BAUER
COLLEGE OF BUSINESS
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INSTITUTE FOR
REGIONAL FORECASTING

Houston After COVID-19: Local Growth Lags the State and Nation

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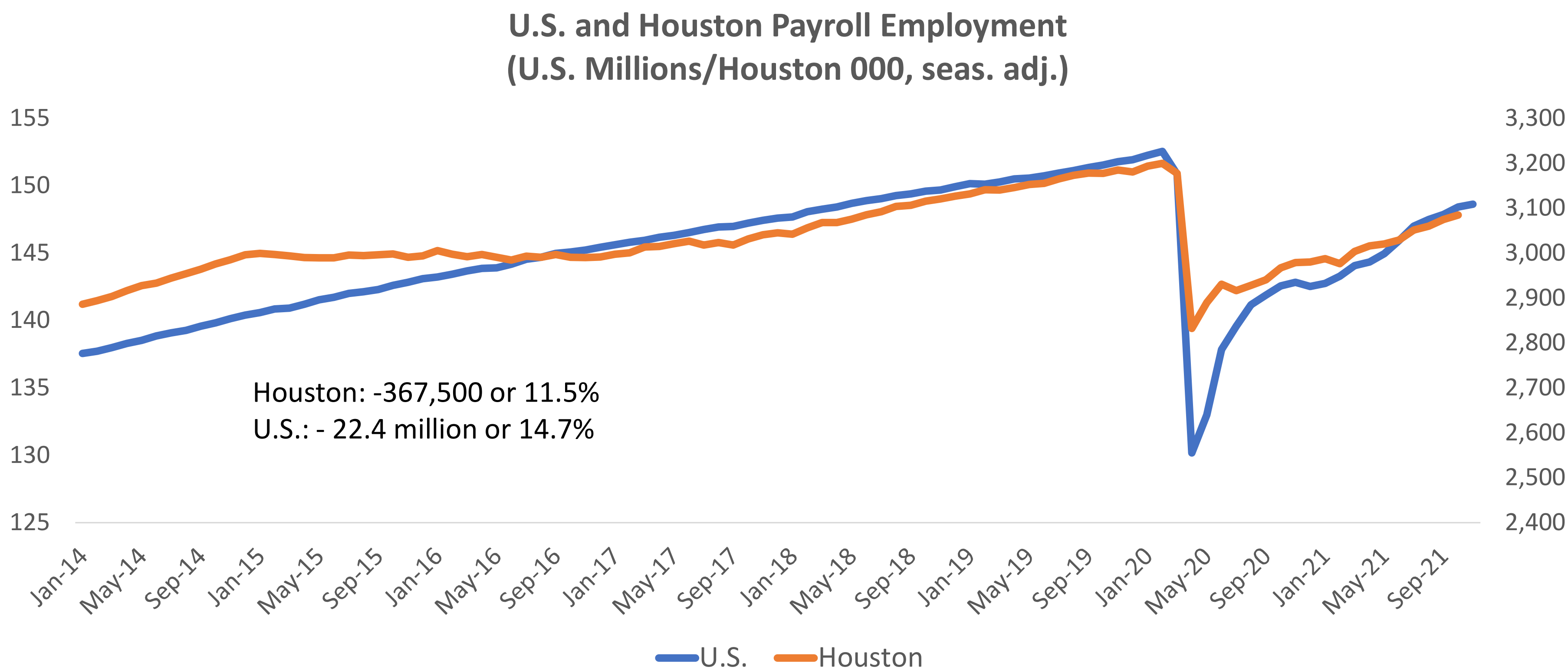
COVID and the Houston Economy

COVID-19 Shock Played Out With Deep Job Losses: But Stronger Recovery Began This Past February



Seasonal adjustment of Houston employment from Dallas Fed and U.S. by BLS

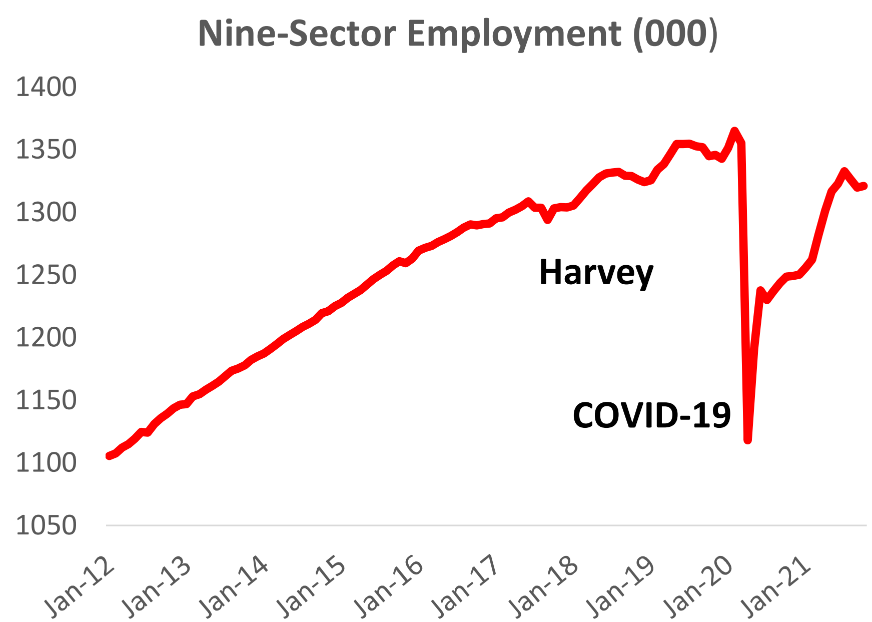
Post-COVID Payroll Recovery Favors Texas Metros, But Oil Leaves Houston as a Major Laggard

	COVID Losses (000)	COVID Recoveries (000)	Percent Losses Recovered
Austin	-139.0	184.4	133.0%
Dallas	-298.0	334.6	112.3%
Fort Worth	127.9	125.6	98.2%
Houston	-367.5	252.1	65.6%
San Antonio	-136.8	117.3	85.8%
Midland/Odessa	-26.6	2.4	9.0%
Texas	-1,437.7	1,317.7	91.7%
U.S.	-22,362.0	18,158.0	81.2%

Dallas Fed adjusted payrolls for Texas and its metros to October

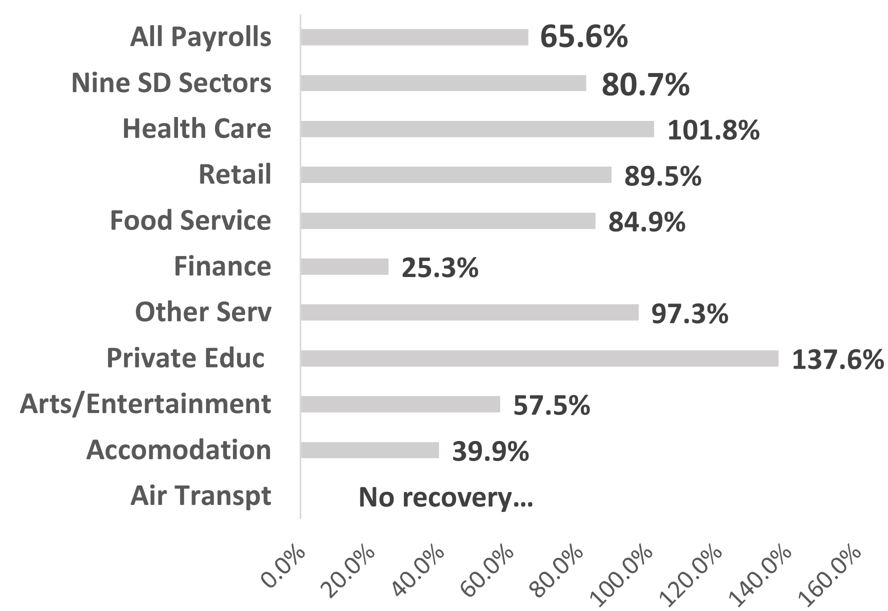
Nine Local Service Sectors Account for 41.9% of Houston's Jobs in 2019, But Contributed 67% of March/April Job Losses

Nine Service Sectors Lost 247,800 Jobs Or 67.2% of Houston's April 2020 Losses



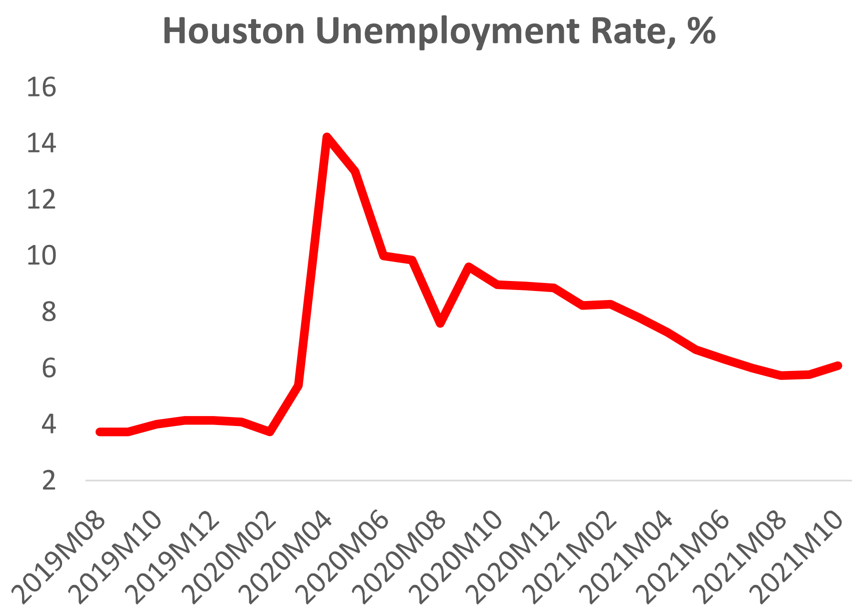
Social-Distanced Services:

Percent Recovery By Sector: April '20 to Oct '21

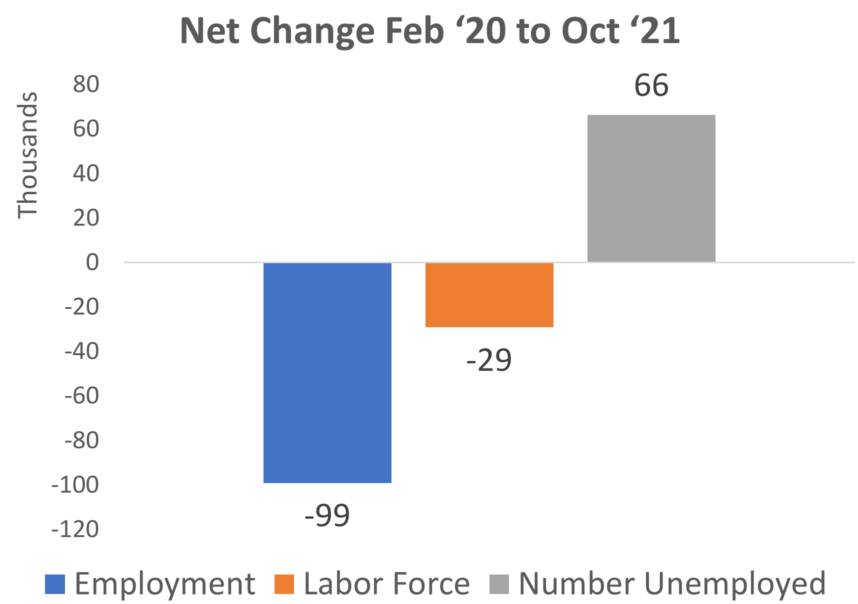


Houston's Unemployment Is a Mirror of the News on Pandemic Payrolls

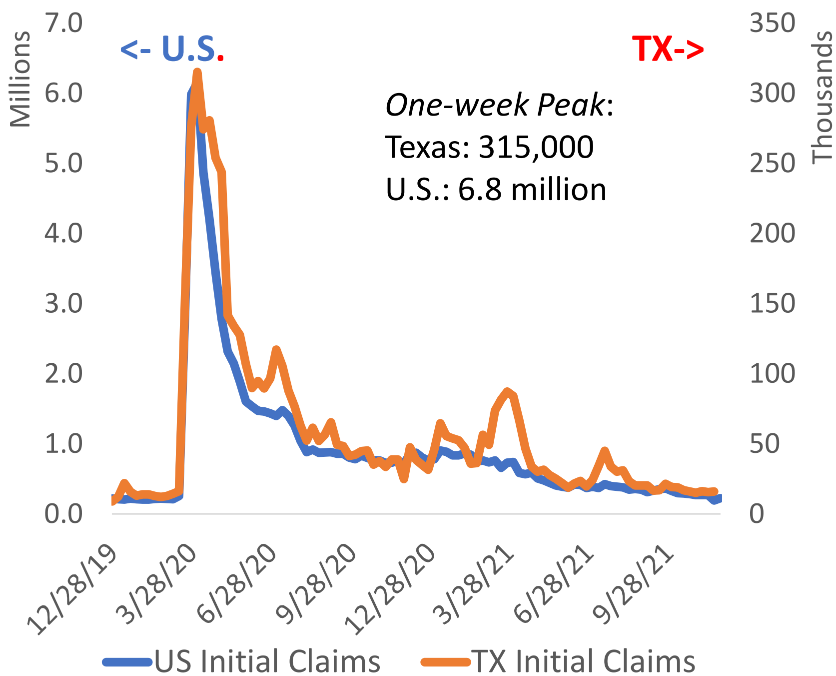
Houston's Unemployment Rate Peaks at 14.2% in Apr '20, Now at 6.1%

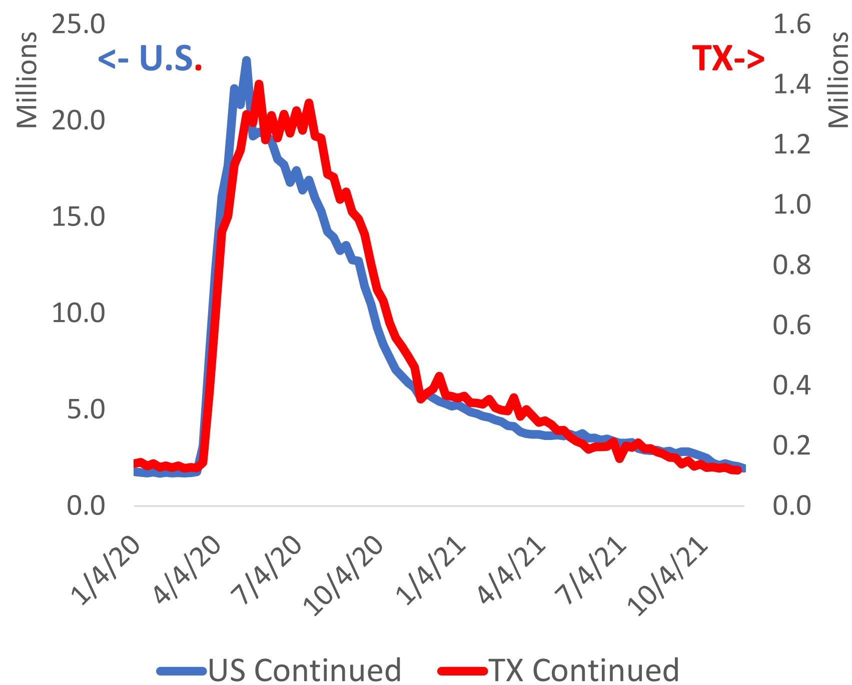


Still 66,100 Local Workers Unemployed in Oct, Labor Force Down 29,127



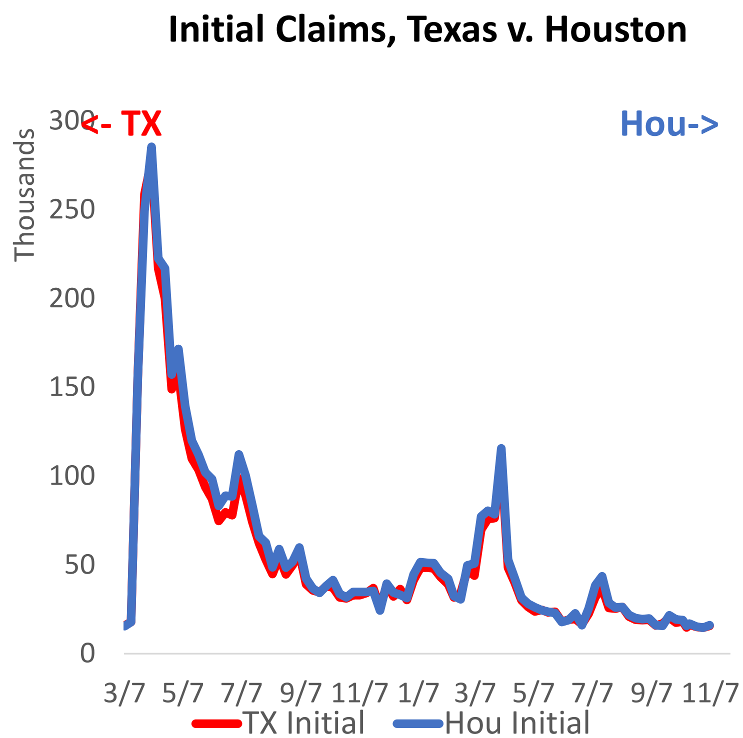
Initial and Continued Claims for Unemployment: A Similar Pandemic Response in Texas and U.S.

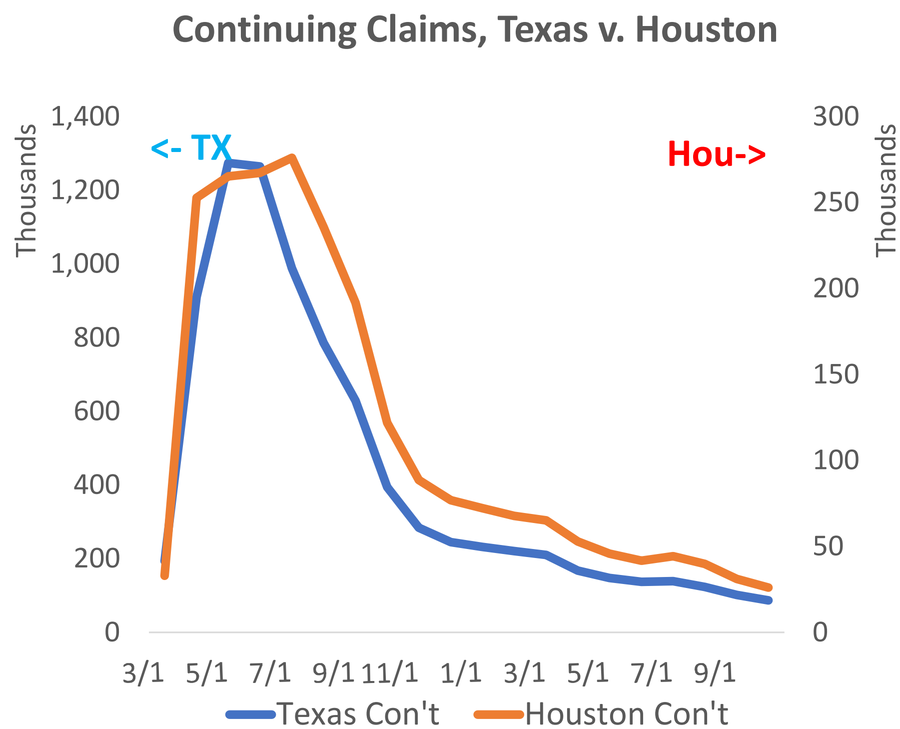




FRED, St Louis Federal Reserve Bank. State unemployment programs only under the Unemployment Compensation Program

Initial Claims Behave the Same in Texas and Houston: Local Continued Claims Lag the State By a Month

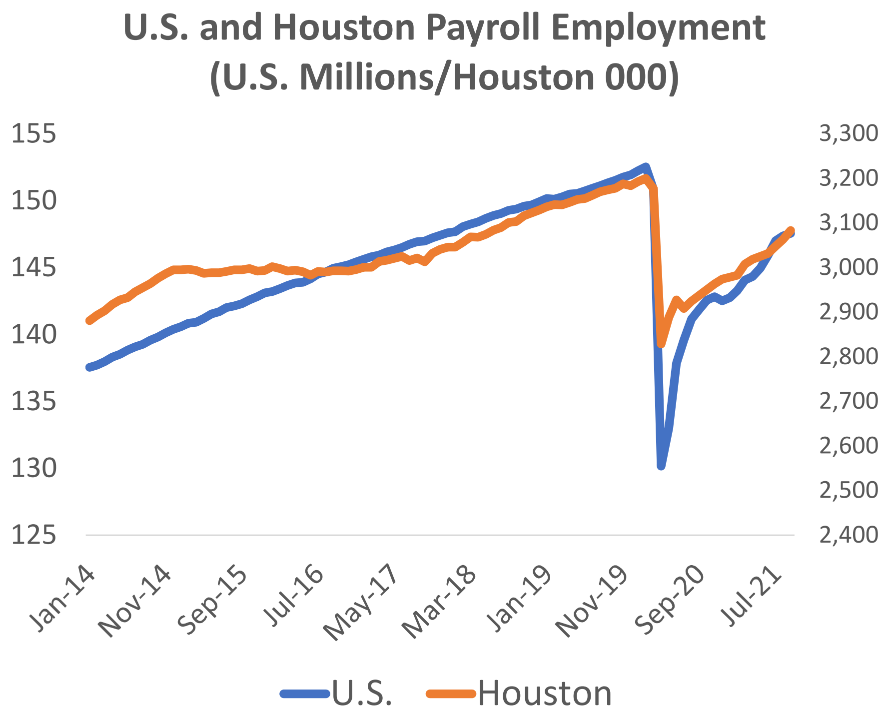


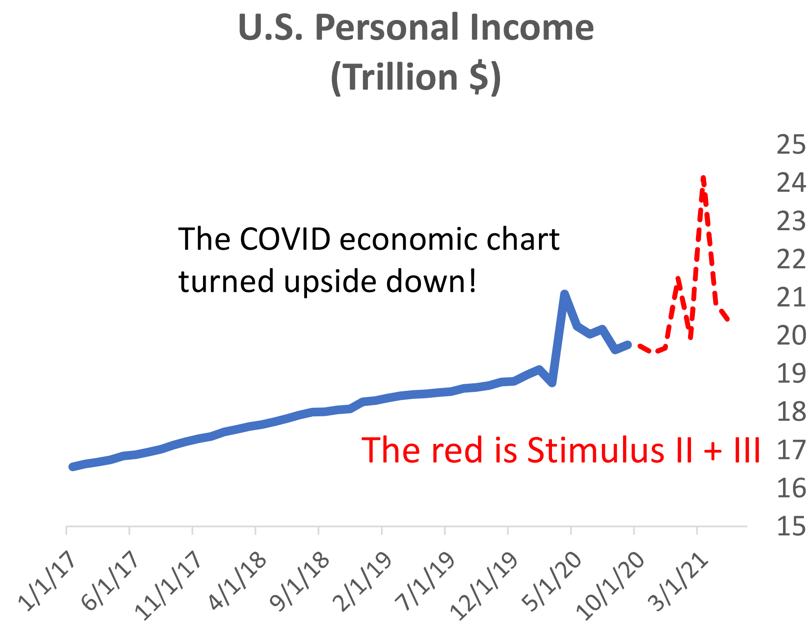


TWC Initial claims for Houston are the 9-county metropolitan area; continued claims for Houston are for the 13-county Gulf Coast Workforce Development Board, including the metro area plus four small counties with less than 2% of 13-county claims

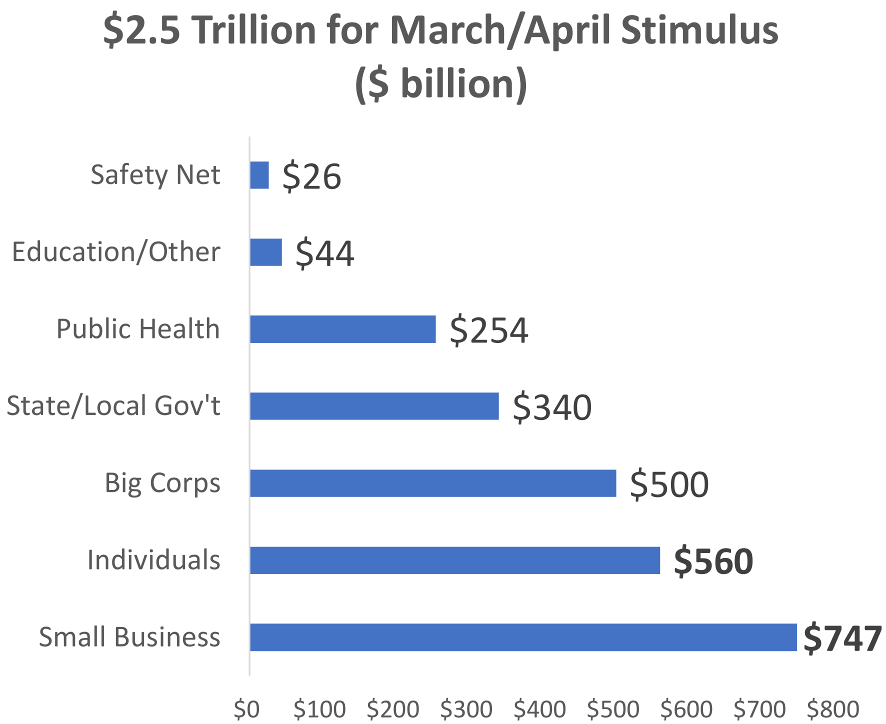
Now for the Good News:
A Large Positive Shock From Stimulus

Stimulus I Brought a Large *Positive* COVID-19 Shock to the U.S. Economy In March/April 2020: Then Stimulus II & III





Stimulus I: Trillions of Dollars Poured Into COVID-19 Programs to Support the Economy in March/April 2020



Federal Reserve/Treasury Stimulus

- Return of 2008-style zero rates, QE2, forward guidance
- The Federal Reserve's 2008 emergency credit market facilities returned, but are all now closed
- Other emergency Treasury Programs like the Payroll Protection Program are closed
- Two additional COVID stimulus packages arrived in December 2020 and January 2021

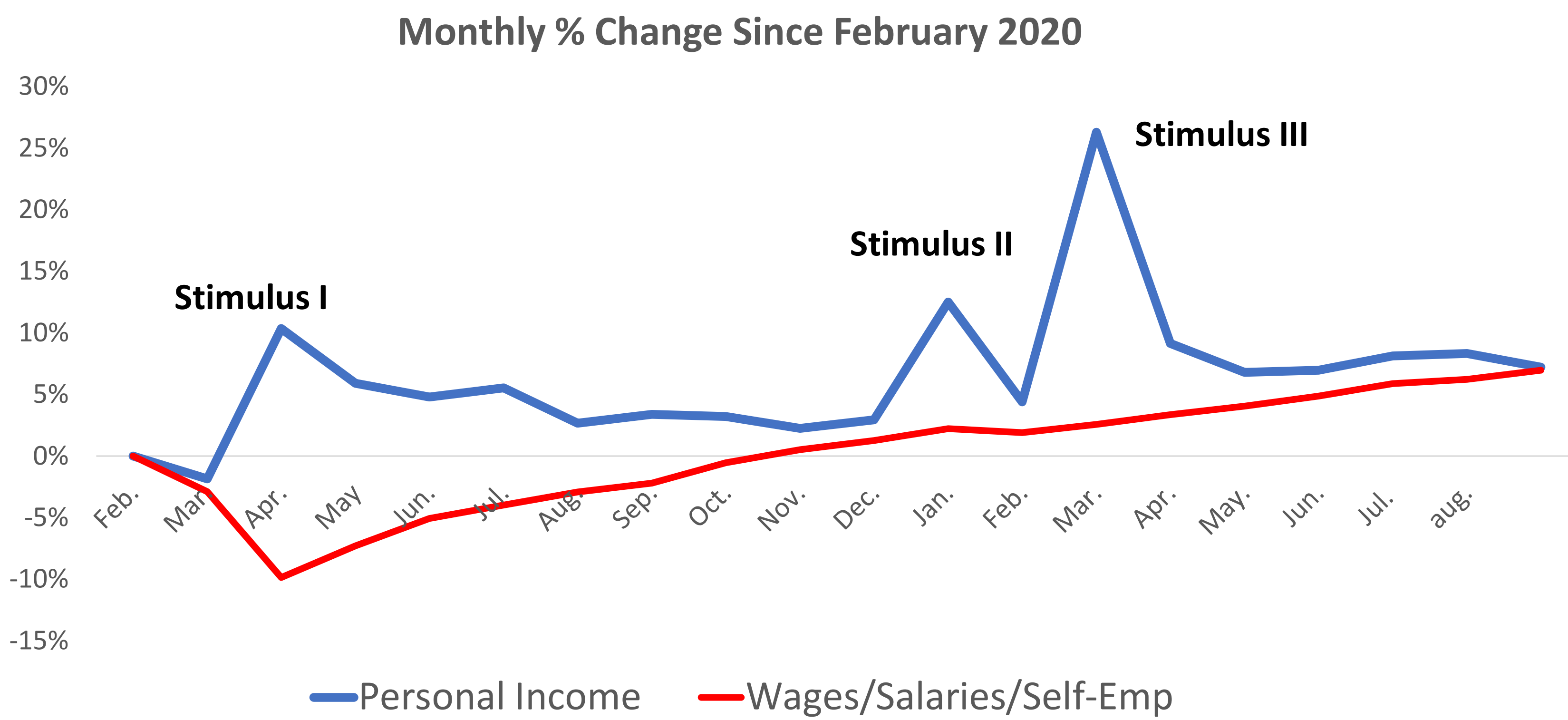
March/April total Includes $470 in additional stimulus from April supplemental appropriation for the Paycheck Protection Program and public health

Stimulus II & III: December and January Packages Total Another $2.7 Trillion in Fiscal Stimulus

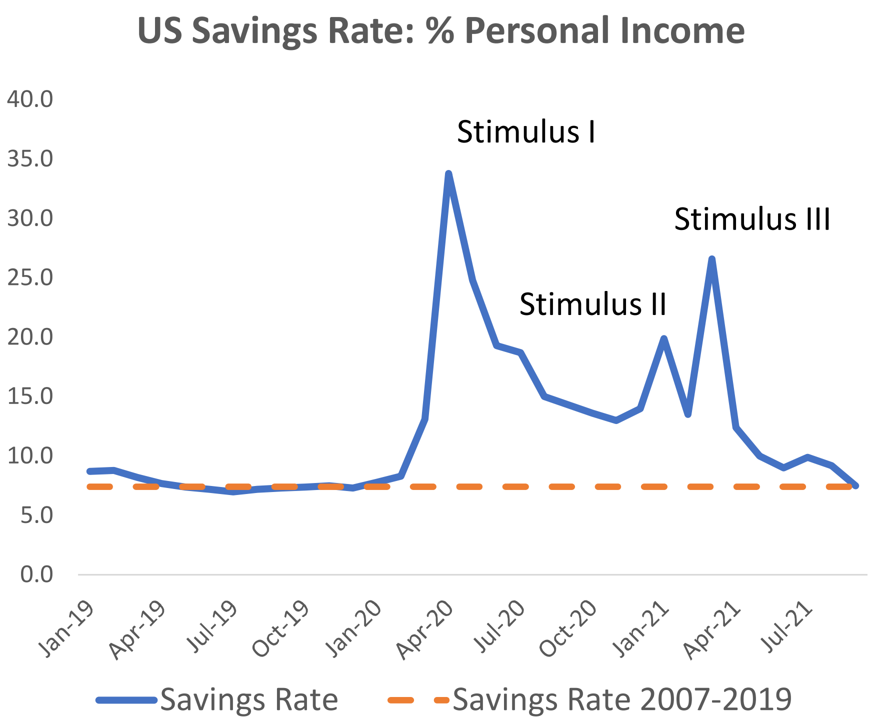
- These federal payments follows on the $2.4 trillion in total spending from March and April. Like these earlier payments, about half go directly to individuals
- *Payments to Individuals and Small Business*
    - Economic Impact Payments is made directly to individuals: $700 Billion
    - Expanded Unemployment Insurance: $240 Billion
    - Small Business/Payroll Protection: $385 Billion
- *Other*
    - State and Local Government Aid: $400 Billion
    - Education/Public Health: $420 Billion
    - Children/Housing/Health Insurance: $250 Billion
    - Other: $300 Billion

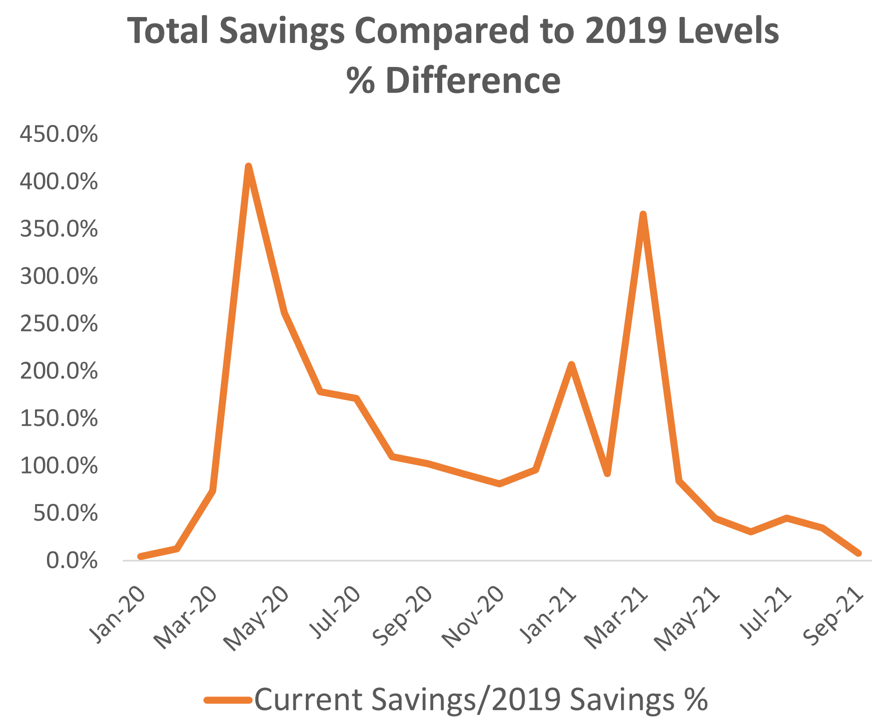
Press and other reports. Categories are rough approximations to reconcile the contents of two different bills.

Changes in Income-Related Activity: Compares Each Month to February 2020



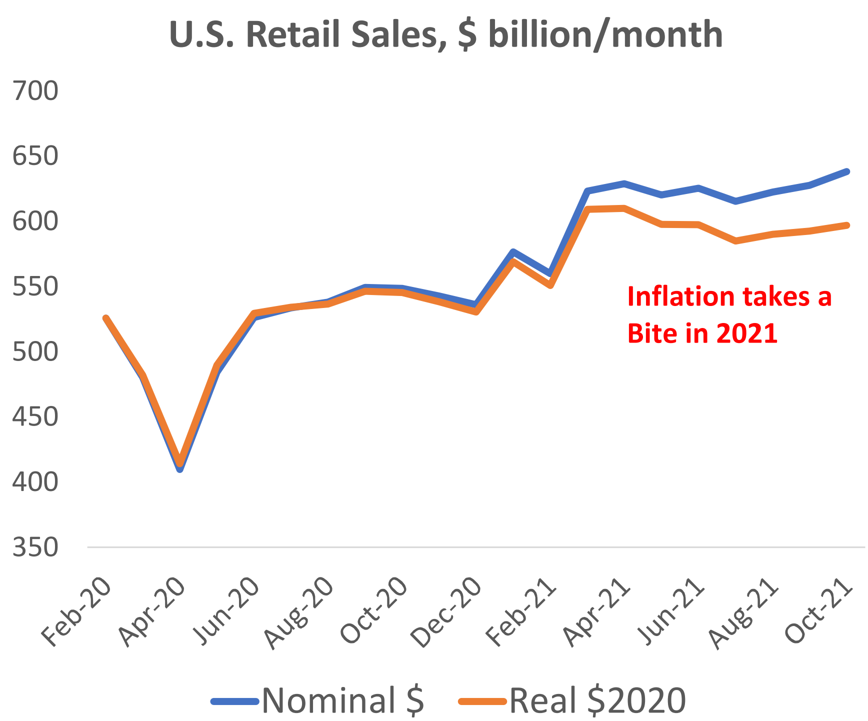
U.S. Savings Rate and Total Savings Are Normal Again: Stimulus Was Exhausted By Late Fall

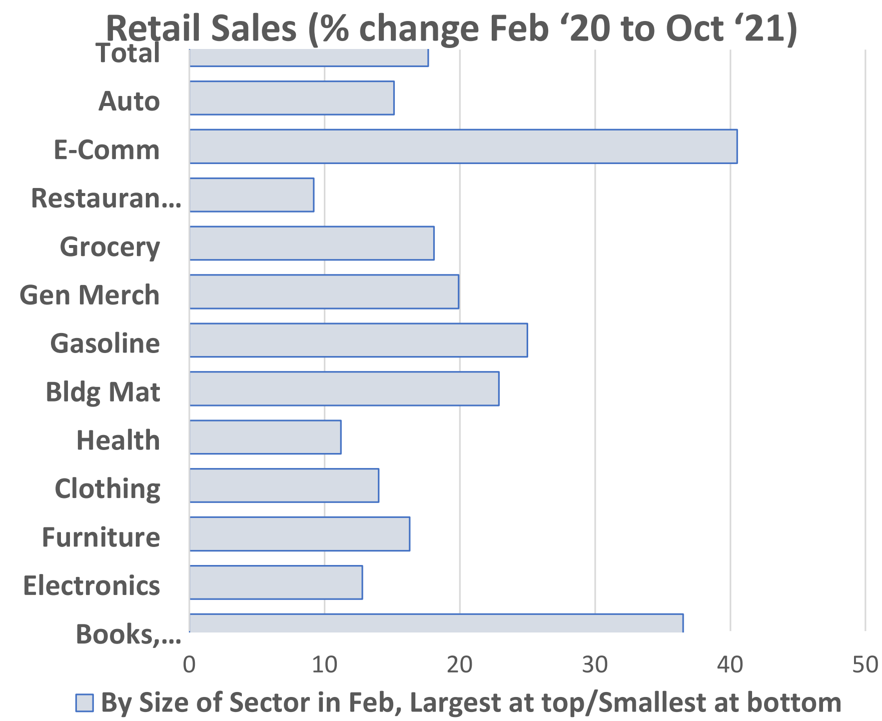




Bureau of Economic Analysis, Personal Income Accounts

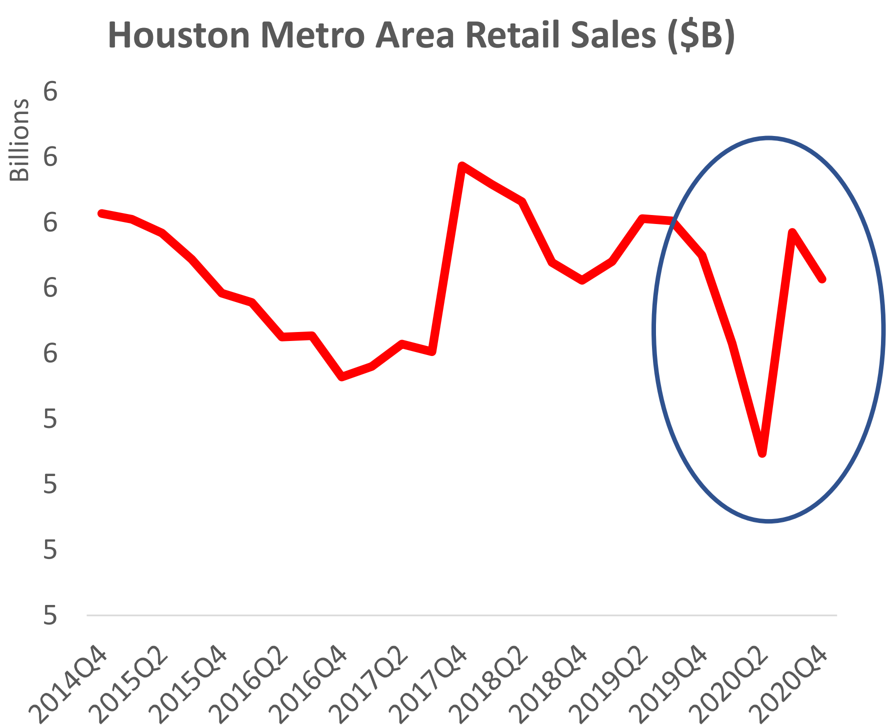
Fiscal Support and Cheap Money Drive Record Retail Sales: A Distinctive COVID Pattern Has Disappeared





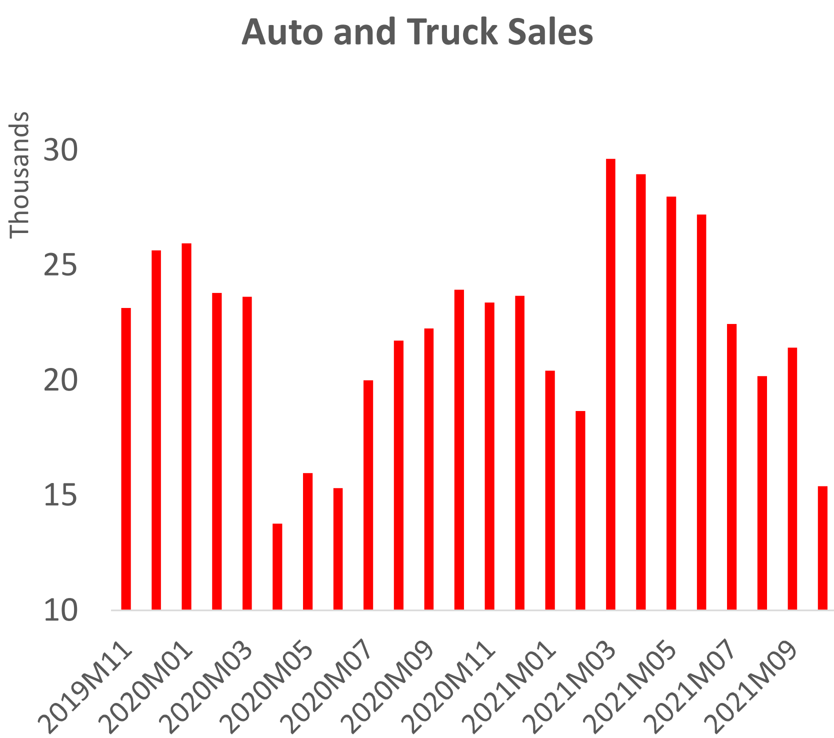
U.S. Census Bureau, Oct 15,2021

After Falling 10.3% in Q1 and Q2 2020, Houston Retail Sales Bounce Back By 12.7% in 2020Q3

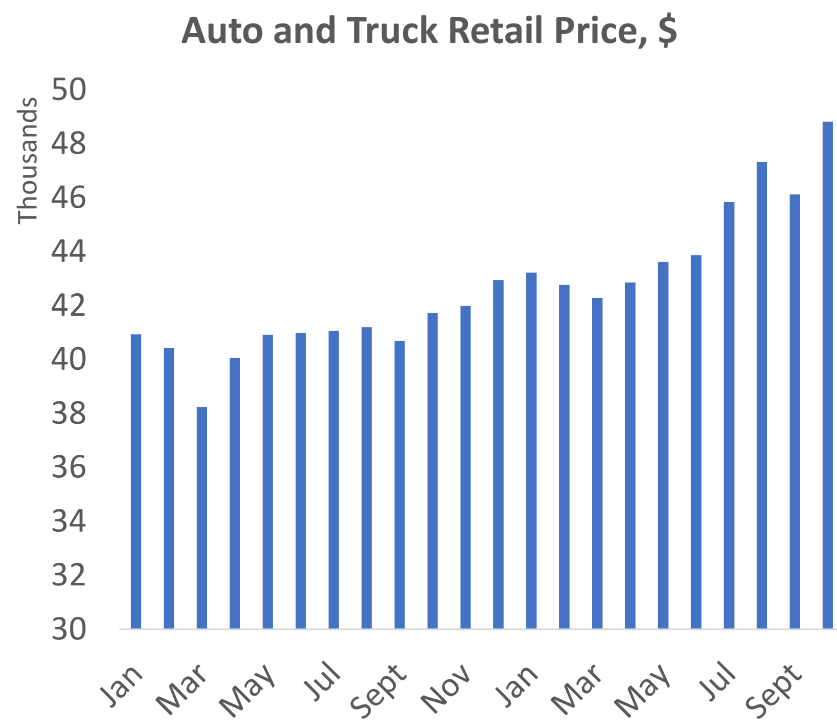


- Local retail sales jump 12.7% as stimulus arrives after a big pandemic drop
- Consumer ingenuity worked around social distancing issues especially using e-commerce for goods purchases
- Laggards in spending including bars and restaurants, entertainment, travel and other non-goods activities. Much smaller bounce here.
- The fourth quarter saw spending flattens out – waiting for Stimulus II, III

Houston Metro Area Auto Sales and Pricing Show the COVID Dip and Multiple Stimulus Impacts

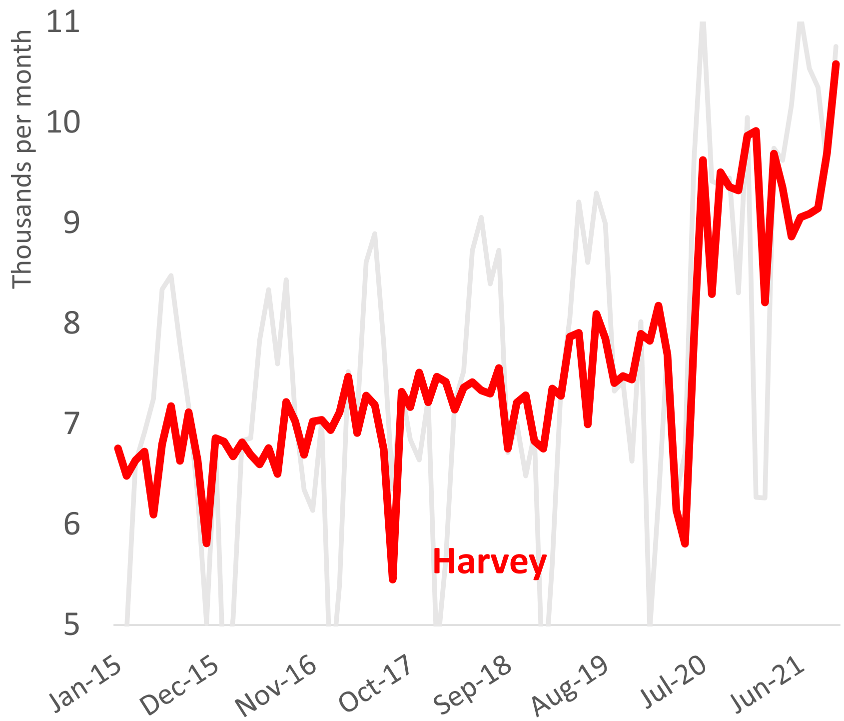


InfoNation



Houston Existing Home Sales Soar in Stimulus-Driven Pandemic

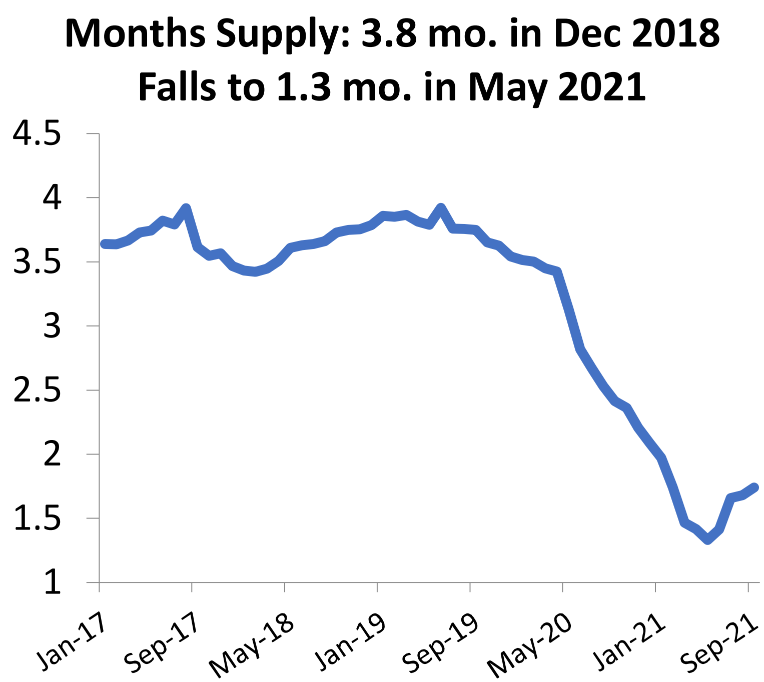
(Houston MLS sales, s.a.)

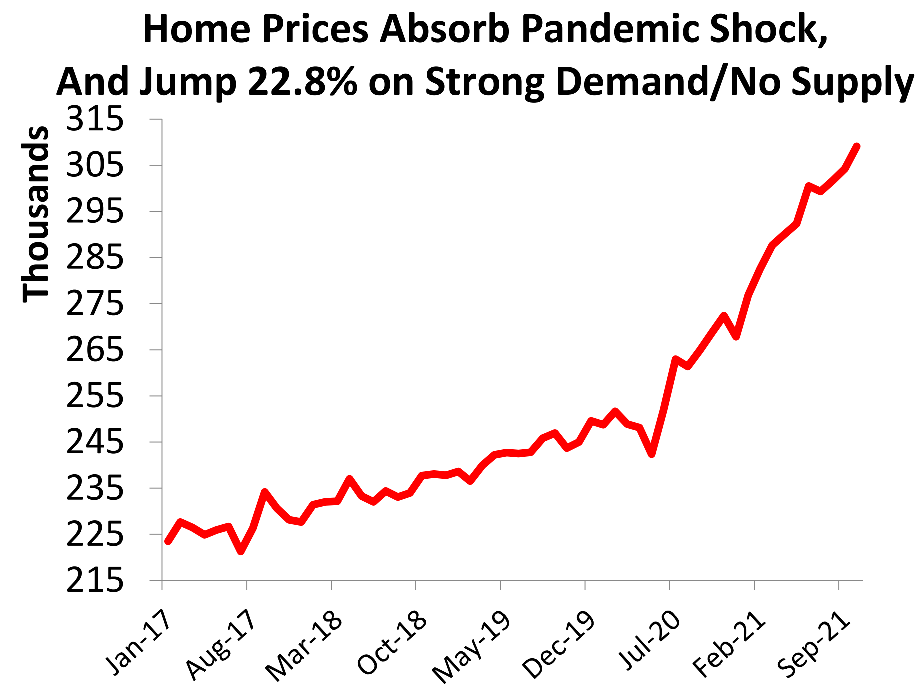


Source: Texas A&M Real Estate Center, seasonally adjusted by IRF

- Houston existing home sales had picked up a little in 2019 as the Fed paused in its push to raise interest rates
- The initial response to the pandemic was a sharp pull-back in sales due to the stay-home orders and nonessential business closings
- Then a sharp drop in interest rates and a check from the federal government ignited a sharp increase in sales
- Sales through Oct were still strong and up % from pre-pandemic levels despite a lack of inventory. The Cold snap hit in February

Houston Existing Home Sales: Pandemic Shrinks Inventory and Raises Prices

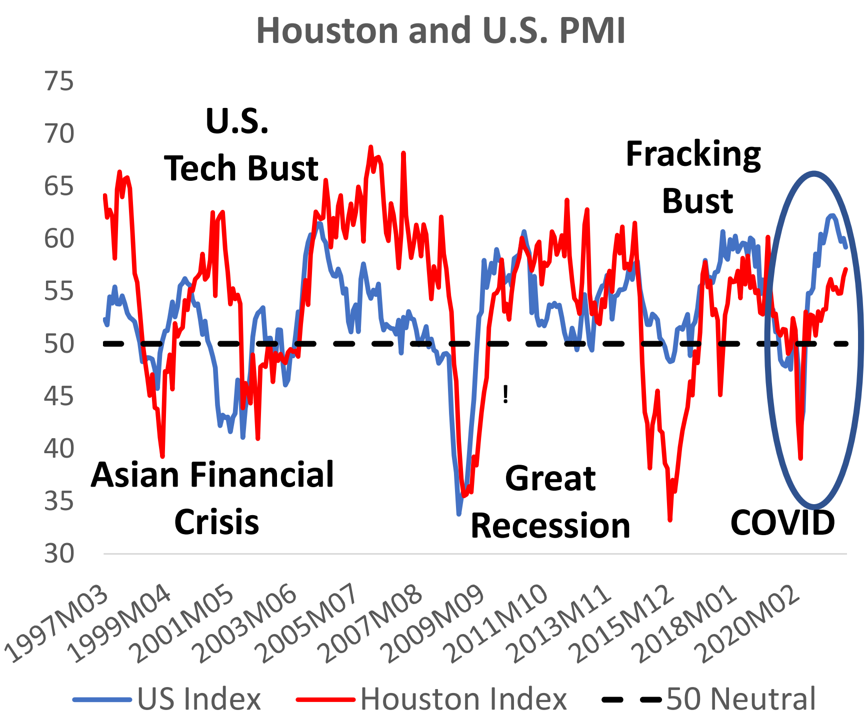


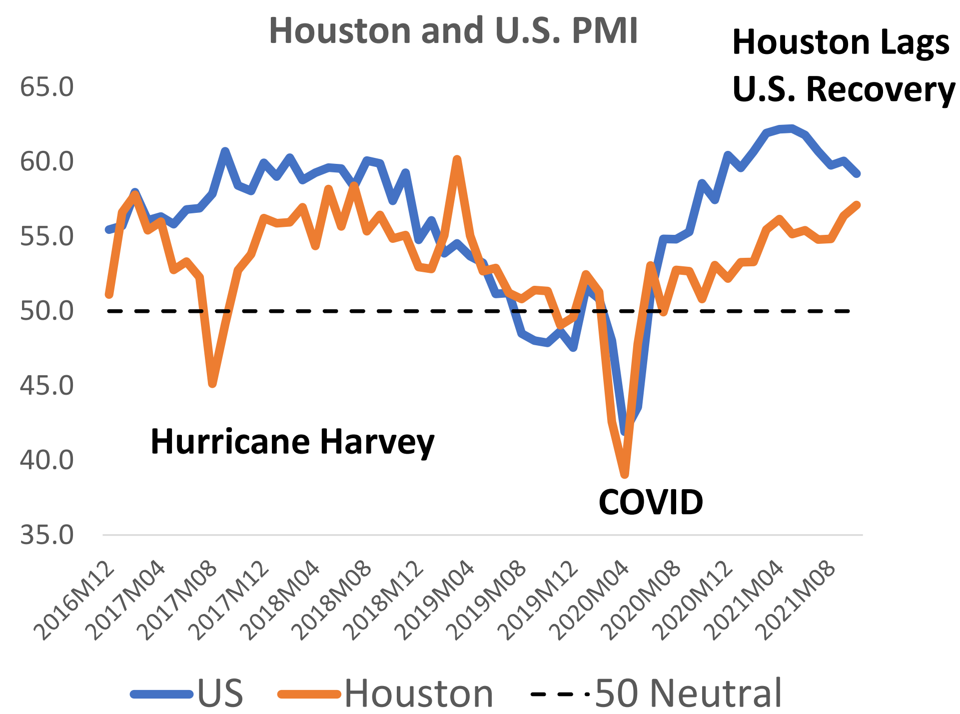


Source: Texas A&M Real Estate Center, seasonal adjustment by IRF

How Bad Was This Downturn?
It Was Very Bad ... Maybe Just Not as Bad As Advertised

Purchasing Managers' Index Sees U.S. and Houston Briefly Contract and Quickly Move to Expansion

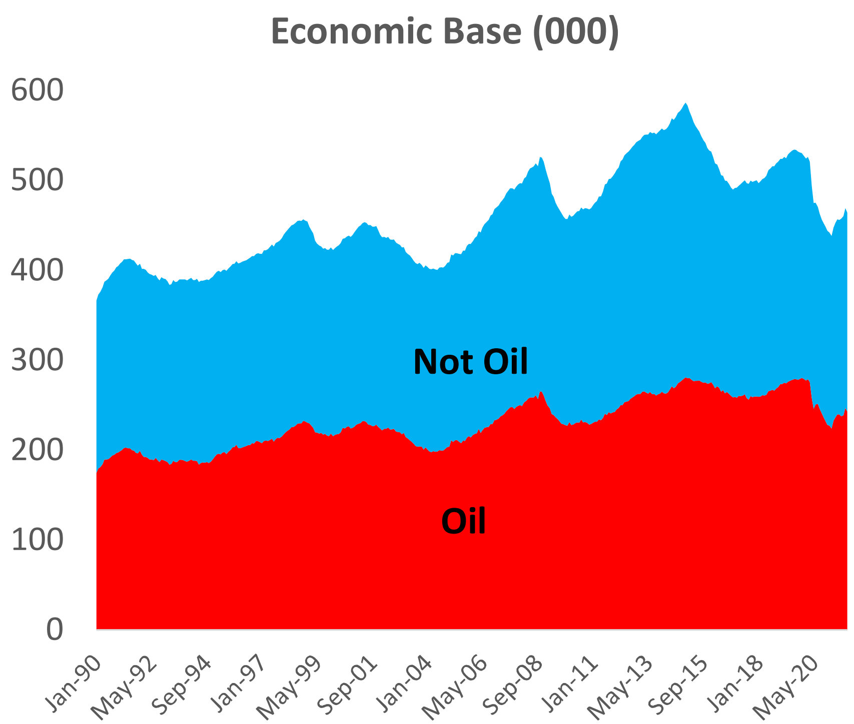


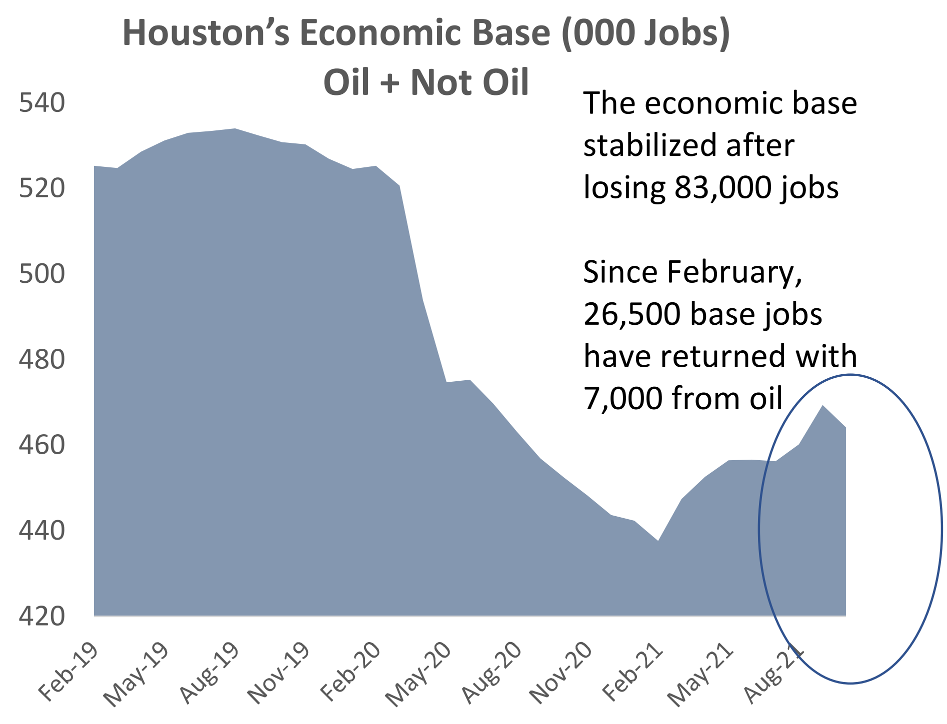


The Local Economic Base
Another Way to Think About Growth

- The economic base is a simple way to think about the key drivers of economic growth, the industries that drive growth, and the secondary industries that follow in its wake
- Growth is driven by the economic base: that set of industries that can sell their goods and services outside the region – to the rest of the state, nation, or world
  - Oil is the obvious example for Houston
  - But AIG, Men's Wearhouse, Sysco, and Waste Management are non-oil companies that also sell outside the region
- Secondary on non-basic industries simply follow the lead of driver industries and expand along with the broader economy. Local growth waits for help from oil and other basic industries
- Many of the best examples of non-basic industries are in COVID-sensitive industries: retail, food service, barbers and beauticians, entertainment, etc.

Houston's Economic Base Continued to Fall Through February, But Has Made On- and Off Gains Since





Current Losses in Houston's Base Point to a Serious Economic Setback, But We Have Seen It Before

Houston's Economic Base in Five Recessions

	Downturn in Economic Base		Oil's Part of Base Losses
Years	**Jobs Lost (000)**	**% Fall**	**%**
1991-93	30.1	7.3	36.4
1998-99	34.0	7.4	51.8
2001-04	52.2	11.5	34.1
2008-09	68.8	13.1	44.9
2015-16	97.0	16.6	76.3
Average	56.4	11.2	48.7
2020-21	***83.0***	***15.8***	***38.8***

**The oil base losses stabilized in the fall of 2020, and non-oil base activity bottomed out in February. The non-oil base is tied to U.S. growth includes non-oil manufacturing and parts of wholesale trade, air transportation, construction, and professional and business services.*

- *1990-93:* A U.S. recession, Iraq invades Kuwait, First Gulf War and oil price collapse
- *1998-99: The* Asian Financial Crisis saw the global economy collapses along with oil prices, while the U.S. stayed strong
- *2001-04:* U.S. recession, 9/11 Attack, and the Second Gulf War
- *2008-09:* The Great Recession brought both economic and oil collapse
- *2015-2016:* The Fracking Bust was mix of a massive speculative collapse in oil and the U.S. economy staying very strong

What I Assume About Houston's Near-Term Economic Future?

- We have restored about 67% of the total jobs lost directly to the lockdown, or nearly 240,000 jobs. Post-vaccine job recoveries in low-wage, contact-sensitive industries have slowed in recent months
  - We remain well short of herd immunity and public fear of offices, elevators, stores, and public transportation is still in place well into next year
  - Employment rose nicely in recent months and unemployment fell. Return to school allowed many low-wage workers (especially women) to return to work. Supplemental COVID unemployment benefits also expired across Texas in July
- With the large losses in contact-sensitive service industries mostly behind us, *we still will have a hang-over of a moderate to serious recession and will see several quarters of recovery. Only 30% of base losses are back through October*
  - This recession was caused by losses in Houston's base industries – by our inability to sell goods and services outside the region as every U.S. city coped with local COVID losses
  - We are finally seeing a broad national and global recovery to help Houston grow again
- *Oh, and don't forget our oil problem … where the current recovery is slow and partial, with the future bringing a smaller U.S. industry*

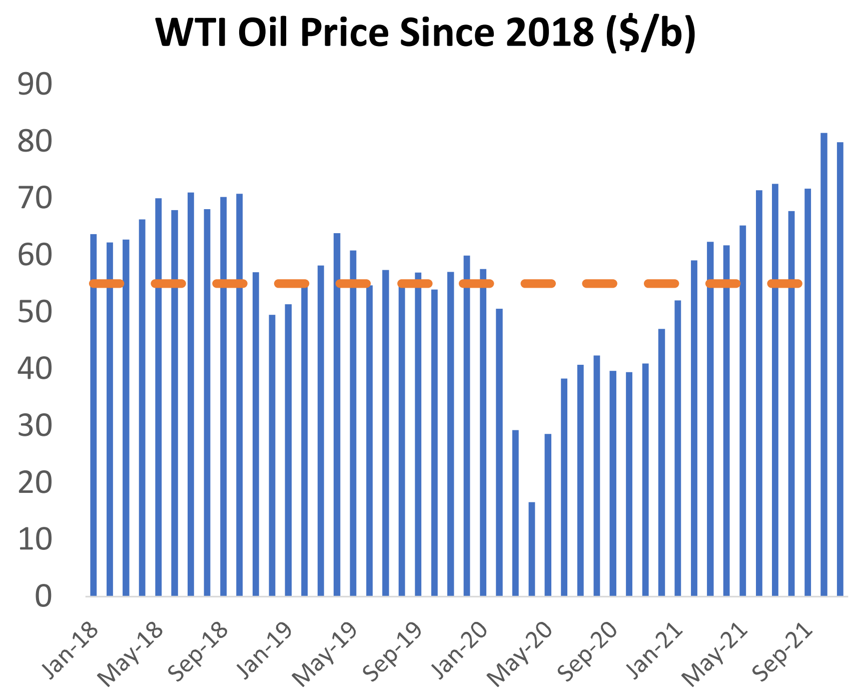
Oil Is Making a Slow and Tentative Recovery …
But More Than COVID Is At Work

Oil and Houston: Difficult Times Since 2014

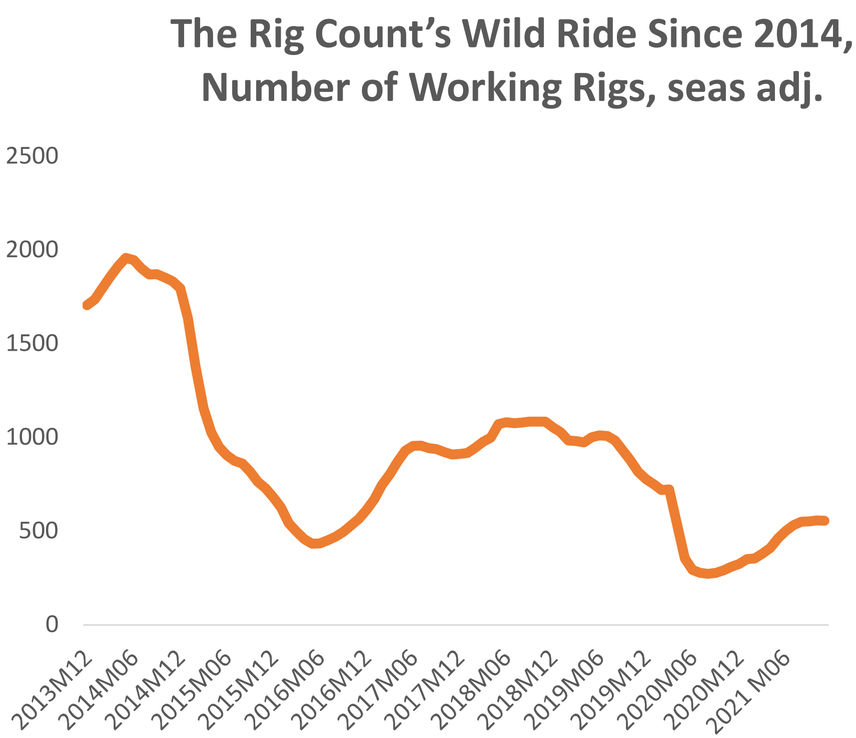
- From 2011-14, Houston enjoyed *an oil boom that rivaled the 1980's*, averaging 100,000 or more new payroll jobs each year
- But the *fracking bubble burst in November* 2014 when OPEC withdrew as swing producer and let the price of oil collapse. While the local oil sector alone lost 77,300 jobs
- A moderate recovery in oil prices in 2017-18 brought a partial return of local oil employment, but by 2018 *an industry-wide credit crunch had set in*. Oil jobs were in decline again in Houston by mid-2019
- Then comes the *COVID-19 pandemic and the Saudi-Russian oil war*, resulting in complete collapse in oil markets in May 2020 to all-time lows
- We now see a *nascent recovery underway but with the oil industry still operating at low levels*

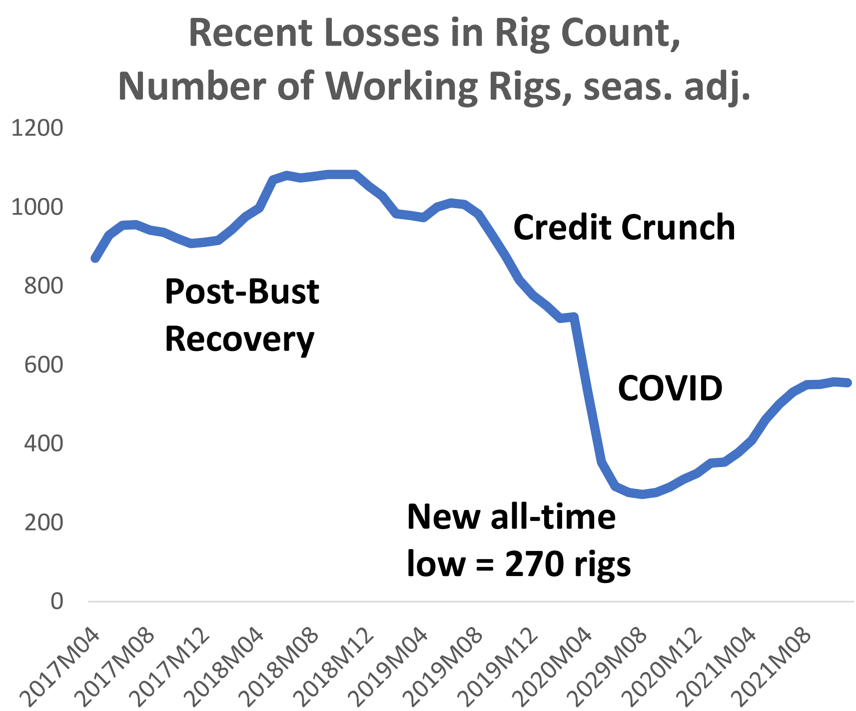
Higher Oil Prices Are Back
But They Mean Less for U.S. Oil Producers

- Higher oil prices are back … but they don't mean what they once did for U.S. oil
- Higher prices are mostly the work of substantial production cuts by OPEC+
- How stable is the OPEC+ outlook? COVID continues globally, Saudi vs Russia, Iran's pending return, …
- U.S. producers have not responded to higher prices:
    - Most companies hedged at $50-$55/b production in early 2021;
    - They face serious financial problems and balance sheet repair that remain as long-term issues



This Brief History of the Baker Hughes Rig Count Shows How Far We Have Fallen

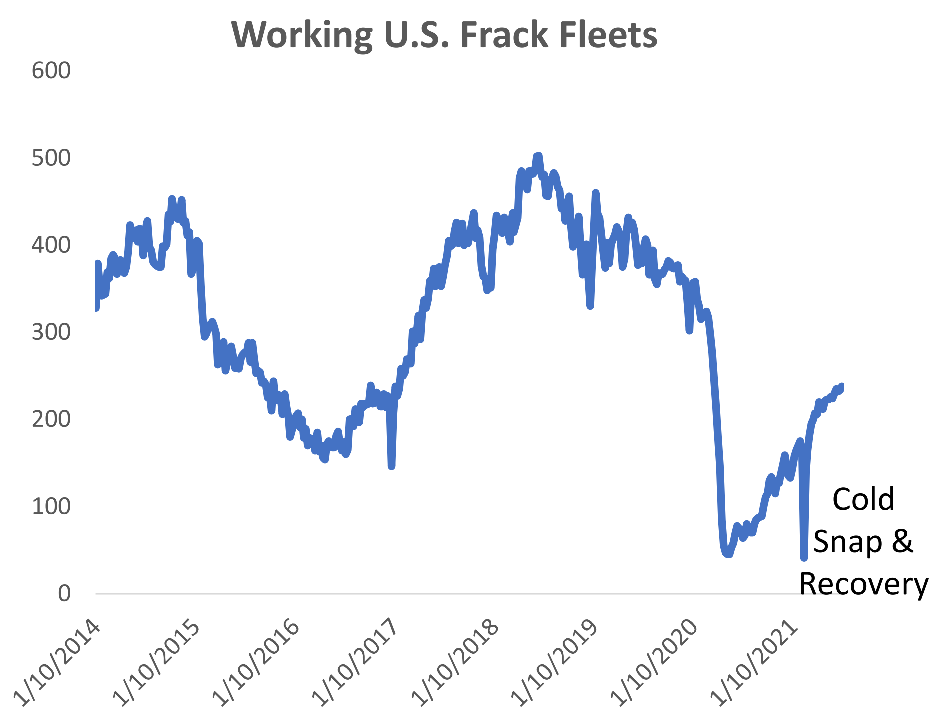




Baker Hughes Rig Count

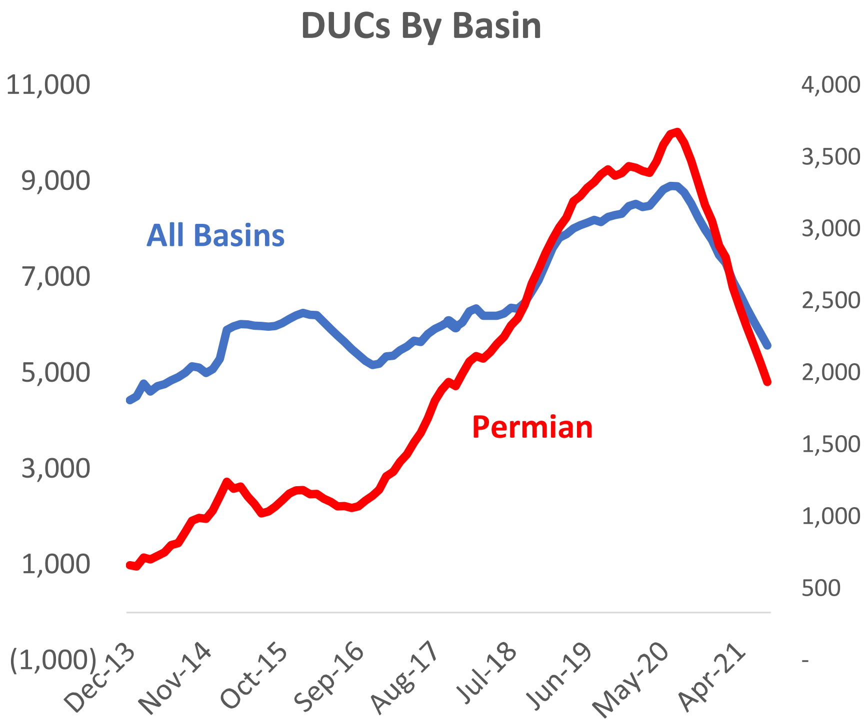
Fracturing and Completion Is the Quickest Way to Replace Reserves and Earn Cash

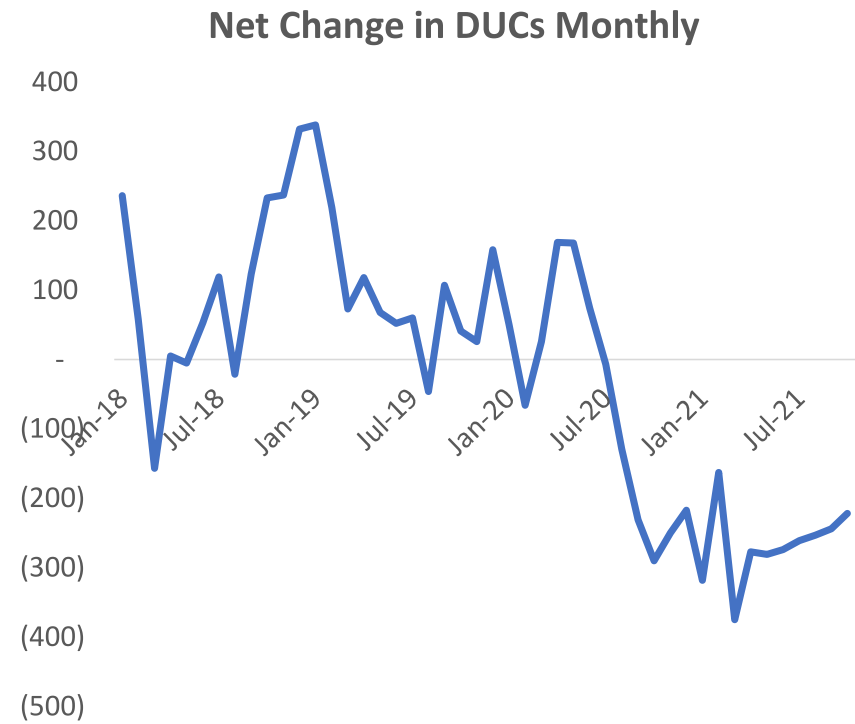
- To the right, you see the number of fracking fleets at work to fracture and complete wells that have already been drilled
- Sunk cost of drilling made this the quickest and least costly avenue for producers to replace reserves and earn cash
- The first meaningful signs of oil-field recovery were in early June as the number of fracking fleets rose from 45 to 223 by May 220
- Despite on-going improvement, the number of crews at work remains half the June 2018 peak at 503 fleets



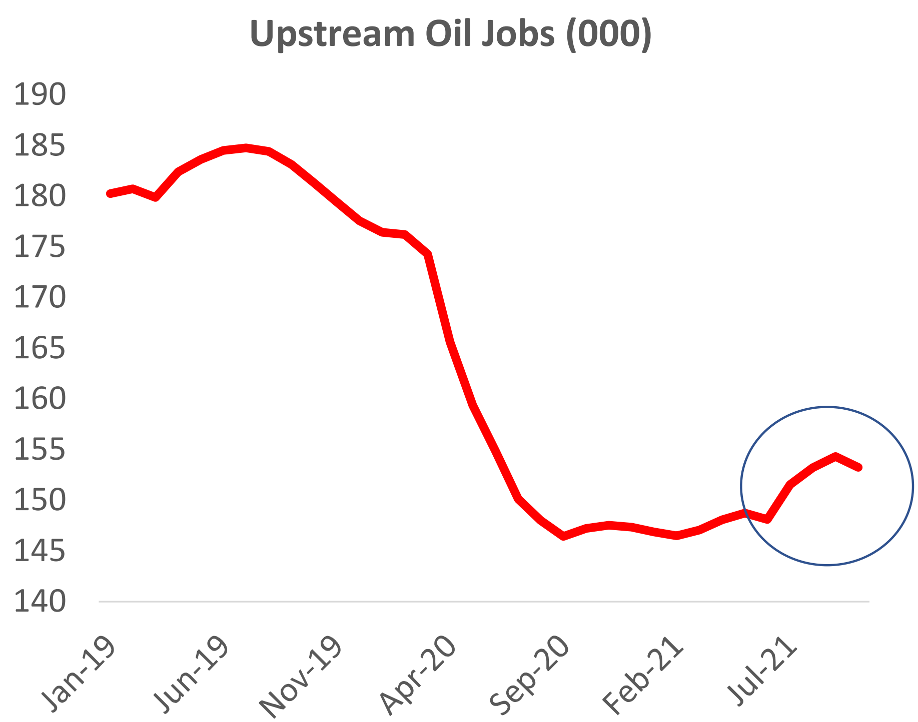
Primary Vision

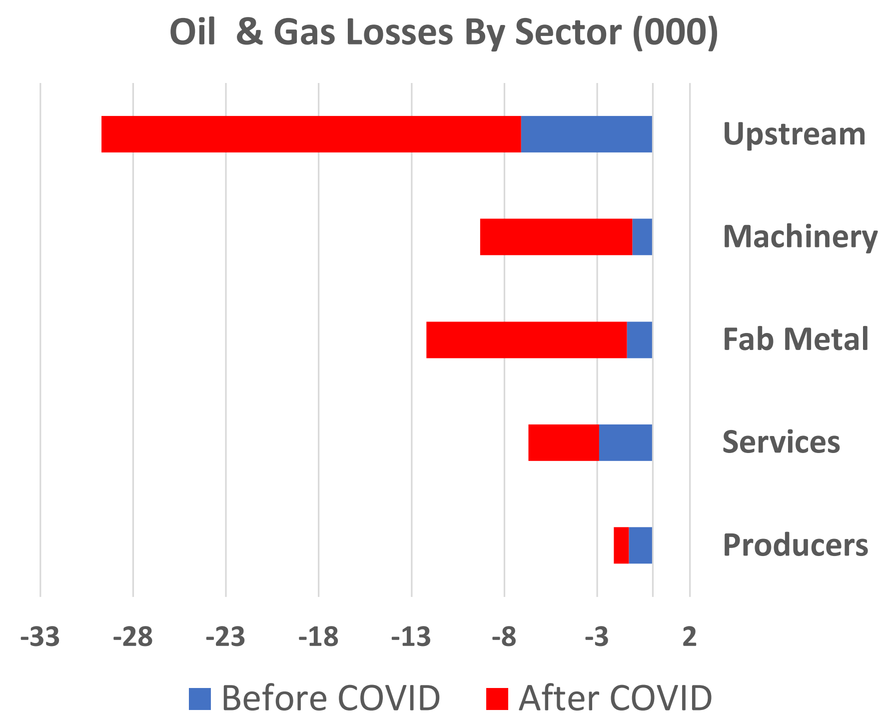
After Oil Collapsed in May 2020 the Number of DUCs Fell by an Average of 203/month





Houston Has Lost 38,100 Upstream Jobs Since Peaking in June 2019, With Progress Beginning This Summer?





Texas Workforce Commission, calculations of IRF

A Smaller U.S. Oil Industry Going Forward

Boom and Bust for Fracking
Followed by Bust, Bust, Bust …

Fracking Is a New Model for Oil Production

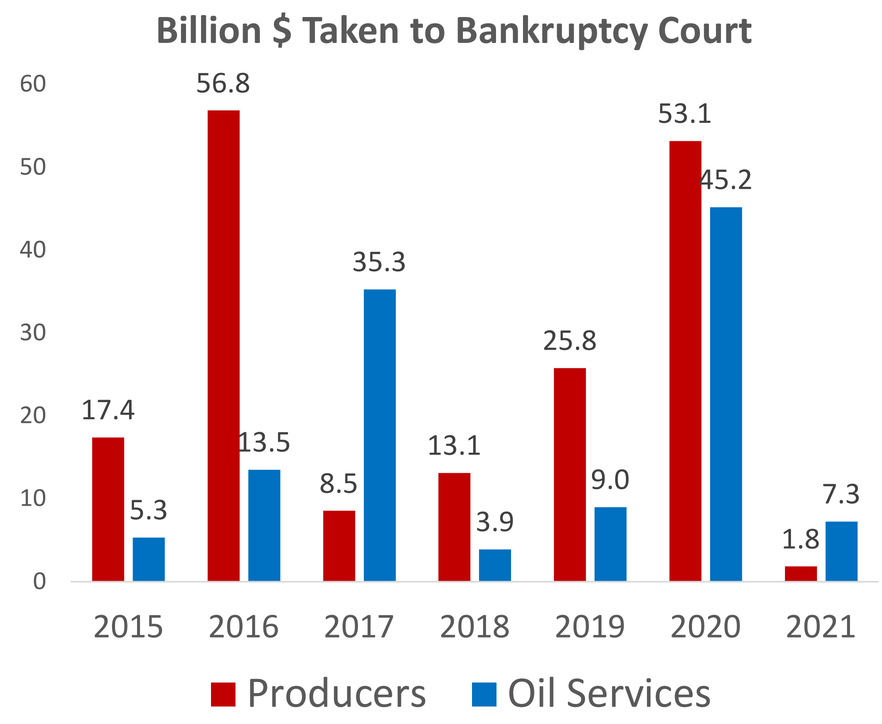
- Looks more like a competitive industry. Many small and medium-sized operators, price-takers, and assembly-line production
- Low barriers to entry for new producers, i.e., capital, some geology, leases, and a hire a service company. Today a hedge fund, tomorrow an oil producer
- Traditional exploration risk is gone, production costs are understood, and the oil is there
- Get a quick and certain rise or fall in oil production in response to changing oil price incentives
- The industry was born in an era of $100 oil and cheap money from the central bank, *and tight oil production grew at 24% per year from 2005 to 2014. Investors sought the industry out …*

Fracking's Problems Now?

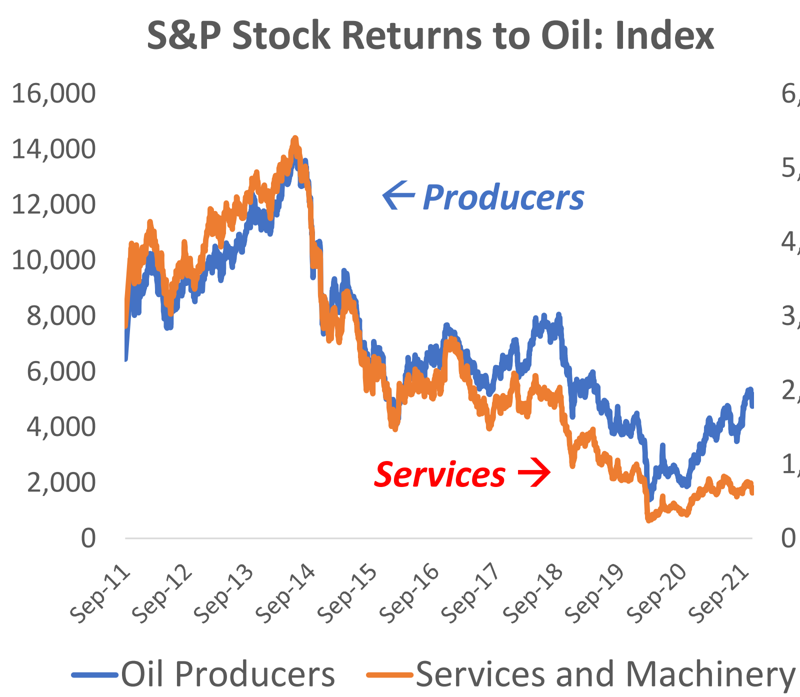
- Fracking is a high-cost source of oil and needs $65 to thrive. Even $55 oil hurts many companies, and $2 natural gas is lethal for others
- Too many companies used low interest rates and a rising stock market to try for a quick killing – instead of building a viable oil business
- Many producers struggled in 2019 to deliver steady income and growth to impress the stock market, which has now turned its back on the industry
- A first wave of bankruptcies hit in 2015-16, followed by wave of bankruptcies, delistings, forbearance, etc. hit hard in 2018-19, then COVID
- Investors are hard to find after $295 billion in assets went through the bankruptcy courts. Producers are diverting cash flows from the oil fields to attract potential investors

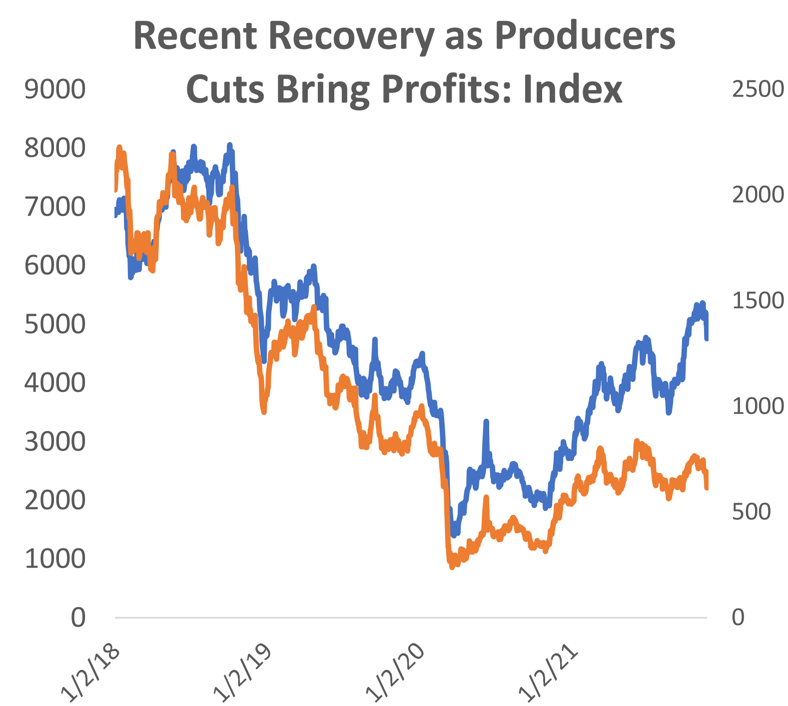
Since 2015 the U.S. Fracking Industry Has Taken Nearly $300 Billion in Assets Through Bankruptcy

- This is $295 billion dollars of secured and unsecured assets taken to bankruptcy court by the fracking industry
- Bankruptcies have come in three waves: Oil Bust of 2015-16, Credit Crunch of 2018-19, and the COVID Crisis.
- *From 2015 to 2021, bankruptcies totaled $295 billion*, 59.9 percent from producers and 40.1 percent for oil services



Poor Performance Pressured Fracking Profits, This Year Finally Sees Modest Turn Up in Stock Values



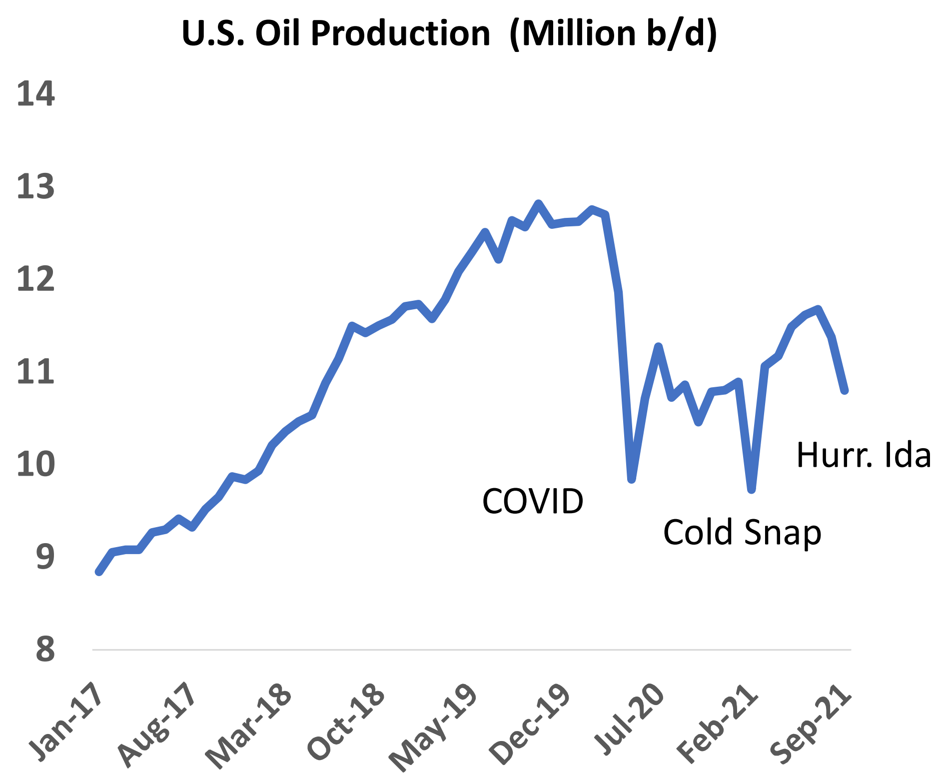


S&P Dow Jones Producer and Oil Service Indexes

U.S. Producers Respond to Financial Needs By Diverting Cash Flows and Cutting Production

- U.S. producers have committed to rewarding investors by diverting up to 30% of free cash flows to dividends
- Recent earnings reports show companies meet these commitments by providing record levels of free cash flows to investors
- This means holding down U.S. production to about 12 million barrels per day. The peak was 12.8 million in March 2020
- DUC inventories are now low and won't contribute strongly to near-term production

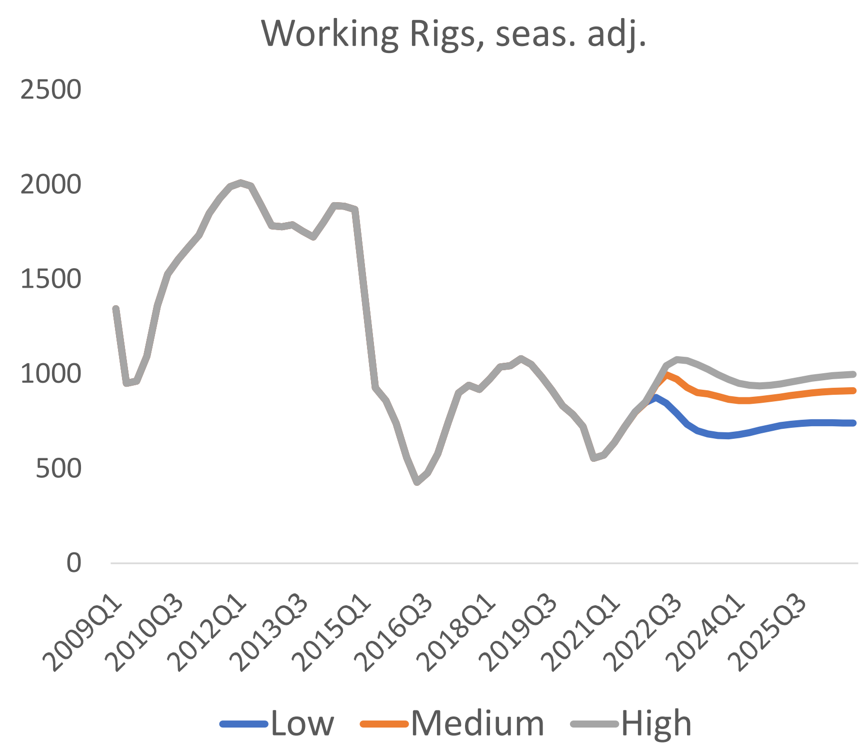
DOE/EIA, Seasonally adjusted by IRF



Impact of 30% Cut to Cash Flows

	2024Q4	2026Q4
No CF Cut # Rigs		
Low	764	795
Medium	966	1015
High	1051	1127
30% CF Cut # Rigs		
Low	715	740
Medium	870	912
High	939	997
Cut Vs. No Cut # Rigs		
Low	-49	-55
Medium	-96	-103
High	-112	-130
Cut Vs. No Cut % Change Rigs		
Low	-6.4%	-6.9%
Medium	-9.9%	-10.1%
High	-10.7%	-11.5%

No Return of the Fracking Boom Here

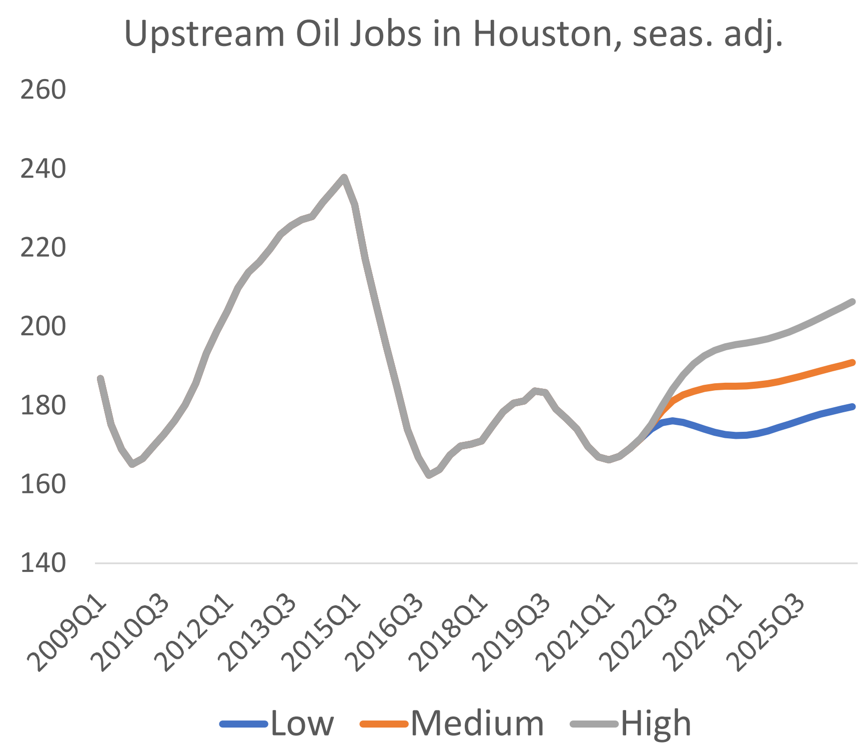


Oil Prices by 2023 settle at $65 in the medium forecast, $40 in the low, and $80 in the high. This comparison is the effect of no change to industry financial model versus 30% cut to cash flow. Chart is with 30% cuts.

Impact of 30% Cut to Cash Flows

	2024Q4	2026Q4
	No CF Cut Local Oil Jobs	
Low	181.2	190.7
Medium	196.4	205.1
High	207.5	219.4
	30% CF Local Oil Jobs	
Low	173.6	179.7
Medium	185.6	190.8
High	196.7	206.3
	Cut Vs. No Cut Local Oil Jobs	
Low	-8.0	-11.0
Medium	-10.8	-14.3
High	-10.8	-13.1
	Cut Vs. No Cut % Change Oil Jobs	
Low	-4.4%	-6.1%
Medium	-5.5%	-7.0%
High	-5.2%	-6.0%

No Return of the Fracking Boom Here Either



Oil Prices by 2023 settle at $65 in the medium forecast, $40 in the low, and $80 in the high. This comparison is the effect of no change to industry financial model versus 30% cut to cash flow. Chart is with 30% cuts.

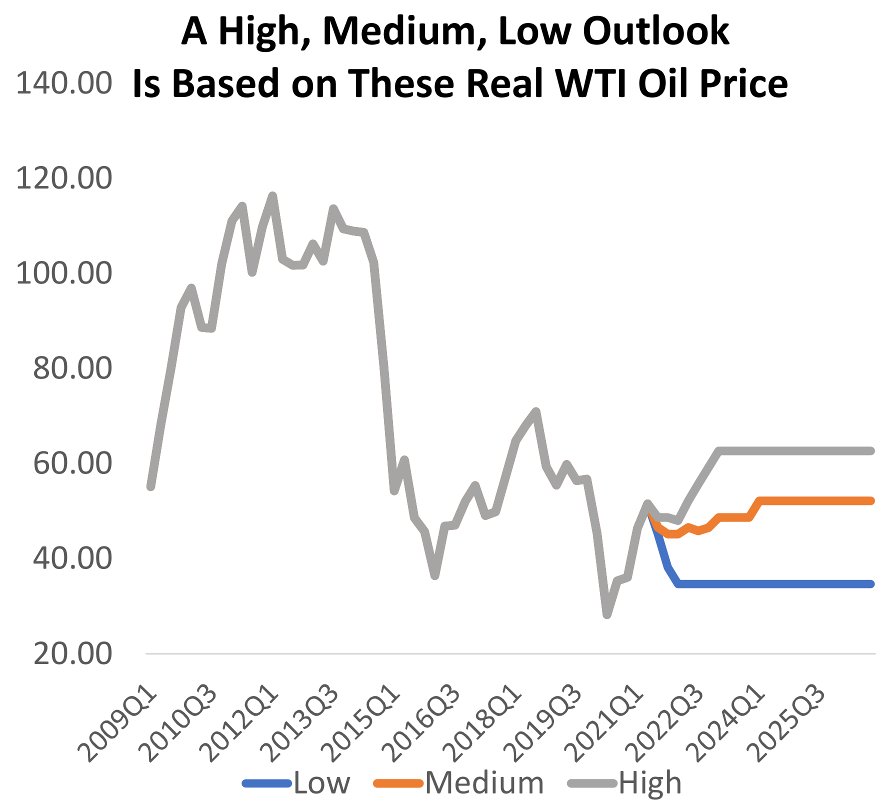
What It Means for Houston

- It is surprising that a change in the financial model for one industry could influence the growth of a metro area of 7.1 million people and 3.3 million workers
- But oil has a special place in Houston. For the last 30 years, Houston has seen jobs grow at 2.0 percent per year, with 1.2 percentage points from shared national growth, 0.6% from oil, and 0.2% from demographic advantages and the Texas Growth Formula
- The cuts to fracking mean a loss of one-third to half of the growth contribution from oil for the next five years … and probably longer
- It is the first cut to Houston's long-term rate I have made in 32 years of studying the Houston economy. *Houston's growth is still much stronger than the U.S. and still impressive at 1.7% versus 1.1% -- but now slower*

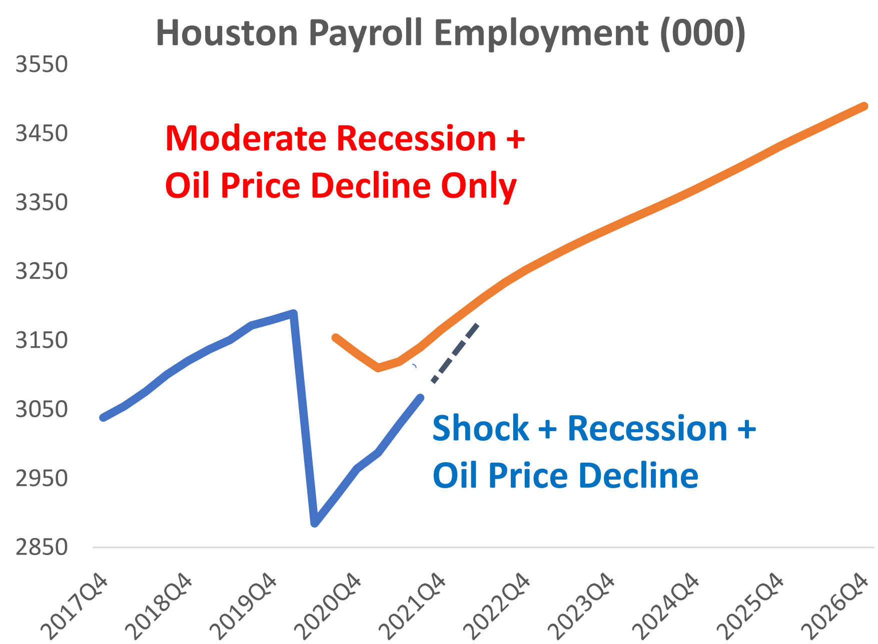
Outlook for Houston:
All the Guesswork Pulled Together

Houston's Turnaround Comes in Three Phases: The Return of COVID Jobs, U.S. Improvement, and Oil Growth

- The local economic turnaround will be driven by the return of COVID contact-sensitive jobs, broad U.S. growth, and an improved oil industry
- COVID jobs seem to have peaked for now, and will return slowly late this year and in early 2022
- The U.S. forecast is for 2022 employment to match pre-COVID levels by the third or fourth quarter
- US oil producers are committed to no production gains until world growth stabilizes and OPEC spare capacity is absorbed. *Slower and lower for oil …*



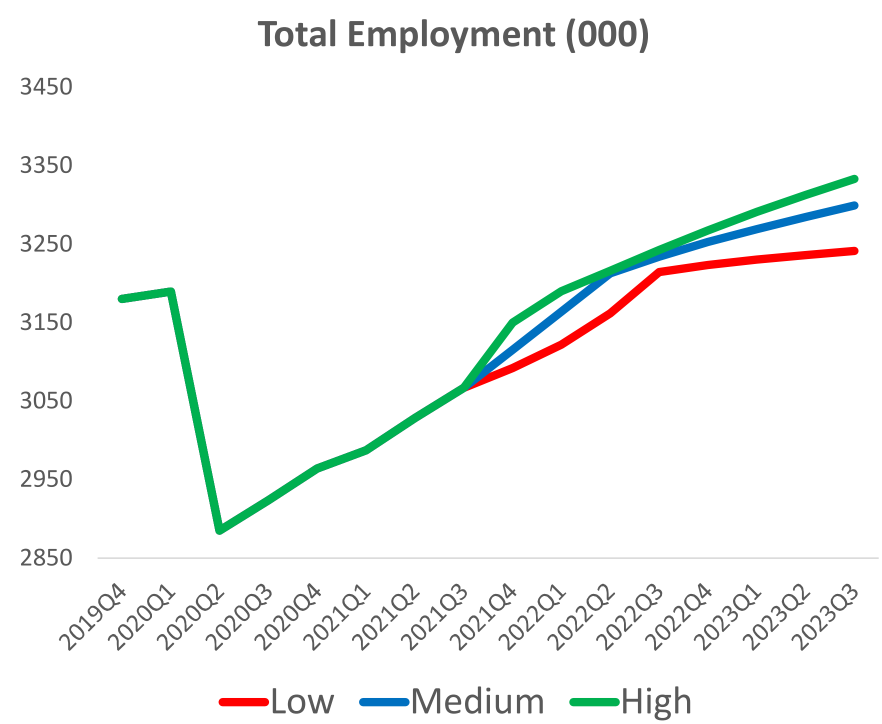
Fitting the Timing and Pieces of the Recovery Together: Some Things We Really Cannot Know



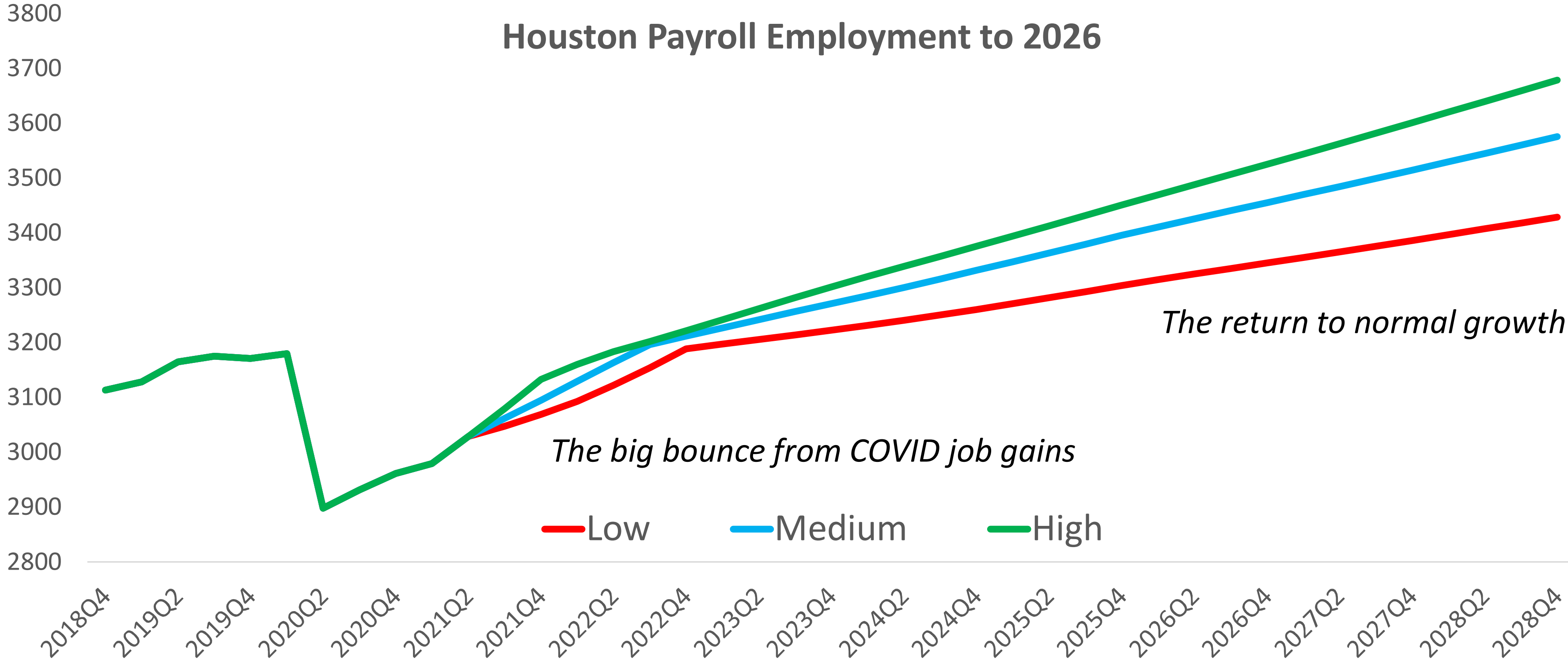
- The 2020Q2 shock to Houston's payroll employment from COVID and the oil war pushed jobs down by 306,700 jobs in 2020Q2 and it was still down 124,700 jobs in 2021Q3 (Blue Line)
- Employment collapsed, *but a serious U.S. recession and oil fundamentals alone* would account for only 79,300 lost jobs by 2021Q2, with the economy then turning around. The difference – again -- is the COVID shock
- At some point, business cycle fundamentals (including oil, the U.S. economy, and the retreat of COVID) reassert themselves and we return to the Red Line. Where? When?

How The End Game for COVID-19 Might Look as Houston Moves to 2022 and 2023

- I can provide nothing specific – just assumptions for a high, medium, and low outlook for the next few quarters
- Houston should see full recovery from COVID damage by mid-year, except for the low forecast in mid- to late-2022
- We know where we are today and where full recovery brings us … but little about the in-between period of this year and mid-2022
- Will we see renewed COVID outbreaks? How will the authorities react? Or perhaps it comes fast with maybe few problems and fast recovery….



Houston Payroll Employment to 2028 Including the Last of Social Distancing: *With Adjustment for Oil*



The Low, Medium, and High forecast with a new oil financial model

Contributions to Houston Job Growth 2020 to 2027: Payroll Employment

('000 Q4/Q4)

	Change in Payrolls			Business Cycle Change			Social Distancing			Payroll Growth Rate		
	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
2019	59.9	59.9	59.9	59.9	59.9	59.9				1.9%	1.9%	1.9%
2020	-216.2	-216.2	-216.2	-49.3	-49.3	-49.3	-166.8	-166.8	-166.8	-6.8%	-6.8%	-6.8%
2021	127.9	151.4	186.0	35.3	35.2	35.4	92.5	116.2	150.5	4.3%	5.1%	6.2%
2022	131.3	137.2	117.5	57.0	86.6	101.2	74.3	50.6	16.3	4.3%	4.5%	3.8%
2023	24.1	60.8	84.1	24.1	60.8	84.1				0.8%	1.9%	2.6%
2024	31.6	55.6	68.4	31.6	55.6	68.4				1.0%	1.7%	2.1%
2025	44.3	62.1	74.2	44.3	62.1	74.2				1.4%	1.9%	2.2%
2026	39.8	58.8	73.7	39.8	58.8	73.7				1.2%	1.7%	2.1%
2027	38.8	58.6	74.2	38.8	58.6	74.2				1.2%	1.7%	2.1%

These Job Gains Are Large and Exciting: But We Are Only Returning to an Earlier Starting Point

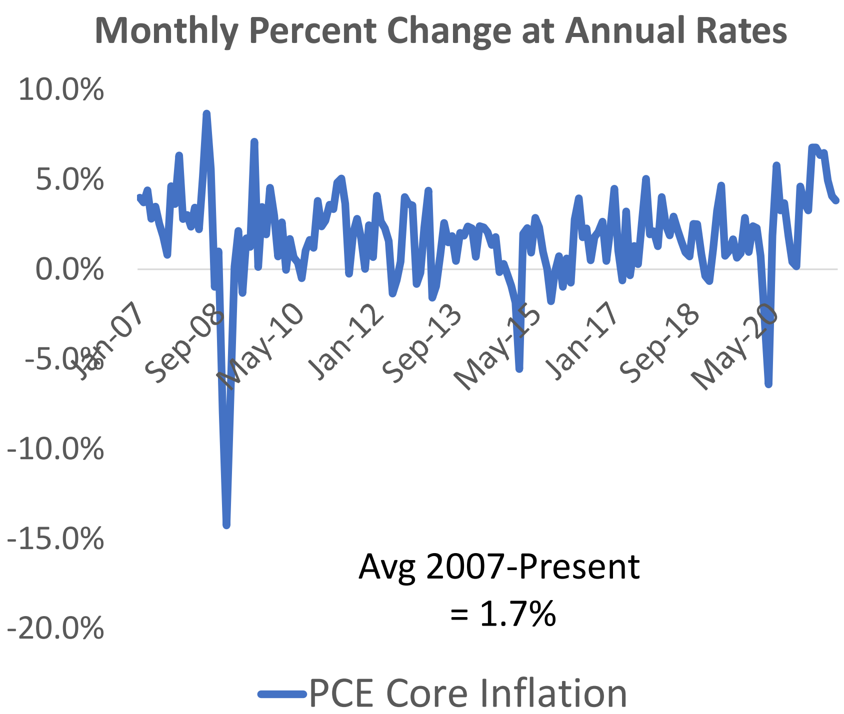
- It is the second half of next year before we move past the 2020Q1 COVID peak in economic activity and see economic expansion. We will have lost 2+ years of growth to COVID
- Fracking has now accepted that it is high-cost source of oil and will be a smaller industry moving forward. The U.S. oil industry should become a more stable source of local growth
- Lower oil production and slower growth in U.S. oil means slower growth for Houston's total employment. It is a moderate but permanent and long-term slowdown (1.7%/y versus 2.0%) that still leaves Houston growing much faster than the rest of the U.S.
- The broader questions about oil's future (global warming, peak demand, ESG) are mostly issues that are still years in the future … but that weigh on the present

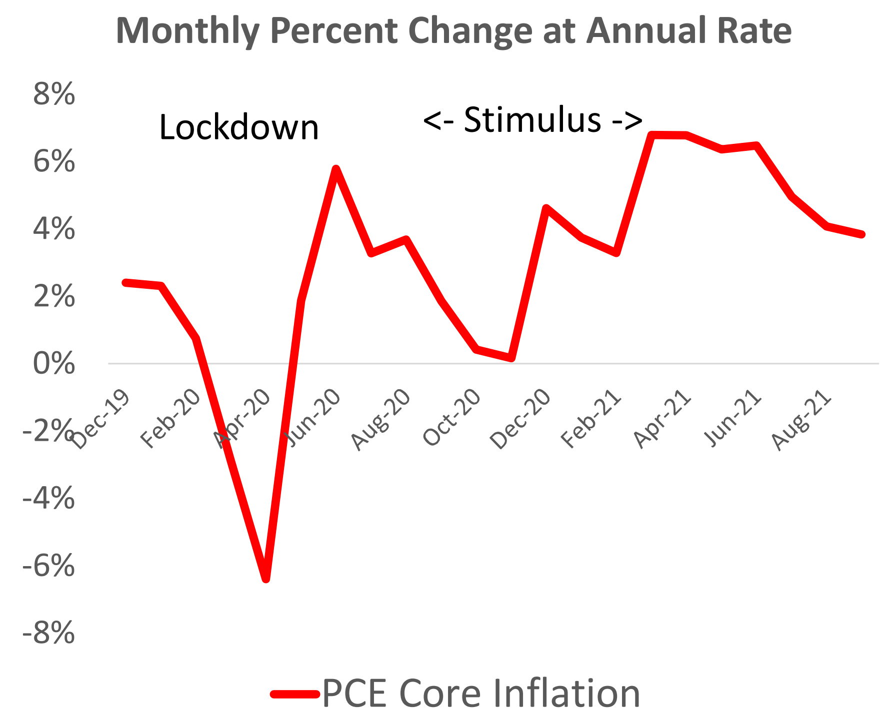
Is Current Inflation Just
Too Much Money Chasing Too Few Goods?

Will the Current Short-Run Surge in Prices Become Durable Inflation?

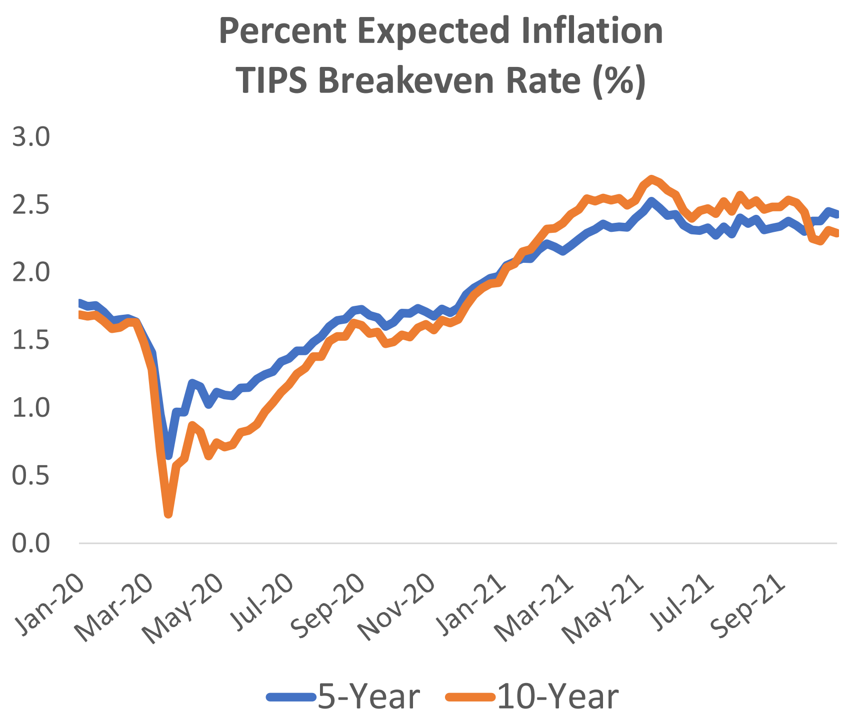
- There is already \$5.4 trillion (\$2.7+\$0.9+\$1.8) in federal stimulus that has been forced into the pipeline. This does not count the physical infrastructure bill – only partly paid by taxes. Spending remains at high levels. More spending to come?
- With COVID recovery we are seeing a *strong short-term surge in prices* as the economy recovers and stimulus: copper, soybeans, semiconductors, oil, chemicals, household rents, …
  - These disruptions look like classic pandemic shortages of labor, e.g., telephone operators, trolley car conductors, or factory workers falling ill in the Spanish flu. Workers leave work as they fall ill or must act as care-takers
  - We still have only one-third of the world vaccinated. We have seen Japanese auto production disrupted, Indonesian semiconductor shutdowns, and India and many other countries see apparel production shut
- *Inflation is a general rise in prices* that is embedded and sustained over time. Consumer price increases lead to demands for increases, wage increases force businesses to increase prices, … and a wage-price spiral is underway

The Prospect of Recovery Has Seen Inflation Surge: Above 4% Annual Rates Since March





Where Does Inflation Go From Here?



- Expected inflation by consumers according to the U of Michigan consumer survey is 4.8% over the next 12 months and 2.9 percent over 5 years. It has been above 4% since May
- *Survey of Professional Forecasters* says 5.8% CPI inflation this year, followed by 2.7% in 2022 and 2.4% in 2023
- Breakeven TIPS rates most recently 2.35 percent annually over the next 5 years and 2.76 percent over 10 years
- Measure this against a two percent *average* Fed target rate

We Have Seen Inflation in Modern U.S. Economic History … And It Was Ugly

- 1965 = 1.6%; 1970 = 5.7%; 1974 = 11.0%; 1980 = 13.5%, 1983 = 3.2%
- What caused this outbreak? It was a classic wage-price spiral …
  - 1960's deficit spending on the Viet Nam War and the Great Society – both guns and butter
  - Two oil price shocks in 1973 and 1980 hit consumers' pocketbooks hard
  - Nixon wage-price controls tried to break the spiral and failed
  - After several weak Fed Chairs, Paul Volker and the Federal Reserve ended the spiral by raising interest rates – the 10-year treasury hit 13.5% -- and inducing the sharp and deep 1982 recession
- Today the Fed has committed to letting prices run moderately above two percent for a period, but also committed to intervene with higher interest rates if inflation rises far or for long above two percent

Inflation Coming or Not? Economists Need to Be Humble

- The 15 years before the pandemic saw inflation run at an average of 1.7 percent. *Technology and globalization* brought downward wage pressure and lower prices
- Will 20-years of low birth rates and immigration barriers work to tighten domestic labor supplies? Or could it be the on-going surge in retirements by Baby Boomers? Does it mean the return of organized labor? Could it set up a wage-price spiral?
- Larry Summers made himself the famous face of likely inflation problems ahead. But he was hardly certain about his original outlook: *a one-third chance* nothing happens, *a one-third chance* stagflation or a combination of 5-6 percent inflation and limited growth; or *a one-third chance* the Fed must intervene seriously in the economy. *Similar uncertainty still rules.*

The Global Economy?
It Is Mostly About COVID, Too

IMF Says World GDP Growth Fell 3.1% in 2020 With Recovery of 5.9%/4.9% in 2021/22

Percent GDP Growth, Year-Over-Year

	2018	2019	2020	2021	2022
World	3.5	2.8	-3.1	5.9	4.9
Advanced Economies	2.2	1.7	-4.5	5.2	4.5
U.S.	2.9	2.2	-3.4	6.0	5.2
Euro Area	1.8	1.3	-6.3	5.0	4.3
Germany	1.3	0.6	-4.6	3.1	4.6
France	1.8	1.5	-8.0	6.3	3.9
Italy	0.8	0.3	-8.9	5.8	4.2
United Kingdom	1.3	1.5	-9.8	6.8	5.0
Japan	0.3	0.7	-4.6	2.4	3.2
Emerging/Developing	4.5	3.7	-2.1	6.4	5.1
Brazil	1.3	1.1	-4.1	5.2	1.5
Russia	2.3	1.3	-3.0	4.7	2.9
India	6.8	4.2	-7.3	9.5	8.5
China	6.6	6.1	2.3	8.0	5.6

IMF, *World Economic Outlook*, update as of October 2021

The Global Economy: COVID-19 Still Dominates the Outlook

- Economic fundamentals still matter less than COVID in most of the world. Only 37% of the planet is vaccinated. Country-to-country differences in economic performance still reflect COVID and the timing and duration of outbreaks, the public health response, and uneven vaccine distribution
- The IMF forecasts a global GDP growth turnaround of 5.9 percent in 2021 and 4.9 percent in 2022. This is return to post-COVID trends
  - On the IMF's list of economies shown earlier, China stood alone in 2020 with growth at 2.3 percent, followed by a strong 8.0 percent this year. Concerns over the Chinese financial system are mounting
  - As bad as was, the -3.4% decline for the U.S. is among the among the smallest for developed countries. And the projected recovery is among the best at 6.0% this year and then 5.2% in 2022. Supply disruptions are the chief threat to developed country growth
  - Only four percent of low-income populations are vaccinated, with new variants the chief threat to growth. Poor countries with limited or no access to a vaccine and poor public health systems will continue to suffer and see slow global growth
- The initial global fiscal response was $12 trillion dollars and a near-universal monetary response with deep rate cuts, massive liquidity injections, and central bank asset purchases. The U.S., Japan, and other countries have continued to add to the fiscal response. For now, central banks are urged to be vigilant but to continue to see inflation as transitory

Houston After COVID-19: Solid Local Growth Lags the State and Nation

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