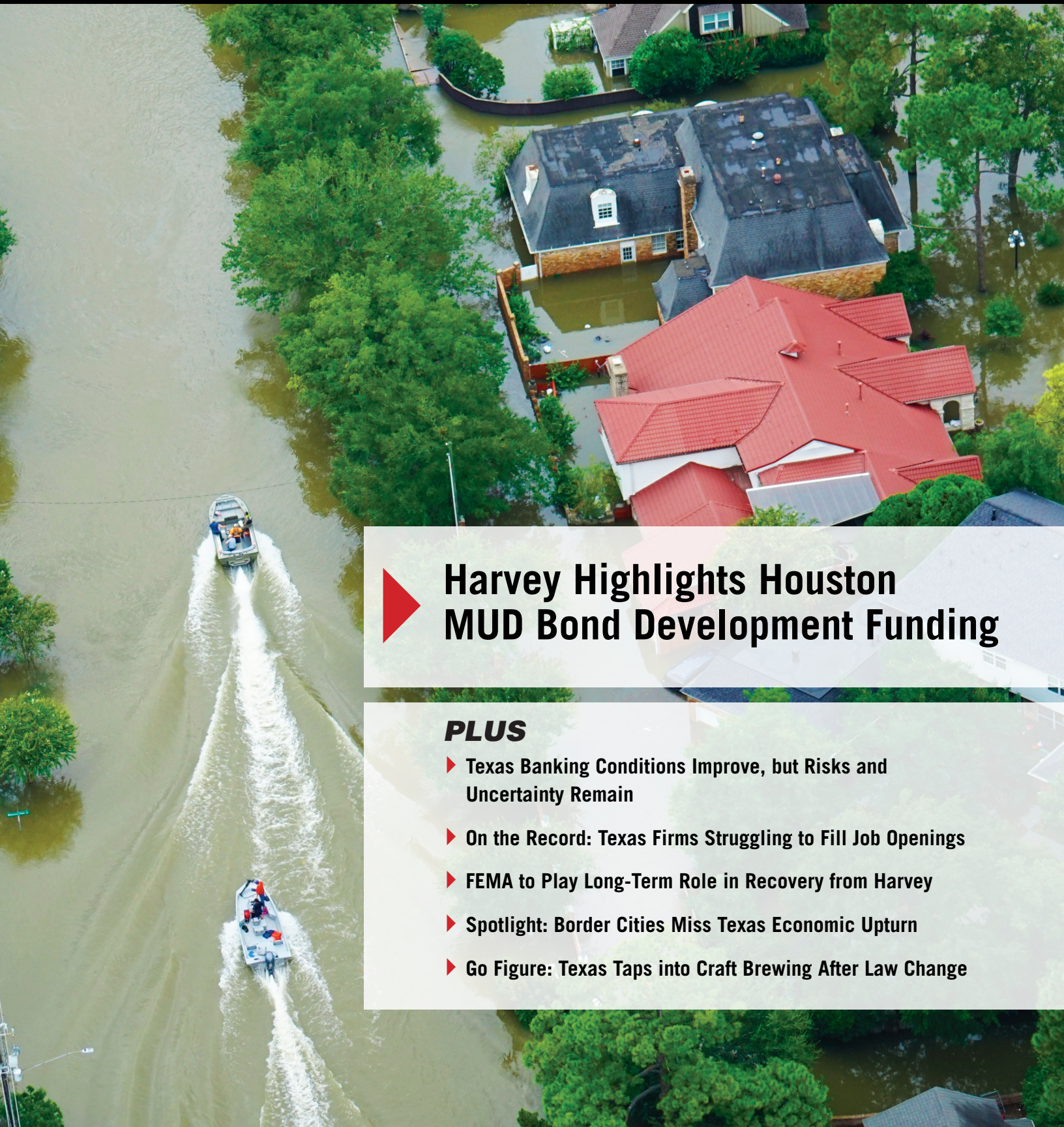




Federal Reserve  
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SECOND QUARTER 2018

# Southwest Economy



## Harvey Highlights Houston MUD Bond Development Funding

### **PLUS**

- ▶ Texas Banking Conditions Improve, but Risks and Uncertainty Remain
- ▶ On the Record: Texas Firms Struggling to Fill Job Openings
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► *Business models are being supplanted by new models, often technology-enabled, to more efficiently sell or distribute goods and services.*

**T**echnological change is affecting every facet of the economy. Workers are increasingly being replaced by automation. Business models are being supplanted by new models, often technology-enabled, to more efficiently sell or distribute goods and services. Consumers are increasingly able to use technology to shop for goods and services at lower prices with greater convenience. As a result, business pricing power is being challenged. These trends appear to be accelerating.

Increasingly, workers with lower levels of educational attainment are seeing their jobs restructured or eliminated. Unless they have sufficient math and literacy skills, or are retrained, these workers may see their productivity and income decline as a result of disruption. This may help explain the muted wage gains and sluggish labor productivity growth we see in the U.S. as well as in other advanced economies.

The impact of technology-enabled disruption on the workforce is likely not susceptible to monetary policy—it requires structural reforms. The reforms could include improving early childhood literacy and overall college readiness in order to increase the percentage of students who graduate college in six years or less—now estimated at 59 percent in the U.S. They could also include stepped-up efforts to increase middle-skills training in order to improve employment, close the skills gap and raise worker productivity.

To address these issues, the Federal Reserve Banks of Dallas and Atlanta jointly organized a conference in Dallas in May that drew business leaders, academics and educators from around the country to discuss the impact of technology-enabled disruption on business, overall economic conditions and the labor force and its implications for structural reforms and monetary policy. Atlanta Fed President Raphael Bostic and I welcomed fellow Federal Reserve Bank presidents from Chicago, Philadelphia and Richmond, as well as a variety of leaders from the Federal Reserve System as participants in two days of discussions.

At the Dallas Fed, we intend to continue to do research and explore the implications of technology-enabled disruption. This is likely to have critical implications for how we think about wages, prices and labor force dynamics. It will also impact our understanding of productivity growth in the U.S.

A handwritten signature in black ink that reads "Robert S. Kaplan". The signature is written in a cursive, flowing style.

**Robert S. Kaplan**  
*President and Chief Executive Officer*  
*Federal Reserve Bank of Dallas*



# Harvey Highlights Houston MUD Bond Development Funding

By Laila Assanie and Michael Weiss

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**ABSTRACT:** Historic flooding from Hurricane Harvey struck many Houston housing developments whose infrastructure was funded with municipal utility district (MUD) bonds. The tax-exempt debt has been widely used in the Houston area, and in the storm's aftermath, MUD bond issuance has come under review with the possibility investors may seek greater future compensation.

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**A**s the months pass following Hurricane Harvey's inundation of southeast Texas, the costs of the epic storm continue to accumulate. The deluge from the slow-moving system exceeded 50 inches over parts of Houston and Galveston from Aug. 25 to Aug. 30, producing record rainfall totals along 46 percent of river forecast points in the region.<sup>1</sup>

Direct damage from Harvey has been estimated at \$73 billion as the ripple effects continue.<sup>2</sup> While hurricane-force winds devastated communities near the Coastal Bend—notably, Port Aransas, Rockport and Victoria—the storm's flooding rains in the Houston area provided some of the most dramatic images. Harris County, the most-populous county in the state, expects property tax receipts to decline in the coming year as homeowners seek reappraisals that reflect lower values for flooded properties.

The cost of building new housing in many areas is sure to rise as officials recalibrate regulations following the storm. A less-visible financial consequence could involve the costs of new infrastructure financed with tax-exempt municipal utility district (MUD) bonds.

The Houston City Council, which has historically avoided limitations on construction, approved regulations that will require new homes built in a 500-year floodplain—with a presumed 0.2 percent likelihood of flooding in a given year—be elevated 2 feet off the ground.<sup>3</sup>

Harris County also implemented new construction guidelines, including one for properties within the 100-year floodplain. The policy will likely increase the cost of new construction both within the city of Houston and in unincorporated areas of Harris County. For instance, raising a slab foundation 1 foot above grade at initial construc-

tion using fill dirt runs roughly \$13,000 to \$14,000, according to a National Association of Home Builders estimate.<sup>4</sup>

Other cost pressures may appear more gradually. These include the MUDs that have been a cornerstone of Houston residential development. Although MUDs are found statewide, they are most prominent in the Houston metro area, where developers use them and their authority to issue tax-exempt debt—for which investors expect compensation for risk—to provide water, sewer and drainage infrastructure and services for new tracts.

Harvey's massive flooding heightened awareness of hazards that may prompt investors to seek a greater risk premium for future MUD bond issues. Among the concerns is rising mortgage delinquency rates that could lead to foreclosure, affecting property inside and outside of MUDs.<sup>5</sup>

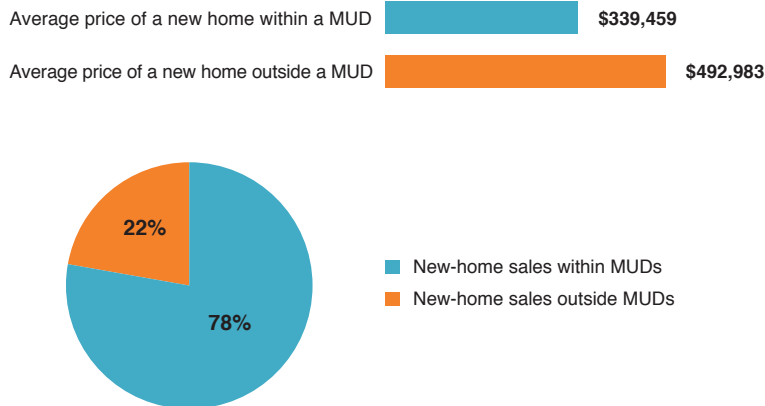
The extensive use of MUD bonds, often repaid over 10 or more years, underscores characteristics that differentiate residential construction in Houston from other areas, such as Dallas. MUDs provided the means to more quickly develop then-distant, massive parcels of land into master-planned communities such as The Woodlands, Kingwood and First Colony that were sometimes far from existing utility services.

By comparison, established North Central Texas water utilities and the more established suburban communities have created a more structured framework for providing basic utilities in new residential projects.<sup>6</sup> Developers in Houston, working through the MUDs they help form, operate with many fewer strictures and can set some of their own rules.

MUDs count on homeowners in the new developments to repay the costs

## CHART 1

### Metro Houston Favors MUDs for Housing Construction

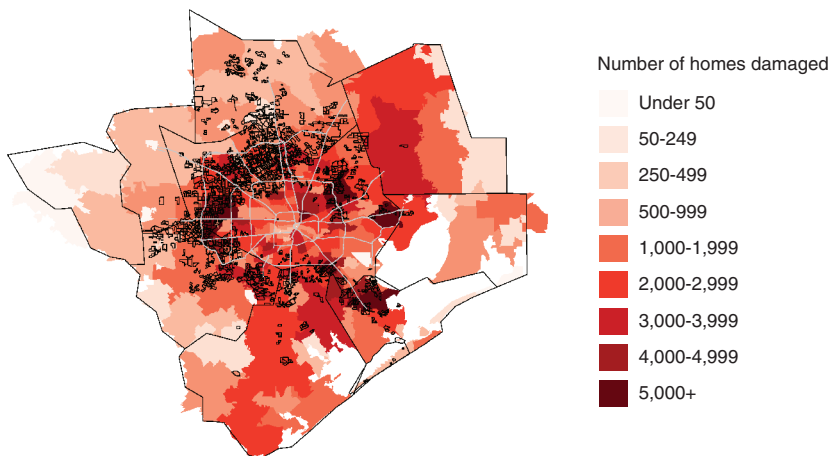


NOTES: MUDs are municipal utility districts. The quality and size of homes compared may vary somewhat. Location of the home may also affect pricing.

SOURCE: "Impact of Harvey on Houston MUDs," Texas Association of Water Board Directors, Meyers Research, April 2018.

## MAP 1

### Flooding Causes Widespread Damage to Homes in Houston Metro Area



NOTES: Flooding data are compiled at the ZIP code level. Black outlines represent active municipal utility districts (MUDs).

SOURCES: Federal Emergency Management Agency; Texas Commission on Environmental Quality.

of infrastructure, which by virtue of the lack of economies of scale can be pricier than bigger-city projects.<sup>7</sup> That said, homes in MUDs are typically cheaper, which makes up for the larger initial tax bill (*Chart 1*). Although the MUDs are government entities—much like park and school districts—they are initially governed by boards on which the developer's interests are represented.

Of the 968 active MUDs statewide, 662 are in metropolitan Houston.<sup>8</sup> The high concentration of MUDs in the Houston area may expose this financing model to new risks—those associated with more frequent and catastrophic flooding events.

While MUDs will likely remain a vital part of the developer's toolkit, this type of debt could become costlier

and raise home prices in residential developments. And rising costs for homeownership might diminish one of the Houston area's traditional selling points: affordability.

### Tracing Harvey's Impact

Damage claims filed with the Federal Emergency Management Agency (FEMA) provide an overview of the storm's effects on Houston (*Map 1*).<sup>9</sup> FEMA data, compiled at the ZIP code level, show pockets of damage around the periphery of the metro Houston area that directly resulted from the torrential rainfall and those from storm-related releases of water from the Addicks and Barker reservoirs in the northwest and western reaches of the city three days into the deluge.

A good portion of central Houston sustained relatively less Harvey damage, particularly away from the area's bayous. Buffalo Bayou—running generally west to east—handled runoff from Addicks and Barker reservoirs and other collection points, moving it to the Houston Ship Channel and eventually to the Gulf of Mexico.

### Creating Housing Developments

Developers in Houston extensively used MUDs as the metropolitan area expanded outward. The districts provide an alternative to annexation by neighboring jurisdictions, which could build necessary infrastructure. MUDs help cities sidestep the potential of incurring additional service costs, and developers can avoid some municipal regulations.

The Texas Commission on Environmental Quality administers the creation of water districts, a class of special utility districts including MUDs, though not their day-to-day operation. Creating a MUD is relatively easy. Filing an application to establish a MUD costs \$700 and can be completed within 120 days with approval by the state environmental commission. Alternatively, the Legislature can authorize a district through the legislative process. Local MUD boards, often including developer and resident representatives, oversee management.

MUDs are legal entities with taxing powers. A MUD sells municipal bonds to investors based on the assumption that as new houses are purchased, their owners will pay MUD taxes to retire the debt incurred for subdivision improvements. Prior to the bond sale, the developer bears the upfront cost of this infrastructure.

Homebuilders gain a sales advantage through a lower cost for lots that reflects the improvements financed with tax-exempt municipal bonds rather than pricier bank or corporate debt. Homeowners may benefit from the lower house prices, requiring a lower down payment. While house prices are generally less than they might otherwise be, homeowners' monthly payments are comparable when often more-expensive MUD-related property taxes are factored in.

### Growing MUD Reach

While the flourishing MUD system has allowed developers to readily supply housing to meet the demands of Houston's rapid growth, the expansion has been largely piecemeal. There are 394 active MUDs in Harris County alone. Almost four-fifths of new Houston homes sold in 2016 were in a MUD, according to data compiled by Meyers Research, a market research and consulting firm.<sup>10</sup>

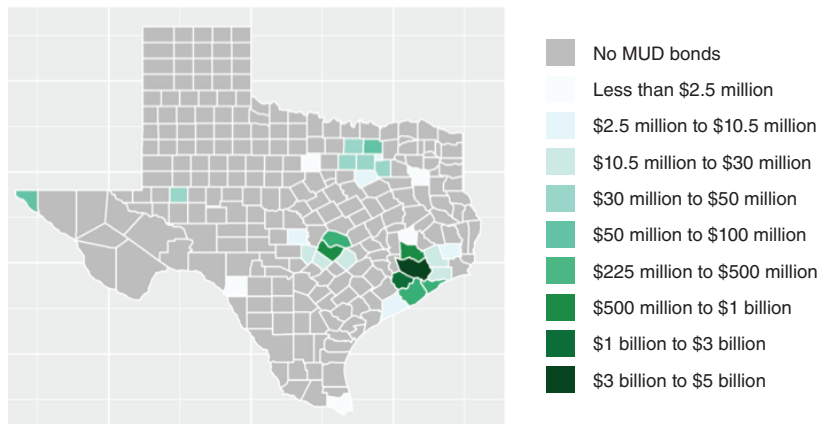
In the rapidly growing western suburbs in Fort Bend County, 149 MUDs are in operation; to the north, in Montgomery County (which includes a portion of The Woodlands), 85 MUDs are similarly active.

Outstanding MUD debt volume as of April 1, 2018, totaled \$10.1 billion statewide, 84 percent of which was tied to districts in the Houston metro area (*Map 2*).<sup>11</sup> Harris County led the pack, with nearly \$5 billion in outstanding MUD debt. Fort Bend County was next with \$1.9 billion, followed by Montgomery County with \$757 million.<sup>12</sup>

Travis County, the most-populated county in the Greater Austin area, was fourth with \$594 million in MUD debt. Other large Texas counties, such as Dallas and Tarrant, had more modest levels at \$47.9 million and \$40.8 million, respectively.

## MAP 2

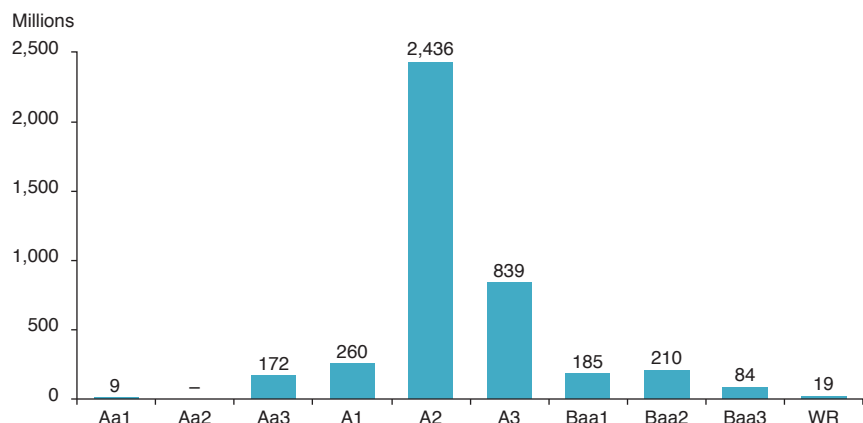
### Outstanding MUD Bond Volumes in Texas Highest in Houston Metro Area



NOTES: MUD refers to municipal utility districts. There were no counties with total MUD bonds in the \$100 million-to-\$225 million range.  
SOURCE: Bloomberg.

## CHART 2

### Texas MUD Bonds Rated by Moody's Mostly Mid-Grade Debt



NOTES: Municipal utility district (MUD) bond ratings, listed from highest to lowest, show distribution of investment-grade issuance. WR indicates withdrawn rating. Data are as of April 1, 2018.  
SOURCES: Bloomberg; Moody's Investors Service.

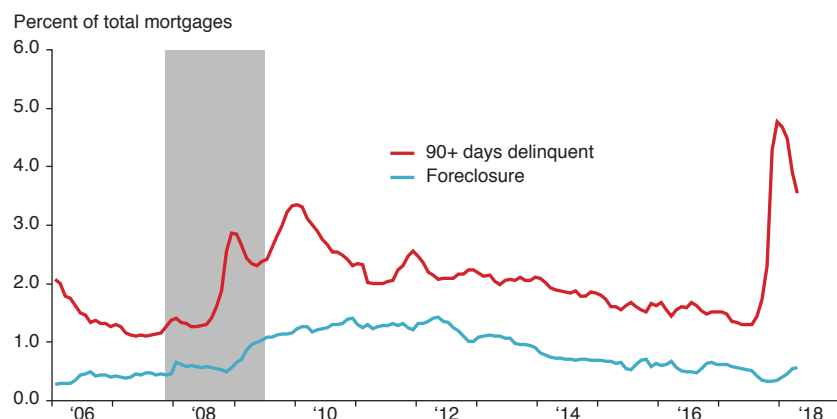
Ratings attached to bonds attempt to grade the risk to investors. The ratings affect the interest rate investors will demand to purchase and hold the debt. MUD bonds have traditionally been rated lower relative to the debt of Texas cities, for example, while at the same time carrying many of the same assurances of payment that come from being able to levy taxes on property owners. MUD-funded projects tend to be confined to the district and, unlike city-built projects, possess little extra capacity for later expansion.<sup>13</sup>

Ratings vary among issuers, based on the underlying creditworthiness, including default risk (*Chart 2*). As a group, MUD bonds are in the middle of the rating scales of the two principal ratings firms, Standard & Poor's and Moody's Investors Service, with 11 percent rated at a lower investment grade.<sup>14</sup> Those with "Baa" ratings "may be characteristically unreliable over any great length of time" and have "speculative characteristics," according to Moody's. By comparison, the Fort Bend County city of Sugar Land,



# CHART 3

## Houston Metro Mortgage Delinquencies Spike Following Harvey



NOTES: Shaded area represents the Great Recession. Hurricane Harvey struck in August 2017.  
SOURCE: Black Knight McDash Data.

an 88,000-population community with many MUDs in the vicinity and whose population has more than doubled since 1990, boasts an Aa1 rating—“high quality by all standards.”

Some MUDs are created with the expectation that nearby communities will annex them once they are built out and homeowners have taken responsibility for virtually all of the bonds’ outstanding debt. When annexation occurs, the city usually takes responsibility for any outstanding MUD bonds. Most cities’ relatively higher credit ratings are conferred on the assumed MUD debt.<sup>15</sup> Thus, the MUD ratings in Chart 2 appear more creditworthy than if only the debt of free-standing districts were depicted. Some MUD bond issues may also carry insurance, helping to boost their ratings and protect investors.

In the days following Harvey, Moody’s placed under review for downgrade the debt of 32 MUD districts where a large number of homes suffered flood-related damage.<sup>16</sup> S&P issued a negative outlook for three additional MUDs, stating that the significant damage to homes in these districts could lead to a reduction in assessed value, subsequently impacting tax revenue.<sup>17</sup>

Though ratings of most of those under review by Moody’s were confirmed—meaning there was no change in investor risk—a handful were down-

graded.<sup>18</sup> Subsequent storm-remediation actions by various municipalities, including amended building codes and ordinances, suggest concern about an upswing in weather events. Harvey was the fourth major flooding episode in Greater Houston since 2008.<sup>19</sup>

Many of the MUDs whose creditworthiness was reassessed were located in suburban Houston and in areas affected by overflow from the reservoirs—the same locations that sustained the most serious damage from the storm, as shown in Map 1.

More immediately, the volume of new MUD issues in Houston between September 2017 and March 2018 declined 11 percent compared with the same prior-year period, in part because the area was at a standstill for nearly two weeks due to Harvey. Other potential issuers likely sought to gauge market receptivity before proceeding with new bond sales.

### Climbing Mortgage Delinquencies

With tens of thousands of homes flooded by Harvey, some affected homeowners have struggled financially. Mortgage loan delinquencies in the Houston metro area climbed in the months following Harvey and remain elevated.

The share of mortgages 90 days or more delinquent rose from a low of 1.3 percent in July 2017 to a high of 4.8 percent in December 2017,

according to Black Knight McDash Data (Chart 3). This share has ticked down, to 3.5 percent in April (the latest estimate available), but remains somewhat elevated compared with levels seen during the financial crisis that began in 2008.

Meanwhile, the share of mortgages 90 days or more past due in the rest of the state (excluding the Houston metro area) ticked up from 1.2 percent in July 2017 to 1.6 percent in December. After peaking in December, the rate dipped to 1.3 percent in April, similar to its year-ago level.

While the receipt of flood-insurance payments and disaster aid may further pare delinquency rates in affected areas, their significant increase has prompted some concern that a wave of foreclosures could occur in coming months.

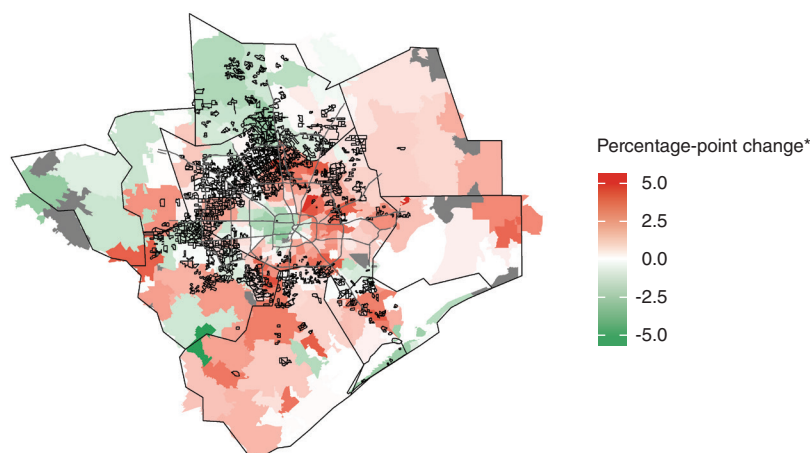
Delinquencies, plotted by ZIP code, exceeded the average increase for Houston as a whole in many of the same areas most severely affected by flooding (Map 3). Areas shaded in red are those where the increase in the delinquency rate was higher than the average increase for Houston from July to December 2017, while areas shaded in green saw either a decline in the delinquency rate or a smaller increase relative to Houston during the same period.

In ZIP codes where more than 1,000 homes flooded, according to disaster claims data provided by FEMA, the average increase in the delinquency rate for mortgages 90 days past due was 4.9 percentage points, compared with a 3.5 percentage-point increase for all of Houston in the July–December period. The average increase was even higher (6.2 percentage points) in ZIP codes that had more than 4,000 homes with reported damage.

As the map indicates, the rise in the delinquency rate was greater to the northeast of Houston as well as to the west in areas located near the Addicks and Barker reservoirs and along the Buffalo Bayou.

Foreclosures had steadily declined in Houston following the financial crisis and even during most of the latest energy bust and were at a recent low of 0.3 percent of total mortgages in October

## Delinquency Rate Rises Sharply in Parts of Houston Metro Area Most Impacted by Flooding



\*Change in delinquency rate relative to the change in Houston rate overall from July to December 2017.

NOTE: Delinquency data are compiled at the ZIP code level; black outlines represent active municipal utility districts in the Houston metro area. Gray shaded areas indicate insufficient data.

SOURCES: Black Knight McDash Data; Texas Commission on Environmental Quality.

2017.<sup>20</sup> But there was an uptick of 0.2 percentage points in the foreclosure rate from October through April 2018.

### Longer-Term Reckoning

Given the magnitude of the Harvey flooding, many purchasers of Houston-area MUD bonds may have been unaware of specific flooding risks in areas that had never before experienced a major event. In those flooded areas with significant property damage and little flood insurance, the recovery will be lengthy and property valuations are likely to sink, at least temporarily impacting tax revenue.

Amid rising costs directly attributable to new market realities in the aftermath of Harvey, the longer-term effects will likely favor areas where the perceived flooding risk is smaller. More difficult to immediately gauge will be investor sentiment and the price at which investors will be willing to invest in and hold MUD debt.

*Assanie is a senior business economist and Weiss is a senior writer/editor in the Research Department at the Federal Reserve Bank of Dallas.*

### Notes

<sup>1</sup> "Hurricane Harvey Info," National Weather Service, Houston/Galveston Weather Forecast Office, accessed April 12, 2018, [www.weather.gov/hgx/hurricaneharvey](http://www.weather.gov/hgx/hurricaneharvey).

<sup>2</sup> "Hurricane Harvey's U.S. Cost: An Update," Moody's Analytics, Oct. 2, 2017.

<sup>3</sup> "Houston City Council Adopts Stricter Development Rules for Houston's Floodplains," by Rebecca Elliott, *Houston Chronicle*, April 4, 2018.

<sup>4</sup> See "The House of the Future Is Elevated," by Amanda Kolson Hurley, *Citylab*, Dec. 8, 2017.

<sup>5</sup> Disasters heighten investor perceptions of risk and can increase the premia demanded, particularly among smaller municipal bond issuers, even well beyond an area immediately impacted. See "Accounting for Natural Disasters: The Impact of Earthquake Risk on California Municipal Bond Pricing," by Jacob Fowles, Gao Liu and Cezar Brian Mamaril, *Public Budgeting & Finance*, vol. 29, no. 1, 2009, pp. 68–83. Special district size constraints and the impact on debt ratings are discussed in "Local Government Risk Assessment: The Effect of Government Type on Credit Rating Decisions in Texas," by Robert A. Greer, *Public Budgeting & Finance*, vol. 36, no. 2, 2016, pp. 70–90.

<sup>6</sup> "The Economics of Municipal Utility Districts for Land Development," by Richard B. Peiser, *Land Economics*, vol. 59, no. 1, 1983, pp. 43–57.

<sup>7</sup> "Land Development Regulation: A Case Study of Dallas and Houston, Texas," by Richard B. Peiser, *Real Estate Economics*, American Real Estate and Urban Economics

Association, vol. 9, no. 4, 1981, pp. 397–417.

<sup>8</sup> Data are from Texas Commission on Environmental Quality's Water Districts Database, [www14.tceq.texas.gov/iwud/index.cfm](http://www14.tceq.texas.gov/iwud/index.cfm). The Houston metro area encompasses Austin, Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery and Waller counties.

<sup>9</sup> See "FEMA to Play Long-Term Role in Recovery from Harvey," by Jesse Thompson and Rachel Brasier, Federal Reserve Bank of Dallas *Southwest Economy*, Second Quarter, 2018.

<sup>10</sup> See "Impact of Harvey on Houston MUDs," Texas Association of Water Board Directors, Meyers Research and Municipal Information Services, April 2018.

<sup>11</sup> Bond volume data are from Bloomberg as of April 1, 2018.

<sup>12</sup> MUD property tax rates for homeowners in newer subdivisions sometimes run one-half or more of those of local school districts, which typically command the highest rate for an individual tax bill.

<sup>13</sup> Some MUDs built within city limits, for example, anticipate that as homeowners occupy the district, the city will annex the MUD and create the opportunity to improve the initial infrastructure.

<sup>14</sup> Bond issuers, in this case the MUDs, pay the ratings firms to evaluate their creditworthiness. Bonds may also be sold without a rating if the issuer chooses to do so. Some jurisdictions purchase bond insurance, which is designed to guarantee repayment should the issuer be unable to do so. Such "credit enhancements" are reflected in bond ratings.

<sup>15</sup> See "Moody's Upgrades Fort Bend County MUD No. 111's, TX GOULT to Aa1 from A2 After Assumed by City of Sugar Land, TX," Moody's, Jan. 26, 2018.

<sup>16</sup> See "Moody's Places 37 Texas Municipalities Under Review for Downgrade," Moody's, Sept. 22, 2017.

<sup>17</sup> See "Outlook Turns Negative for Five Texas Utility Districts in Harvey's Wake," by Richard Williamson, *The Bond Buyer*, Oct. 18, 2017.

<sup>18</sup> See "Moody's Confirms the Ratings of 18 Texas Municipal Utility Districts," Moody's, Nov. 10, 2017.

<sup>19</sup> Major flooding events were Hurricane Ike in 2008, the Memorial Day floods of 2015, the Tax Day floods of 2016 and Hurricane Harvey in 2017. The 2015 and 2016 episodes were categorized as 500-year floods, Harvey as a 1,000-year flood.

<sup>20</sup> The share of mortgages in foreclosure increased from 0.5 percent in July 2015 to 0.7 percent in October 2015 and remained close to that level until March 2016. Data are from Black Knight McDash.

*A Conversation with David Howard and Dan Howard*

## Texas Firms Struggling to Fill Job Openings

*David Howard and Dan Howard are the president and vice president of Staff Force Personnel Services in Katy, Texas, outside Houston. For 29 years, their firm has provided temporary, direct-hire and light-industrial staffing for employers in Texas' major metros and along the border. The Howards offer insight into the state's labor market.*

**Q. The Texas unemployment rate reached at least a 40-year low of 3.9 percent in November. Is the labor market as tight as the data suggest?**

**Dan:** The labor market is extremely tight. The supply of workers is not growing as fast as the demand. We have to be more creative than we have been in 15 to 20 years. We are hosting more career fairs, and we have begun extending these past 5 p.m. on weekdays and holding them on weekends. For the first time in 20 years, we are paying referral bonuses.

More companies that usually hire on their own are struggling and coming to us. They are behind on their production and in desperate need of workers. The current environment gives workers with little experience a chance to work their way up; whereas, in the past, they may not have been hired because they did not have enough experience.

**David:** We have more unskilled job positions open than qualified candidates coming through the door. I see customers being less picky about candidates in terms of backgrounds, qualifications and languages. If someone wants to work in Texas right now, there is a job out there for them.

**Q. What labor demand differences do you see among Texas' metro areas?**

**David:** I see firms in every Texas city struggling to fill jobs. However, there are some big differences, particularly between South Texas and Dallas-Fort Worth. South Texas is a lower-wage area where there is a lot of demand, but we tend to have enough workers to fill those openings. In DFW, demand is outstripping the supply of available workers.

**Dan:** Part of the problem in DFW is big companies coming in, such as Amazon, which hire 1,000–2,000 employees, and they are obviously paying more than companies that have been in DFW for years, so that is absorbing a lot of workers. Every city is different. DFW is also more skilled [job-wise], which is harder to fill. Austin is the high-tech capital with a lot of demand for skilled positions.

**Q. What kinds of workers and skills are most in demand? Which industries are struggling the most to find workers?**

**David:** In DFW, we are saturated with orders for logistics and wholesale warehouse workers. Cherry pickers (hydraulic crane operators) and reach order se-

lectors are in high demand, especially in cold/freezer warehouse environments. Forklifts now have sophisticated inventory- and order-picking capabilities, so our drivers must be tech savvy and pull orders quickly without errors.

Across the state, we find that physical warehouse laborers and production/assembly workers are in the highest demand. For most loading, unloading and general warehouse jobs, candidates need to be able to lift at least 25 to 50 pounds all day. For food production jobs, workers must be able to stand on their feet in a cold environment and do repetitive assembly line work for eight to 10-plus hours.

**Dan:** Our client base is about 75 percent industrial. In this area, the biggest demands are for warehousing, forklift driving and assembly jobs. Then you have the skill and trade jobs such as welders, machinists and pipefitters—those are probably the top six. We also fill clerical positions such as administrative assistants and file clerks, and those are also in strong demand.

**Q. Wage growth has generally been mild over the past few years. Are tight labor markets pushing up wages and, if so, for whom?**

**Dan:** Wages have gone up. The increase has not been drastic. We have hundreds of clients in Texas, and only a small number say [they are paying] no increase at all. One firm is keeping its pay at \$7.25 an hour, which is unheard of. It represents a significant challenge for us to staff a department at that wage. Most companies have been receptive to pay above the minimum wage and to recent gradual increases. Our average pay is \$11.45 an hour, although forklift drivers are getting \$15.

We go to a lot of meetings and try to convince clients that they will need to raise wages to attract the workers they need. Many are looking for that happy medium between budget restrictions versus getting the job done. In the past six months, we've had three or four large companies that said, 'OK, we are ready





David Howard (left), Dan Howard (right)

► *"We go to a lot of meetings and try to convince clients that they will need to raise wages to attract the workers they need."*

– Dan Howard

to raise the wage 25 cents or even a dollar—whatever it requires to get the workers.' But there are also a lot of companies that are constrained by budgets, where their hands are tied.

We have to explain that lost business due to lack of workers can cost profits. Many times firms seem to focus on keeping down labor costs without taking into account the often higher cost of lost production from lack of workers.

**David:** We have seen few wage gains for unskilled workers, and that is making it extremely difficult to attract the number of workers needed to fill these positions. The more skilled positions, such as forklift operators, machine operators and mechanics, have had pay increases. This is mostly due to OSHA (U.S. Occupational Safety and Health Administration) laws and certifications/testing required for these positions. The candidates must meet these qualifications, and they know they can demand more money for these particular skills.

#### Q. What kind of wage growth is likely through the end of 2018?

**David:** Most wage pressures are at the lower-skill jobs, such as the light-industrial general laborers. I think through the end of the year, the economy will be booming. Wages likely will go up further as everyone will be fighting for workers. The expectation of further wage increases is based on the law of supply and demand—demand is increasing fast, and supply is dwindling.

**Dan:** To fulfill production plans and to get product out the door, I think a pickup in wage growth is coming. Clients are

already coming to us and saying that while they have held wages fixed for the past several years, they are now willing to raise them to attract the workers they need. Internally, we have had to increase the amount we pay recruiters.

#### Q. What are the key factors driving the labor market?

**David:** The main factor is the strength of the Texas economy, due in part to less regulatory burden and a stronger outlook for many companies. The [federal] tax law passed at the end of last year played an important role in this. During the past year, there have been a lot of companies moving to Texas and looking for workers.

**Dan:** Production is up tremendously, and companies are spending more money.

#### Q. How do constraints on immigrants affect efforts to meet labor demand?

**David:** We use E-Verify (the federal digital employment documentation system) so companies look to us to screen workers to make sure they are in compliance [with immigration laws]. We protect our client from immigration issues, and that has increased the demand for our services as companies have become more concerned about this issue.

#### Q. How did Hurricane Harvey affect labor demand? How will it change through the year?

**David:** We don't do construction or renovation/restoration jobs. We have helped our workers whose homes were impact-

ed. As for the industries in which we work, we haven't seen any change in the desire of people to move to Houston and people wanting to move out from Houston.

**Dan:** As far as our warehouse workers, most of our Houston clients were not severely impacted. Some warehouses got flooded, but they bounced back pretty quickly. We did not notice much impact on demand for industrial and warehousing [jobs]. These workers have different skills than carpenters and construction workers, so the reconstruction effort did not seem to draw workers away. Overall, the Houston economy is booming, and we see continued strong demand.

#### Q. What is your outlook for the rest of the year?

**Dan:** We had our best year ever last year, and I think we will beat it this year. There are new companies constantly moving to Texas; while Dallas has been in the spotlight, we see this in Houston, Austin, El Paso, the Valley and throughout the state. One thing driving this is lower-cost land and real estate. People see home prices escalating in Dallas and Austin and think, 'Wow, these are really high prices.' But when you compare them to places in California, they are still a lot less.

**David:** I don't see any weakness. Optimism is strong, and companies need workers. If a company wants to move operations from California to Texas, it can lower its taxes and work in a better economic climate. Texas is the place to be.

# Texas Banking Conditions Improve, but Risks and Uncertainty Remain

By Kelsey Reichow

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**ABSTRACT:** Banks in the Eleventh District, benefiting from a rebounding energy sector and strong regional and national economies, are poised to do well through the remainder of 2018. Asset growth has been solid, though concentrations in commercial real estate loan portfolios bear watching as do limited new bank formations.

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**E**leventh District banks, benefiting from accelerating economic growth in Texas, appear poised to build on the positive momentum with which they began 2018.<sup>1</sup> The banks experienced improved conditions in 2017, propelled by increased profitability, better asset quality and strong loan growth.

Last year, higher oil prices, rising exports, business optimism following changes to federal tax laws and strength in the U.S. economy bolstered the regional economy. While Hurricane Harvey significantly affected Gulf Coast residents, its impact on economic growth and banking activity was transitory.<sup>2</sup>

Some challenges banks faced abated in 2017. Asset quality and commercial and industrial (C&I) portfolios—hurt by energy-sector weakness in 2015 and 2016—strengthened with the recovering oil market.<sup>3</sup> Banks' overall loan growth picked up after slowing in 2016, with strength in commercial real estate (CRE) portfolios (the largest driver of overall loan growth) at both regional and U.S. financial institutions.

However, some risks remain. While rising CRE concentrations have not negatively impacted banks, risk management practices at institutions with the highest concentrations continue to be closely monitored given CRE's historic volatility.

Banks have also boosted profitability through improved net interest margins.<sup>4</sup> With the Federal Reserve tightening monetary policy, banks have benefited from the resulting higher rates, repricing loans faster than deposits.

As interest rates continue rising from historic lows, the impact on funding costs will bear watching, particularly among the relatively smaller community banks.<sup>5</sup> Also, overall financial

industry growth and increased competition from nontraditional institutions could compel banks to pay more to maintain or enlarge their deposit base.

The banking industry continues to confront consolidation. A majority of such consolidation since the end of the Great Recession is attributable to voluntary mergers, as banks have sought economies of scale, expanded business lines or geographic reach, and cost-cutting through operational efficiencies. Bigger, efficient banks can benefit customers and the economy alike as long as access to banking services and credit is not reduced as a result.<sup>6</sup>

## Profitability Diverges

Profitability for Eleventh District banks improved in 2017—reversing a two-year slowdown—while profitability nationwide declined, largely due to a one-time hit arising from the Tax Cuts and Jobs Act enacted at year-end 2017 (*Chart 1*).

Eleventh District banks earned a return on assets of 1.15 percent in 2017, similar to profitability prior to the energy bust, and up from 1.02 percent in 2016 and 1.09 percent in 2015. The rise was driven by increased net interest margin and declines in both provision expense—the money banks set aside to cover expected loan losses—and noninterest expense.

Nationwide, bank profitability dropped eight basis points, from 1.05 percent in 2016 to 0.97 percent in 2017. Lower noninterest income (principally fees) and higher tax expense, which more than offset higher net interest income, were responsible.

The new federal tax law prompted banks to take a one-time charge for the revaluation of deferred tax assets. Deferred tax assets are intangible items

created when losses used to claim deductions in a given year are carried forward to offset future profits. For banks, deferred tax assets are usually generated through loan-loss reserves.

When the tax law changes were enacted, existing deferred tax assets were revalued at the tax code's new, lower tax rate. In essence, banks were forced to reflect the assets' reduced future value in the fourth quarter, taking the charge, which temporarily increased income tax expense.<sup>7</sup> Another one-off effect of the tax change, encouraging repatriation of profits held abroad, had little impact on banks.

While bank earnings reports and regulatory filings provide insufficient detail to completely delineate federal tax changes' impact on profitability, U.S. banks' deferred tax assets declined \$27 billion, or 45 percent, in 2017. Over the same period, tax expense increased \$22 billion, or 29 percent. U.S. banks' 2017 tax expense, at 0.58 percent of average assets, was 12 basis points higher than the average for the previous five years, even as total profitability was lower.

The impact was similar among Eleventh District banks, with taxes up 10 basis points to 0.44 percent of average assets in 2017 compared with the average of 0.34 percent for the previous five years (*Chart 2*). Despite district banks' higher profitability, their tax expense remains relatively lower than their national counterparts.<sup>8</sup>

However, the tax law's impact on bank profitability has been transitory. Large banks reported effective tax rates of 16–24 percent in first quarter 2018, down from 23–31 percent in 2017. The median tax rate for regional banks in first quarter 2018 was about 22 percent, down from 41 percent in fourth quarter 2017 and 30 percent in first quarter 2017.<sup>9</sup>

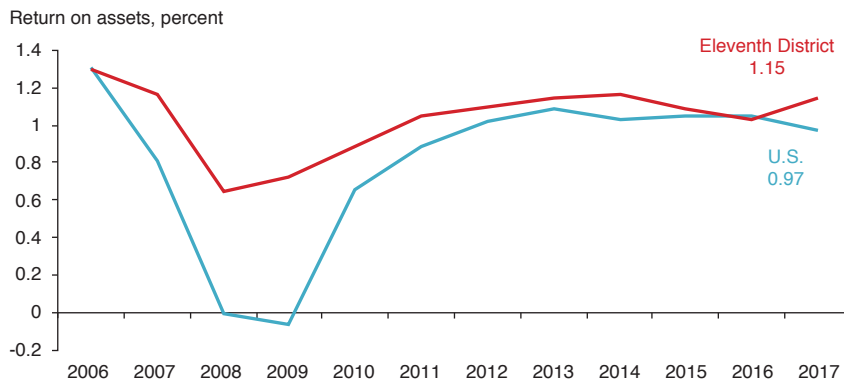
Lower effective tax rates will boost future bank profitability, with strong economic growth providing an additional tailwind this year.

### Asset Quality Improving

Eleventh District asset quality improved in 2017 after deteriorating the previous two years; asset quality for all U.S. banks has improved since 2009.

## CHART 1

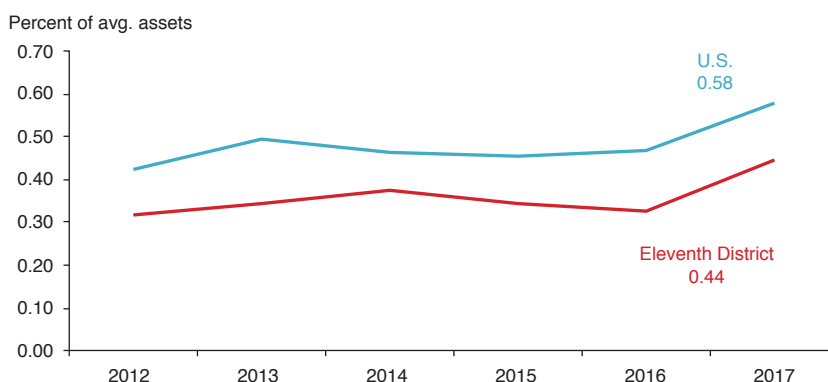
### Profitability of Eleventh District Banks Rises, Diverges from Nation



SOURCE: Quarterly Reports of Condition and Income, Federal Financial Institutions Examination Council.

## CHART 2

### Tax Expense for Banks Increases in 2017



SOURCE: Quarterly Reports of Condition and Income, Federal Financial Institutions Examination Council.

Among Eleventh District banks, 0.91 percent of total loans were noncurrent, down from 1.04 percent at year-end 2016 and below the national rate of 1.17 percent.<sup>10</sup> The share of noncurrent loans has been lower at Eleventh District banks than U.S. banks over the past decade, although the difference between local and national institutions has narrowed (*Chart 3*).

Commercial and industrial loans remain the largest portion of noncurrent loans in the Eleventh District, at 41 percent. They are followed by residential real estate (26 percent) and commercial real estate (16 percent). Recovery in the energy industry in 2017—with increases in oil prices, rig counts and production—improved the quality of

the C&I portfolio. However, economic changes affect asset quality with a lag; thus, higher energy prices are not yet fully reflected in C&I portfolios.

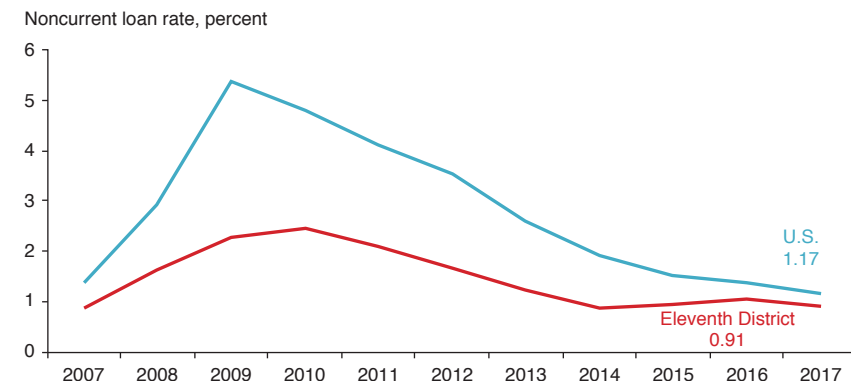
Nationwide, the noncurrent loan rate declined from 1.39 percent in 2016 to 1.17 percent in 2017, with declines in all categories except consumer loans—those increased 11.5 percent, largely attributable to the credit card portfolio. Nationally, noncurrent residential real estate loans remain the biggest component of noncurrent loans at 57 percent, dropping slightly from 58 percent in 2016, followed by C&I (16 percent) and consumer (14 percent).

Another measure of asset quality is loan charge-off rates—the share of total loans deemed unlikely to be collected.



### CHART 3

#### Noncurrent Loan Rate Drops for U.S. and Eleventh District Banks

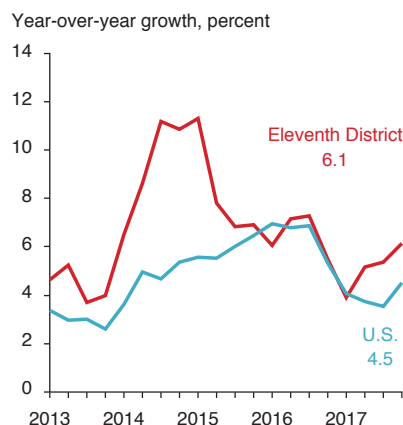


SOURCE: Quarterly Reports of Condition and Income, Federal Financial Institutions Examination Council.

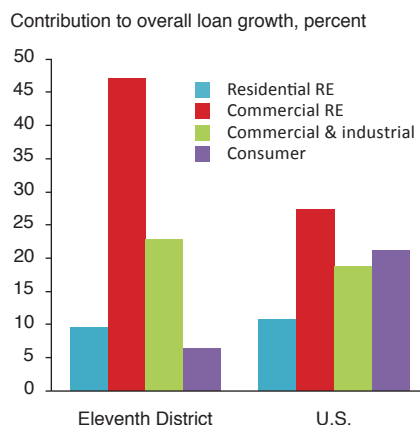
### CHART 4

#### U.S. and Eleventh District Loan Growth Picks Up in 2017

##### A. Eleventh District Loan Growth Rebounds, Outpaces National Loan Growth



##### B. Commercial Real Estate Drives Overall Loan Growth in 2017



SOURCE: Quarterly Reports of Condition and Income, Federal Financial Institutions Examination Council.

District banks charged off 0.38 percent of loans in 2017, down from 0.45 percent in 2016, another sign of improving asset quality. The net charge-off rate for U.S. banks increased slightly to 0.50 percent in 2017 from 0.47 percent in 2016.

### Loan Growth Picks Up

Loan growth accelerated among Eleventh District banks in 2017 after slowing in 2016. It reached 6.1 percent in 2017, from 5.5 percent in 2016, and continued outpacing national loan growth at 4.5 percent (*Chart 4A*).

CRE loans—loans for construction

and land development, loans secured by multifamily property and loans secured by nonfarm nonresidential real estate—remain the biggest driver of overall lending. CRE loans grew 9 percent on a year-over-year basis, accounting for 47 percent of overall loan growth among Eleventh District banks (*Chart 4B*). Nationally, loan growth is more balanced, though CRE is the biggest driver of lending, up 6 percent year over year and accounting for 27 percent of total loan growth.

Banks' CRE loan concentrations have increased, particularly within the

Eleventh District.<sup>11</sup> While CRE loan performance remains strong, contributing to bank profitability and asset quality, a disruption in the sector would be especially felt within the Eleventh District.<sup>12</sup>

### Increased Consolidation

The banking industry continued to consolidate as profitability improved. Nationwide, the total number of banks declined from a peak of 14,483 in 1984 to 4,909 at year-end 2017 (*Chart 5*). In Texas, commercial banks reached a high of 1,972 in 1986, falling to 423 at year-end 2017.<sup>13</sup> Mergers predominated, though failures contributed to the trend.

The number of bank mergers has exceeded failures every year, even in crisis periods.<sup>14</sup> Voluntary mergers have been the primary force behind the decreased number of community banks since 2011.

Most mergers occur as smaller banks aim to become more efficient by realizing economies of scale or diversifying to expand business lines or geographic reach. Improved economic and banking conditions also play a role, making targets more attractive, acquirers stronger and the overall banking market healthier.

On the surface, a decline in the number of firms suggests a less competitive market. However, technological advances allow banks to extend their geographic reach electronically, and banks also face increased competition from nontraditional financial institutions, such as alternative lenders and financial technology (fintech) that promote financial transactions through mobile phones.

Aside from the business and economic motivations for mergers, banking industry contacts frequently report regulatory burden as another factor fueling consolidation, particularly among smaller entities.

While the Dodd–Frank Wall Street Reform and Consumer Protection Act of 2010 was designed to end institutions deemed “too big to fail”—those whose demise would pose existential risks to the financial system—an unintended consequence was increased regulatory and compliance burden on

the smaller banks that were tangential to the financial crisis.<sup>15</sup>

In response, the Federal Reserve, Office of the Comptroller of the Currency, Treasury and Federal Deposit Insurance Corp. have looked at requirements for smaller banks and reduced by 40 percent the number of items on small banks' call reports that outline the institutions' financial health. Additionally, the time between bank examinations has been extended and a more risk-focused supervisory approach implemented. Yet, even with these measures and overall industry conditions improving, few new banks have formed since the most recent financial crisis.

While merger activity continues a long-run trend, there is no historical precedent for the recent downturn in the number of de novo (newly formed) banks.<sup>16</sup> Seven years after Dodd-Frank, only seven new banks have been chartered nationally compared with an average of 123 annually in the seven prior years, 2003–09.<sup>17</sup> In Texas, only one new bank has been chartered since 2010.

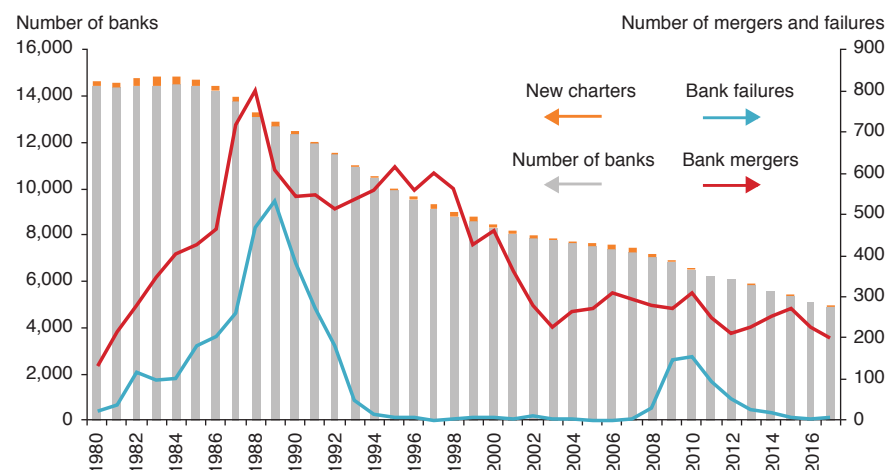
## Net Interest Margin

Amid economic improvement and Fed efforts to normalize monetary policy, rising interest rates create uncertainty for the banking industry. The impact on an institution's net interest margin (NIM)—the difference between a bank's interest income and interest expense—and earnings depends on the maturity profile. Simply, that's the level of long-term assets (mostly loans) relative to long-term liabilities (mostly deposits).

Broadly speaking, banks with the ability to reprice loans faster than deposits benefit from rising interest rates.<sup>18</sup> The "net-over-three-year position" of a bank is defined as loans and securities that reprice in more than three years minus liabilities that reprice in more than three years as a percent of assets. It offers guidance regarding profitability as interest rates change. The higher the net position, the greater the vulnerability to rising interest rates.

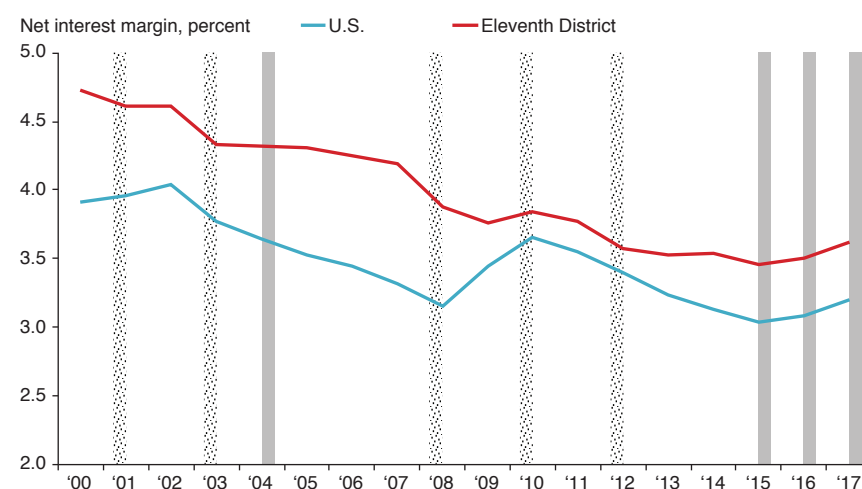
Banks began narrowing their net position in third quarter 2015 as the Fed

**CHART 5** Mergers Drive Decline in Number of U.S. Banks



SOURCE: Federal Deposit Insurance Corp.

**CHART 6** Banks' Net Interest Margin Increased Following Recent Rate Hikes



NOTE: Solid gray bars denote periods of tightening by the Federal Reserve, and patterned bars denote periods of easing.

SOURCE: Uniform Bank Performance Report, Federal Financial Institutions Examination Council.

began normalizing the federal funds rate, though the net position remains high by historic standards. The net position has narrowed more rapidly for Eleventh District institutions compared with the industry as a whole due to area banks' balance sheet composition.

Still, rising rates do not have an unambiguous effect on bank profitability. Theoretically, a bank's NIM should increase after rate hikes and decline

after periods of easing, as assets tend to reprice faster than liabilities. However, policy rate decisions impact the NIM and profitability inconsistently.

For example, NIMs decreased after rates rose in 2004, yet increased among U.S. banks after interest rates fell in 2008 (Chart 6). In the 30 years before the current tightening cycle, the only case in which a higher NIM accompanied a rate hike was from first quarter

► *While the industry stands to benefit from more efficient banks, consolidation becomes a concern if the reduction in smaller banks reduces access to credit and banking services, especially in rural areas.*

1988 through second quarter 1989.<sup>19</sup> So far, bank NIMs have increased during the ongoing tightening period.

### Looking Ahead

The performance of Eleventh District banks is strong and looks to further improve in 2018. The energy industry turnaround and a robust state economy reduced risks to the industry, leading to increased profitability, strengthened C&I portfolios and improved loan growth.

The number of institutions continues to decline, largely because of voluntary mergers. While the industry stands to benefit from more efficient banks, consolidation becomes a concern if the reduction in smaller banks reduces access to credit and banking services, especially in rural areas.

Rising interest rates are the greatest uncertainty this year. Banks' NIMs and earnings have increased after each rate hike as the Fed has tightened monetary policy, though this is an area for continued monitoring.

While the future impact of consolidation and expected rate increases remains unclear, economic conditions will likely remain the primary performance driver for the banking industry. The Federal Reserve Bank of Dallas forecasts Texas job growth of 3.3 percent in 2018, significantly higher than in 2017. Lower effective tax rates coupled with a strong economic outlook should help boost the profitability of Eleventh District institutions through this year.

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### Notes

<sup>1</sup> The Eleventh Federal Reserve District consists of Texas, northern Louisiana and southern New Mexico.

<sup>2</sup> See "Texas Economy Starts 2018 Firing on All Cylinders," by Keith R. Phillips and Christopher Slijk, Federal Reserve Bank of Dallas *Southwest Economy*, First Quarter, 2018.

<sup>3</sup> See "Risks Mount for Eleventh District Banks amid Energy Weakness," by Kelly Klemme and Edward C. Skelton, Federal Reserve Bank of Dallas *Southwest Economy*, Second Quarter, 2016.

<sup>4</sup> Net interest margin is the difference between interest income and interest expense, weighted by average earning assets.

<sup>5</sup> See "Smaller Banks Less Able to Withstand Flattening Yield Curve," by Pavel Kapinos and Alex Musatov, Federal Reserve Bank of Dallas *Economic Letter*, forthcoming.

<sup>6</sup> See "Bank Consolidation and Merger Activity Following the Crisis," by Michael Kowalik, Troy Davig, Charles S. Morris and Kristen Regehr, Federal Reserve Bank of Kansas City *Economic Review*, First Quarter, 2015.

<sup>7</sup> Some banks have net-deferred tax liabilities, so their earnings were helped by the tax reform. However, for the industry as a whole, deferred tax assets far exceed deferred tax liabilities.

<sup>8</sup> One reason tax expense is historically lower among district banks is that 53 percent of the banks in the Eleventh District elect Subchapter S reporting status, which allows a flow-through of tax expenses to shareholders, compared with only 35 percent nationwide.

<sup>9</sup> According to S&P Global Market Intelligence. Large banks include institutions with more than \$50 billion in total assets; regional banks in this discussion include U.S. banks and savings and loans with total assets between \$20 billion and \$50 billion.

<sup>10</sup> Noncurrent loans are loans that are past due 90 days or more or on nonaccrual status.

<sup>11</sup> Typically, commercial real estate concentrations are measured relative to risk-based capital, which weighs assets by their riskiness, adjusting bank capital levels to reflect the risk in the balance sheet.

<sup>12</sup> See "Eleventh District Banks Confront Challenging Energy, Rate Situation," by Kelly Klemme and Edward C. Skelton, Federal Reserve Bank of Dallas *Southwest Economy*, Second Quarter, 2017.

<sup>13</sup> According to Federal Deposit Insurance Corp. (FDIC) Number of Institutions, Branches and Total Offices, FDIC-Insured Consolidated Banks, U.S. Balances at Year-End, 1934–2017.

<sup>14</sup> See note 6.

<sup>15</sup> See "Small-Business Lending Languishes as Community Banking Weakens," by Kelsey Reichow, Federal Reserve Bank of Dallas *Economic Letter*, vol. 12, no. 3, February 2017.

<sup>16</sup> See "Explaining the Decline in the Number of Banks Since the Great Recession," by Roisin McCord, Edward Simpson Prescott and Tim Sablik, Federal Reserve Bank of Richmond *Economic Brief*, March 2015.

<sup>17</sup> Data from FDIC Statistics at a Glance, Changes in Number of Institutions, FDIC-Insured Commercial Banks, 1934–2017 year to date.

<sup>18</sup> See note 12.

<sup>19</sup> See note 12.



# FEMA to Play Long-Term Role in Recovery from Harvey

By Rachel Brasier and Jesse Thompson

**ABSTRACT:** Federal disaster assistance following Hurricane Harvey has emphasized immediate recovery costs but will likely shift its focus to infrastructure improvements. The timeline for FEMA's aid program appears to be evolving while increasingly frequent extreme weather events test local disaster-management planning.

**H**urricane Harvey, the second-costliest storm to strike the U.S., slammed into Port Aransas and Rockport, Texas, around 10 p.m. on Aug. 24, 2017. It spent the next days meandering over the central and southeastern Texas Gulf Coast, inundating the Houston and Port Arthur-Beaumont metropolitan areas with as much as 51 inches of rain.

The storm overwhelmed flood control infrastructure with an estimated total water volume approaching 11 trillion gallons. Of the 277,000 Texas homes affected, about 148,000 were damaged and 11,000 destroyed.<sup>1</sup> Individuals and state and local agencies turned to many sources of funding in their search for assistance, chief among them the Federal Emergency Management Agency (FEMA).

The massive scale of a megastorm such as Harvey complicates the assessment of overall costs, especially for FEMA, an agency that handles both immediate impacts and preparedness for possible future events through individual assistance, public assistance and hazard mitigation grant programs.

Individual assistance provides survivors with funding for housing and other disaster-related expenses. Public as-

sistance, FEMA's largest grant program, reimburses a share of public works projects' costs to reduce the burden on state and local governments. Hazard mitigation grants fund community efforts to minimize the long-term risks of natural disasters to people and property.

Harvey recovery is far from completed. FEMA has told Congress it plans to approve \$6.4 billion for Harvey disaster relief, including individual assistance, public assistance and mitigation, by Sept. 30, 2018 (*Table 1*).<sup>2</sup>

More broadly, amendments to the 2018 federal budget—the fiscal year that began Oct. 1, 2017—added \$42.2 billion to the initial \$12.8 billion authorized for FEMA disaster relief programs.<sup>3</sup>

There can be a wide variance in the timeline for recovery from large storms: \$30.5 billion was committed in the year following Hurricane Katrina in 2005, \$13.4 billion of which supported individual assistance efforts.<sup>4</sup> The agency awarded about \$6.5 billion in 2012 following Hurricane Sandy.<sup>5</sup>

Once grants are allocated for hurricanes, it has historically taken about eight years for the expenditure process to run its course. For example, FEMA approved eight hazard mitigation grants totaling \$60 million to Harris County in

**TABLE 1** Harvey Individual Assistance to Grow Modestly, Public Assistance to Double by September 2018

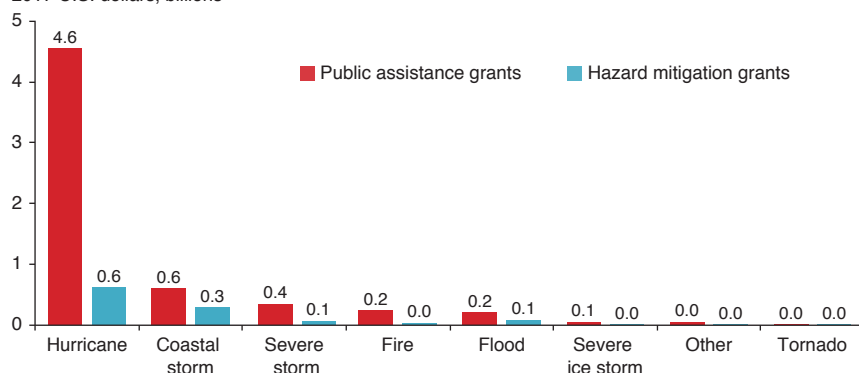
|                       | Actual obligations through<br>March 31, 2018 (in millions) | Projected totals through<br>Sept. 30, 2018 (in millions) |
|-----------------------|--|--|
| Individual assistance | \$2,804  | \$2,969  |
| Public assistance     | \$638  | \$1,269  |
| Hazard mitigation     | \$17   | \$43   |
| Operations            | \$188  | \$264  |
| Administrative        | \$1,477  | \$1,806  |
| <b>Total</b>          | <b>\$5,124</b>   | <b>\$6,351</b>   |

SOURCE: Federal Emergency Management Agency May 2018 Disaster Relief Fund Report.

# CHART 1

## Majority of FEMA State Aid Funding in Texas Allocated to Hurricanes

2017 U.S. dollars, billions

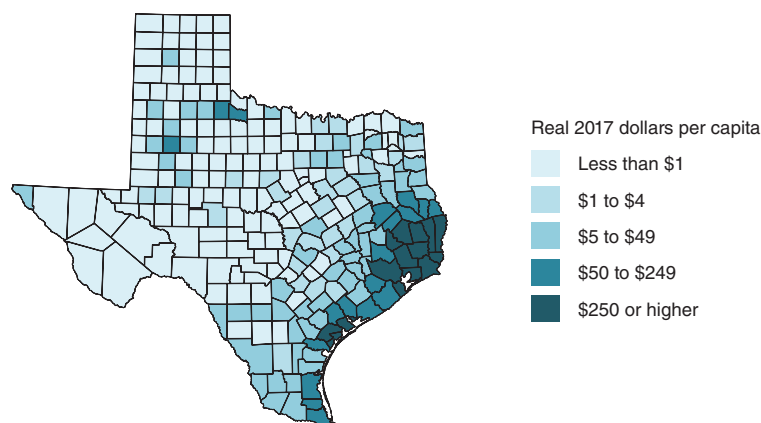


NOTES: Records begin August 1998 and include obligated grants for disasters declared through December 2017. Totals reflect rounding. The chart excludes other types of Federal Emergency Management Agency (FEMA) grants, including for individuals.

SOURCES: Bureau of Labor Statistics; FEMA; authors' calculations.

# MAP 1

## Hurricane-Related State Aid Funding Saturates Coast



NOTES: Records begin August 1998 and include obligated grants for disasters declared through December 2017. Hurricane-related funding includes public assistance grants distributed in response to hurricane and coastal storm events.

SOURCES: Bureau of Labor Statistics; Census Bureau; Federal Emergency Management Agency; authors' calculations.

response to Hurricane Ike, which struck the Houston–Galveston area in September 2008. Of those, only three projects with a combined federal share of \$7.5 million have been closed out.<sup>6</sup>

### Providing Aid to Texas

Public assistance, FEMA's largest grant program, provides funds to aid communities' recovery from major disasters or emergencies declared by the president. The program funds emergency assistance to save lives and protect property and, separately, for perma-

nent restoration of infrastructure.

More public assistance grant money in Texas is attributable to hurricanes than to all other disaster types combined (*Chart 1*).<sup>7</sup> Longer-term hazard mitigation grants for improvements to existing infrastructure, often tied to specific storm events, are more evenly distributed across disaster types, although hurricanes and coastal storms garner the largest share.

Hurricanes and coastal storm events, mostly in southeastern Texas, since 1998 have generated \$5.2 billion in public

assistance grants (in real 2017 dollars) out of the \$6 billion sent to Texas. Harris County, the state's most-populous county, received \$1.8 billion, followed by Galveston County (\$511 million), Jefferson County (\$243 million), Chambers County (\$88 million) and Orange County (\$70 million) (*Map 1*).

By comparison, non-hurricane-related grants—for disasters such as the inland flooding during the Memorial Day 2015 storms or the 2011 Bastrop area wildfires—totaling \$809 million were awarded to 240 of Texas' 254 counties. The largest recipients were McLennan County (\$34 million), Travis County (\$24 million) and Bastrop County (\$24 million).<sup>8</sup>

### Hazard Mitigation Grants

The FEMA Hazard Mitigation Grant Program works with local jurisdictions to prevent disruption of basic services. Grants are awarded on a competitive basis nationally to shore up infrastructure. These expenditures have not entirely followed traditional storm paths. Notably, New York and Louisiana together received nearly half of all public assistance grants largely due to Sandy and Katrina, but just over 2 percent of all pre-disaster mitigation grants (*Chart 2*).

Conversely, California received 13 percent of all pre-disaster mitigation money—mostly for retrofitting public structures to withstand earthquakes—but less than 3 percent of all public assistance grants. Texas received roughly equivalent shares.<sup>9</sup> Relatively low amounts in Texas, Florida and Puerto Rico likely reflect incomplete data following the 2017 hurricane season.

FEMA grant assistance relative to overall disaster cost varies widely. Katrina, the nation's costliest hurricane at an estimated \$164 billion in real 2017 dollars, prompted \$24 billion in FEMA public assistance and hazard mitigation funding—about 14 percent of the total cost.<sup>10</sup>

The second-costliest hurricane, Harvey, with an estimated price tag of \$76 billion, led to appropriation of \$655 million in FEMA public assistance and hazard mitigation grants as of March 30, 2018, though the amount will

likely increase with review of pending projects.<sup>11</sup> Meanwhile, Sandy, the third-costliest hurricane at \$72 billion, generated \$18 billion for recovery and mitigation public works projects from FEMA, or 26 percent of the total cost. Ike, with estimated damages of \$35 billion, garnered \$3 billion, or 10 percent.<sup>12</sup>

## What Comes Next

Harvey's record flooding followed two other Houston-area water disasters, the Memorial Day flood in 2015 and the Tax Day floods in 2016. These events, which were preceded by drought and heat waves across the state, have brought increased attention to the probable effects of climate change and to applications for project grants to help mitigate future extreme events.

Houston-area officials are taking a hard look at a variety of measures to control inland flooding.<sup>13</sup> Among them are upgrades to the Addicks and Barker reservoirs in the western suburbs and creation of a new reservoir to improve rain water retention and limit downstream flooding.<sup>14</sup>

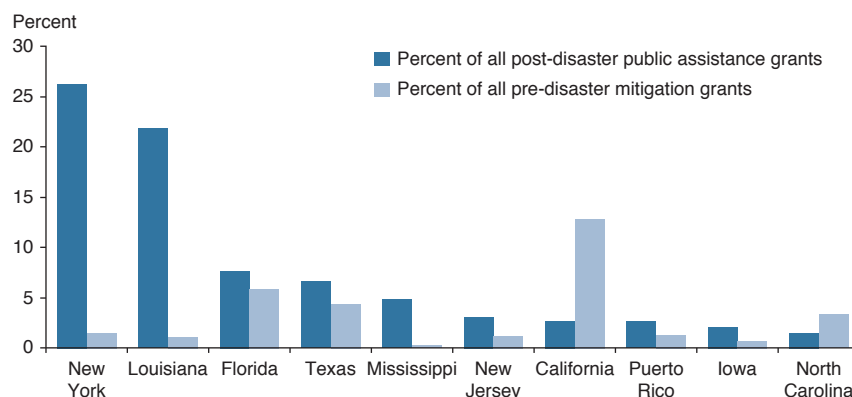
Another measure involves leveraging plans to expand green space along the bayous—the relatively small and typically slow-moving streams that carry rainwater to the Gulf of Mexico—to expand their capacity while providing increased green space for residents.<sup>15</sup>

One of the more ambitious mitigation plans aims to reduce catastrophic damage from storm surge during hurricanes. The “coastal spine” is a 17-foot-tall barrier to prevent major storm surges from breaching Galveston Bay and the Houston Ship Channel where critical refining, petrochemical and transportation infrastructure could be at risk. While Harvey did not inflict such damage, Hurricane Ike did, and 10 years later, no new protections have been built.<sup>16</sup>

Other suggestions include increased buyouts of properties that repeatedly flood. Houston was identified as an outsized source of repetitive flood-related losses as far back as 1998. Severe repetitive flood-loss claims in Texas totaled more than \$200 million prior to Harvey; the figure increased by \$111 million after Harvey.<sup>17</sup>

## CHART 2

### Pre- and Post-Disaster State Aid Funding Varies Between States



NOTES: Records begin August 1998 and include obligated grants for disasters declared through December 2017. The chart shows the percent of all Federal Emergency Management Agency (FEMA) grants (inflation-adjusted) awarded to U.S. states and territories during that period.

SOURCES: Bureau of Labor Statistics; FEMA; authors' calculations.

Whatever measures are selected, the Houston area's major recent flooding events underscore the importance of a local response in addition to federal grant funding. While there is interest in public works projects to limit storm risk, surveys by the University of Houston and Rice University found that less than half of respondents were willing to pay higher taxes to aid the adoption of flood prevention proposals.<sup>18</sup>

## Plans for Future Calamities

As the Texas Gulf Coast considers what preparations might best help it weather future hurricanes, FEMA evaluates its funding policies in terms of the agency's long-term financial health.<sup>19</sup>

Hazard mitigation grants are intended to reduce the total cost—and therefore the federal public assistance cost—of subsequent disasters. However, FEMA has awarded \$90.7 billion (real 2017 dollars) in public assistance grants since 1998. This begs the question of whether local residents, businesses and governments may systematically underestimate the investment necessary to protect themselves from flood- and storm-related losses, in part because they believe the federal government will cover the majority of costs.

If FEMA tightens its standards for grant eligibility to reduce its spending, building resilience through investing in

mitigation may prove to be a more cost-effective safeguard for local businesses and residents.

*Brasier is a research analyst in the Research Department, and Thompson is a senior business economist in the Houston Branch at the Federal Reserve Bank of Dallas.*

## Notes

<sup>1</sup> Data from “DSO Spreadsheet 17-0021 Harvey 2017 112917,” Texas Division of Emergency Management, Nov. 29, 2017.

<sup>2</sup> “May 2018 Disaster Relief Fund Report,” Federal Emergency Management Agency, May 5, 2018, [www.fema.gov/media-library/assets/documents/31789](http://www.fema.gov/media-library/assets/documents/31789).

<sup>3</sup> See note 2.

<sup>4</sup> “Oversight of Gulf Coast Hurricane Recovery: A Semiannual Report to Congress,” President's Council on Integrity and Efficiency and Executive Council on Integrity and Efficiency, October 2006, [www.ignet.gov/sites/default/files/files/hksemi0906.pdf](http://www.ignet.gov/sites/default/files/files/hksemi0906.pdf).

<sup>5</sup> “Disaster Relief Fund: Fiscal Year 2013 Report to Congress,” Federal Emergency Management Agency, Oct. 21, 2013, [www.fema.gov/media-library/assets/documents/31789](http://www.fema.gov/media-library/assets/documents/31789).

<sup>6</sup> Data from OpenFEMA Dataset, Hazard Mitigation Assistance Projects—V1, Federal Emergency Management Agency, accessed April 17, 2018, [www.fema.gov/openfema-dataset-hazard-mitigation-assistance-projects-v1](http://www.fema.gov/openfema-dataset-hazard-mitigation-assistance-projects-v1).

*(Continued on back page)*



# Border Cities Miss Texas Economic Upturn

By Marycruz De León and Dylan Szeto

**E**mployment growth along the Texas–Mexico border slowed in 2017, as the region dealt with the cross-currents of the strong U.S. economic expansion and a pickup in Texas activity, along with a slowing Mexican economy and weaker peso.

Overall, employment grew 1.5 percent in border metros—El Paso, McAllen, Laredo and Brownsville. The rise amounted to a net increase of about 11,700 net new jobs in 2017, down from the previous year's gain of 14,800. Employment activity ranged from a 0.5 percent contraction in Brownsville to a 2.4 percent expansion in McAllen.

Statewide, excluding border metros, employment grew a healthy 1.9 percent—above the 2016 rate of 1.2 percent (*Chart 1*).

About two-thirds of border employment falls in three broad sectors: government; trade, transportation and utilities; and education and health care services. Government employment was little changed in 2017, while retail and wholesale trade, transportation and utilities jobs declined 1.4 percent. Employment growth in education and health care services, which paced border job gains in recent years, reached 3.9 percent in 2017, down from 4.6 percent in 2016.

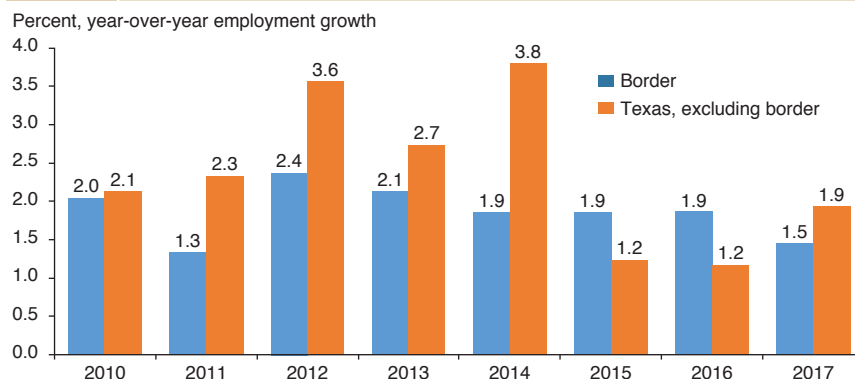
By comparison, all major sectors posted employment increases elsewhere in the state. The border's divergent performance suggests that its proximity to Mexico may be a factor.

## Slowing Retail Activity

U.S.–Mexico border cities are linked in many ways, but one of the main connections is through retail trade. Mexican citizens spend more than \$4.5 billion annually on food and retail items in Texas border metros.<sup>1</sup>

Mexican purchasing power eroded in late 2016 and early 2017 due to a weaker peso relative to the dollar and rising inflation. The peso eventually

**CHART 1** Border Employment Growth Trailed State in 2017



NOTE: Measured as December-over-December change.

SOURCES: Bureau of Labor Statistics; Federal Reserve Bank of Dallas; authors' calculations.

recovered and stabilized, but inflation remained high for much of 2017.

The latest data indicate retail sales contracted in the four Texas border metros. Sales activity along the border fell 4.5 percent in third quarter 2017 on a year-over-year basis. Retail sector employment declined 4.6 percent.

By comparison, statewide retail sales rose 6 percent year over year during the same time period.

Increased violence in Tamaulipas, the Mexican state that includes border communities of Matamoros, Nuevo Laredo and Reynosa, may also be a factor. To avoid traveling through troubled areas, some Mexican citizens may have opted out or chosen to fly into Texas' interior cities for shopping excursions.

## Trade Policy Uncertainty

Mexican manufacturing activity also has a strong impact on Texas border cities' economies. Increased manufacturing output in Mexican border cities—particularly Ciudad Juárez, Matamoros, Nuevo Laredo and Reynosa—increases employment, especially for business services, in Texas border communities.<sup>2</sup>

Mexican manufacturing production expanded at its slowest pace in four years in 2017, and hiring by manufac-

turers in Mexico's border cities was either little changed or slowed significantly from previous years.

U.S. trade policy uncertainty may be constraining manufacturing growth and slowing service sector expansion in Texas-border metros. For example, transportation and warehousing, a sector closely linked to manufacturing, contracted by 0.4 percent in fourth quarter 2017.

While Texas anticipates robust activity statewide through year-end, the border region's outlook is less certain given North American Free Trade Agreement talks and Mexico's presidential election on July 1. The uncertainty has led to recent peso volatility. However, the Mexico gross domestic product forecast envisions a bounce-back this year that would aid U.S. border communities.

## Notes

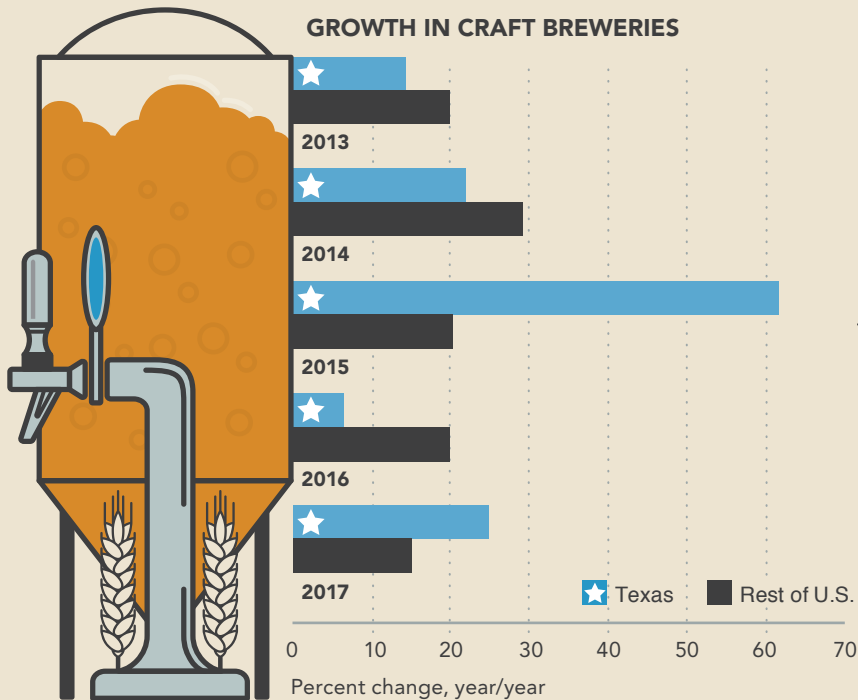
<sup>1</sup> Estimates represent net exportable retail sales. For more details, see "Exported Retail Sales Along the Texas–Mexico Border," by Roberto Coronado and Keith R. Phillips, *Journal of Borderlands Studies*, vol. 22, no. 1, 2007, pp. 19–38.

<sup>2</sup> See "The Impact of the Maquiladora Industry on U.S. Border Cities," by Jesus Cañas, Roberto Coronado, Robert W. Gilmer and Eduardo Saucedo, *Growth and Change*, vol. 44, no. 3, 2013, pp. 415–42.

# Texas Taps into Craft Brewing After Law Change

Design: Olumide Eseyin, Kishya Mendoza Greer; Content: Christopher Slijk

## Small-Scale Craft Brewing Booms in Texas Since 2013



MAJORITY OF CRAFT BREWING JOB GROWTH CONCENTRATED IN THREE METRO AREAS



2013  
848,259

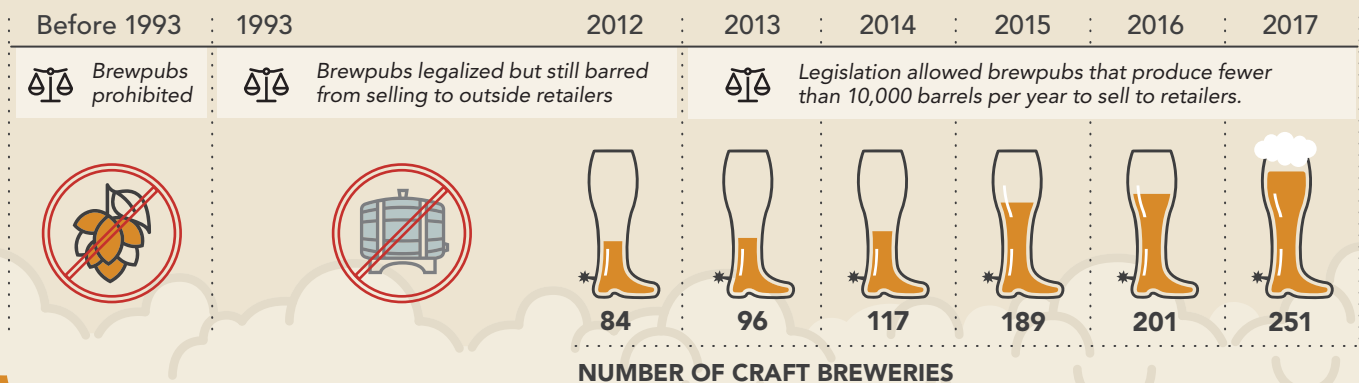


2016  
1,165,579

BARRELS OF CRAFT BEER PRODUCED IN TEXAS

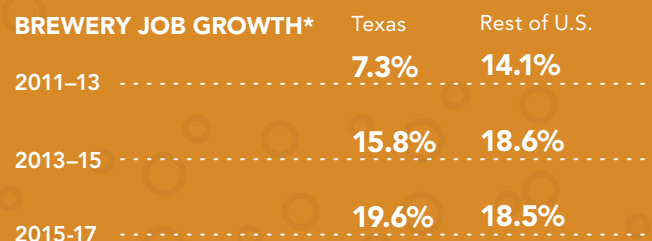
## Why Has Craft Brewing Taken Off?

In 2013, Texas allowed brewpubs (bars or restaurants that brew their own beer on-site) to sell both on-site and to retailers.



## Law Opens a Tab for Growth

Growth in Texas brewery jobs has picked up significantly since the law change in 2013. Craft brewing has attracted new investment, and the employment growth rate accelerated in recent years.



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# FEMA to Play Long-Term Harvey Role

(Continued from page 17)

<sup>7</sup> Data from OpenFEMA Dataset, Public Assistance Funded Projects Details—V1, Federal Emergency Management Agency, accessed April 23, 2018, [www.fema.gov/openfema-dataset-public-assistance-funded-projects-details-v1](http://www.fema.gov/openfema-dataset-public-assistance-funded-projects-details-v1).

<sup>8</sup> See note 7.

<sup>9</sup> See note 6.

<sup>10</sup> Data from National Centers for Environmental Information, Billion-Dollar Weather and Climate Disasters: Table of Events, National Oceanic and Atmospheric Administration, accessed April 23, 2018, [www.ncdc.noaa.gov/billions/events/US/1980-2017](http://www.ncdc.noaa.gov/billions/events/US/1980-2017). Also see note 7.

<sup>11</sup> We use Moody's Analytics' estimate for Hurricane Harvey damages. The National Oceanic and Atmospheric Administration, whose estimates we use for all other storms, estimates damages of \$125 billion. See "U.S. Disaster Costs Come Into Clearer Focus," by Adam Kamins, *Today's Economy*, Moody's Analytics, Oct. 27, 2017, [www.economy.com/dismal/analysis/](http://www.economy.com/dismal/analysis/)

[today's-economy/298539/US-Disaster-Costs-Come-Into-Clearer-Focus](http://today's-economy/298539/US-Disaster-Costs-Come-Into-Clearer-Focus).

<sup>12</sup> See note 10.

<sup>13</sup> See "On the Record: A Conversation with Judge Ed Emmett," Federal Reserve Bank of Dallas *Southwest Economy*, Fourth Quarter, 2017.

<sup>14</sup> For more information, see "Strategies for Flood Mitigation in Greater Houston, Edition 1," Greater Houston Flood Mitigation Consortium, April 10, 2018, <http://houstonconsortium.org/p/report>.

<sup>15</sup> See "Houston's City-Beautification Efforts Might Also Fight Future Flooding," by Stephen Paulsen, *Grist*, Jan. 11, 2018, <https://grist.org/article/houstons-city-beautification-efforts-might-also-fight-future-flooding>.

<sup>16</sup> See "Protecting the Houston—Galveston Region from Coastal Flooding: A Systems Approach (H-GAPS)," by Larry Dunbar, Severe Storm Prediction, Education and Evacuation from Disasters Center, Rice University, Feb. 22, 2018, [http://sspeed.rice.edu/sspeed/downloads/2018\\_Conference/presentations/D2-16.%20Dunbar.pdf](http://sspeed.rice.edu/sspeed/downloads/2018_Conference/presentations/D2-16.%20Dunbar.pdf).

<sup>17</sup> "Flood Insurance Policies Grow in Texas after Hurricane Harvey," by Mark Collette, *Houston Chronicle*, Feb. 22, 2018, [www.chron.com/business/article/Flood-insurance-policies-grow-in-Texas-after-12653753.php](http://www.chron.com/business/article/Flood-insurance-policies-grow-in-Texas-after-12653753.php).

<sup>18</sup> "Flooding Is Seen as a Regional Problem. What About Its Solutions?" by Leah Binkovitz, Kinder Institute Research, Rice University, April 23, 2018, <https://kinder.rice.edu/2018/04/17/flooding-seen-regional-problem-what-about-its-solutions>; "Hobby School Survey Details Houston's Harvey Experience," by Jeannie Kever, Hobby School of Public Affairs, University of Houston, Feb. 12, 2018, [www.uh.edu/news-events/stories/2018/february-2018/02122018Hobby-School-Harvey-Survey.php](http://www.uh.edu/news-events/stories/2018/february-2018/02122018Hobby-School-Harvey-Survey.php).

<sup>19</sup> Electronic Code of Federal Regulations: Title 44, Chapter I, Subchapter D, Part 206, Subpart B 48, Office of the Federal Register; "Federal Disaster Assistance After Hurricanes Katrina, Rita, Wilma, Gustav and Ike," Federation of American Scientists, May 1, 2018, Congressional Research Service Report for Congress R43139, [www.hsdl.org/?abstract&did=810267](http://www.hsdl.org/?abstract&did=810267).



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