Houston's Economy Returned to Basics in 2018
But How Solid Are the Fundamentals Now?

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Houston Payroll Employment Was Revised Down Significantly for 2018

- Payroll workers are those eligible for unemployment insurance
- Initial releases from the Texas Workforce Commission are based on a sample of Houston employers
- Initial benchmark revisions are released each March based on a count of administrative records of workers eligible for unemployment benefits
- The latest revisions cover the period 2017Q4 to 2018Q3. The 2018Q4 unrevised sample says jobs were added at an annual rate of 83,600, which seems high
- The just-released data for the first quarter of this year saw payrolls slow down to a seasonally adjusted annual rate of 53,400 jobs

BLS, Texas Workforce Commission and calculations of IRF
## 2018 Payroll Estimates Reduced 32% from 108,300 to 73,300

<table>
<thead>
<tr>
<th>Industry</th>
<th>Sample</th>
<th>Revised</th>
<th>Difference</th>
<th>Biggest Source of Change?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Payrolls</td>
<td>108.3</td>
<td>73.3</td>
<td>-35.0</td>
<td></td>
</tr>
<tr>
<td>Prof/Business Services</td>
<td>28.5</td>
<td>14.3</td>
<td>-14.2</td>
<td>Professional/Technical, Empl Services</td>
</tr>
<tr>
<td>Construction</td>
<td>19.4</td>
<td>9.0</td>
<td>-10.4</td>
<td>Building Construction</td>
</tr>
<tr>
<td>Trade/Transport</td>
<td>19.3</td>
<td>14.0</td>
<td>-5.3</td>
<td>Retail/Grocery Stores</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>15.6</td>
<td>11.6</td>
<td>-4.0</td>
<td>Fabricated Metal, Machinery</td>
</tr>
<tr>
<td>Education/Health</td>
<td>12.8</td>
<td>8.9</td>
<td>-3.9</td>
<td>Nursing and Residential facilities</td>
</tr>
<tr>
<td>Finance</td>
<td>5.3</td>
<td>4.1</td>
<td>-1.2</td>
<td>Real Estate/Rental/Leasing</td>
</tr>
<tr>
<td>Other</td>
<td>1.7</td>
<td>-2.7</td>
<td>-4.4</td>
<td>Miscellaneous</td>
</tr>
<tr>
<td>Government</td>
<td>2.8</td>
<td>5.8</td>
<td>3.0</td>
<td>Local Education</td>
</tr>
<tr>
<td>Leisure/Hospitality</td>
<td>2.9</td>
<td>8.3</td>
<td>5.4</td>
<td>Eating and Drinking Establishments</td>
</tr>
</tbody>
</table>

BLS, Texas Workforce Commission : The change in the number of jobs shown here is measured Dec/Dec
Our November Forecast Was Little Affected By the 2018 Payroll Numbers

• The next round of revisions won’t be seen from BLS/TWC until March 2020. But the Dallas Fed does early revisions as data becomes available through the year; early/preliminary revisions are on their website at https://www.dallasfed.org/research/econdata/tx-emp.aspx#tab2

• The early revisions can be used to give you an early heads-up on big misses like 2018. Our November forecast was not much affected by the 2018 data, because we assumed there would be only 69,000 jobs – not 108,000

• Because 2018Q4 data is still not revised, further downward revisions are possible for 2018. The reported data for 2018 looking surprisingly high and 2019 has fallen back to lower levels

• Don’t disparage 60-70,000 new local jobs last year, especially coming on the heels of three years of weak or no growth. It is a return to Houston’s long-term average of 2.0 percent annual job growth
A Quick Look Back At Where We Have Been
Local Oil Jobs Are Returning
But at a Pace That Match $60/b Oil Prices – Not $100

Oil recovery is here in 2017-19. But no big bounce in oil jobs so far

Bureau of Labor Statistics, calculations of the Institute for Regional Forecasting, University of Houston
Nine Service Sectors Account for Half of Houston Jobs: They Carried the Economy in 2015-16

Job Growth in 9 Key Service Sectors Has Slowed from 3.0 to 1.0 Percent

3-month growth rate, annualized

New Jobs Added in Recovery: December 2016 to Present

- 15,416 health care
- 8,669 bars and restaurants
- 7,461 finance
- 7,348 local gov’t
- 3,841 private education
- 2,327 state gov’t
- 2,065 accommodation
- 808 arts and entertainment
- -6,496 retail trade
- 40,465 all 9 sectors

Texas Workforce Commission and calculations of IRF
Ship Channel Chemical Boom Slows Down, But Construction Continues at Slower Rate

Chemical Expansion Essential to Helping Houston Offset Drilling Bust

- New proposals and projects continue, but the first wave of construction is winding down, becoming a modest drag on the economy
- Houston is now home to 49% of the U.S. petrochemical industry, but other Gulf Coast cities – Corpus, Lake Charles, Orange -- are increasingly attractive
- The Ship Channel has only a handful of undeveloped sites, land prices are very high, redevelopment is expensive, and companies seek geographic diversification against storms

Big New Projects Still Coming on Line

- As the ethylene and polyethylene projects have come on line, they have produced a glut of product that has slowed future expansion
- Some large projects continue, there are recent proposals and announcements
  - CP Chem, 250,000 mt/year proposed at Baytown
  - ExxonMobil, $1.9 billion for plastics processing at Baytown by 2021
  - Baystar/Total, 625,000 mt/year of polyethylene at Pasadena by 2021
Harvey’s Floods Had a Limited and Short-Lived Effect on the Houston Economy

• There was a one-time impact from Harvey of 17,200 flood-related jobs in 2017Q4. Longer-term employment impacts of the storm were too small to be measured.

• Spending jumped as a result of the cleanup. City of Houston sales tax revenue, for example, increased due to Harvey by an average of 4.4% in 2017Q4, 2018Q1, and 2018Q2. Given a one cent sales tax, this implies about $2.36 billion in additional taxable sales.

• While storms and other natural disasters have devastating consequences for individuals in their path, their effect on an economy of 3.1 million workers and 7.0 million residents is typically small and short-lived.

• The continuing impacts of Harvey are confined to disaster relief and future infrastructure construction. These effects are doled out slowly, or are too uncertain in scope and timing, to have foreseeable impacts on the local business cycle.
<table>
<thead>
<tr>
<th>Factor</th>
<th>2014-2017</th>
<th>2018-19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>U.S. Economy</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Ship Channel Expansion</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Catch-Up from Boom Years</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Hurricane Harvey</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
Recent Data Point to Healthy Growth
The Oil Downturn Is Over And Houston Has Returned to Moderate Growth

Despite a Severe Oil Downturn, Four Positives Kept Us Out of Recession

- The Dallas Fed Business Cycle Index used four variables to track the timing and growth rate of Houston’s cycle
- The setback to Houston from the oil downturn was surprisingly small and over by December 2016
- The return to growth has been slower than the boom years, with the 2017-18 typical of the last 28 years in Houston, 3.7% vs 3.8%

Dallas Fed data through March 2019
The Revised 2018 Job Numbers Moved Houston Back In Line With the U.S. Economy

(3-month percent change at annual rates, s.a.)

Texas Workforce Commission adjusted by the Dallas Fed, IRF calculations
Houston PMI Also Tracks the U.S. Economy

U.S. and Houston PMI

Houston PMI and Local Employment

\[ y = 235.34x + 49.698 \]

\[ R^2 = 0.5128 \]
Houston Unemployment Rate Fell Steadily in 2018, Now Matches the U.S.

Houston unemployment rate equals low U.S. rate at 3.8% in March
Percent unemployed, Houston vs. U.S.

With oil rebound, Houston’s labor force surged by 64,000 Worker in 2018-19
Houston labor force, millions

Oil workers look for work again after long layoffs

BLS and TWC
What Does OPEC Want Now?
Another Go at Slowing U.S. Oil Production
Despite Much Talk and Many Promises
OPEC Struggles to Support Oil Prices

• Nov 2014 -- OPEC withdraws as swing producer
• Feb 2016 -- Oil falls to $30/b, rig count collapses
• Nov 2016 -- OPEC declares victory, returns as swing producer
• Jun 2017 -- Oil falls back to $45 per barrel
• Nov 2017 -- OPEC comes back, prices stick with help from Russians and others
• Oct 2018 -- Oil prices averaged $71/b
• Dec 2018 – Oil averages $49 per barrel as Iran sells oil and OPEC compliance lags
• April 2019 – OPEC seeks a third path?
OPEC Seeks a Third Path
As U.S. Shale Oil Production Soars
(million barrels/day, s.a.)

- **Path 1**: Crush American fracking. It is a high cost source of oil that can only thrive at $100 per barrel. Cut the price like 2014.

- **Path 2**: U.S. fracking is in decline, and can’t respond. Raise the price again like December 2016

- **Path 3**: Set the price in the $50-$60 range and see if you can at least slow U.S. fracking down

DOE/EIA, Seasonally adjusted by IRF
Why $50-$60 Oil?

• If OPEC wants to slow U.S. fracking production, technical considerations say $50-$60 per barrel for WTI will work

• Based on returns in the stock market, investors in oil production and services have set their current expectations of returns based on $50-$55 oil

• It is what producers are acting on in their 2019 plans for capital expenditure

• Apart from near-term political risk to oil markets, it is what the futures market for WTI is telling us

• As we will see, however, near-term oil security is trying to brew up a perfect storm right now – Iran waivers, Venezuelan collapse, and Libyan rebels
Drilling Recovery Means Oil Price Near $65/bbl.

Long-Run Marginal Cost of Global Oil Production

This chart is stylized and illustrative.
What Is the Right Price of WTI?
Oil Price Implied by the Stock of 40 Oil Producers

Goldman Sachs Research, at first week of each quarter

S&P Dow Jones
Upstream Capital Spending for 2019 Based On Expectations of WTI Oil Price at $50-$55

- The *Oil and Gas Journal* 2019 survey of capital spending by upstream producers says industry spending will be down slightly this year at $173.1 billion.
- The survey found operators assuming oil prices in the $50 to $55 range.
- The current level is roughly double the 2016 trough level of $89.7 billion, but still half the 2012 peak of $342.4 peak.
Oil Market Risk Runs High
What Could Possibly Go Wrong?

• **Global oil politics could create a perfect storm that could outstrip OPEC spare capacity of 2.8 million barrels per day**
  • Venezuela economic collapse could remove 1.2 million barrels per day
  • Iran sanctions and waivers revoked for five countries to “drive Iranian exports to zero.” This would remove 1.2 million barrels
  • Rebel takeover of Libya could remove 1.0 to 1.2 million from Africa’s largest producer.

• **There is downside risk as well**
  • A U.S./Global Recession would cut consumption and price
  • Can Russia and the Saudis restrain American oil production?
    • Russia and the Saudis now joined by the U.S. in an unstable coalition of as the world’s three largest oil producers
    • Is there any that can stop American oil production? In the short run? Long run?
The Number of Drilled But Uncompleted Wells Soars With Permian Pipeline Constraints

Energy Information Administration
A New Era of Shale Consolidation
Led by the Majors

Yesterday? High Cost Oil at Low risk

• Looks more like a competitive industry. Many small operators, price-takers, and assembly-line production

• Low barriers to entry for new producers, i.e., capital, some geology, leases, and a hire a service company. Today a hedge fund, tomorrow a producer

• Traditional exploration risk is gone, production costs understood, and the oil is there

• Get a quick and certain rise or fall in oil production in response to changing oil price incentives

Tomorrow? Consolidation in the Permian

• The small producers have struggled to deliver steady income and growth to impress the stock market.

• Major companies now see value in the reduced risk and certain timing of today’s “short cycle” oil industry

• A new era of consolidation has begun?
  • BP buys $10.5 billion in shale assets from miner BHP Billington
  • Chevron announces plans to ramp up Permian production from 200,000 to 900,000 barrels per day by 2023; then buys Anadarko for $33 billion
  • ExxonMobil announces plans to ramp up Permian production from 200,000 to one million barrels per day by 2024
Russia, Saudi Arabia, and U.S.: The World’s Largest Oil Producers Are An Unstable Threesome

The U.S numbers are the DOE/EIA forecast for domestic production; Saudi and Russian figures are current quotas.
Short-Term Political Risk Keeps Oil Price Futures Near $65, Then Longer-Term It Falls to $50-$60

WTI Futures, $/bbl

CME Group
Houston’s Oil Workers
The Current Downturn and Recovery in Rigs Looks Very Different from The Last One in 2008-09

- This recovery brings fewer rigs because oil prices are lower and technology reduces the number of rigs at work
- The 2008-09 recovery brought an average of $95 oil and 1855 rigs after 2011
- This 2018 recovery is built on $65 oil and 1022 rigs in 2018
- How much is technology, how much is price?

Baker Hughes, IRF Calculations
“Forecasting” Rig Count and Oil Jobs From 2012Q4 to 2018Q4
The *Actual* Forecast of Working Rigs From 2018Q4 to 2024Q2 As Oil Goes from $30 to $100
The *Actual* Forecast of Working Rigs From 2018Q4 to 2024Q2 As Oil Goes from $30 to $100
Given the Price of Oil: Where Should the Rig Count Be By 2020Q4?

<table>
<thead>
<tr>
<th>Oil Price ($/b)</th>
<th>Working Rigs</th>
</tr>
</thead>
<tbody>
<tr>
<td>$30</td>
<td>631</td>
</tr>
<tr>
<td>$40</td>
<td>767</td>
</tr>
<tr>
<td>$50</td>
<td>887</td>
</tr>
<tr>
<td>$55</td>
<td>944</td>
</tr>
<tr>
<td>$60</td>
<td>999</td>
</tr>
<tr>
<td>$65</td>
<td>1053</td>
</tr>
<tr>
<td>$70</td>
<td>1105</td>
</tr>
<tr>
<td>$80</td>
<td>1210</td>
</tr>
<tr>
<td>$90</td>
<td>1314</td>
</tr>
<tr>
<td>$100</td>
<td>1415</td>
</tr>
</tbody>
</table>

Average 2018 oil price was $65.20, and the rig count was 1032.

This is the number of working rigs after the oil price stabilizes at the given level and remains there through 2020q4; it accounts for innovational and trend effects, as well as real oil price changes.

Only 1415 rigs would be predicted today if oil returned to $100 oil per barrel.
Rig Count: Use $80 for the High Scenario, $40 for Low, and Moderate in a $55 to $65 Range
Lower Oil Prices, Technology and the Number of Oil Jobs: Only 30% Are Back Since 2016
(Net Change in Jobs, Dec. to Dec.)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Dec’14 to Dec ’16</th>
<th>Dec ’16 - Now</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstream</td>
<td>-77.2</td>
<td>26.0</td>
</tr>
<tr>
<td>Oil Producers</td>
<td>-16.2</td>
<td>-1.8</td>
</tr>
<tr>
<td>Oil Services</td>
<td>-20.7</td>
<td>8.2</td>
</tr>
<tr>
<td>Machinery</td>
<td>-19.8</td>
<td>7.6</td>
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<tr>
<td>Fabricated Metal</td>
<td>-20.5</td>
<td>11.9</td>
</tr>
<tr>
<td>Downstream</td>
<td>1.6</td>
<td>1.9</td>
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<tr>
<td>Refining</td>
<td>-0.1</td>
<td>.4</td>
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<tr>
<td>Chemicals</td>
<td>1.6</td>
<td>1.5</td>
</tr>
<tr>
<td>Energy Base</td>
<td>-74.1</td>
<td>26.8</td>
</tr>
</tbody>
</table>

Lost 74,100 jobs in the energy base by Dec 2016
Added back only 26,800 through March 2019

*Texas Workforce Commission estimates. Oil-Related Jobs = Oil Producers and Services, Machinery and Fabricated Metal, Refining, Chemicals, Plastics, Pipelines, and some Wholesale Trade and Professional Services.
The Actual Forecast of Houston Oil Jobs From 2018Q4 to 2024Q2 As Oil Goes from $30 to $100

Houston’s Energy Base, ‘000 jobs


$30  | $40  | $50  | $55  | $60  | $65  | $70  | $80  | $90  | $100

Graph showing the forecast of Houston oil jobs from 2018Q4 to 2024Q2 as oil price goes from $30 to $100.
Given the Price of Oil: How Many Local Oil Jobs in Our Future?

Even with fewer rigs at $100 oil, today’s Houston oil jobs would be down less than 10%.

The current 252,000 oil-related jobs are near equilibrium for $60 oil, so no immediate pressure on oil jobs if price holds through 2019.
Oil Jobs: Use $80 for the High Scenario, $40 for Low, and Moderate in a $55 to $65 Range

Houston’s Energy Base, ‘000 jobs
Good News for the Future of Oil Employment in Houston

• We saw earlier that even after two years of layoffs, local oil workers are willing and able to come back to work

• While the number of oil workers in Houston is still down, more good news stems from the fact that technology seems to be playing a relatively small role. Lower oil prices are the dominant factor reducing today’s oil jobs

• This good news comes despite the rig count is down by nearly half since 2014, with technology accounting for half of that decline
  • The fall in the number of rigs is partly because of the size, power, and complexity of the modern rig. And it requires worker input -- costing $25 million and 50,000 manhours of engineering and production to deliver
  • Further, advanced technology and modern control systems push oil jobs out of the remote oil fields – but into control rooms in Houston headquarters
Three Scenarios for a Drilling Recovery

- **Oil price and rig count:**
  - *High Scenario:* It takes a supply disruption to move oil price over $80 for a number of months
  - *Medium Scenario:* Oil price stays near $60-$65 in 2019 due to oil market risk, then slowly falls back to $55-$60 in 2020
  - *Low Scenario:* OPEC withdraws as swing producer again – with oil price near $40

- **New estimates of rig count by 2023:**
  - *High Scenario:* 1212
  - *Medium Scenario:* 1044
  - *Low Scenario:* 885

- **Return of Drilling Jobs in Houston**
  - *High* brings 10,000 oil jobs back in 2019, 6,000 in 2020
  - *Medium* 6,500 oil jobs in 2019, but none in 2020
  - *Low* in 2019 is -10,000 and 2020 is -11,000 as oil prices fall again.
The Global Economy Continues to Slow
IMF Forecasts of Global Growth Have Fallen Each Year Since 2012: Still Just Above Trend

- Demographics have slowed, with employment already peaking in Japan, Germany, Italy and Russia; China and South Korea soon follow.
- The BRIC Boom ended with recession in Brazil and Russia, slower growth in China. Only India is left to lead the group.
- Europe has never faced up to its banking problems after the 2008 financial crisis.

IMF Database, history 1988 to 2018 and annual forecasts; October forecasts except January update to 2018
# A High and Rising Dependency Ratio in the Developed World

*(Population Aged 65+ Relative to Population Age 16-64)*

<table>
<thead>
<tr>
<th>Region</th>
<th>Dependency Ratio</th>
<th>Region</th>
<th>Dependency Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>13%</td>
<td>Euro Area</td>
<td>32%</td>
</tr>
<tr>
<td>OECD Countries</td>
<td>26%</td>
<td>Germany</td>
<td>33%</td>
</tr>
<tr>
<td>Latin America and Caribbean</td>
<td>12%</td>
<td>France</td>
<td>32%</td>
</tr>
<tr>
<td>Middle East &amp; North Africa</td>
<td>8%</td>
<td>Italy</td>
<td>36%</td>
</tr>
<tr>
<td>Sub Sahara Africa</td>
<td>6%</td>
<td>North America</td>
<td>24%</td>
</tr>
<tr>
<td>East Asia and Pacific</td>
<td>13%</td>
<td>U.S.</td>
<td>23%</td>
</tr>
<tr>
<td>India</td>
<td>15%</td>
<td>Canada</td>
<td>25%</td>
</tr>
<tr>
<td>China</td>
<td>9%</td>
<td>Mexico</td>
<td>10%</td>
</tr>
</tbody>
</table>
The Boom Slows As BRIC Countries Find Tighter Credit, Maturity, and Recession

Percentage Change in GDP

- **China**: 10.5, 10.1, 6.9, 6.9, 6.2, 2.4
- **India**: 7.4, 9.1, 7.7, 8.0, 7.4, 1.8
- **Brazil**: 4.2, 4.4, 2.9, 4.3, -2.8, 2.4
- **Russia**: -4.0, 2.9, 6.4, 4.3, -2.8, 1.8

IMF Database
IMF Forecasts of Global Growth Have Fallen Below Trend

IMF Database, history 1988 to 2018 and annual forecasts; October forecasts except January update to 2018
The U.S. Economic Outlook: Recession Ahead or Not?
Let’s Talk About the Looming U.S. Recession. Just Kidding!

• In July, the U.S. economy seems virtually certain to set the record for the longest economic expansion in U.S. history, surpassing the 120 months of the 1990-2001 expansion

• Is it time for a recession? Expansions don’t die of old age, they die of speculative excesses. Trite but true. They don’t happen in a vacuum, and they must begin with an external shock or catalyst

• Expansions don’t die in 2020 just because you don’t like Donald Trump. Wishing doesn’t make it so

• The best reason for no recession in sight: Data in 2019 remain solid. The economy was widely expected to slow this year following the stimulus for the Tax Cuts and Jobs Act, and it is doing so. But 2019 fundamentals look good

• Given the right reasons and conditions, a recession could be upon us in in only three or four quarters. But that is always true, and we are missing the catalyst for recession at this time
Three Surveys of Economists and Only Two Different Answers!

<table>
<thead>
<tr>
<th>Probability of Recession by Year</th>
<th>NABE</th>
<th>Wall Street Journal</th>
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</thead>
<tbody>
<tr>
<td>2019</td>
<td>10</td>
<td>4.1</td>
</tr>
<tr>
<td>2020</td>
<td>42</td>
<td>49</td>
</tr>
<tr>
<td>2021</td>
<td>25</td>
<td>34.7</td>
</tr>
<tr>
<td>2022</td>
<td>21</td>
<td>12.2</td>
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<table>
<thead>
<tr>
<th>GDP Growth Change</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 0 recession</td>
<td>3.3</td>
<td>8.5</td>
<td>12.7</td>
<td>9.9</td>
</tr>
<tr>
<td>0 to 1.9 weaker</td>
<td>27.6</td>
<td>45.9</td>
<td>46.6</td>
<td>42.7</td>
</tr>
<tr>
<td>2.0-2.9 moderate</td>
<td>53</td>
<td>32.3</td>
<td>28.1</td>
<td>31.8</td>
</tr>
<tr>
<td>&gt;3.0 stronger</td>
<td>16.1</td>
<td>12.8</td>
<td>12.9</td>
<td>15.6</td>
</tr>
</tbody>
</table>

NABE respondents are from the membership of the National Association of Business Economists; the Wall Street Journal survey is a monthly panel of more than 60 economists; the Philadelphia Fed’s Survey of Professional Forecasters included 38 respondents. All surveys cover the first quarter of 2019.
The Recent Inversion of the Yield Curve Signals Recession in 12 Months?

- Why does the slope turn negative?
  - *Short-end rises:* Fed raising rates
  - *Long-end falls:* inflation expectations recently declined, economic growth and the markets have cooled off

- Does it matter?
  - It has been a good predictor of recession IF past inversions that signal recession have been large and lasted months
  - This inversion was a few basis points and quickly disappeared after a few days
  - The end of Fed’s quantitative easing program is distorting the curve we see today
Based on GDP Data Through Late 2018 the Chances of Recession Fell to Near Zero

The probability U.S. economy was expanding or in recession, %

- An index value greater than 67% would indicate the U.S. economy is in recession
- Below 33% it is almost certainly expanding. Recent data says it was expanding with no trend toward recession in 2018
- The transition from expansion to recession can come quickly, however. Usually it takes only two to four quarters to move from strong expansion to recession

James Hamilton, *GDP-Based Recession Indicator Index*, retrieved from FRED, St. Louis Fed
As the U.S. Economy Slows, Messages Become Mixed Across Various Sectors

• If slower growth means all sectors are not clicking along on the same track, then lower growth opens the door to mixed messages as some sectors slow or even reverse. Data revisions become bigger and more common

• This has been compounded in recent reports by the late 2018 government shutdown, polar vortex, and a big swoon in the stock market. Consumer spending and income was particularly hard hit, and for the consumer it has been two steps forward, one step back in early 2019

• The final report on 2018Q4 GDP was 2.2%, followed by 2019Q1 growth of 3.2%. This latest GDP growth report was inflated by inventory accumulation and trade tensions, but it still confirms healthy growth that is slower than the previous year. It is expected remain on a slow to moderate track

• New and existing home sales were hurt by winter weather, but have come back nicely with better weather, lower prices, and lower mortgage rates

• The US economy bounced back in March with a very strong 196,000 new payroll jobs; the April PMI data indicate solid growth in April for both services and manufacturing; The Conference Board’s leading indexes point to continued moderation in growth back to trend levels by year-end; inflation remains under the Fed’s two-percent target
The Fed Went on Alert With Passage of the TCJA With the Economy and the Tight Job Market

% Slack versus 4-Quarter Change in Core Personal Consumption Deflator

4-Quarter Percent Change, Employment Cost Index, All Civilian Occupations

Congressional Budget Office, Bureau of Economic Analysis
Fed Funds Futures Say the Fed’s Pivot Means No Interest Rate Increases in 2019

Only rate decreases now on the horizon

<table>
<thead>
<tr>
<th>Meeting Date</th>
<th>Range b.p.</th>
<th>Prob. of Decrease</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 May</td>
<td>225-250</td>
<td>0.0%</td>
<td>--</td>
</tr>
<tr>
<td>19 Jun</td>
<td>225-250</td>
<td>16.4%</td>
<td>--</td>
</tr>
<tr>
<td>31 Jul</td>
<td>225-250</td>
<td>19.8%</td>
<td>--</td>
</tr>
<tr>
<td>19 Sep</td>
<td>225-250</td>
<td>34.1%</td>
<td>--</td>
</tr>
<tr>
<td>30 Oct</td>
<td>225-250</td>
<td>37.2%</td>
<td>--</td>
</tr>
<tr>
<td>11 Dec</td>
<td>200-225</td>
<td>48.2%</td>
<td>--</td>
</tr>
<tr>
<td>29 Jan</td>
<td>200-225</td>
<td>54.9%</td>
<td>(-)</td>
</tr>
</tbody>
</table>

Fed policy now on track to cut rates?

- At its March meeting, they said it sees little chance of a 2019 rate increase, after expressing concern about tariffs, the slowing U.S. economy, and problems in Europe and China.
- The federal funds market now predicts no rate increases, and sees only the possibility of rate decreases going forward.
- Fed funds futures now predict only one rate decrease in January with a 54.9% probability.
- **BUT the Fed decision-making is fluid and dynamic, and they have clearly stated that is still data dependent and data driven.**

Source: Fed Funds futures, CME Group, 4/23/2019. Table assumes as soon as probability of a rate change passes 50% a 25 basis point increase or decrease is triggered.
U.S. and Houston Share Three Recessions Since 1990, Houston Has Flirted with Two Others

U.S. payrolls, 3-mo average % change

Houston payrolls, 3-mo average % change

Job loss = 2.8%

Job loss = 3.5%

Job loss = 13.0%

120

73

121 by July

Months of U.S. expansion
### U.S. Growth Slows: But a Moderate U.S. Recovery Continues

<table>
<thead>
<tr>
<th></th>
<th>Real GDP (%)</th>
<th>Unempl Rate (%)</th>
<th>Payroll Jobs ('000/mo)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quarterly Data:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019Q1</td>
<td>1.5</td>
<td>3.9</td>
<td>198.9</td>
</tr>
<tr>
<td>2019Q2</td>
<td>2.4</td>
<td>3.7</td>
<td>156.8</td>
</tr>
<tr>
<td>2019Q3</td>
<td>2.2</td>
<td>3.7</td>
<td>168.5</td>
</tr>
<tr>
<td>2019Q4</td>
<td>2.2</td>
<td>3.7</td>
<td>142.1</td>
</tr>
<tr>
<td>2020Q1</td>
<td>2.1</td>
<td>3.7</td>
<td>143.6</td>
</tr>
<tr>
<td><strong>Annual Average:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>2.4</td>
<td>3.7</td>
<td>191.8</td>
</tr>
<tr>
<td>2019</td>
<td>2.0</td>
<td>3.7</td>
<td>166.6</td>
</tr>
<tr>
<td>2020</td>
<td>1.8</td>
<td>4.0</td>
<td>151.3*</td>
</tr>
<tr>
<td>2021</td>
<td>2.1</td>
<td>4.2</td>
<td>153.1*</td>
</tr>
</tbody>
</table>

Source: FRED, St. Louis Fed; Philadelphia Fed, *Survey of Professional Forecasters*, First Quarter 2019. The (*) value is not provided by this survey, but inserted by the IRF, University of Houston.
What Happens to Houston with U.S. or Global Recession? High or Low Oil Prices?

Oil Price

<table>
<thead>
<tr>
<th>U.S. Growth</th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expansion</td>
<td>Boom</td>
<td>Tepid/Zero</td>
</tr>
<tr>
<td>Recession</td>
<td>?</td>
<td>Recession</td>
</tr>
</tbody>
</table>
Moderate Growth Continues in Houston
Pull It All Together?

• Three oil scenarios: high, medium, or low. *High* is based on $80 oil and political disruption to oil markets; *medium sees 2019 $60-65 oil and falling to $55-60 by 2020 as oil risk disappears*; *low has U.S. over-production and OPEC again pulling out as swing producer and $40 oil price*

• Continued U.S. expansion at moderate rate; no recession predicted

• Petrochemical construction slows; momentum from the fracking boom years is gone; Harvey is over

• Once higher oil prices are absorbed, all three forecasts settle down to Houston’s trend rates of growth near 2 percent
Forecast Job Growth Is Moderate As Oil Prices Stabilize or Improve
(000 New Jobs, Q4/Q4)

<table>
<thead>
<tr>
<th>Year</th>
<th>High</th>
<th>Medium</th>
<th>Low</th>
<th>20/60/20</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>112.6</td>
<td>112.6</td>
<td>112.6</td>
<td>112.6</td>
</tr>
<tr>
<td>2016</td>
<td>-2.3</td>
<td>-2.3</td>
<td>-2.3</td>
<td>-2.3</td>
</tr>
<tr>
<td>2017</td>
<td>30.5*</td>
<td>30.5*</td>
<td>30.5*</td>
<td>30.5*</td>
</tr>
<tr>
<td>2018</td>
<td>75.5**</td>
<td>75.5**</td>
<td>75.5**</td>
<td>75.5**</td>
</tr>
<tr>
<td>2019</td>
<td>73.9</td>
<td>66.8</td>
<td>36.0</td>
<td>62.06</td>
</tr>
<tr>
<td>2020</td>
<td>76.2</td>
<td>58.2</td>
<td>38.1</td>
<td>57.78</td>
</tr>
<tr>
<td>2021</td>
<td>67.1</td>
<td>55.8</td>
<td>42.7</td>
<td>55.44</td>
</tr>
<tr>
<td>2022</td>
<td>65.1</td>
<td>62.8</td>
<td>58.3</td>
<td>62.36</td>
</tr>
<tr>
<td>2023</td>
<td>69.3</td>
<td>70.3</td>
<td>70.1</td>
<td>70.06</td>
</tr>
</tbody>
</table>

*Excludes 17,200 temporary jobs in 2017Q4 driven by Hurricane Harvey. ** Subject to further revisions
Calculations of IRF, based on drilling scenarios above. Figures are Q4/Q4. The 2016 calculations include benchmark revisions of March 2019.
## This Forecast Compared to Recent Outlooks

(000 New Jobs, Q4/Q4)

<table>
<thead>
<tr>
<th>Year</th>
<th>This Forecast</th>
<th>Nov 2018</th>
<th>May 2018</th>
<th>Nov 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>2014</td>
<td>112.6</td>
<td>112.3</td>
<td>112.7</td>
<td>112.7</td>
</tr>
<tr>
<td>2015</td>
<td>9.2</td>
<td>8.9</td>
<td>11.0</td>
<td>11.0</td>
</tr>
<tr>
<td>2016</td>
<td>-2.3</td>
<td>-2.6</td>
<td>10.8</td>
<td>-1.5</td>
</tr>
<tr>
<td>2017</td>
<td>30.5*</td>
<td>27.9*</td>
<td>35.2</td>
<td>41.1</td>
</tr>
<tr>
<td>2018</td>
<td>78.3**</td>
<td>62.4</td>
<td>52.6</td>
<td>42.1</td>
</tr>
<tr>
<td>2019</td>
<td>66.8</td>
<td>67.4</td>
<td>68.0</td>
<td>56.0</td>
</tr>
<tr>
<td>2020</td>
<td>58.2</td>
<td>54.8</td>
<td>74.1</td>
<td>64.5</td>
</tr>
<tr>
<td>2021</td>
<td>55.8</td>
<td>67.1</td>
<td>78.8</td>
<td>73.2</td>
</tr>
<tr>
<td>2018-2021</td>
<td>259.1</td>
<td>251.7</td>
<td>273.5</td>
<td>235.8</td>
</tr>
</tbody>
</table>

*Hurricane Harvey jobs removed from 2017

Note: Calculations of IRF, based on drilling scenarios above. Figures are Q4/Q4. This forecast (*) in 2017Q4 excludes 27,800 one-time jobs from Hurricane Harvey. May forecast did not foresee Harvey, November forecast underestimated Harvey impacts. The 2018 estimate adjusted down for likely over-estimates of payroll data.
Houston Metro Population Has Been Slowing Since 2014

It Is Domestic Migration That Makes Local Population Growth Volatile

<table>
<thead>
<tr>
<th>Year</th>
<th>Pop Change</th>
<th>Natural Increase</th>
<th>Net Migration</th>
<th>Int'l Migration</th>
<th>Domestic Migration</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>108,957</td>
<td>59,236</td>
<td>49,917</td>
<td>26,921</td>
<td>22,996</td>
</tr>
<tr>
<td>2012</td>
<td>128,495</td>
<td>57,839</td>
<td>70,411</td>
<td>30,982</td>
<td>39,429</td>
</tr>
<tr>
<td>2013</td>
<td>145,796</td>
<td>57,303</td>
<td>87,874</td>
<td>32,796</td>
<td>55,078</td>
</tr>
<tr>
<td>2014</td>
<td>172,961</td>
<td>60,926</td>
<td>111,044</td>
<td>43,797</td>
<td>67,247</td>
</tr>
<tr>
<td>2015</td>
<td>172,947</td>
<td>62,711</td>
<td>109,862</td>
<td>47,902</td>
<td>61,960</td>
</tr>
<tr>
<td>2016</td>
<td>135,695</td>
<td>62,962</td>
<td>72,681</td>
<td>45,475</td>
<td>27,206</td>
</tr>
<tr>
<td>2017</td>
<td>93,435</td>
<td>59,171</td>
<td>34,074</td>
<td>43,948</td>
<td>-9,874</td>
</tr>
<tr>
<td>2018</td>
<td>91,689</td>
<td>56,119</td>
<td>35,397</td>
<td>44,535</td>
<td>-9,138</td>
</tr>
</tbody>
</table>
Single-Family Housing Slows in 2018, Now 2019 Depends on Mortgage Rates
2018 U.S. Single-Family Market In Long Slide, But Has Stabilized for Now

- 2018 brought a long slide in the U.S. single-family market, followed by some revival in early 2019. This was thanks to better weather and a decline in mortgage rates.

- Existing home sales fell 8.3 percent in 2018 measured December to December, then jumped 3.4 percent by March. Home prices rose 6.1 percent Q4/Q4, but had slowed to a 1.3 percent rate by Q4.

- New home sales were up 23.7 percent in Dec to March, after falling 7.5 percent in 2018. Price fell 6.0% in 2018, helped by builder price cutting; in early 2019, price has been flat.

- The best way to look forward through the winter weather is probably through single-family permits, which have bottomed out at low levels.

![Single-Family Permits (000) at annual rate](chart.png)
Mortgage Rates Fall By 80 Basis Points November to April, Refinancing Picks Up

30-Year Fixed Mortgage Rate (%)

Mortgage Refinance Applications, Weekly % Change
Building Material and Labor Costs Continue to Rise While Interest Rates Take a Breather

- Recent price increases for commodity inputs include steel mill products, oil-related inputs like diesel and asphalt, truck transportation, and construction machinery.
- The employment cost index for construction says wages and salaries rose 3.1 percent in 2018, up from 2.5 percent in 2017.
- Strong demand for construction workers combine with an aging workforce, immigration and other restrictions to bring growing labor shortages.

BLS: JOLTS, Employment Cost Index, Producer Price Indexes
Houston Existing Home Sales Share National Slide in 2018, Jump in Early 2019 (sales, s.a.)

- Harvey had a short-lived impact on home sales, with sales and listings back now back on a normal path
- Sales in 2018 fell 4.9 percent from December to December, then jumped 4.4 percent in the first two months of the year
- This pretty much tracks what we see in the national market, with the improvement in 2019 following the Fed pivot on interest rates

Source: Texas A&M Real Estate Center
Houston In 2018:
Stable Inventories and Rising Prices

Months Supply, Affected By Harvey and oil Prices

Home Prices Rise 4.4% in 2018 But Weaken After September

Source: Texas A&M Real Estate Center, seasonal adjustment by IRF
Inflation Pushes Existing Home Prices Off the Lowest Price Rung And Into the Middle

From 2014 to 2018 Prices Have Shifted Up and to the Right

Virtually No Change In Price Distribution Since 2016

% Distribution By Price ($000)
Houston’s Home Affordability Helped By Rising Local Income, But Gains Offset By Rising Interest Rates

Wells Fargo Housing Opportunity Index
Ship Channel Cities
Baytown, Channelview, Pasadena

Sales and Home Prices Turn Flat After the Construction Boom

Inventory Still Tight at Less Than 3.0%

Source: Texas A&M Real Estate Center, calculations of IRF
South Houston
South Belt, Clear Lake, League City

Sales flat, price slows

Inventory low but slowly loosens up

Source: Texas A&M Real Estate Center, calculations of IRF
Close-In and Upscale
Rice Military, Heights, Galleria

Sales pick up in early 2017, Stagger in recent months

Inventory stable near 6 months

Source: Texas A&M Real Estate Center, calculations of IRF
South Of I-10 West
Memorial and Energy Corridor

Prices hold up, sales flat to down
Even after Harvey recovery

Inventory at 6.0 months and flat
since Harvey is over

Source: Texas A&M Real Estate Center, calculations of IRF
Other Distant Suburbs
Pearland, Sugar Land, Kingwood, Katy

Sales flat & price increases slow as new homes building robust

Inventories rose quickly in 2018 after Harvey settled out, now near 3.0% again

Source: Texas A&M Real Estate Center, calculations of IRF
Houston does not show the same big 2018 declines in closings and starts in 2018 that we saw in the U.S..

Locally, 18Q4/17Q4 brought a 4.3% increase in closing and 18.2% rise in starts.

The seasonally adjusted quarterly data shows that starts surged ahead of closings in mid-2018, but fell back over the last three quarters.

In early 2019, Houston’s starts were only a few hundred homes higher than closings.
We Saw 39,600 Permits in 2018, But SF Permits Slowed by 5% July to March

(monthly permits at annual rates, s.a.)

Houston metropolitan area permits, Texas A&M Real Estate Center
New Home Sales Are Still Strong at the Entry-Level and Prices Just Above

Closing By Price, 18Q1 to 19Q1

2019Q1 Inventory (months)

Metrostudy
The Entry-Level Market for Sales Sets the Table for Lot Demand

77% of current lot inventory is for homes priced <400K

Metrostudy
Half the Lot Inventory is 55’ Frontages or Smaller, Under 60’ Is In Short Supply in 19Q1

Current Lot Inventory, By Frontage

- Half the lot Inventory is below 55 ft

Months Supply of Lots, By Frontage

- Equilibrium lot supply
Growth Brings A New Apartment Construction Cycle in Houston
Apartments Share the Economy’s Moderate Growth Path

- Harvey is behind us, and we have settled into an economy that is growing again.
- In February 2018, Apartment Data Services put Class A occupancy at 85.2% with the current rate at 87.5%; CoStar has a higher current occupancy at 90.7 in 19Q1.
- Monthly rent remained basically unchanged over the 12 months at $1,495.
- There are still plenty of buildings with incentives, but more than a month is rare except for high-rise buildings.

### Class A Rents and Occupancy After Harvey

<table>
<thead>
<tr>
<th></th>
<th>Stable</th>
<th>In Lease Up</th>
<th>All Class A</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Units</td>
<td>139,969</td>
<td>8,046</td>
<td>148,015</td>
</tr>
<tr>
<td>Monthly Rent</td>
<td>$1,498</td>
<td>$1,599</td>
<td>$1,495</td>
</tr>
<tr>
<td>Occupancy</td>
<td>90.7%</td>
<td>32.3%</td>
<td>87.5%</td>
</tr>
</tbody>
</table>

Apartment Data Services through February
A new building cycle is underway. The number of units absorbed each year in our medium forecast should be about 12,000, with growth of about 5 jobs to fill each new unit.

Permitting over the past 6 months is jumped to 25,000 units at annual rates, or two years of future job growth.

Apartment Data Services says 30,000 units that will need to be filled in the future: 10,000 units leasing up, 20,000 under construction, and another 30,000 is proposed. CoStar estimates 21,000 units now under construction.
Effective Class A Rents Remain Flat According to CoStar

- Vacancy figures look okay for Class A, just under 90% occupancy or the dividing line between whether the advantage goes to the tenant or landlord
- Class A effective rents surged from 2011 to 2014 as the fracking boom brought big job and population growth
- In 2015-18, 67,700 new units were delivered, and only 52,000 absorbed. Then job growth and Class A rents both turned flat or decline slightly after 2015
- Job growth has resumed, and the rent premium between Class A and Class B has settled into a steady $500/month

CoStar, calculations of IRF
A Construction Pipeline of 18-20,000 Units Keeps Vacancy Rates Stable in 2019-20, If a Bit Higher in Class A

Vacancy Rate (%)

- **Class A**
- **Class B & Below**

Annual Units Added, All Classes (000)

- **Deliveries**
- **Net Absorption**

CoStar, calculations of IRF
Multi-Family Apartments Located Where the Surrounding Two-Mile Area Has 10% Vacancy Rate or Higher

CoStar, calculations of IRF
Office Still Treads Water
Three Short Lessons on Houston’s Office Space And How This Problem Was Made

#1 Absorption Stumbled in 2015
(Million ft²)

<table>
<thead>
<tr>
<th>Year</th>
<th>Deliveries</th>
<th>Absorption</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>2.1</td>
<td>5.1</td>
</tr>
<tr>
<td>2013</td>
<td>4.4</td>
<td>4.5</td>
</tr>
<tr>
<td>2014</td>
<td>8.9</td>
<td>9.0</td>
</tr>
<tr>
<td>2015</td>
<td>12.5</td>
<td>3.4</td>
</tr>
<tr>
<td>2016</td>
<td>5.6</td>
<td>-0.3</td>
</tr>
<tr>
<td>2017</td>
<td>4.1</td>
<td>-1.3</td>
</tr>
<tr>
<td>2018</td>
<td>1.5</td>
<td>0.7</td>
</tr>
</tbody>
</table>

#2 There Are 44.8 Million Vacant ft² On the Market Or a 19.5% Vacancy Rate

<table>
<thead>
<tr>
<th>Class</th>
<th>Direct Vacant</th>
<th>Vacancy Including Sublet</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Million ft²</td>
<td>Percent Vacant</td>
</tr>
<tr>
<td>Total</td>
<td>40.6</td>
<td>17.7</td>
</tr>
<tr>
<td>Class A</td>
<td>22.9</td>
<td>17.8</td>
</tr>
<tr>
<td>Class B</td>
<td>16.5</td>
<td>18.4</td>
</tr>
<tr>
<td>Other</td>
<td>1.2</td>
<td>9.2</td>
</tr>
</tbody>
</table>

#3 Years to Eliminate Half of Existing Vacancy If There Were No Deliveries

<table>
<thead>
<tr>
<th>Net Absorption* (Million ft²/year)</th>
<th>Years to Eliminate Half of Direct Vacancy</th>
<th>Years to Eliminate Half of Total Vacancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.83</td>
<td>7.2</td>
<td>7.9</td>
</tr>
<tr>
<td>2.51</td>
<td>7.1</td>
<td>8.9</td>
</tr>
</tbody>
</table>

CoStar, calculations of IRF

*2.83 is the average net absorption in Houston from 1998 to 2018 and 2.51 is the average if the highest and lowest two years are eliminated.
Improvements Still Come Slowly in 2018

Class A Rents ($/ ft$^2$) Show Boom to Bust
Rents Still Run Below Long-Run Trends

Direct Vacancy Rates Have Peaked But
No Substantive Progress Yet

CoStar, calculations of IRF
Red Dots Indicate An Office Building In An Area With High Vacancy in the Surrounding Two Mile Area

Red dot shows vacancy rate greater than 10%, a widespread problem

Here the red dot indicated a building in an area with 20% vacancy or more

CoStar, calculations of IRF
Where Is Office Now?

- There are 13 buildings under construction in Houston that will deliver about 3 million square feet. Among them...
  - Capital Tower: CBD, 778,000 square feet, 80% preleased, deliver mid-2019
  - Texas Tower: CBD, 1 million square feet, 30% preleased, deliver late 2021
- The higher quality, better amenities and superior floor plans of new buildings is bringing a flight to quality by tenants, especially in the CBD. New deliveries are being justified this way. Major renovations underway in Allen Center and Houston Center, for example, as existing buildings try to compete by upgrading.
- Oil got us into this mess, can oil get us out? Not likely, at least not without another oil boom.
  - We discussed oil jobs earlier. We now have about 256,000 jobs in Houston’s energy base. The oil bust has been over for two years, and that is about the number needed as long as oil is priced at $60-$65 oil.
  - Oil at $80 could run the total up to 264,000 and $100 to 274,000. But this is not a cure for our office space problem – oil priced at $100 likely would be one-more short-lived sugar high.
  - The recent push into shale by Exxon and Chevron, and the acquisition of Anadarko by Chevron suggests a period of oil industry consolidation is here. This is never good for employment.
Weak Retail Sales for Brick and Mortar Meet
An Expansion Driven By Population Growth
Harvey Had a Big But Short-Lived Impact On Taxable Sales in Houston

<table>
<thead>
<tr>
<th>Event</th>
<th>% Impact</th>
<th>$ Billion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y2K</td>
<td>12.1</td>
<td>$1.55</td>
</tr>
<tr>
<td>2004 Super Bowl</td>
<td>6.3</td>
<td>$0.36</td>
</tr>
<tr>
<td>Hurricane Ike</td>
<td>9.2</td>
<td>$1.51</td>
</tr>
<tr>
<td>2017 Super Bowl</td>
<td>4.7</td>
<td>$0.77</td>
</tr>
<tr>
<td>Harvey</td>
<td>13.2</td>
<td>$2.27</td>
</tr>
<tr>
<td>17Q4</td>
<td>4.6</td>
<td>$0.81</td>
</tr>
<tr>
<td>18Q1</td>
<td>4.1</td>
<td>$0.69</td>
</tr>
<tr>
<td>18Q2</td>
<td>4.4</td>
<td>$0.77</td>
</tr>
</tbody>
</table>

Notes: All events in 2018 dollars; Estimates are from a statistical model that accounts for the state of the local economy; figures are sales tax revenue divided by one-cent tax rate.
The Pressure on Brick and Mortar Remains Intense With Little Growth in Local Retail Sales

- Harvey aside, taxable sales in the City of Houston have not recovered from the 2014 oil downturn
- The growth rate of out-of-state sales more than doubles the in-state growth. Remote sales are now 10.8% of state retail
- Nationwide we saw 5,000 retail outlets close in 2019Q1 including stores of the Gap, Victoria’s Secret, Abercrombie & Fitch, Payless Shoe Store, Family Dollar, Chico’s, Gymboree, and Charlotte Russe
- Proposed state legislation in reaction to the Wayfair decision will not do much to rebalance the scales in favor of brick and mortar

Texas Comptroller
Growth of Retail Square Footage Moves In Line With Population and Suburban Growth

% Growth: Retail Space vs Population

CoStar, calculations of IRF
Retail Rents Continue to Rise As Vacancy Falls

CoStar, calculations of IRF
Industrial Finds More Ways to Grow
The Rebound in Houston’s Economy Has Diversified Local Industrial Activity

• In 2015-16, new industrial space in Houston was driven by two factors: e-commerce and petrochemical expansion. The chemical industry drove warehousing and bagging of plastic pellets, which has now eased back with the chemical buildout is completed

• E-commerce boomed and continues to boom as consumers seek the best of all worlds: wide selection, good prices and free delivery in two days or less. The freeway intersections on the north and northwest side of Houston are important gateways

• Oil has bounced back, and with it the traditional oil-related warehousing and manufacturing activity. This is also mostly found in the north and northwest

• The Port of Houston adds to logistic activity with booming inbound container activity, importing over one million containers in 2017 and 20.3% more than 2016. The key driver is not the Panama Canal, but large retailers like Walmart looking for a hedge against continuing labor strife at LA-Long Beach
East/West Split Becomes Less Meaningful As Houston Growth Resumes

CoStar, calculations of IRF
Both East and West Are Adding Space at the Same Rate in 2018 and 2019

Annual Industrial Deliveries, Million ft\(^2\)

CoStar, calculations of IRF
Existing Home Price Inflation in Houston Comes and Goes with the Price of Oil

After adjusting for the cost of living, the average annual price increase of in a Houston home since 1990 is 2.4 percent.

A thirty-year bond issued in 1990 would have paid 5.99% after inflation

TAMU Real Estate center, BLS for Houston CPI
Thank you for attending.

Our next symposium will be held on
Tuesday, November 19, 2019.
Registration will open in mid-September 2019