Hurricane Harvey's Impact on Households Disposable Income and Real Estate Values in the Southeast Texas Region

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ABSTRACT

This paper examines the impact of Hurricane Harvey on households disposable income and values of flooded houses in South East Texas region. The disposable income analysis is based upon data obtained from the reports of 10 local credit unions and from the National Credit Union Administration. The data of the flooded 48 houses are used for the analysis of the values of flooded homes pulled from the Multiple Listing Service and the Jefferson County Tax Assessor's Office. Based on data analysis of this small sample of financial institutions, the findings suggest that the residents of Southeast Texas obligated to use more of their disposable income to maintain the pre-Harvey levels. The results of real estate analysis show a significant drop in value for the flooded houses with few having flood insurance looking at both the sales prices and new appraise values by the tax assessor.

Keywords: Hurricane Harvey's impact, Real estate values, Households Disposable Income

INTRODUCTION AND BACKGROUND

More than 51 inches rain dropped in Hardin, Jefferson, and Orange counties of Southeast Texas, which broke the record of 48 inches set in 1978. (Holmes, 2017) Harvey was one of the most expensive hurricanes in United States history after Hurricane Katrina, 2005. The property damage and impact on households of South East Texas region were substantial. The objective of this research was to analyze the impact of Hurricane Harvey on households disposable income and values of flooded houses. The disposable income analysis is based upon data obtained from the reports of local credit unions and from the National Credit Union Administration. The small sample of flooded houses used for the analysis of the real estate values.

According to The Wall Street Journal hurricane Harvey had a temporary impact on employment. "Payroll employment growth slowed in the weeks after Harvey, rising just 14,000 in September, and then bounced back with growth of 271,000 the following month." (Torry & Chaney, 2018) Texas Comptroller of Public Accounts considered a reduction in the productivity of labor. Salaried employees remained unaffected, while non-salaried employees experienced a deep decrease in their income. However, Comptroller assumed that the negative impact on employment would be counterbalanced by recovery efforts. (Hegar, 2018)

Storms had a significant effect on households checking account deposits and expenditures. "Checking account deposits for consumers were more than 20 percent ($400) lower and expenditures were more than 30 percent ($500) lower than the baseline in the week of Harvey." (Greig et al., 2018) Hurricane also had a big impact on debt return. "Debt payments dropped by more than 15 percent in the week of landfall and cumulatively remained lower than baseline 12 weeks after Hurricane Harvey." (Greig et al., 2018)

Harvey's direct impact on households' can be summarized as follows:
- 88 fatalities,
- 44,000 people forced to shelters,
- 450,000 people needed assistance to recover,
- employment grew only by 14,000 in September,
- 370,000 customer lost electricity,
- 120,000 customers left without water in Beaumont. (Aon Benfield, 2018)

The intensive construction and current infrastructure were not prepared to handle more than 51 inches of rain. The clay soil type provided an additional risk for flooding. (Ramchand & Krishnamoorti, 2017) This factors led that Harvey destroyed $125 billion worth of property including damaged:
- 148,000 single-family homes,
- 163,000 apartments,
- 500,000 cars. (Ramchand & Krishnamoorti, 2017)

According to Goldman Sachs, rebuilding efforts has the capacity to offset slowdowns. Long rebuilding, construction, and purchases lead the economic boost. (Torry & Chaney, 2018)

The Analysis of Hurricane Harvey's Impact on Households Disposable Income

   Using 10 local credit unions and other local data sources; this study shows a glimpse into the impact Hurricane Harvey had on the Hardin, Jefferson, and Orange counties of Southeast Texas. The report for each credit union was pulled from the National Credit Union Administration to gather the data examined. The results are only a sampling of the effects of Hurricane Harvey on resident's disposable income and savings. The authors believe that many residents used their savings and borrowed money to repair and replace lost items due to the flooding. This study shows that residents replaced or repaired the damage due to flooding from Hurricane Harvey using their monthly disposable income and/or savings. These losses potentially cause their ability to afford health care, higher education, travel, and other costs.

   The obtained data used to examine the need in financial services in Southeast Texas after Hurricane Harvey. As indicated in Table 1 (Appendix) local credit unions had an increase of $132,393,658 (7%) in 2017 in total loans outstanding from $1,894,314,692 in 2016 to $2,025,708,623 in 2017. Through this small sample of only 10 credit unions research shows that the number and the amounts of various types of loans increased significantly after Hurricane Harvey by 6.5% in 2017 over 2016. The number of loans granted decreased by 25,260 (18.9%) from 133,362 in 2016 to 108,102 in 2017. However, the value of loans granted increased by $73,813,490 (8.3%) from $893,085,836 in 2016 to $966,949,326 in 2017. This lead to the average aggregate loan grant increase on average by $2,248 (33.6%). This large increase in outstanding loan average amounts represents a significant increase in monthly payments $99.63 per loan based on the average increase.[1] CU's had their loan losses increase by $1.99m (14.1%) and the provision for next year's loan losses increased by $1.8m (14.7%). The increase in loans' losses can be attributed to Hurricane Harvey.

   The increase in new car loans is another example of hurricane Harvey's negative impact on South East Texas. Here authors show how much it costs Harvey victims to replace destroyed vehicles. For the overall credit union group, the average car loan increased to $25,883 in 2017 from $24,607 in 2016. Only the new car loans in 2017 increased by 2,208. The average loan was $33,464 up by $8,857 (36%) over the previous outstanding balance average. This increase translated into an additional $163.46 in payments each month.[2] The average payment was estimated to be $449.52 based on previous year's averages, but now the new loan average payment is estimated to be $612.98. The 15,329 new car loans held by the CU group represent only a small portion of car loans in Southeast Texas. Car title applications each year is slightly below 50,000 with an average of 3,100 made each by the CU group each year on average. As indicated in Chart 1 the title applications increased by 8,444 (72.2%) in the 4th quarter from 11,703 in 2016 to 20,147 in 2017. The CU group had 2,208 more new car loans in 2017 for $73,863,490. CU group held $396,757,252 in new car loans. Residents of the Golden Triangle that had to replace paid off or partially paid off vehicles with a new vehicle that have higher per month payments and higher insurance cost. The CU group had 122 less used car loans but had an increase of $24,775,016 in used car loan values outstanding. The outstanding average loan for used cars increased from an average of $14,603 in 2016 to $15,437 in 2017. The average used

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[1] Based on 24 months at 6% APR
[2] Based on 60 months at 3.7% APR

car payment rose from $329.98 to $349.24.[3] This is an increase of $19.26 per month per loan. The CU group held 31,856 used car loans for a book value of $491,744,307.

Chart 1. Car title applications
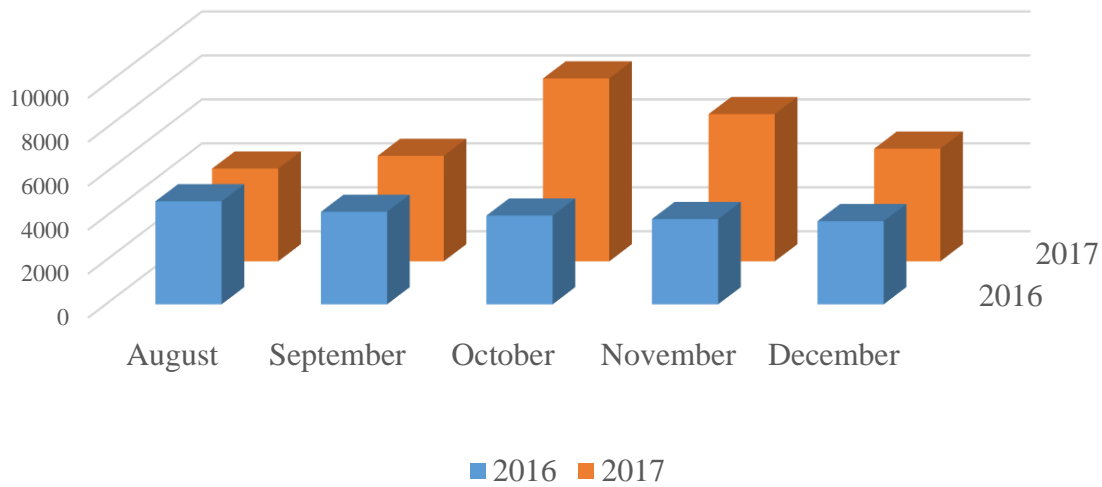
As indicated in Table 2 (Appendix) the number of approved registrations for individual assistance in the Hardin, Jefferson, and Orange counties of Southeast Texas for FEMA was 54,578. The total amount in survivor's pocket in three counties of Southeast Texas was $1.77 billion as estimated by FEMA. FEMA issued 11,290 applications for business loans in the three counties of Southeast Texas. The number of applications received was 1,461. The total of applications approved was 470. Theses approvals were 4.2% of applications issued and 32.2% of applications received. The average business loan approved was $131,072. A business would on average have to pay an extra $1036.52.[4]

Post-Harvey Real Estate Analysis in Flooded Area of South East Texas

National Flood Insurance Program (NFIP) paid $752.5 million in the Hardin, Jefferson, and Orange counties of Southeast Texas for the 11,968 flood claims. It was estimated that in Beaumont alone there were over 20,000 flooded homes. Housing and other disaster-related expenses for the three research counties of Southeast Texas were $331 million.

As indicated in Table 3 (Appendix) FEMA also issued 57,826 applications for home loans. The number of applications received was 15,927. Applications approved were 7257 for $625 million. These approvals were 12.5% of applications issued and 27.5% of received applications. The average home loan approved by FEMA was $86,138. The extra payment on their home to service this new mortgage on their home would be $364.56 a month in addition to

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[3] Based on 48 months at 4.1% APR
[4] Based on 180 months at 5% APR

any previous 1st or 2nd mortgage already on their residence.[5] These numbers show that a lot of people got applications for home and other loans but for various reasons did not apply or get approved. Using another small sample of real estate loans from the CU group, the number of real estate loans increased by 227 ($40,987,121). The overall average new loan can be estimated at $180,560. This means the potential payment for principal and interest ignoring escrow cost would be $1,427.86 per month.[6] Aggregate the whole real estate loan together, the authors can estimate at least a $42.82 increase in payments on average. The one fact that shows clearly from the data is for this small sampling of real estate loans, many residents are paying more per month on average.

Sales tax collected increased by $1,599,964 (24%) in the 4th quarter in 2017 as compared to the 4th quarter of 2016 (Chart 2). This increase represents an unplanned additional expenditure of $319,992,800. This increase was due to residents having to replace items lost due to Hurricane Harvey. Research also observed a significant increase in sales in a local hardware store in Southeast Texas. In the 4th quarter of 2017, sales increased by 66.7% in their Beaumont store, 173.2% in their Lumberton store and 124.1% in Vidor store (Table 6).

Chart 2. Collected sales tax in Jefferson county, 4th quarter of 2016 vs. 2017
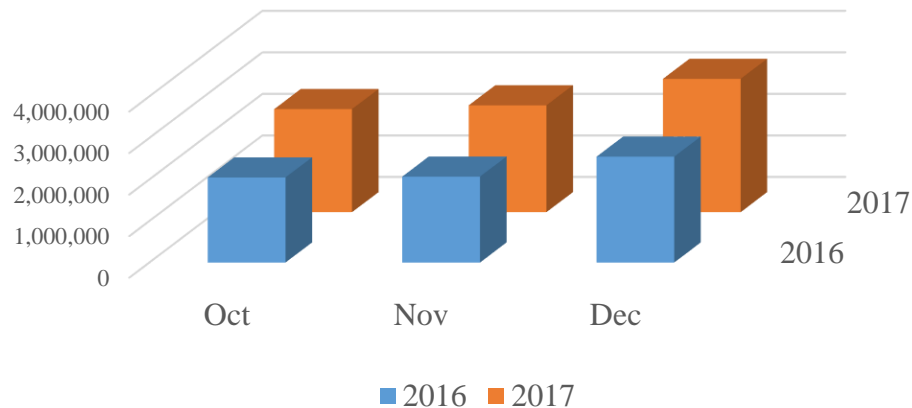
Examining a small sample of flooded homes in Beaumont, the appraised value for 2017 before Harvey had an average of $105,628 per home. The average for this sample after Harvey is $36,190. This difference is $69,438 (65.7%) less for the home value after Harvey. The average price that homes sold after Harvey was $73,749. This difference is $31,879 (30.2%) less than their 2017 pre-Harvey appraised values by the appraisal district. These losses represent a huge decrease in the homeowners' equity. A regression model with a dummy variable for pre versus post-Harvey flooded homes shows that the sales price on average was $33,664 less after Harvey as compared to before Harvey (Table 4 & 5).

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[5] Based on 360 months at 3.03% APR
[6] Based on 360 months at 5% APR

CONCLUSION

In summary, residents of Hardin, Jefferson, and Orange counties of Southeast Texas obligated to use more of their disposable income each month to recover and maintain the pre-Harvey standard of living. The victims of Hurricane Harvey paid on average $164 more each month for their new car loan, $20 more each month for their used car loan, $100 more a month for the general outstanding loan, $365 more a month for the FEMA home loan, $1,037 for SBA business loan, $1,428 per month for CU real estate loan, plus many other hidden cost associated with Hurricane Harvey. The real estate analysis showed a significant drop in value for flooded houses with few having flood insurance.

Households of Southeast Texas should always be prepared for the negative financial impact on their disposable income and the physical damage of real estate they own. Otherwise, they can face long-term damages and financial consequences. These are some recommendations that can help to minimize the risks related to hurricanes.

- National Flood Insurance Program (NFIP) and private property insurance are important risk management tools to minimize the damage from natural disasters. Using this risk management tools will help to avoid big financial losses.
- Households should set aside emergency cash to withstand the financial shock created by the hurricane. It is recommended to maintain a $2500-$3000 cash buffer to overcome the difference in costs and income.
- In the case of hurricanes government, businesses and nonprofit organizations should continue their best practices in providing resources to disaster relief, medical assistance, food, shelter, and reconstruction. Without this support, recovery will be much difficult, and it is desirable that all supporters coordinate their efforts in a way to maximize the benefits of their resource allocation.

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http://www.jcad.org/ Jefferson Central Appraisal District

https://www.ncua.gov/ National Credit Union Administration

APPENDIX

Table 1. Loan data obtained from reports of 10 local Credit Unions of Southeast Texas

	Dec-17	Dec-16	Difference
Cash on hand	$ 38,871,873	$ 35,808,306	$ 3,063,567
Total investments	$ 550,445,891	$ 393,505,210	$ 156,940,681
Loan losses	$ 16,079,737	$ 14,087,282	$ 1,992,455
Provision loans losses	$ 14,169,249	$ 12,348,356	$ 1,820,893
Number of credit card loans	47,493	46,393	1,100
Credit card loans, dollar amount	$ 107,969,440	$ 107,650,970	$ 318,470
Number of new car loans	15,329	13,121	2,208
New car loans, dollar amount	$ 396,757,252	$ 322,867,957	$ 73,889,295
Number of used car loans	31,856	31,978	-122
Used car loans, dollar amount	$ 491,744,307	$ 466,969,291	$ 24,775,016
Number of total loans	161,593	160,826	767
Total loans, dollar amount	$ 2,025,708,623	$ 1,893,314,965	$ 132,393,658
Number of loans granted	108,102	133,362	-25,260
Loans granted, dollar amount	$ 966,949,326	$ 893,085,836	$ 73,863,490
Credit card loss	$ 2,769,378	$ 2,468,384	$ 300,994
New car credit loss	$ 1,759,287	$ 856,539	$ 902,748
Used car credit loss	$ 3,566,960	$ 2,297,824	$ 1,269,136

Table 2. Business loans data obtained from SBA and FEMA

	Jefferson	Hardin	Orange	Southeast Texas (3 counties)
SBA loans				
Number of SBA loans	3,787	950	3,050	7,787
Total SBA loans, $ Amt	$ 294.5 M	$ 110.3 M	$ 279.9 M	$ 687.4 M
FEMA business loans				
Applications issued	6918	1190	3182	11290
Applications received	896	132	433	1461
Applications approved	263	51	156	470
Dollars approved	$ 32.8 M	$ 8.1 M	$ 20.7 M	$ 61.5 M
Average business loan	$ 124,661.22	$ 158,588.24	$ 132,884.62	$ 131,072.13
Average business loan payment	$ 985.82	$ 977.55	$ 1,050.85	$ 1,036.52

Table 3. NFIP claims and FEMA home loan data analysis

	Jefferson	Hardin	Orange	Southeast Texas (3 counties)
Number of approved registrations for individual assistance	32,237	4,735	17,606	54,578
Number of NFIP claims	6941	798	4229	11968
Amount paid on NFIP claims	$ 391.99 M	$ 90.3 M	$ 270.2 M	$ 752.5 M
Housing and other disaster related expenses	$ 173.3 M	$ 35.1 M	$ 122.4 M	$ 330.8 M
Total amount survivors pocket	$ 859.8 M	$ 235.7 M	$ 672.6 M	$ 1.77 B
FEMA home loans				
Applications issued	34220	5707	17899	57826
Applications received	8466	1698	5763	15927
Applications approved	3486	893	2878	7257
Dollars approved	$ 259.3 M	$ 110.4 M	$ 255.4 M	$ 625.1 M
Average home loan	$ 74,382.21	$ 123,615.45	$ 88,749.27	$ 86,138.27
Average home loan payment	$ 314.81	$ 523.17	$ 375.61	$ 364.56

Table 4. Real estate appraisal value and sales price analysis of the small sample of flooded houses

	Appraised value 2017	Appraised value 2018	Post harvey sales price	Difference in appraise values and sales prices	
				2017 vs Sales Price	2018 vs 2017
Mean	105,627.71	36,190.21	73,749.35	69,437.5	31,878.35
Standard error	8,163.02	2,951.48	6,938.79	5,383.00	6,524.96
Median	88,135	33,980	61,950	58,315	28,615
Mode	#N/A	#N/A	25,000		
Standard deviation	56,555.04	20,448.46	48,073.34	37,294.50	45,206.27
Sample variance	3198473001	418139360	2311046123	1.391E+09	2.04E+09
Kurtosis	8.057	8.256	2.814	6.775	-0.600
Skewness	2.226	2.181	1.406	2.053	0.078
Range	326,330	117,560	248,705	208,770	181,380
Minimum	36,960	12,550	1,295	24,410	-54,990
Maximum	363,290	130,110	250,000	233,180	126,390
Sum	5,070,130	1,737,130	3,539,969	3,333,000	1,530,161
Count	48	48	48	48	48

Table 5. Regression on a sample of flooded houses

Regression statistics	
Multiple R	0.7530
R square	0.5671
Adjusted R square	0.5461
Standard error	40193.47
Observations	66

ANOVA				
	df	SS	MS	F
Regression	3	1.31203E+11	43734381574	27.07148384
Residual	62	1.00162E+11	1615514754	
Total	65	2.31365E+11		

	Coefficients	Standard error	t stat	P-value
Intercept	19873.32	13890.13302	1.430751183	0.157522569
Acres	15054.24	6977.144721	2.157651035	0.034837497
SQFT	42.83	7.227622762	5.926038859	1.48411E-07
Dummy (pre vs post)	-33663.94	9894.947454	-3.402134226	0.001175682

Table 6. Summary of sales and customer increase in the local hardware store

	Increase in Sales	Increase in Sales	Increase in customers
Hardware store in Beaumont			
2nd Q 2018	$ 1,012,215.00	29.48%	9317
1st Q 2018	$ 1,026,915.00	32.32%	16667
2017	$ 2,932,672.00	24.02%	18576
4th Q 2017	$ 1,618,830.00	66.72%	14782
Hardware Store in Lumberton			
2nd Q 2018	$ 170,574.00	23.18%	4042
1st Q 2018	$ 187,314.00	27.18%	4019
2017	$ 715,926.00	27.36%	9386
4th Q 2017	$ 615,112.00	173.20%	3416
Hardware Store in Vidor			
2nd Q 2018	$ 307,105.00	43.26%	10474
1st Q 2018	$ 614,533.00	94.94%	21048
2017	$ 1,121,458.00	42.86%	28710
4th Q 2017	$ 791,704.00	124.14%	21829