there estimates for the environmental losses due to e. coli and petrochemical damages?

It is simply too soon to quantify the impact of environmental damage associated with the hurricane. Health impacts unfold over many years, and there are not yet data on the number of cases of illness resulting from the hurricane. As time goes on, it will be more straightforward to calculate some of these costs.

Aerial footage from drones on YouTube and other sources show many of the streets flooded with water creeping well into front yards—but vehicles are parked close to the house and don't appear to be affected—could that mean we will have fewer lost vehicles?

Based on initial estimates, this seems unlikely. Claims for cars that were damaged or totaled during the hurricane are already in the six figures and are expected to climb to a half million or more, according to experts. So, if anything, our figures may be conservative.

Have you identified any counties in the "Severe Category" that are at a high risk of population decline post-storm?

The broader Houston metro area is not at risk of population decline because of its booming job market and very strong demographics before the storm. In Jefferson County, the severity of the damage and fairly modest growth create some risk of population decline as a result. Among smaller counties, those with the weakest medium-term population growth bear closest watching—these include Refugio County, San Patricio County, Matagorda County, Wharton County, Kleberg County, and Karnes County.

Do you see any other states/regions gaining significant short-term increases in their economies from taking on some of this loss of production? Any past trends or indication that industries may move operations as a protection against future disasters?

We do not meaningfully expect other states or regions to experience short-term increases, but there is some upside for certain areas. Dallas, for example, may prove a more compelling location for residents who were displaced from Houston but are seeking a somewhat nearby metro area with a wealth of good jobs. And it is possible that a temporary pickup in vehicle demand will benefit parts of the Midwest and the South.

There is no indication that any firms plan to move operations to protect themselves against future disasters, and the pivotal energy industry has too much infrastructure already in place in southeast Texas to consider a move. However, relatively mobile white-collar industries may eventually consider other locations if Houston's demographics worsen or floods prove to become an annual event. For now, though, that remains confined to a downside risk.

1) Is it possible for you to quantify these losses as % of GDP, especially inflation-adjusted? 2) Can you also attempt to break down the property losses into insurance versus government assistance, versus mortgage holders?

See the [table](#) for a breakdown of recent natural disasters, sorted by share of real GDP. As for property losses, we have broken them down into insurance and government aid for previous disasters, but it is too soon to know how that will play out with Harvey. What we do know is that \$8 billion of federal aid has been approved so far, and that the insurance figures will likely be low given low levels of flood insurance coverage.

Do you think the current housing inventory (after the destruction of many homes) will be enough to meet demand? How will house prices be impacted?

Housing inventory after the hurricane will not be sufficient to meet demand in the sense of having house prices grow at the same rate as before the hurricane. Close to 40,000 homes have been destroyed in Houston alone, and it is estimated that over 180,000 homes throughout the Texas coast have been damaged or destroyed by the hurricane. If any significant fraction of the residents of those homes decide to go on the market to purchase homes (which is even more likely if Texas or the City of Houston start to impose penalties for homes situated in flood plains) then it is unlikely that there will be enough listings to keep prices steady, given that the Houston housing market was already tight before the hurricane. After Hurricane Katrina, which had a roughly similar total amount of residential destruction, the annualized appreciation rate of house prices in New Orleans increased between 20 and 30 percentage points in the four months after the hurricane before returning to its normal trend. Houston and Beaumont should expect a similar effect, with a more moderate increase for Corpus Christi.

[Supporting document](#)

With focus on rebuilding after Harvey, would that draw away housing resources from the rest of the nation? Meaning, given that existing inventory/supply is not good, does this make things worse?

The national market for construction labor is already seriously tight. The unemployment rate for experienced construction workers and the ratio of construction workers to units under construction are both at cyclical lows. The estimated numbers for construction workers on the Texas coast and in Texas as a whole are already at a high point, which means that it will be hard for this total to increase quickly without in-migration. So any increase in the construction labor to repair Harvey damage would likely have to come from the rest of the country unless both wages increase and immigration restrictions are significantly loosened.

What will happen to the banks, especially the smaller banks, whose collateral (real estate, autos, boats) in large part is not insured through flood insurance?

We do not expect banks to suffer too badly as a result of a lack of flood insurance. For one, auto and boat losses should be covered independent of flood insurance coverage levels. And while a lack of flood insurance coverage will cause significant pain for homeowners, we expect that federal aid will fill some of that gap. A small percentage of homeowners may walk away from their homes and default on their mortgage, hurting banks, but this is a small enough figure that it will not cause too much harm to the financial sector. Further, the lack of flood insurance may compel some residents to borrow in order to replace damaged items such as home furnishings, which will provide something of an offset.

What is the one-year impact on the insurance industry?

The financial impact for the insurance industry is a function of many factors in addition to exposure through direct policies written in the impacted region. Some of the exposure will likely be passed on to reinsurers, but the amount that is ultimately reinsured varies widely among insurers. Since data on the amount and type of reinsurance purchased by each company are not routinely published, it is difficult to estimate

how much of the direct exposure is retained versus transferred to reinsurers. Capital adequacy and availability are also important factors since even large losses will be more easily absorbed by a company that has adequate capital or that can raise capital easily. Odds are that insurers will raise rates after a storm of this magnitude.

While a single natural disaster has not, on a historical basis, led to a macro downturn, is there a precedence for back-to-back disasters? The obvious reference here is to Irma, should it hit Florida and roll up the East Coast, for example.

Hurricane Rita hit the Gulf Coast shortly after Hurricane Katrina in 2005. After Rita, Hurricane Wilma threatened the Gulf Coast before moving over Florida and up the East Coast. These additional storms added to the overall economic cost of the 2005 hurricane season, but this did not lead to an economic downturn. GDP growth was below trend in the U.S. in the fourth quarter of 2005, which may be partly attributed to the lost economic output in the region but also because of the sizable increase in energy prices because of the hurricanes' damage to the U.S. energy infrastructure.

A hurricane or even back-to-back storms are unlikely to have a significant direct impact on U.S. GDP as a measure of the nation's current production of goods and services. GDP is not directly affected by the loss of property, residential and nonresidential structures, or vehicles and equipment that were produced previously. GDP will be indirectly affected by cleanup, replacement of damaged property, release of pent-up demand, and rebuilding of residential and nonresidential structures. Much of the economic activity disrupted by Harvey will be made up in subsequent months.

GDP is not the best measure to gauge the economic costs of a natural disaster, as it is not designed to do so.

How does the recovery in Houston compare to other disasters? Is your time horizon pretty reasonable?

Natural disasters don't have to be economic disasters, but the policy response is critical. The road map for restarting a regional economy after a natural or man-made disaster has six steps: providing short-term income and other financial assistance to distressed households; reviving the regional economy's disrupted export-oriented businesses; providing financial, legal and regulatory forbearance; reconstructing public infrastructure and institutions; providing tax incentives for housing and business development; and facilitating a well-functioning insurance market.

To assess how regional economies recover following natural disasters, we looked at the costliest U.S. hurricanes (excluding Katrina). We did not include other types of natural disasters, as each type has a unique effect on the economy. We identified either the largest or the most affected metro area from each of those hurricanes, and we looked at both employment and GDP. We excluded Katrina since that storm caused a large portion of the New Orleans population to be displaced and many didn't return. This is unusual following a hurricane and it magnified the impact on the economy and contributed to a slower than normal recovery from the natural disaster.

The effect on employment varies and a large decline in the month the hurricane occurs or immediately after doesn't always occur. One reason is likely timing; hurricanes that occur around the payroll reference week have a great effect on employment. Also, cleanup efforts create a number of temporary jobs, helping limit the negative impact of a hurricane on employment. Still, hurricanes disrupt the labor market, likely more than seen in the employment statistics. Hurricanes prevent people from getting to work and disrupt businesses' hiring plans.

Rebuilding provides some support to job growth, but this occurs with a lag. Insurance payments and federal funding can take time to be distributed and, particularly in the cases of Harvey and Katrina, floodwaters need to recede and the land needs to dry before construction can begin.

We next turn to metro area GDP, as employment likely underestimates the regional economic impact of rebuilding since construction is the primary industry that benefits. Among those metro areas affected by significant hurricanes, GDP increases after the storm, as rebuilding boosts residential and nonresidential investment. Also, consumers replace damaged possessions, including vehicles, and this lifts consumer spending. From a GDP perspective, those metro areas affected by a severe hurricane, with the exception of New Orleans, were made whole within a year. Our timeline for Houston follows a similar path seen in past severe hurricanes excluding Katrina.

The increase in metro area GDP in our forecast would suggest that hurricanes stimulate an economy. This is an economic debate that nearly always surfaces after natural disasters.

Those with opposing views often mention the broken window fallacy, which is based on the argument that destruction does not stimulate the economy. The broken window fallacy does not hold today given some spare capacity and cyclical unemployment in the region affected by Harvey. Therefore, federal funding, government spending, and some out-of-pocket expenses for homeowners will lift economic activity, because they would not have been deployed otherwise. For example, rebuilding from Harvey will put to work construction workers who would have remained unemployed.

There is also an important difference between economic activity and economic welfare. Although those affected by the storm are not better off now than before the storm, over time economic welfare will improve. If done properly, rebuilding can play an important role, as it will improve the capital stock. New infrastructure will replace old and outdated infrastructure.

Do you expect natural gas prices to behave in a manner similar to oil?

We do not expect there to be any long-term implications on natural gas prices. Because of the emergence of the Marcellus Shale, the U.S. could marshal investment and production if there were any extended production outages in the Gulf. Even that doesn't seem to be the case. Over 75% of oil and gas production in the Gulf of Mexico that was shut in has been restored. While Eagle Ford is very important to U.S. oil production, it is less important to the U.S. natural gas supply and demand balance.

I have heard conflicting stories about how easy it is to restart refineries: Some say it just requires power restoration, others say it's complicated and time-consuming. Comment?

As discussed during the webinar, this depends on the extent of the damage to refineries. If no damage occurred, they were able to get back on line very quickly, but others like the ExxonMobil Baytown Refinery may need months before they are back at full speed. Therefore, it will take a long time to get affected refineries back up to where they were pre-Harvey.

Why are gas prices up 55 cents in the Dallas-Fort Worth area?

It is reasonable to expect gasoline prices to rise by an outsize amount in areas affected by the hurricane. Comments to gas price levels on the call were to national averages.

What is the geographic impact of increased gas prices? Odd trend: Prices in Southern Virginia and South Carolina are usually 25 to 30 cents lower than North Carolina. Last week North Carolina was on par with both, seeing a far smaller increase.

It is a common occurrence for a hurricane to cause disruptions in energy infrastructure that can cause regional variability in gas prices. In this case, perhaps the place in NC was closer to the colonial pipeline, which carries a huge amount of gasoline supplies. More available gasoline in NC could explain the behavior that you are observing. There can also be differences in the retail markup at particular filling stations or regions. This could create additional gas price volatility aside from what can be explained by economic fundamentals. It is likely that one or both of these factors explain what you've observed.

[Supporting article](#)

What was the condition of the Texas UI fund before the storm? Is the state likely to have to borrow from the feds pursuant to Title XII?

The Texas unemployment insurance fund was recovering prior to the storm after the drawdown in 2015 following the oil price collapse. Now, because federal disaster UI relief has been made available, the Texas fund is less likely to have to borrow from the federal government.

Has there been any impact on the healthcare/education sector in Houston?

Yes. Some healthcare and educational facilities have been damaged, just as many homes and some offices, including medical offices, and industrial facilities have been damaged. The start of K-12 school was delayed. Further, damage to many motor vehicles will impede the ability of healthcare to be delivered to homebound people. A more subtle effect is that some medical research facilities were affected.

For residential construction, is the spike in permits just a function of needing to rebuild, or are more total units going to be added as well? What do you think happens to total housing stock?

The jump in permits reflects both the need to rebuild and also the fact that Houston will ultimately return to rebounding from the 2015 oil price collapse. The latter implies an acceleration of employment growth and demand for housing. Total housing stock will ultimately rise above its pre-Harvey level, but that of course will take several years.

We monitor subprime auto ABS and wonder what is your estimation of the potential loss of not having insurance coverage for subprime auto loan borrowers?

The data are insufficient to make a firm estimate at this point. As more information is made available, Moody's Investors Service will be revisiting its expectations for ABS performance. In the near term, we expect that Hurricane Harvey consumer relief efforts will mask any immediate uptick in auto loan delinquencies, which will likely materialize by the end of the year. [Please see the referenced report](#) for additional information.

Do you do any forecasts on increased delinquencies/credit losses on consumer loans/mortgages due to Harvey?

Post-crisis prime non-agency MBS generally have low exposure to the areas impacted by Hurricane Harvey, according to early assessments. Moody's Investors Service said that among the deals it has rated, an estimated 1.8% of the current unpaid principal balance is tied to collateral in counties where a disaster has been declared.

About two weeks back Michael Vogan shared an outlook for used auto residual valuation to trough in 2018, does Harvey's destruction of Houston's auto market impact that outlook?

Used-car prices will temporarily surge in the local Houston market; approximately 500,000 vehicles were damaged in the hurricane, creating upward price pressure driven by reduced supply and increased demand as consumers purchase replacement vehicles. However, dealers and manufacturers are likely to ship out vehicles to capitalize on arbitrage opportunities, which would help meet the demand and mitigate some of the supply-side shock. Despite the regional bump in car prices, our forecast for national used-car prices to reach bottom in 2018 remains unchanged. Vehicles damaged by Harvey represent a mere 0.2% of the 264 million registered vehicles in the United States, and the shock to Houston should not have a significant effect on used-car markets elsewhere in the country.

Authors

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