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Short-Term Job Growth Impacts of Hurricane Harvey on the Gulf Coast and Texas

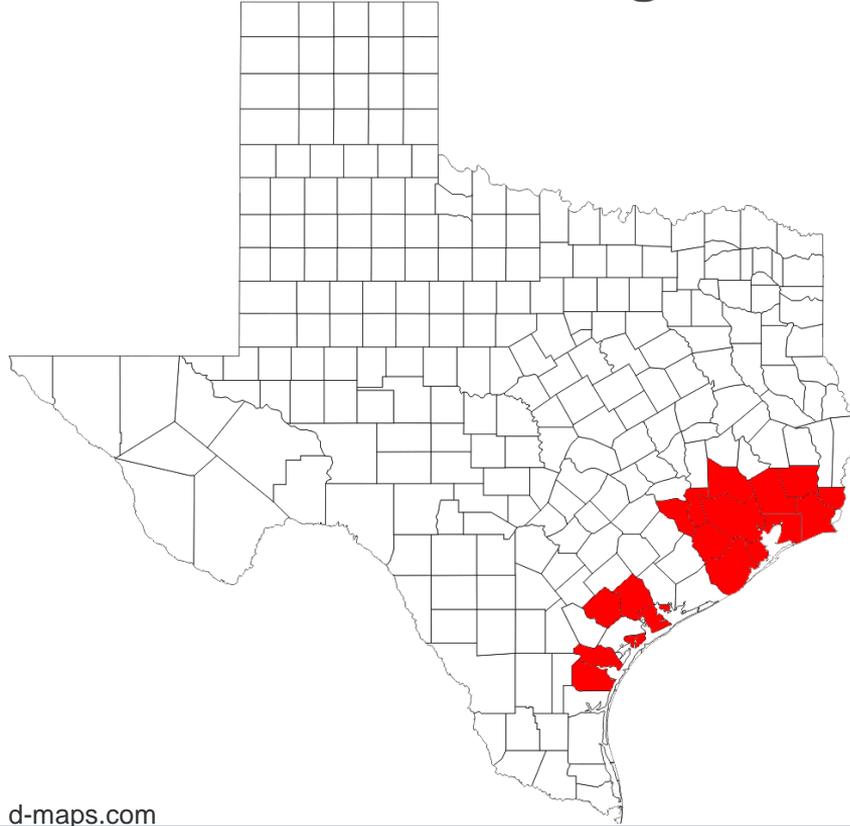
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Gulf Coast is Large and Economically Important

- We define the Gulf Coast as the metro areas of Houston, Beaumont-Port Arthur, Corpus Christi and Victoria.
- This region has 7.7 million people, 3.4 million jobs and produces \$556 billion in GDP (3.1 percent of U.S. output) , which is 28.2 percent of Texas jobs and 34.5 percent of Texas output.
- Houston is by far the biggest part of the region, representing 88 percent of regional jobs and 91 percent of regional output.
- This region tends to get hit with the same large weather events.

Gulf Coast Region



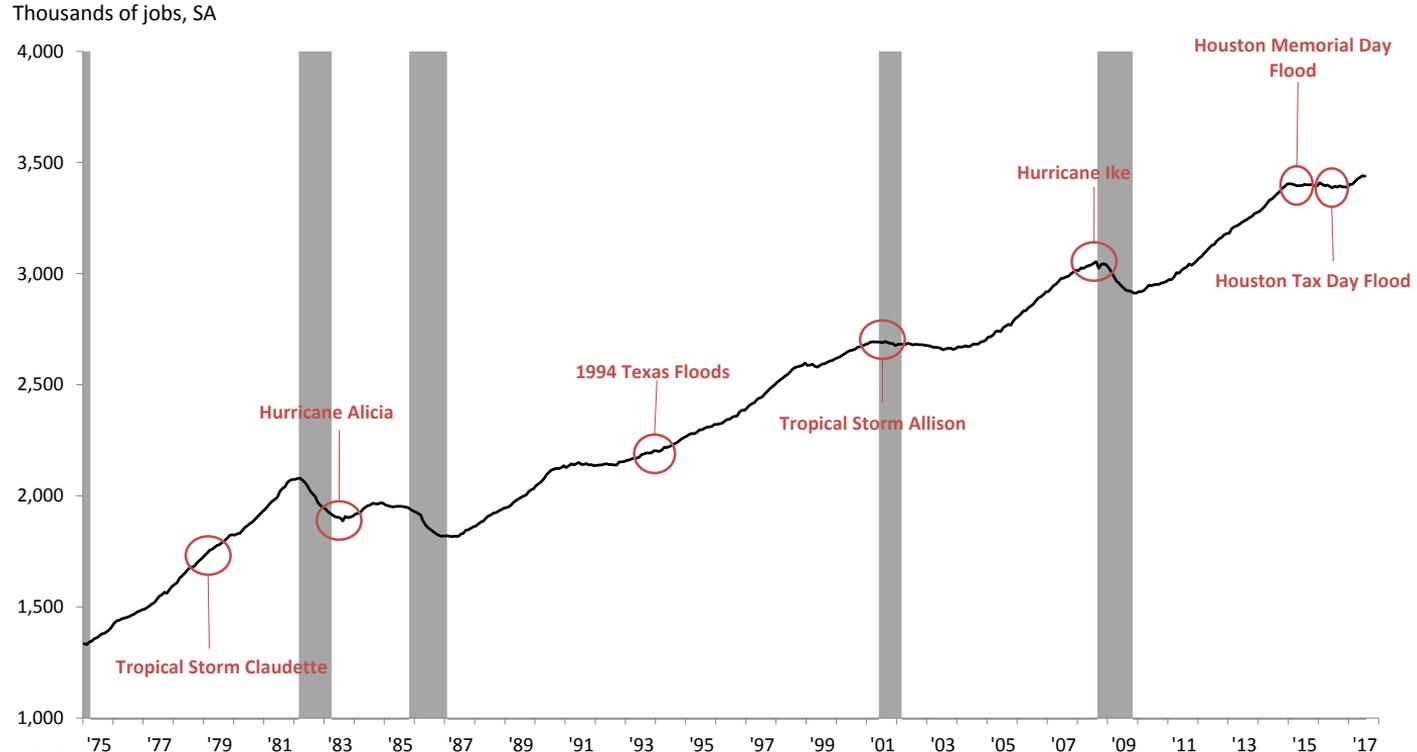
d-maps.com

There Have Been Seven Large Weather Events to Hit the Region Since 1975

- Best to study impacts on given region since regions differ in their topography, population density, long-term trends, etc. that affect how they respond
 - Tropical Storm Claudette (July 1979)
 - Hurricane Alicia (Aug. 1983)
 - Southeast Texas Floods (Oct. 1994)
 - Tropical Storm Allison (June 2001)
 - Hurricane Ike (Sept. 2008)
 - Houston Memorial Day Flood (May 2015)
 - Houston Tax Day Flood (Apr. 2016)

NOTE: Severe weather events are defined by the NOAA as those causing over \$1 billion in damages.

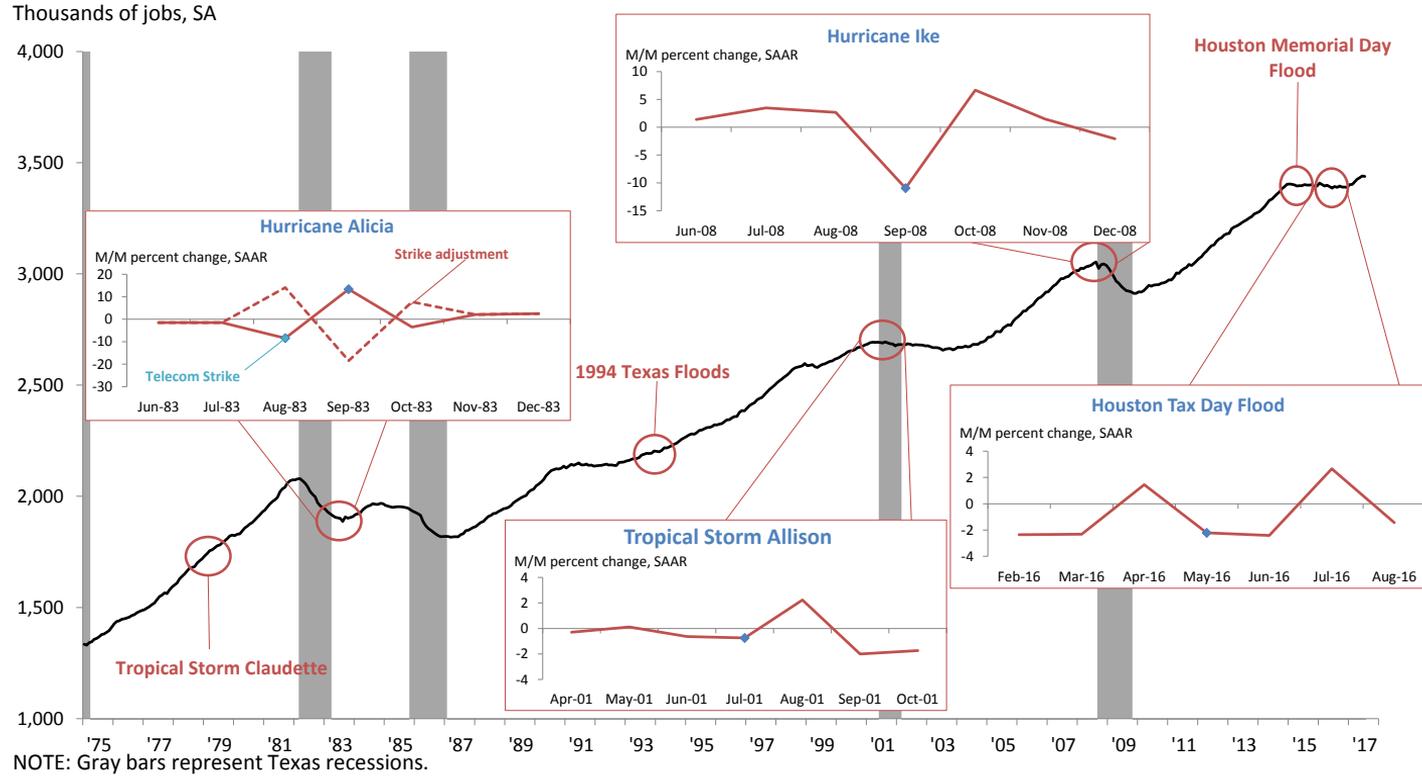
Past Severe Weather Impacts on Gulf Coast Job Growth Have Been Short-lived



NOTE: Gray bars represent Texas recessions.

SOURCES: Bureau of Labor Statistics; National Oceanic and Atmospheric Administration; adjustments by Federal Reserve Bank of Dallas.

Past Severe Weather Impacts on Gulf Coast Job Growth Have Been Short-lived



Hurricane Ike Was a Big Recent Event

- Occurred in September 2008 at an estimated cost of \$34.8 billion.
- Gulf Coast jobs declined by 29,000 (or 11 percent annualized rate (AR)) percent in September but bounced back by 16,000 (or 6.7 percent AR) in October. This was near peak in business cycle due to decline in oil prices and Great Recession.
- Best to model impacts to account for normal business cycle impacts.

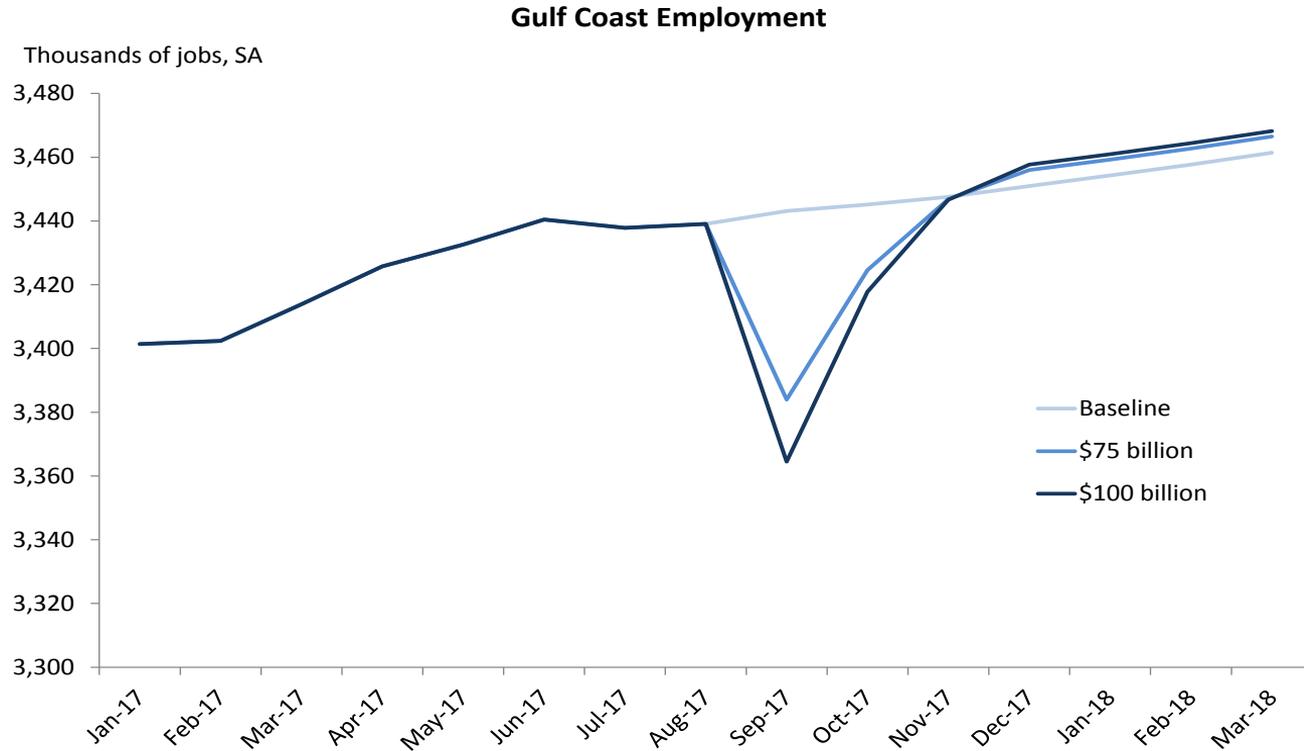
Compare Job Growth to What It Would Have Been Without Hurricane Harvey

- Look at momentum in economy and how size of event impacted job growth in month of hurricane and following months
- We use simple ARIMA model on growth rates to estimate momentum and then put in variable on direct cost of weather event and lags until no longer statistically relevant – also used a 1,-1 dummy for telecom strike in August, September 1983
- Model shows statistically significant current month decline followed by three months of significant bounce back

Harvey's Impact on Gulf Coast Job Growth is Large in September but Rebounds Quickly

- We use direct cost estimates of \$75 and \$100 billion
- In September, instead of gaining 5,000 jobs, the Gulf Coast is now projected to lose between 55,000 and 75,000 jobs (-18 to -23 percent AR)
- Instead of growing by 3,000 jobs in October and 4,000 jobs in November, jobs grow by 41,000-53,000 (15 to 21 percent AR) in October and 22,000-29,000 (8 to 11 percent AR) in November.
- December is milder with growth of 9,000 to 11,000 jobs.
- Forecast for remainder of 2017 prior to the hurricane was for growth of 1.0 percent AR and with Harvey is 1.5 - 1.6 percent AR.

Gulf Coast Results Show Sharp Decline in September, Return to Pre-Hurricane Estimates by November



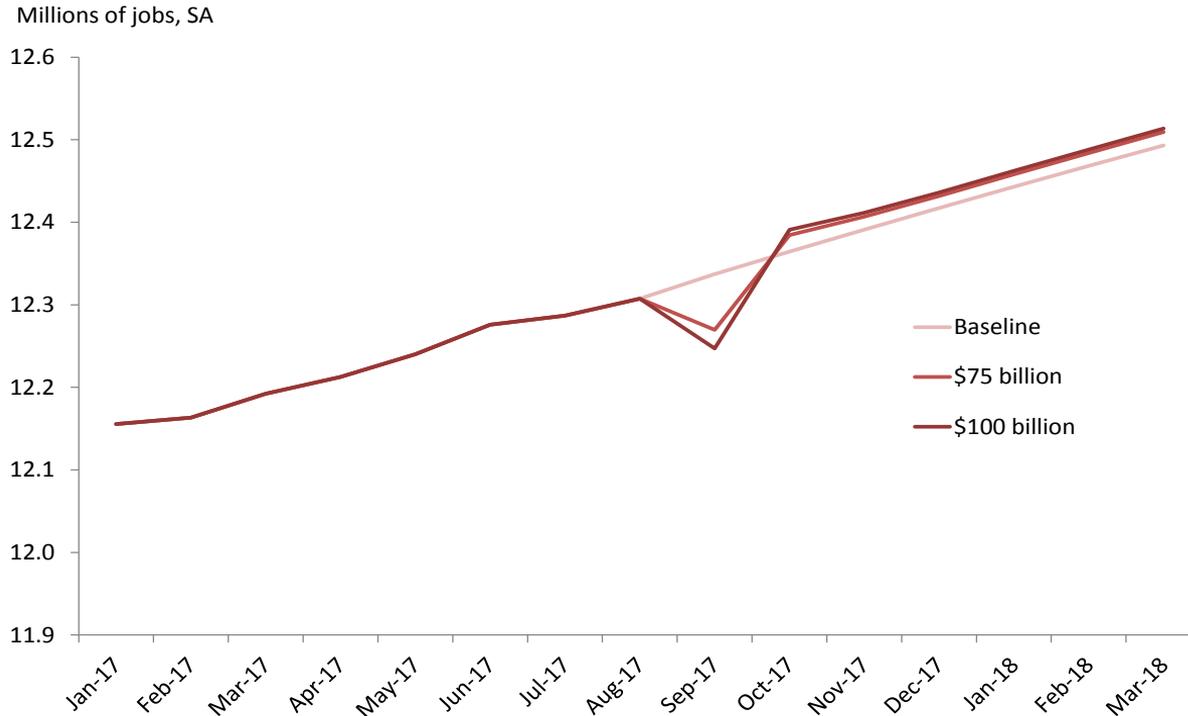
SOURCES: Bureau of Labor Statistics; National Oceanic and Atmospheric Administration; authors' calculations.

Impacts on Texas

- State-level jobs rebound to trend more quickly as jobs may be created in unaffected regions to help with reconstruction.
- Statewide, instead of job growth of 29,800 in September we now expect job losses of 37,800 to 60,400 (-2.3 to -5.7 percent AR) and instead of jobs growing by 27,400 jobs in October we now expect jobs to grow by 115,000-144,000 (12-15 percent AR).
- Forecast for remainder of the year prior to the hurricane was for growth of 2.7 percent and with Harvey is 3.1-3.2 percent.

Texas Results Show a Decline in September followed by Quick Rebound

Texas Employment



SOURCES: Bureau of Labor Statistics; National Oceanic and Atmospheric Administration; authors' calculations.

Summary

- Harvey will have big negative effects on wealth and on peoples lives but temporary effects on job growth – some good news for residents.
- Harvey not big enough to derail the positive job growth momentum in Gulf Coast region or Texas.
- Model looks at how Gulf Coast region responded to past weather events – current labor market tightness (particularly in construction sector) in state may slow the recovery response.
- Model looks at current momentum in economy – a sharp change in oil prices or other big economic shock would change outcomes.