



HURRICANES, HOUSING AND THE ECONOMY

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ABOUT TED, C. JONES, PHD

Ted C. Jones is the Chief Economist for Stewart Title Guaranty Company. Previously, he served as the first director of investor relations for Stewart Information Services Corporation NYSE-STC for 17 years, ending March 2014. Currently, Ted addresses the information needs of internal and external customers, conducts on-going research and supports economic and financial analysis for the company and its customers.

Jones earned a PhD in finance with a minor in statistics and a master's degree in land economics and real estate from Texas A&M University. He holds a Bachelor of Science degree from Colorado State University.

Prior to joining Stewart, he served as chief economist at Texas A&M University's Real Estate Center, the nation's largest publicly funded real estate research group. Before that, he authored and taught the valuation and appraisal section of the bachelor of commerce in valuation and property management at Lincoln College, University of Canterbury near Christchurch, New Zealand. An internationally recognized real estate expert, Ted has completed appraisals and property analysis in New Zealand, Australia, Canada, Mexico, the United Kingdom and the United States.

Ted C. Jones' recognized specialty is applied real estate research. Ted has completed numerous mass-appraisal assignments, including more than \$3 billion of income producing property owned by the Federal Deposit Insurance Corporation, retail properties, hotels, motels, offices, commercial land, multifamily housing, residences and numerous other special use properties. He completed a study on the impact of the Resolution Trust Corporation on real estate values and testified before the Oversight Board. Expert witness testimony has included analysis and evaluation of a solid rocket missile and carbon fiber plant, hydro, gas and coal-fired electric utilities and co-generation plants, an internal pipe coating plant in Scotland servicing the North Sea oil and gas production, and arguments on the treatment of deferred income taxes in the valuation of regulated public utilities. He has consulted The Boeing Company on property valuation issues relating to ad valorem property taxes at Boeing's diverse aerospace and aircraft manufacturing plants in Washington.

An accomplished speaker, Ted typically gives more than 150 presentations on real estate and the economic outlook each year. Representative real estate groups addressed include the National Association of REALTORS®; National Association of Home Builders; National Association of Corporate Real Estate Executives; Fannie Mae®; American Land Title Association®; The Housing Round Table; Association of University Real Estate Officials; New Zealand Property Management Institute; Employees Relocation Council; GMAC Real Estate; Prudential Real Estate Associates; Institute of Professionals in Taxation; American Bar Association®; Association of Real Estate Law Licensing Officials; and National Conference on Unit Value Standards.

He is a past member of the board of directors of the National, Texas and Houston associations of REALTORS® and served as chairman of the board of the Houston Association in 2004.

HURRICANES, HOUSING AND THE ECONOMY

For those who live near the East or Gulf Coasts in the U.S. long enough, a hurricane or tropical depression will likely enter your life at some stage. Since I moved to Houston in 1997, the city has experienced three major storms in the Gulf of Mexico: Tropical Depression Allison, Hurricane Ike and the now-infamous Hurricane Harvey.

These events do not just impact people, but also the economy and the demand for real estate. As usual, I invoke the **TINSTAANREM** axiom – **There Is No Such Thing As A National Real Estate Market**. Nor is there such a thing as a typical hurricane or tropical depression. Damage can arise from rain, wind and storm surge. Intense hurricanes can be short in duration with just wind damage. Tropical depressions, such as Allison, and Harvey when it was in Houston, can stall and drop enough rain that it must be measured in feet rather than inches.

What should be expected from such storms in terms of jobs and housing sales as a result of the massive damage inflicted by Harvey? And, more broadly, what happens to housing sales both near and long-term in such disasters?

HOME SALES MAY DECLINE IMMEDIATELY BUT LIKELY RISE IN ONE YEAR

Housing sales will undoubtedly decline the month of and perhaps the month following such events, as some homes under contract are damaged by the storm. Many homes will need an additional inspection prior to closing to assure the lender of underlying value and livable condition. What about longer term? Immediately following these storms, there is an overall decline in the inventory of housing – putting pressures on existing home listings and rental properties. Hence, aggregate market rents and prices are likely to rise. New construction, though in greater demand, now has to compete for materials and construction workers, with the surge in repairs and remediation created by the flooding and destruction.

- Some people will list their homes for sale that, without the hurricane, would otherwise not have moved but they have **“had enough”**. They will sell and leave town. These sellers will generate transactions that, without the storm, would never have taken place.
- Many individuals have jobs, business or family connections, or a combination thereof, that had damage to their existing property but will remain in the area. They will buy another property as it may take a year or more to repair or rebuild. This will cause a purchase transaction due to the storm, putting upward pressure on home prices. Supply, at least in the short run, is diminished while demand increases, even though there are the same number of households. When the original dwelling unit is repaired or rebuilt for these people, either it or the recently purchased property will be sold. Hence for some individuals, the storm triggers two transactions that otherwise would not have taken place. Given tight housing inventories in most markets today, these added listings do not have downward pressure on overall prices.
- Some individuals that own and have been flooded or had their current dwelling damaged will temporarily rent while repairs or rebuilding takes place, placing upward pressure on demand for rental properties. At the same time, the total inventory of rental properties is reduced by damaged and flooded rental houses and apartments.

Many people that own and plan to remain in the area see this as an opportune time to relocate within the locale whether they were damaged, flooded or not.

To answer how these storms impact housing and economy, I go back to my appraiser roots to look for so called **comparable sales**. Perhaps the best way to answer this is to view what happened in the past. Houston does not require a long-look back to find natural disasters.

Following are summaries of Hurricane Charlie, Hurricane Katrina, Hurricane Ivan, Tropical Depression Allison, Hurricane Rita and Hurricane Ike. Hurricane Katrina housing sales data in that time period could not be found.

The table summarizes the hurricanes and tropical depression from a perspective of home sales changes in the 12-months following the event versus 12-months prior, benchmarked to existing U.S. home sales for the same time period. There are five storm events with housing sales data available.

HOME SALES INCREASED POST-STORM WHEN COMPARED TO THE U.S.

In two of the five storms, housing sales in the 12-months post-storm increased in the impacted markets versus the U.S.

% Change, 12-Months Post-Storm				
Hurricane Charlie	Cape Coral Ft Myers	+11.1 percent	U.S.	+6.3 percent
Hurricane Rita	Beaumont Pt Arthur	+5.6 percent	U.S.	-5.1 percent

HOME SALES REMAINED CONSTANT PRE- AND POST-STORM

Tropical Depression Allison in Houston saw housing sales for the 12-months following June 2001 increase compared to the 12-months prior. In that same time period, U.S. home sales rose at approximately the same rate. Same scenario happened in the 12-months following the Hurricane Ivan.

% Change, 12-Months Post-Storm				
Tropical Depression Allison	Houston	+4.6 percent	U.S.	+4.9 percent
Hurricane Ivan	Pensacola	+5.6 percent	U.S.	+6.7 percent

HOME SALES DECLINED POST-STORM VS. PRE-STORM COMPARED TO THE U.S.

Following Hurricane Ike, Houston home sales declined post-storm versus the U.S. percent. Not all of the Houston drop, however, can be attributed to Hurricane Ike. As shown in the Appendix, the U.S. was in a recession at this time, which Houston entered later than the country.

% Change, 12-Months Post-Storm				
Hurricane Ike	Houston	-17.4 percent	U.S.	-3.0 percent

Ongoing was the implosion of the housing bubble previously driven by subprime lending. A second factor contributing to the decline was declining oil prices (also discussed in the Appendix). While this benefits the overall U.S. economy, cheap oil prices adversely impact the

Houston economy and the corresponding demand for housing. In one-of-the-five storm events home sales declined – but not necessarily due to the storm itself.

Hurricane & Tropical Depression Housing Sales

Storm	Location	Month	Post-Storm 12-Month Change Housing Sales *		Housing Sales 12-Months (U.S. Millions)	
			Local	U.S.	Pre-Storm	Post-Storm
Tropical Depression Allison	Houston MSA U.S.	Jun 2001	4.6%	4.9%	51,154	53,506
					5.234	5.489
Hurricane Charlie	Punta Gorda MSA Cape Coral-Ft Myers MSA U.S.	Aug 2004	6.3%		12,281.0	13,646.0
		Aug 2004	11.1%	6.3%	6.609	7.027
Hurricane Ivan	Pensacola MSA U.S.	Sep 2004	5.6%	6.7%	6,008	6,346
					6.641	7.087
Hurricane Katrina	New Orleans MSA U.S.	Aug 2005	New Orleans Housing Sales Not Available		6.960	6.744
				-3.1%		
Hurricane Rita	Beaumont-Port Arthur U.S.	Sep 2005	5.6%	-5.5%	2,431	2,567
					7.027	6.643
Hurricane Ike	Houston MSA U.S.	Sep 2008	-17.4%	-3.0%	67,993	56,136
					4,229	4,101

* Percent change in total home sales 12-months after the storm vs 12-months prior to storm, month of storm not included

Overall, expect home sales to increase or remain flat in the 12-months following these type storm events, as they each did four out of five times in the recent past.

JOBs MAY DECLINE IMMEDIATELY BUT LIKELY RISE IN THE LONG RUN

Also impacted are jobs. While the destruction and damage creates demand for demolition, repairs and construction, those same damages can implode some jobs for the short run. A damaged refinery, for example, has no need for workers until the refinery is repaired and back online. An economy attuned to leisure and hospitality goes into hibernation following a storm if hotels, restaurants and attractions are temporarily unavailable.

Immediate job declines are more likely in smaller markets with a less diverse economic base. The week following Hurricane Harvey saw U.S. jobless claims benefits jump by 62,000, the largest single one-week gain since November 2012 immediately following Hurricane Sandy.

The following table shows job changes for all of the previously discussed storms. Included also are comparative local and U.S. job growth rates for the 12-months ending the month of the storm. Metrics include (all with the U.S. rate as a benchmark):

- **ONE-MONTH POST-STORM:** Employment declined at greater rate in the local market, when compared to the U.S., in all but the two storms in Houston – Tropical Depression Allison and Hurricane Ike. This can be partially attributed to the impact of oil and gas prices on the overall Houston economy and the stage of Houston in the ongoing U.S. recession at those times. Graphs are shown in the Appendix.
- **SIX-MONTHS POST-STORM:** The impacted markets had superior job growth rates in five of the six storms.
- **12-MONTHS POST-STORM:** The impacted markets had superior job growth rates, compared to the U.S., in four of the six storms, essentially tied in one (Hurricane Ivan with Pensacola at 1.35 percent and the U.S. at 1.70 percent), and down in one (Katrina in New Orleans).

Job growth will likely falter immediately following such storms, but by 6 to 12-months post-storm, these markets equal or out-perform the U.S. economy.

Hurricane Job Growth Metrics										
Storm			Job Growth Rate							
			Pre-Storm		Post-Storm					
			Prior 12-Months *		One Month		6-Months		12-Months	
			Local	National	Local	National	Local	National	Local	National
Tropical Depression Allison	Houston MSA	Jun 2001	1.81%	-0.05%	-0.043%	-0.084%	-0.194%	-0.948%	-0.32%	-1.22%
Hurricane Charlie	Punta Gorda MSA Cape Coral-Ft Myers MSA	Aug 2004 Aug 2004	3.13% 7.78%	1.41% 1.41%	-3.780% 0.004%	0.123% 0.123%	1.256% 4.690%	0.727% 0.727%	9.34% 9.56%	1.87% 1.87%
Hurricane Katrina	New Orleans MSA	Aug 2005	-0.70%	1.95%	-21.6%	0.050%	-24.5%	0.923%	-19.31%	1.65%
Hurricane Ivan	Pensacola MSA	Sep 2005	5.64%	1.87%	0.047%	0.062%	-1.310%	0.923%	1.35%	1.70%
Hurricane Rita	Beaumont-Port Arthur	Sep 2005	1.99%	1.87%	-5.164%	0.062%	1.958%	0.923%	3.46%	1.70%
Hurricane Ike	Houston MSA	Sep 2008	1.28%	-0.97%	0.532%	-0.328%	-1.419%	-2.505%	-3.31%	-4.77%

* 12-Month growth as of the month of storm

Economic Commentary and Events

Storm	Data Issues and Observations
Tropical Depression Allison	U.S. was in a recession, but the Houston MSA job growth was greater than the U.S. both pre- and post-storm. Oil prices fell to almost \$20 per barrel in the six months following Allison
Hurricane Katrina	Big issue was not the hurricane, but rather breaching of the levee system that flooded 80% of all housing, many with 1 to 10 feet of water inside for more than 1 month
Hurricane Charlie	Housing bubble was just underway in Florida and rocketed up following the storm, with little change in Cape Coral-Ft Myers but jobs plunged the month following the storm in the Punta Gorda MSA for the next two years
Hurricane Rita	Jobs plunged the month following hurricane due to narrow economic base (refineries and petrochemical) but completely recovered within two months
Hurricane Ike	Ike hit in the middle of an extended recession, U.S. job growth had troughed but Houston was still declining, oil price plummeted 60% in next four months

HOME PRICE CHANGES

Not addressed in this blog is the specific impact on individual home values – flooded versus non-flooded. Overall market price statistics cannot be implied to each and every property in the marketplace. It is likely that while overall mean or median home values increase following hurricanes and tropical depressions, those that flooded dropped in value while those remaining dry increased.

The **Houston Chronicle** (September 10, 2017) quoted Tom Crawford, Houston real estate appraiser stating, “The minute that water comes across your threshold, you’ve lost about 22 percent of your value.” The appraiser’s analysis was based on a study of River Plantation, a subdivision in Conroe, Texas. Compared were homes that had flooded in the past to those that remained dry.

Whether a home has flooded or not is a material topic. The Houston Association of REALTORS® (HAR) added a data field to the MLS stating, based on disclosure by seller, whether or not the house flooded during Harvey. They also added a **Harvey Temporary Housing** section on HAR.com allowing people with housing in the city to create an HAR account that provides full contact information and then submit information about temporary housing availability. HAR then reviews these data, and when approved it goes onto the site allowing people with the available housing to receive inquiries from people looking for housing.

APPENDIX

Local Market Job Growth and Housing Market Performance Following Hurricanes and Tropical Depressions

Descriptions of the following storms were taken from multiple sources, with dollar amount of damages stated at the time of the storm. These are merely descriptive in nature. Employment, oil prices and housing sales are exact data from sources as referenced.

- Hurricane Charlie, Punta Gorda and Cape Coral-Ft Myers, Florida, August 2004
- Hurricane Katrina, New Orleans, Louisiana, August 2005
- Hurricane Ivan, Pensacola, Florida, September 2005
- Hurricane Rita, Beaumont-Port Arthur, Texas, September 2005
- Tropical Depression Allison, Houston, Texas, June 2001
- Hurricane Ike, Houston, Texas, September 2008

HURRICANE CHARLIE, PUNTA GORDA AND CAPE CORAL-FT MYERS, FLORIDA, AUGUST 2004

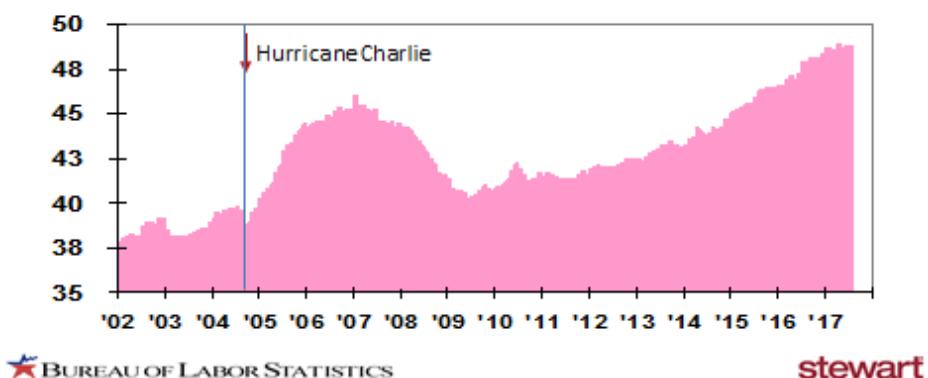
Hurricane Charlie, a Category 4 storm, directly hit Punta Gorda and impacted Cape Coral-Ft Myers, Florida in mid-August 2004, with 150 mph winds resulting in more than 2 million Floridians without power. At the time, Charlie was the second most damaging Hurricane to the U.S. at \$16 billion in losses.

Damage in the path of Charlie continued into Orlando. The following graph shows employment for the Cape Coral-Ft Myers MSA and Punta Gorda MSA. Unlike Harvey, Charlie was a very quick event without the lingering rains and with minimal flooding.

Punta Gorda, which has a relatively narrow leisure- and hospitality-oriented economy, plunged in employment the month following the Hurricane. Cape-Coral-Ft Myers, with a much broader economic base deflected slightly in comparison.

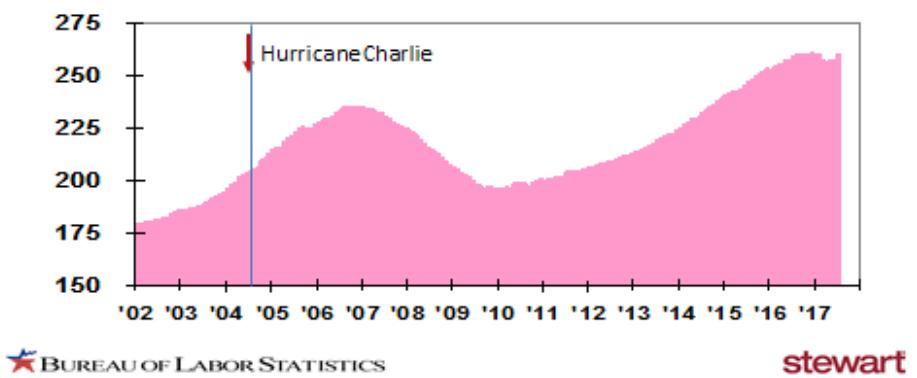
Punta Gorda MSA Employment

Thousands – Seasonally Adjusted

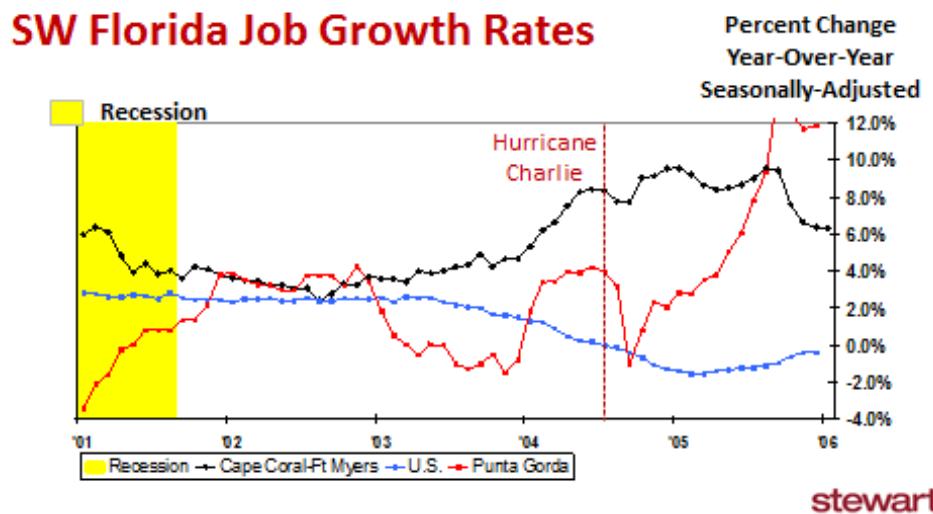


Cape Coral-Ft Myers MSA Employment

Thousands – Seasonally Adjusted

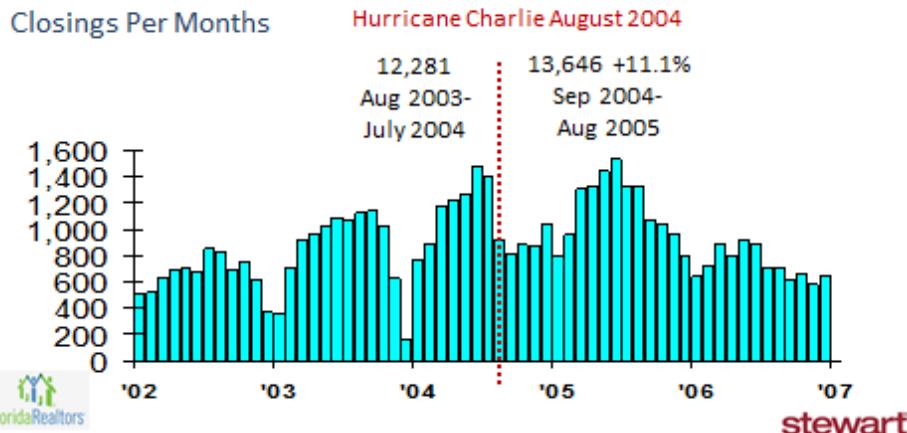


The following graph illustrates what I believe to be the classic impact of a Hurricane, with jobs in the Punta Gorda MSA falling immediately after the event, but then rising more than normal as reconstruction comes back into play. The Cape Coral-Ft Myers MSA experienced the same but at a much lower rate of decline.



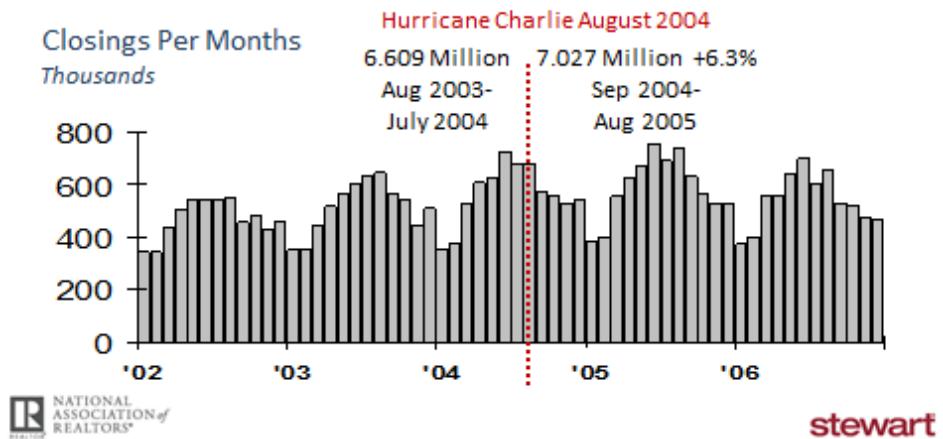
Though Punta Gorda was ground zero for Charlie, missing home sales data prevented making a pre- and post-Hurricane analysis. Cape Coral-Ft Myer housing sales are used as a proxy.

Cape Coral-Ft Myers MSA Home Sales



While U.S. existing home sales were up 6.3 percent in the 12-months ending August 2005 (as shown in the following graph), Cape Coral-Ft Myers was up 11.1 percent. Part of this was due to the building housing bubble driven by subprime lending.

U.S. Existing Home Sales



HURRICANE KATRINA, NEW ORLEANS, LOUISIANA, AUGUST 2005

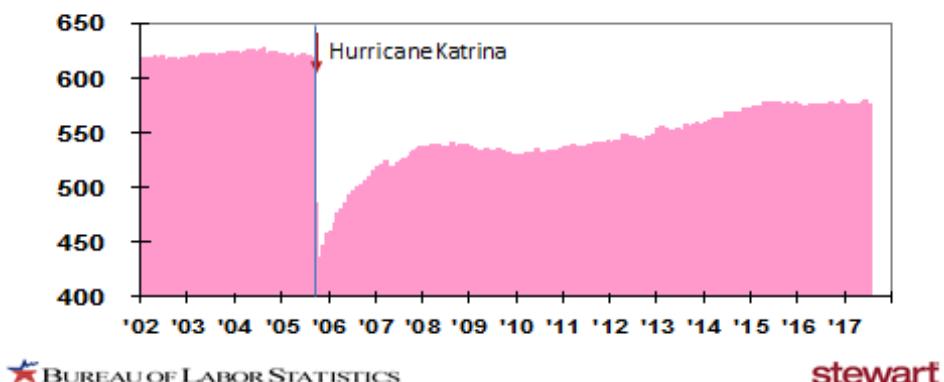
Katrina arrived packing 174 mph winds as a Category 5 Hurricane in August 2005. Despite the high winds, the devastation of the Hurricane was not limited to the wind effect, but primarily to flooding, storm surge and levee failure protecting New Orleans days following the Hurricane.

An estimated 80 percent of New Orleans was flooded. A full month later, up to 600,000 households were still displaced. After 10-years in 2015, the city population was just 80 percent of the count found in the 2000 U.S. Census. Total damages at the time from Hurricane Katrina were estimated at \$135 billion. The Data Center reported that, while \$120.5 billion of federal funds were spent on the Hurricane, 62 percent (an estimated \$75 billion) was spent on emergency relief rather than rebuilding.

Total employment (seasonally adjusted) is shown in the following graph for the New Orleans-Metairie MSA. Twelve years after the event, New Orleans is still down 7.1 percent in total job numbers. The second graph shows year-over-year change in the year-over-year percentage change in total jobs (seasonally adjusted).

New Orleans MSA Employment

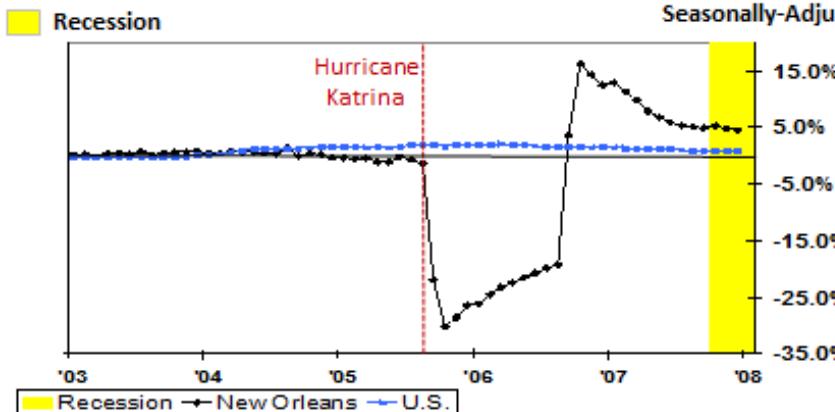
Thousands – Seasonally Adjusted



New Orleans MSA Job Growth Rates

Percent Change
Year-Over-Year

Seasonally-Adjusted

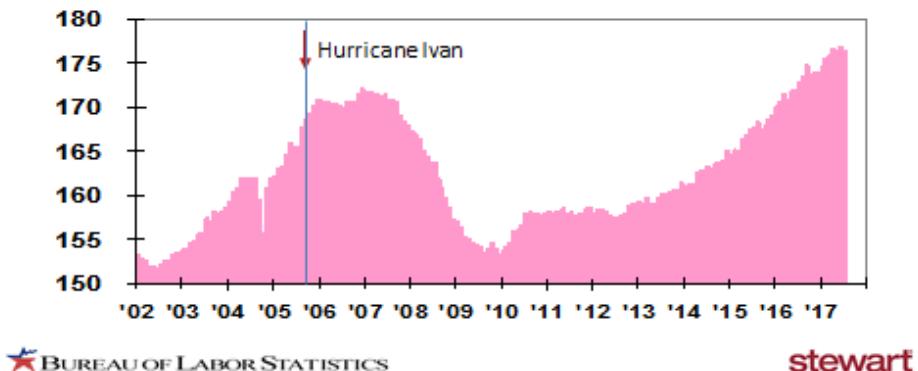


HURRICANE IVAN, PENSACOLA, FLORIDA, SEPTEMBER 2005

Hurricane Ivan came ashore as a Category 3 Hurricane, and while primarily hitting Orange Beach, Alabama, sustained winds in Pensacola hit 107 mph. The storm surge was 10 to 15 feet in height, enough to severely damage Interstate Highway 10 Bridge. Florida alone had \$8 billion in damages from Ivan. Total employment for the Pensacola MSA is shown in the next graph, followed by the year-over-year percentage change in the total number of jobs.

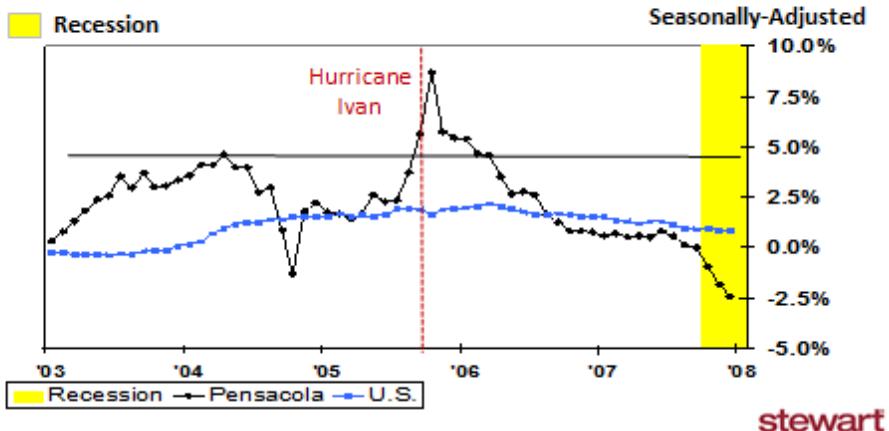
Pensacola MSA Employment

Thousands – Seasonally Adjusted



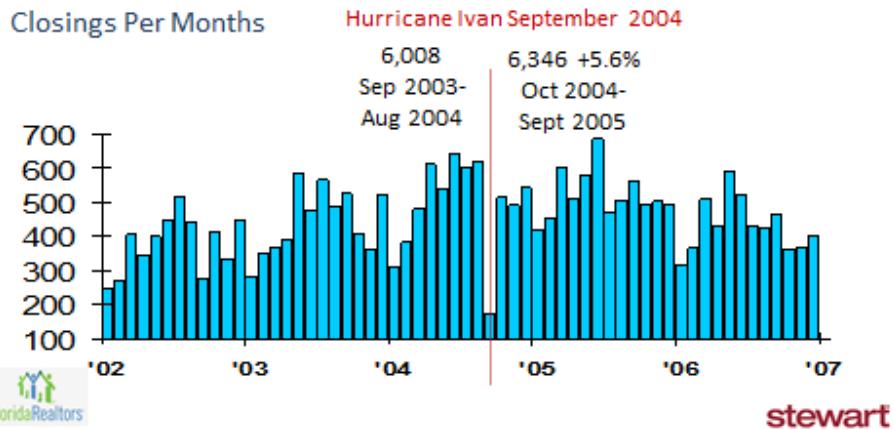
Pensacola MSA Job Growth Rates

Percent Change
Year-Over-Year
Seasonally-Adjusted

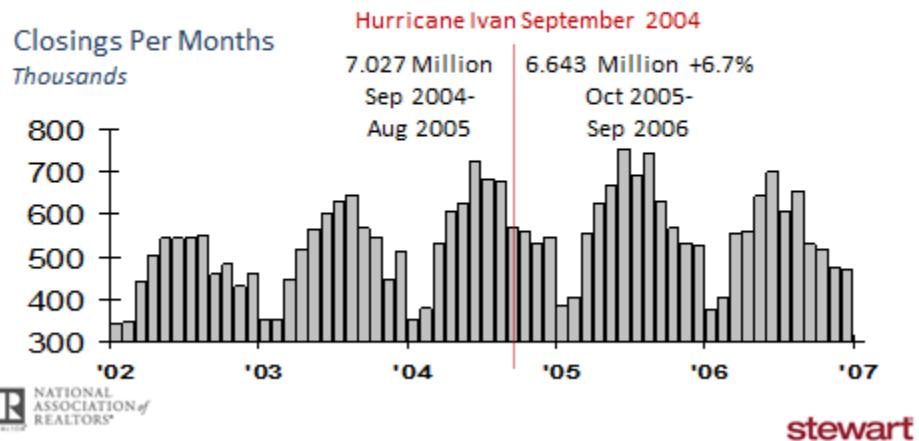


Pensacola housing sales significantly outperformed the U.S. sales volume as shown in the following two graphs.

Pensacola MSA Home Sales



U.S. Existing Home Sales

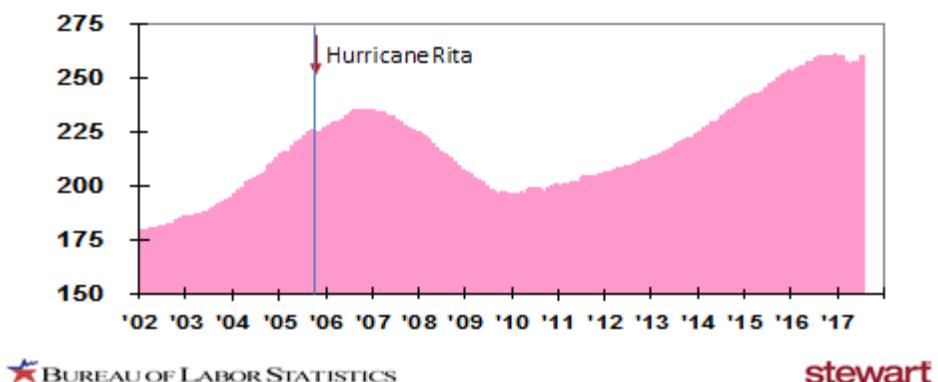


HURRICANE RITA, BEAUMONT-PORT ARTHUR, TEXAS SEPTEMBER 2005

Hurricane Rita came ashore as a Category 3 storm and, at one point, had sustained winds as high as 180 mph. At that time, Rita was the fourth most intense Atlantic Hurricane ever recorded. Primary U.S. impact was Beaumont-Port Arthur and Eastern Louisiana. More than 4,500 homes were destroyed in East Texas, with damage to another 14,256 single family dwellings.

Beaumont-Port Arthur MSA Employment

Thousands – Seasonally Adjusted

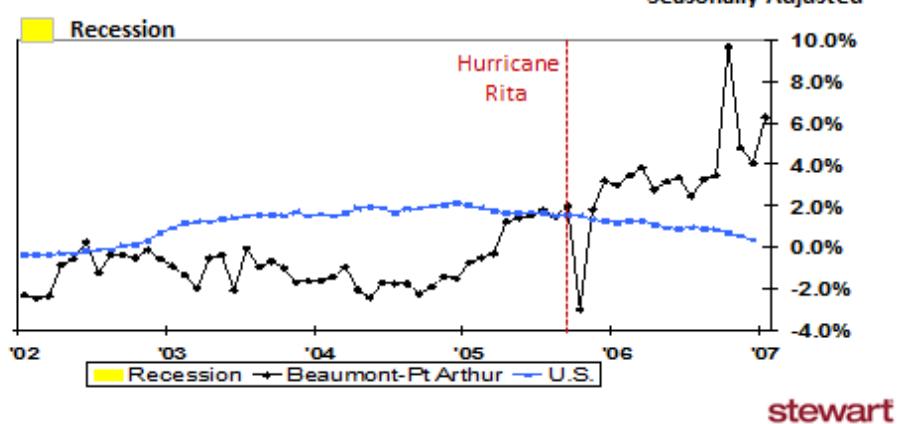


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Beaumont MSA Job Growth Rates

Year-Over-Year
Seasonally-Adjusted

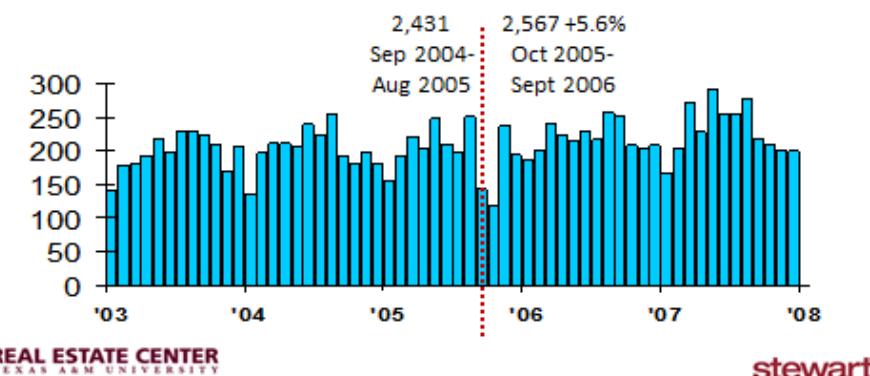


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Beaumont-Port Arthur MSA Home Sales

Closings Per Months

Hurricane Rita September 2005



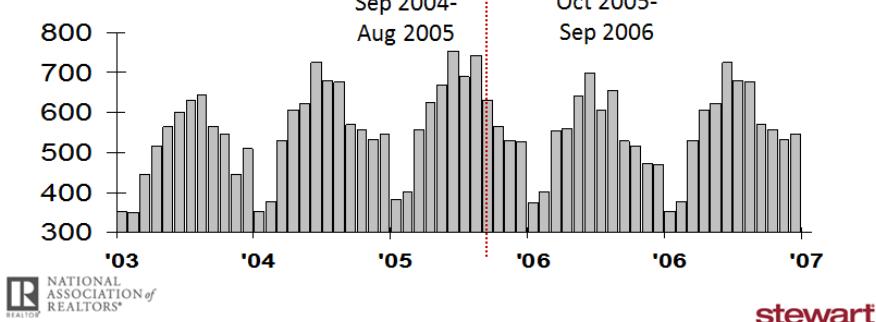
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U.S. Existing Home Sales

Closings Per Months
Thousands

Hurricane Rita September 2005



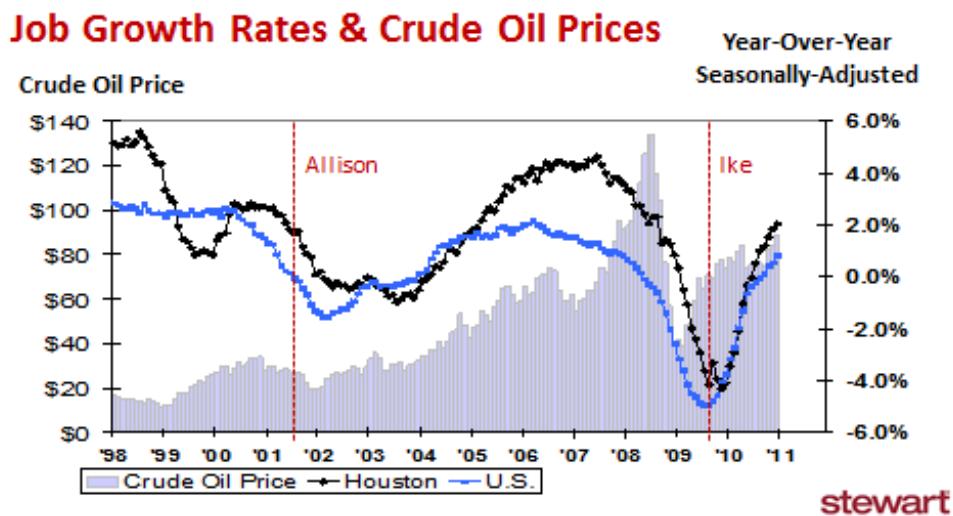
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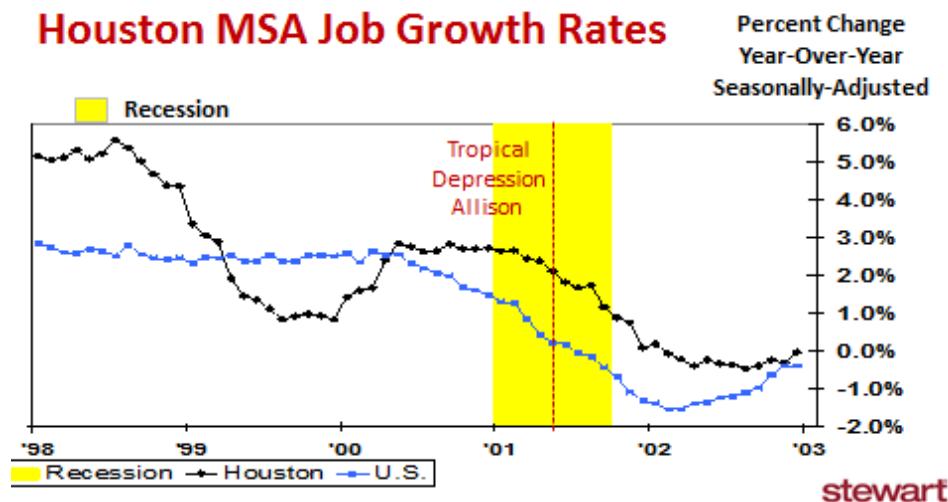
TROPICAL DEPRESSION ALLISON, HOUSTON, TEXAS, JUNE 2001

Though just a Tropical Depression in June 2001 with peak winds of 60 mph, the four days of heavy storms culminated in 35 inches of rainfall from Allison across Houston. Devastation from the flooding was widespread. An estimated 70,000 homes were flooded and approximately 3,000 destroyed. This is very similar to the 100,000 current estimate of flooding from Hurricane Harvey. Total storm damage was an estimated \$9 billion.

Unique to this analysis is the impact of oil prices on the Houston economy and ultimately housing sales. The following graph shows the Houston MSA job growth rates, timing of the two storms and oil prices.



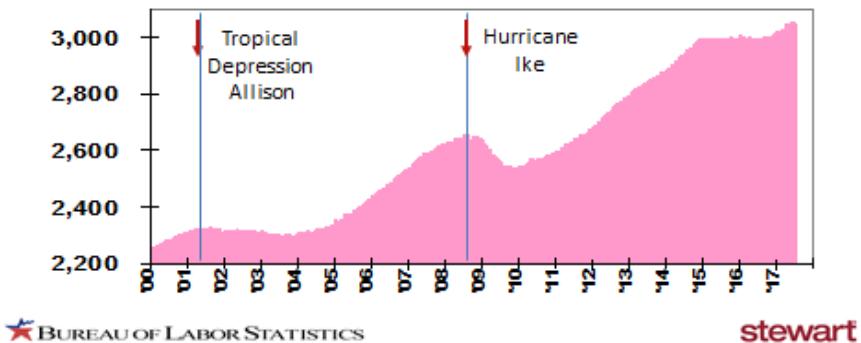
The next graph shows the U.S. recession, oil prices and Houston MSA job growth rates.



Total Houston employment is shown in the next graph.

Houston MSA Employment

Thousands – Seasonally Adjusted



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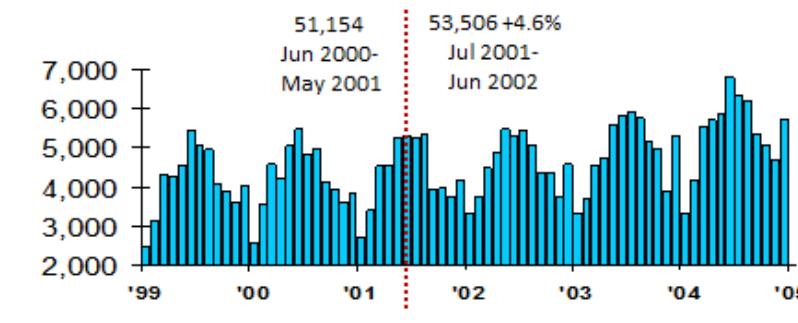
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Houston fared well following Allison in housing sales. The first table shows overall existing home sales for Houston, with tallies for home sales in the 12-month period prior to the month of Allison and the 12 months following the event. In the U.S., housing sales rose 4.9 percent following Allison versus the 12-months prior. This becomes the benchmark for comparison to Houston.

Houston The-Woodlands-Sugar Land MSA Home Sales

Closings Per Months

Tropical Depression Allison June 2001



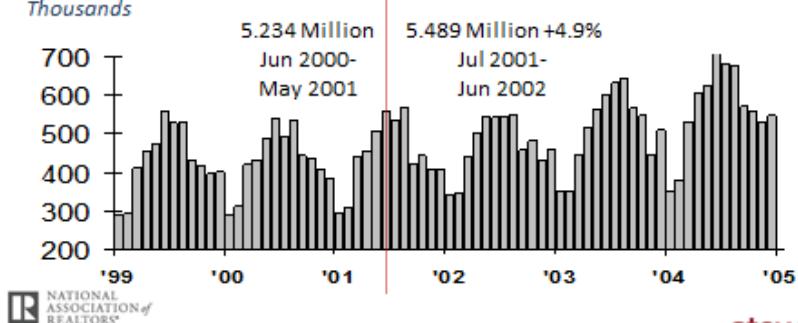
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U.S. Existing Home Sales

Closings Per Months
Thousands

Tropical Depression Allison June 2001



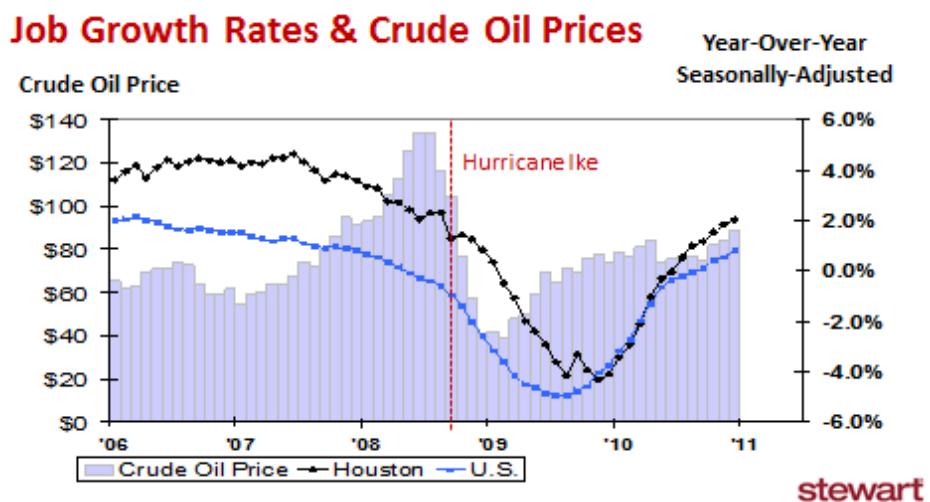
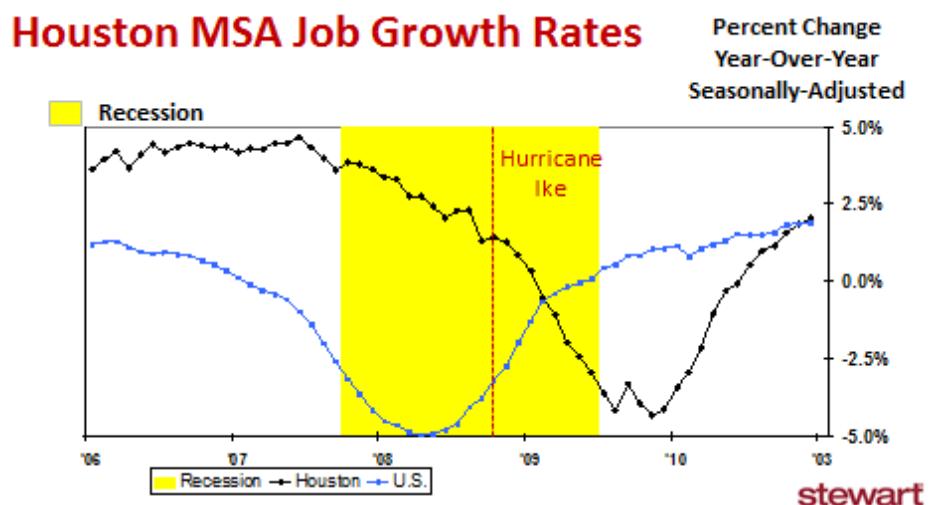
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HURRICANE IKE, HOUSTON, TEXAS, SEPTEMBER 2008

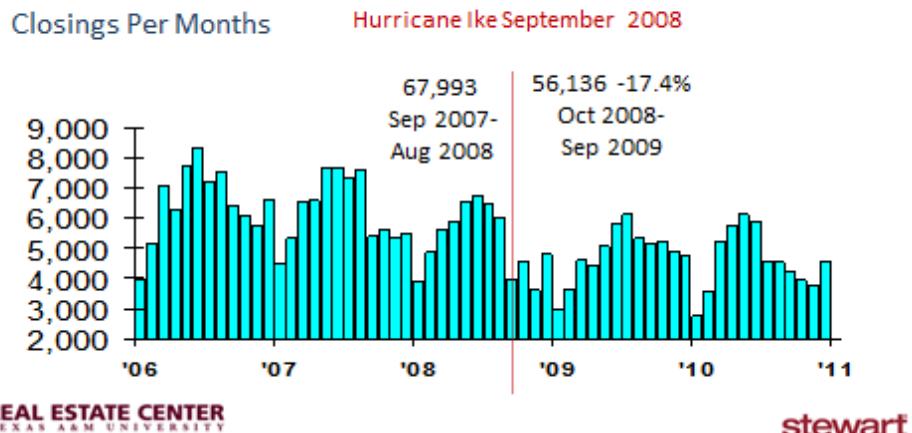
A major storm that came ashore in Texas as a Category 2 Hurricane with peak winds of 110 mph, Hurricane Ike hit some of the Texas coast with an estimated storm surge from 16 to 22 feet. An estimated 100,000 homes were flooded in Texas (most in the Houston area), and 2.8 to 4.5 million people were left without power for multiple weeks. At that time, Ike was the second most expensive Hurricane in damages to hit the U.S. at an estimated cost of \$37.6 billion – topped only by Katrina. Since then Sandy Hook and Harvey have demoted Ike to the fourth highest-loss Hurricane in the U.S.

The following graph shows the U.S. and Houston MSA job growth pre- and post- Hurricane Ike. Just as with Allison, Houston outperformed the U.S. in year-over-year percentage job growth rate prior to and in the six months following the storm. Not all of the decline six months after the Hurricane can be attributed to the storm. Houston entered the pre-recession job softening phase almost one and half years following the U.S.



Home sales were on a decline nationwide due to both the housing bubble implosion and the ongoing recession, as shown in the following graph. Although Ike had no impact at all on U.S. existing home sales, they declined by 3.0 percent in the 12-months following the storm due to the recession and housing bubble implosion.

Houston The-Woodlands-Sugar MSA Home Sales



U.S. Existing Home Sales

