



Houston's Economy in the Wake of COVID-19 and the Oil War

Robert W. Gilmer, Ph.D.

C.T. Bauer College of Business

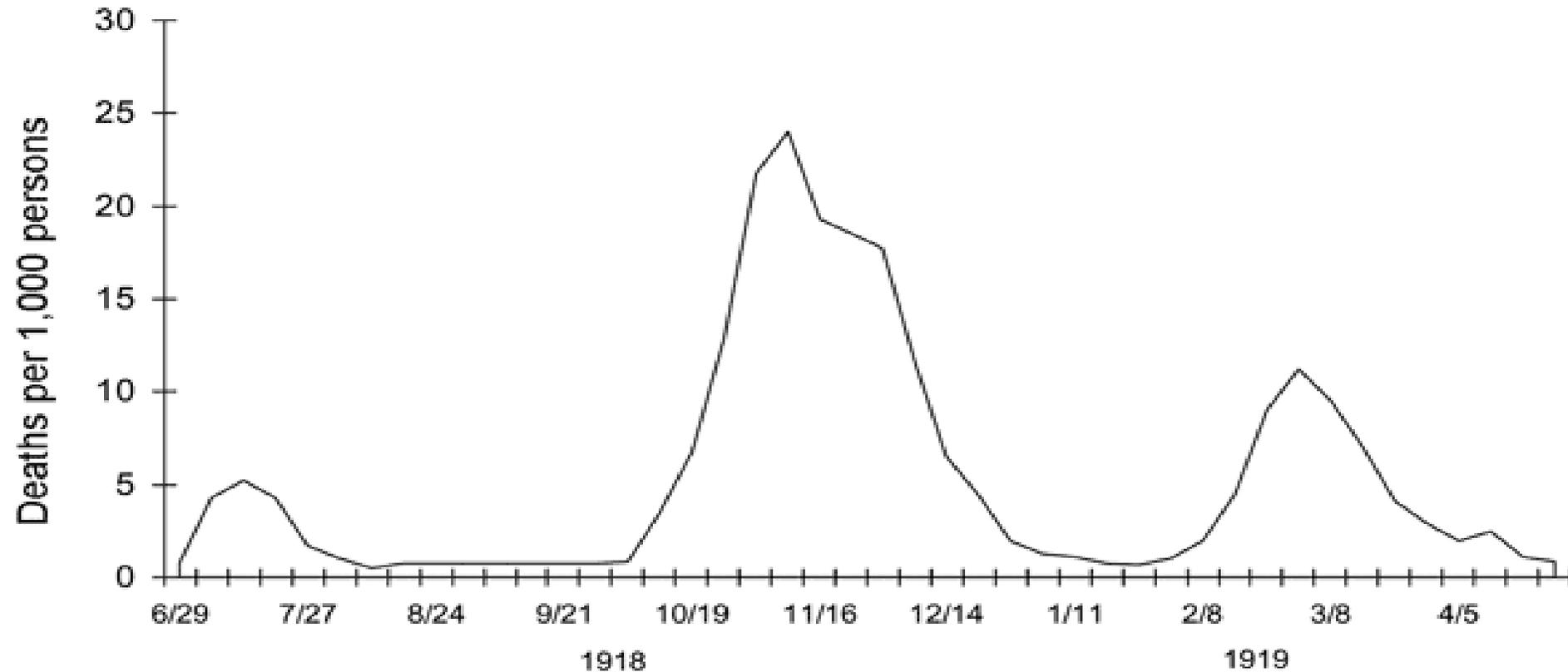
May 6, 2020



Overview

- COVID-19 presents a classic example of an unanticipated economic shock that disrupts markets and poses a threat of economic downturn. The U.S. economy has recently seen this role played by a financial crisis, a tech bust, and several oil downturns
- We know something about the past business-cycle impact of these viruses
 - They last six months, have a high infection rate, and can cause many deaths
 - Their business cycle impact is a mild to typical recession in the U.S. due to illness, labor shortages, and supply disruptions
- The economics of this epidemic have been turned upside down by the public health stay-home orders
 - The virus still has control of the wheel, but public health officials' reactions give them an expanded role, and the economy is just in the back seat and along for the ride
 - How does this change things? What are the costs of this decision? What is the trade-off between the economy and the stay-at-home orders? Are the economic effects really all that different?
- The global economy has joined the U.S. in a virus-driven recession with all regions of the world facing a sharp decline
- All this is even more complicated in Houston because of the oil glut caused by COVID-19. It has rendered the oil-industry credit crunch and Saudi-Russian oil war irrelevant, with everyone now on board in a joint effort to rebalance oil markets

Three Pandemic Waves of the Spanish Flu in the United Kingdom, 1918-20



E. Jordan, Epidemic *Influenza: A Survey*, Chicago, Ill. American Medical Association, 1927



Historic Influenza Pandemics And Their Effects

Years	Pandemic	Case Infection Rate	Case Fatality Rate
1918-20	Spanish flu	33%	2-3%
1957-58	Asian flu	8-33%	0.20%
1968-69	Hong Kong flu	7-28%	0.20%
2009-10	Swine flu	7-28%	0.30%
2019-20	COVID-19	???	5.4%?*

*U.S. mortality divided by *confirmed* cases, WHO, *COVID-19 Situation Report*, May 4, 2020



COVID-19 and the U.S. Economy: From a CBO Study of Potential Impacts of an Epidemic

The Influenza Outbreak

- **Base Case:** No impact or minimal impact from influenza much beyond normal seasonal effects
- **Moderate:** The Asian Flu of 1957-58 is the model with 25% infection
- **Severe:** The Spanish flu of 1918-20 with 30% infection rate and high mortality rate provides the model for this scenario

Effect on the Economy

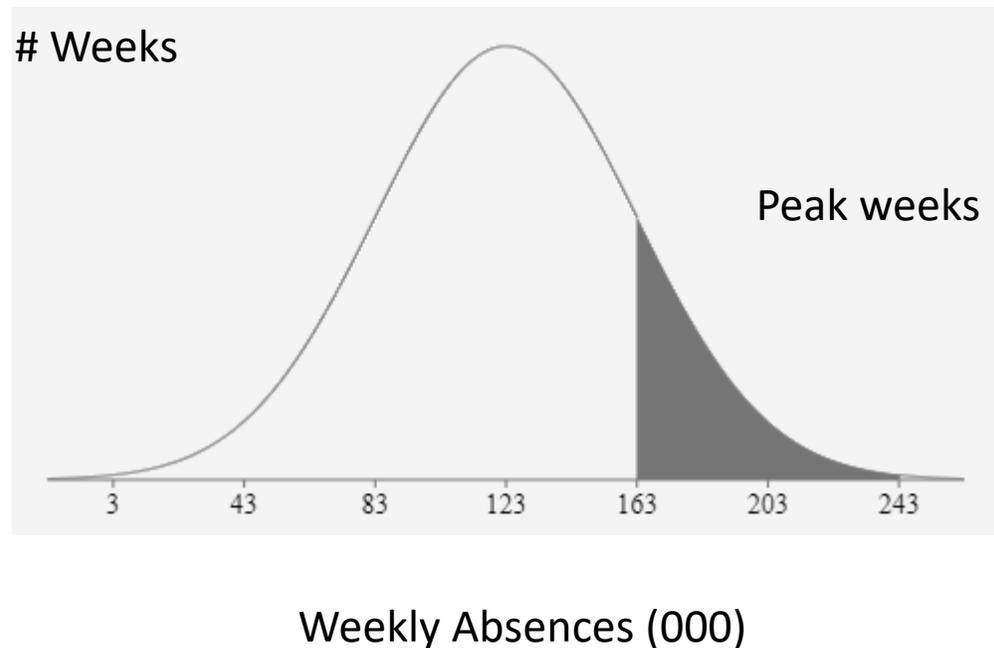
- **Base Case:** This horse is out of the barn, now just a measure of where we thought we were in February
- **Moderate:** Growth measured by GDP or employment slows to a standstill or declines slightly. We assume GDP flat and payrolls fall 1.5%
- **Severe:** This is a typical U.S. recession with GDP falling about 2.8% and employment 3.0%

Why Would a Recession Follow an Epidemic?

The CBO View Before Stay-Home Orders

- The CBO assumes a 30% infection rate and I will add a 0.5% mortality rate. For Houston this means that 2.1 million Houstonians would fall ill and 35,000 would die
- Past epidemics saw social distancing mostly driven by fear, with restaurants, stores and personal services avoided. There might be some school or theater closings, but work continues
- Beyond social distancing, major damages to the economy stem from losses of workers to illness plus those workers needed as caretakers at home. Back-of-the-envelope calculations show Houston with 80-160,000 workers out for 6 to 8 weeks and over 200,000 out in peak weeks
- Worker shortages drive reduced shifts, plant shutdowns, and disrupted supply lines. Critical industry is disrupted in energy, communication, and transportation.

Weekly Worker Absences in Houston with 30% Infection Rate Would Average 123,000, but with 200-250,000 at Peak



- Houston: 7 million population and 4 million workers
- 30% infection rate implies 1.2 million fall ill or an average of 46,000 per week over 26 weeks
- If there are two waves, assume the first and bigger wave is 800,000 illnesses over 12 weeks or 66,500 per week
- With two weeks of illness per worker, total absences average 123,000 weekly and reach 160-240,000 absences in peak weeks.

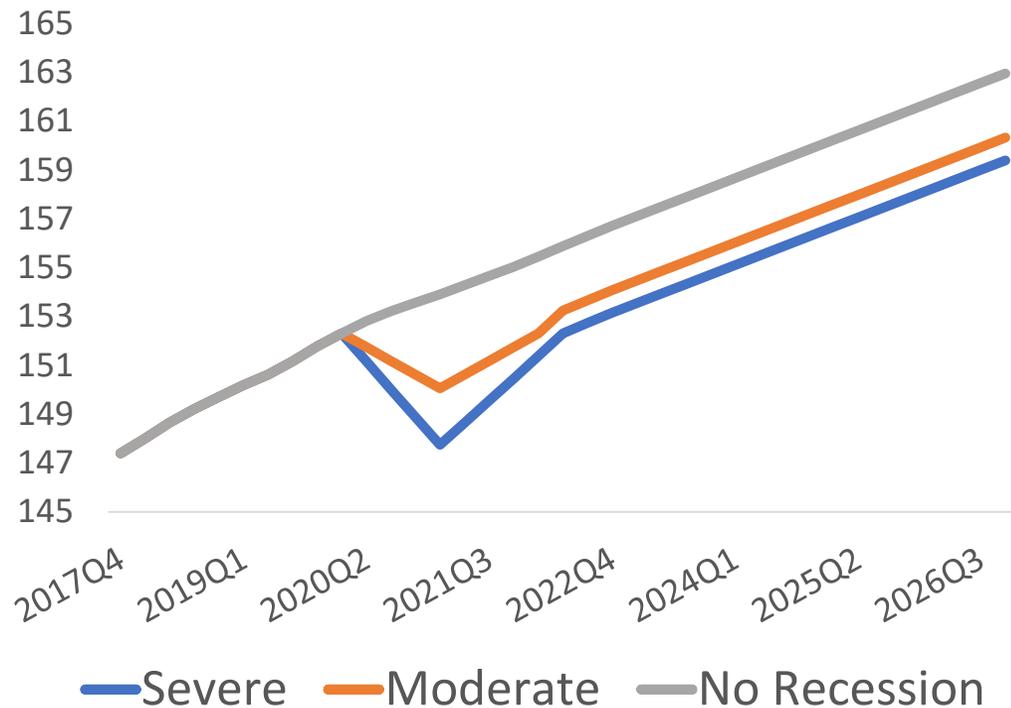
This is a hypothetical example of what might happen in a severe pandemic with limited public intervention

With Stay-Home Orders Imposed, This Pandemic Has Different Health *AND* Economic Consequences

- Recent stay-home orders have emphasized the need to use social distancing to prevent local hospital systems and critical infrastructure from being overwhelmed. This has kept Houston's infection rate low and mortality rates very low
- However, the stay-home orders have had economic consequences, with early public health orders already exacting a price tag of 250,000 jobs in Houston over five weeks
- The job losses now come earlier in the infection cycle than previous virus outbreaks. With this virus uncharacterized, there is no certainty about when additional orders come or go in coming weeks or months.
- A significant part of the burden of past outbreaks (the previous slide) would be born by private employers, as 75 percent of Americans have some health insurance. The stay-home orders created an immediate public burden of 30 million Americans and 250,000 Houstonians applying for unemployment benefits

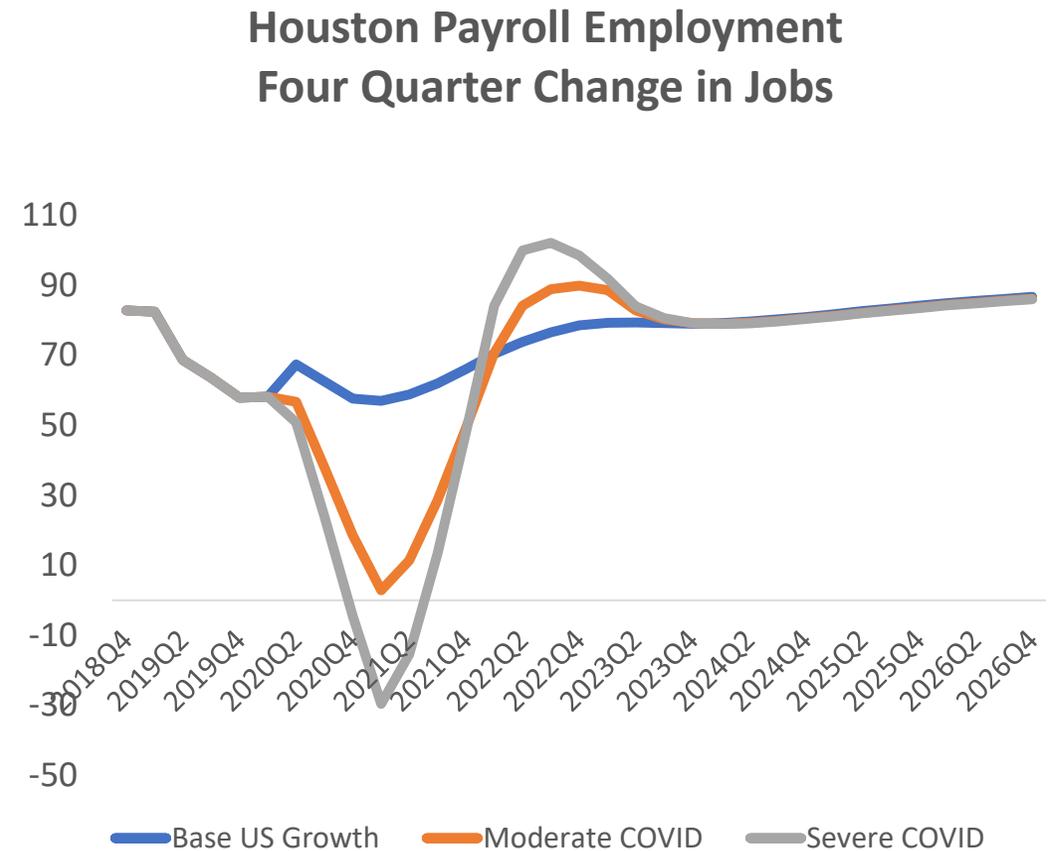
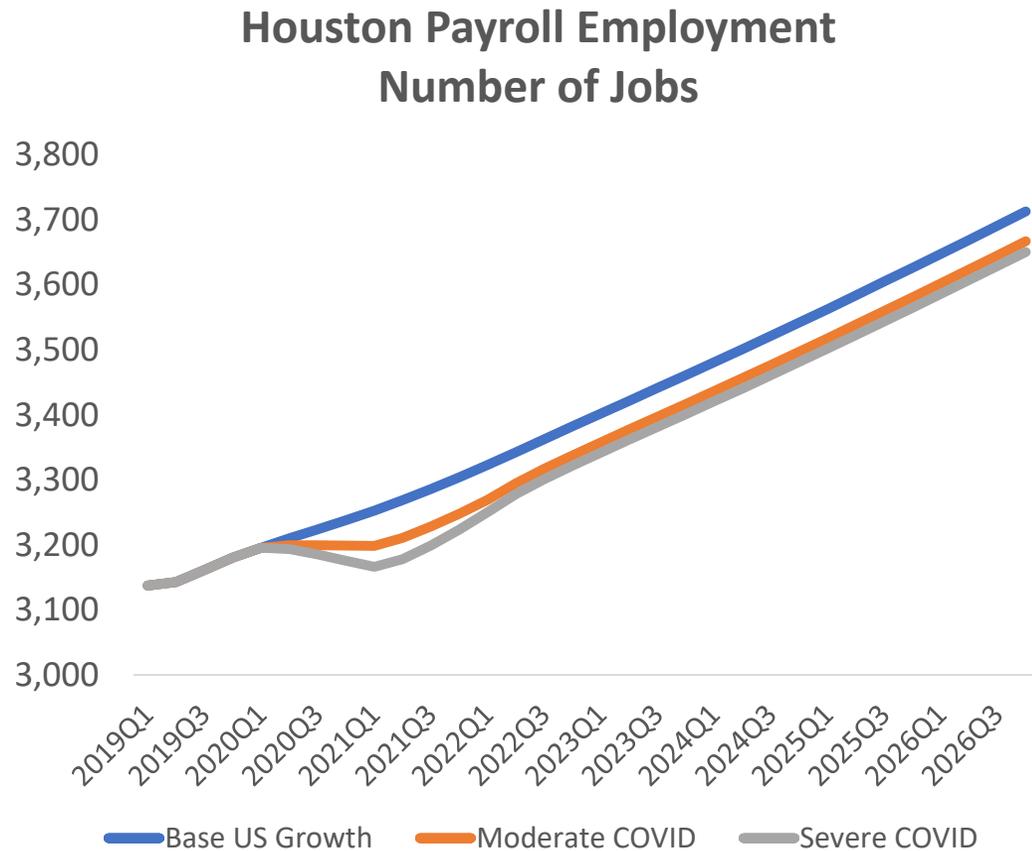
Two U.S. Recession Scenarios for COVID-19

U.S. Payroll Employment (million)



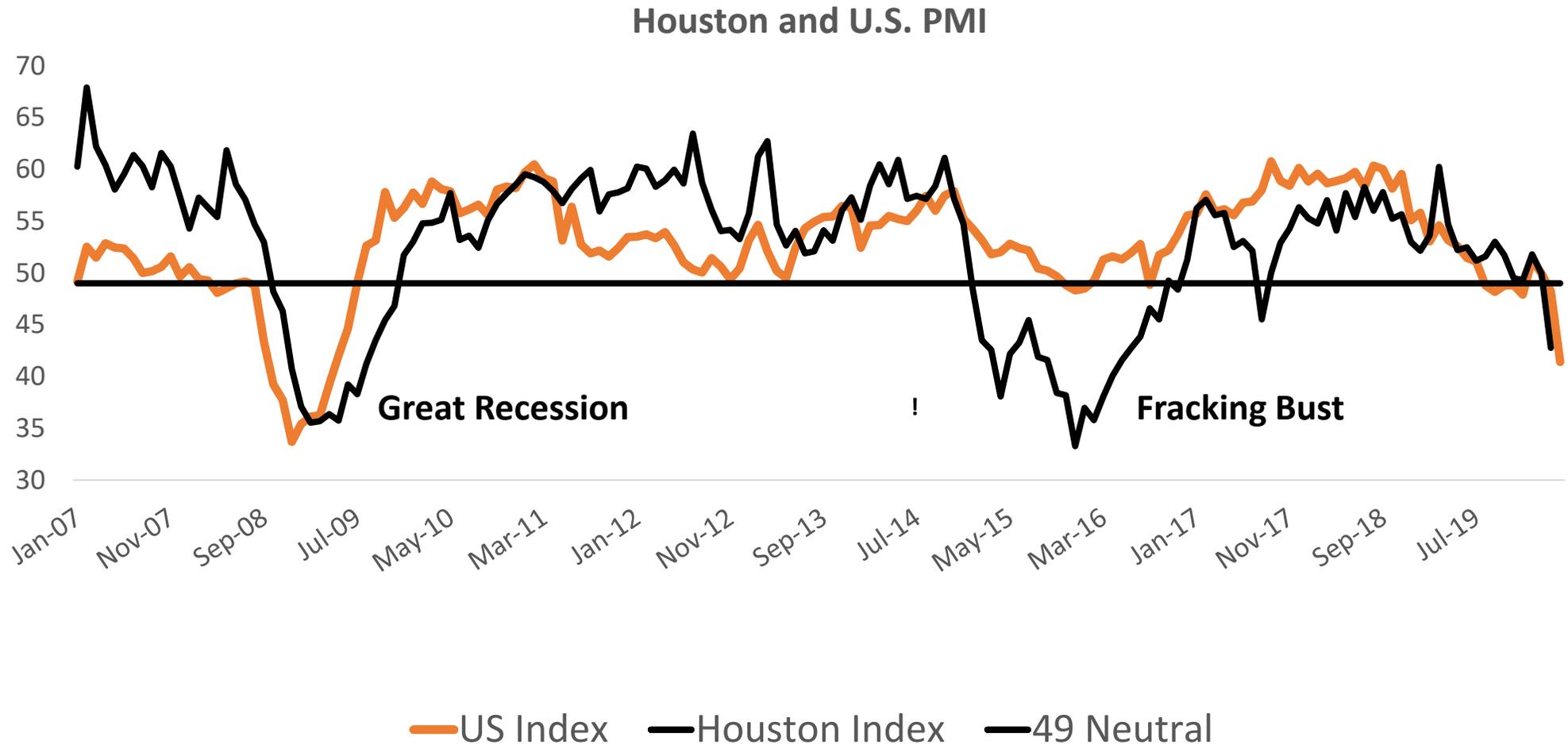
- The mild U.S. recession or growth recession sees payroll employment fall 1.5 percent over four quarters and recover in four more
- A typical U.S. recession sees payroll employment fall 3.0 percent over four quarters and then recover in five more
- Recovery means a return to the beginning level of employment, but the loss of eight to nine quarters of growth sees no easy return to the *levels* of employment that were forecast before 2026
- *We have clearly reached the severe epidemic stage. We take this to be our overall economic guide through 2020, but with a wild ride from quarter to quarter*

Impact of No COVID Pandemic Versus Moderate and Severe: Houston Payrolls with Oil Price at \$55 in All Cases



Note: It is unlikely oil prices could hold at \$55 per barrel with a moderate U.S. recession underway, which is the assumption in the SEVERE COVID example. The example still serves to make its point, however.

PMI: U.S. and Houston Quickly Head Toward Recessionary Levels After Stay-Home Orders



Hypothetical Service Sector Losses By Occupation in Houston

Houston Service Sector Jobs at Risk to COVID-19 Losses By Occupation in 2019

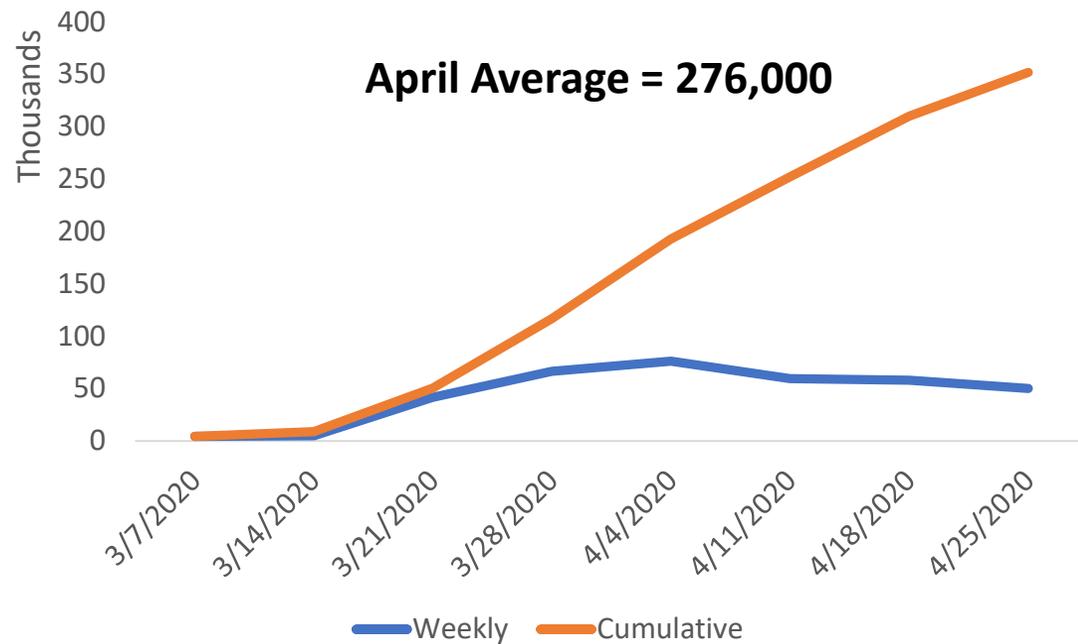
<i>Sales Occupations</i>	<i>Jobs</i>	<i>Personal Services</i>	<i>Jobs</i>
Retail Supervisors	23,420	Barbers/Stylists	7,640
Retail Salesperson	87,880	Manicurists	560
Cashier	66,240	Other	2,430
<i>Total</i>	<i>177,540</i>	<i>Total</i>	<i>10,630</i>
<i>Building and Grounds</i>		<i>Travel and Accommodation</i>	
Janitor	43,170	Porter/Concierge	1,100
Maid/Housekeeper	20,080	Hotel Desk Clerk	5,190
<i>Total</i>	<i>63,250</i>	Rental/Counter Clerk	10,350
<i>Food Preparation</i>		<i>Total</i>	<i>16,640</i>
Supervisor	20,280	<i>Amusements</i>	
Fast Food Cook	10,230	Recreation Workers	3,060
Other Cooks/Chefs	35,470	Attendants	2,010
Waiter/Waitress	29,510	Fitness Instructors	4,880
Dining Room Attendees	12,170	Ushers	2,010
Dishwashers	9,320	<i>Total</i>	<i>11,960</i>
Host/Hostess	7,600	<i>Childcare Workers</i>	<i>11,200</i>
<i>Total</i>	<i>124,580</i>		
Grand Total -- Jobs	415,800		

Possible Job Losses In April Under Current Stay-Home Orders By Occupation in 2019

<i>Sales Occupations</i>	<i>Jobs</i>	<i>Personal Services</i>	<i>Jobs</i>
Retail Supervisors	11,710	Barbers/Stylists	6,112
Retail Salesperson	52,728	Manicurists	448
Cashier	26,496	Other	1,944
<i>Total</i>	<i>115,401</i>	<i>Total</i>	<i>8,504</i>
<i>Building and Grounds</i>		<i>Travel and Accommodation</i>	
Janitor	17,268	Porter/Concierge	770
Maid/Housekeeper	8,032	Hotel Desk Clerk	3,633
<i>Total</i>	<i>25,300</i>	Rental/Counter Clerk	7,245
<i>Food Preparation</i>		<i>Total</i>	<i>11,648</i>
Supervisor	7,098	<i>Amusements</i>	
Fast Food Cook	3,581	Recreation Workers	2,448
Other Cooks/Chefs	21,282	Attendants	1,608
Waiter/Waitress	20,657	Fitness Instructors	3,904
Dining Room Attendees	8,519	Ushers	1,608
Dishwashers	6,524	<i>Total</i>	<i>9,568</i>
Host/Hostess	5,320	<i>Childcare Workers</i>	<i>10,080</i>
<i>Total</i>	<i>72,981</i>		
Grand Total -- Jobs Lost	253,482		



Nightmare Becomes Reality: Initial Claims Surge In Houston



Local Jobs Lost to Stay-Home Orders And Social Distancing (000 jobs)

	Low	Medium	High
19Q4	0.0	0.0	0.0
20Q1	10.6	13.3	16.0
20Q2	124.4	172.2	206.7
20Q3	73.3	108.3	170.0
20Q4	20.0	25.0	30.0
21Q1	0.0	0.0	0.0

These are illustrative examples only, not a forecast

An Example of How Stay-Home Orders Drive Big Job Losses ... and Big Gains Later

	Period of Month		
	1	2	3
March	--	--	40
April	250	250	250
May	150	100	100
June	100	100	250
July	250	100	100
August	100	100	100
September	75	75	75
October	50	50	50
November	25	25	25
December	0	0	0

Number = number of jobs lost in service sector to virus

30-days per month, 10-day periods

Red = period of stay-home orders

Yellow = Current period of limited relaxation of orders

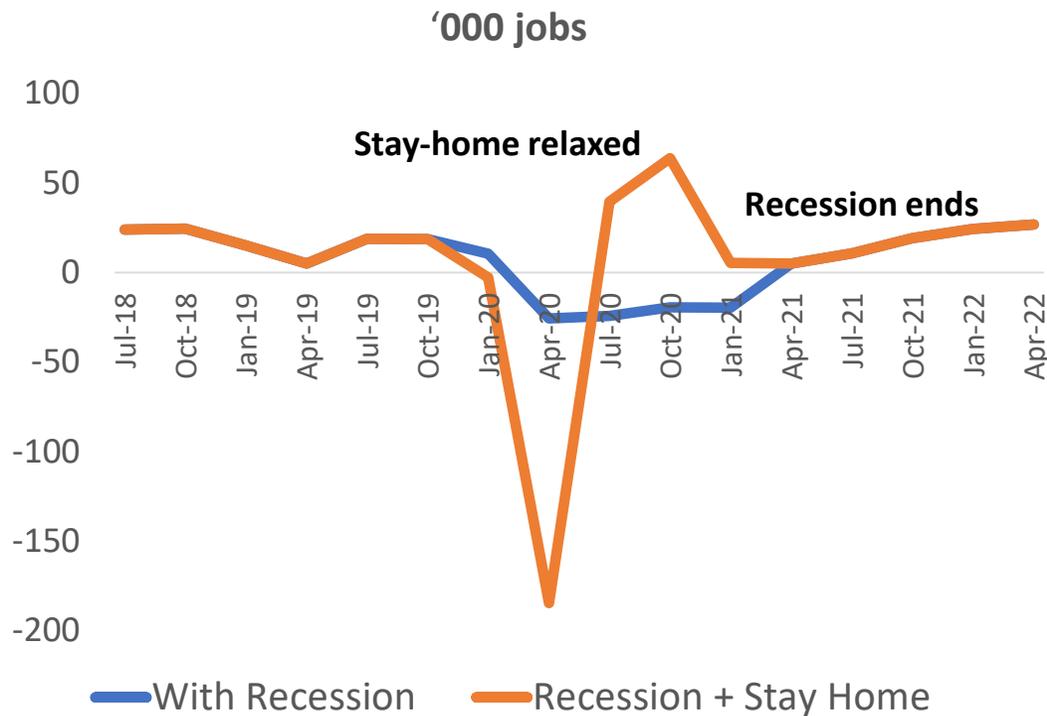
Others = period of social distancing only

- With an uncharacterized virus and no guidance from public health authorities we are reduced to illustrative examples
- Each month has three 10-day periods, with the number indicating job losses due to virus
- Red indicates 250,000 jobs lost to full stay-home orders; yellow is the current period of limited stay-home orders
- No-color cells are losses to social distancing only, no orders, and they diminish throughout the year

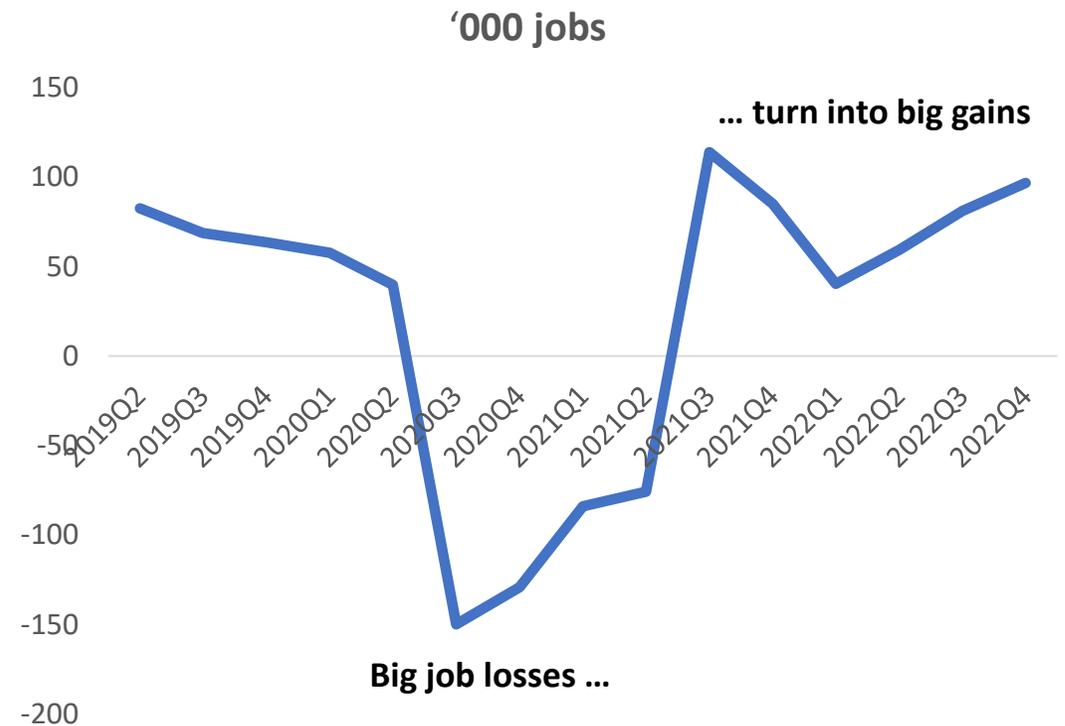


Change in Houston Employment: With Recession, Oil Crisis, Stay-Home Measures and Social Distancing

Quarterly Changes in Number of Jobs



Four-Quarter Change in Local Jobs



This is a hypothetical example and not meant as a forecast. Timing depends on the virus and public health orders



What Is the Trade-Off?: Stay-Home Now vs. Stay-Home (Sick) Later

- The question for the economist? Do the stay-home orders cause less upfront damage to the economy than otherwise would have been incurred later in the pandemic in the absence of such orders?
 - Stay-home orders reduce illness and death, as well as protect the hospital system and other essential businesses from acute shortages
 - However, we have seen the impact of public health orders in Houston with 250,000 or more jobs lost in Houston in late March and April alone. How many more such orders are to come this year?
 - But if the virus simply ran its course without strict stay-home orders and imposed social distancing, past epidemics show there is a heavy price to pay in lost worktime, labor shortages, supply-chain, disruption, *and especially illness and deaths*
- The decision between human life and the economy is important here – and is made all the time. ***The ethical questions are for the political system, not the economist***
 - *Retrospectively*: After an accident, the courts set compensation based on the value of a lost limb or a life. Standard formulas are given to the judge.
 - *Prospectively*: Health and safety regulations decide where the line is between standards that are “too loose” to adequately protect workers and those that are “too expensive” for employers to impose. There is an implicit decision public decision about how much illness and how many deaths to allow
 - The current tug-of-war between stay-home orders and the economy is playing out as it should, as a political question



Policy Response I: Helicopter Money from Congress

- There is no better time than now for helicopter money. These policies are an effort to preserve basic economic infrastructure until the COVID-19 crisis has passed, with the focus on individual employees and helping businesses of every size
- CARES Act and other fiscal stimulus delivers about \$2.8 trillion or 12% of annual GDP. More is likely on the way ...
 - Direct payments of \$1,200 to individuals making under \$75,000; \$2,400 if married, plus \$500 per child
 - Greatly expand value and coverage of unemployment benefits to include the self-employed
 - Payroll Protection Program lends to small business, forgives loans if certain requirements are met, e.g., keeping workers on the payroll
 - Delay tax filing date, suspend student loan payment for six months, businesses can defer payments on the Social Security tax, etc., etc.
- What about the Federal deficit? When the house is on fire, you worry about the termites later



Policy Response II: More Helicopter Money from the Fed

- Financial panic set up a race for financial safety. The Fed re-established a series of 2008-style liquidity facilities for money market funds, primary dealer credit, commercial paper, primary and secondary corporate debt, and asset-backed securities
- Fed cut effective short-term interest rates to zero again
- Open-ended purchase of treasuries and mortgage-backed securities to expand the Fed balance sheet is announced, etc., etc.
- Main Street Liquidity facilities set up with \$600 billion available for small, medium and large businesses. Three programs by company size and risk. Requires bank participation and some risk assumption.
- Municipal Liquidity Facility to help manage near-term cash flows of states, municipalities and counties with investment grade credit rates before the crisis. Treasury absorbs up to \$35 billion in losses if necessary.
- Regulatory agencies encourage banks to use the discount window for up to six months and to use their credit and liquidity buffers
- Increase size, frequency of the U.S. dollar swap arrangements with foreign central banks



More Gloom as the Global Economy Also Shrinks

- China's brush with COVID-19 saw Q1/Q1 industrial output fall 8.4% early this year, while retail sales fell 19.0%, and GDP dropped 6.8%
- Measured the same way, Europe saw Q1 GDP fall 3.8%, and data for Q2 will almost certainly be worse.
 - Individual major countries have issued fiscal packages that range from 1.4% to 4.5% of GDP; the European Central Bank has committed to purchasing 870 billion euros in assets in 2020
 - Europe has authorized 540 billion euros as *joint* fiscal policy to respond to the crisis. Italy, Spain and the south want it issued as cheap European debt, while Germany, Netherlands and Austria want it issued as individual country debt. That is, cheap for the north, expensive for the south. No deal yet as feelings run strong
 - Before COVID-19, Europe had never cleaned up its banking system after the 2008-09 crisis. *Italy is a possible flash point.* It holds the third largest sovereign debt in the world, was already in the middle of a budget crisis, and much of that Italian debt is held by French and German banks
- ***The bottom line is an IMF forecast for global growth is -3.0 percent this year, with a sharp rebound to 5.8 percent in 2021. With the recession quickly falling into place, the extent and timing of recovery remains at risk***

World Growth Suffers a Severe Setback Across All Regions

Percent GDP Growth, Year-Over-Year

	2018	2019	2020	2021
<i>World</i>	3.6	2.9	-3.0	5.8
<i>Advanced Economies</i>	2.3	1.7	-6.1	4.5
U.S.	2.9	2.3	-5.9	4.7
Euro Area	1.9	1.2	-7.5	4.7
Germany	1.5	0.6	-7.0	5.2
France	1.7	1.3	-7.2	4.5
Italy	0.9	0.7	-9.1	4.8
Japan	0.8	0.9	-5.2	3.0
<i>Emerging/Developing</i>	4.5	3.7	-1.0	6.6
Brazil	1.1	1.1	-5.3	2.9
Russia	2.3	1.3	-5.5	3.5
India	6.8	4.2	1.9	7.4
China	6.6	6.1	1.2	9.2

IMF, *World Economic Outlook*, April 2020



Oil Problems: More and More Oil Problems

- Start with the **credit crunch** of 2019, when financial markets turn their back on much of the fracking industry. The weakest producers fell into bankruptcy, were delisted by exchanges. The rig count fell by 25 percent last year
- The **oil war** breaks out between Saudis and Russians. A bizarre contest to see which country can better survive low oil prices? The oil price decline was dramatic and frightening and short-lived
- Where are we now?
 - Everyone has a credit crunch at current oil prices. Weak companies just die faster
 - The oil price war is over and COVID-19 wins. **COVID-19 is forcing an enormous glut** and prices neither the Russians or Saudis can afford.
 - Thanks to stay-home orders and a weak global economy, global oil demand falls from 100 million b/d to 75 million. This has created an enormous and immediate glut of oil
 - OPEC, Saudis, Russians, and Americans work to clear the glut. **Rebalancing unlikely until late this year**, and even if oil price is back to \$50-55 next year, for U.S. fracking it will feel like \$40/b
 - **U.S. recession and global recession would have brought oil price down no matter what.** After glut clears this fall, I assume 6-8 quarters of oil at \$40-\$50 per barrel

Why I am More Optimistic than Most About Oil's Long-Term Future?

- If the price of oil returns to \$60-\$65 per barrel and the world again needs 100 million barrels per day of oil, there is a long-run need for American fracking
- This is not a speculative bust like the 1980's or 2015-16, with the price of oil falling from \$110/bbl. It is a severe, but relatively short-lived, virus-driven event
- The industry enters this downturn quite lean. The rig count and oil-related jobs have already been falling since mid-2019
- The bigger oil producers are holding onto jobs, expecting the global oil glut to clear by fall. They think also it will be a relatively short-lived downturn once fundamentals are found. Oil services, in contrast, are being forced to cut hard and fast as the rig count collapses in coming months



80 \$/bbl.

Drilling Recovery Means Oil Near \$65/bbl.

Long-Run Marginal Cost of Global Oil Production

70

60

50

40

30

20

10

0

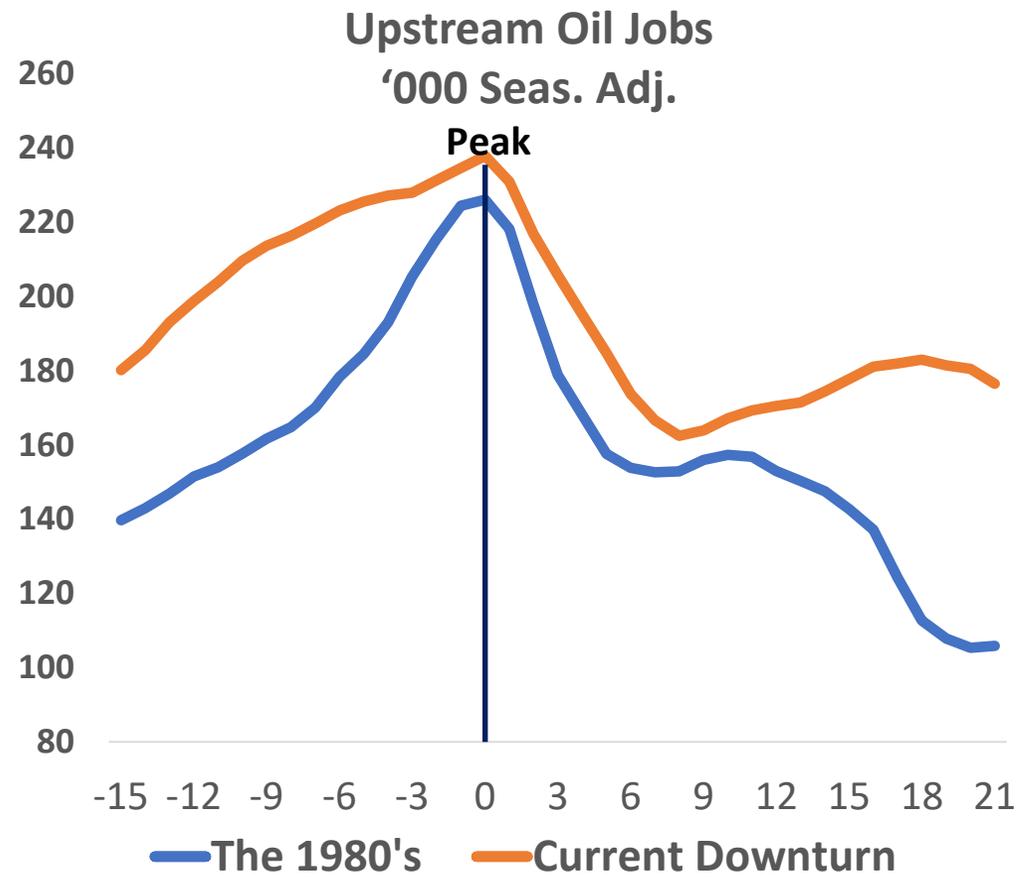
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100

Production (million bbl./d)

- | | |
|--------------------------|---------------------|
| 1, 2 Onshore Middle East | 7. Deep Water |
| 3. Offshore Shelf | 8. Ultra-Deep Water |
| 4. Heavy Oil | 9. U.S. Shale |
| 5. Onshore Russia | 10. Oil Sands |
| 6. Onshore Rest of World | 11. Arctic |

This is chart is stylized and illustrative

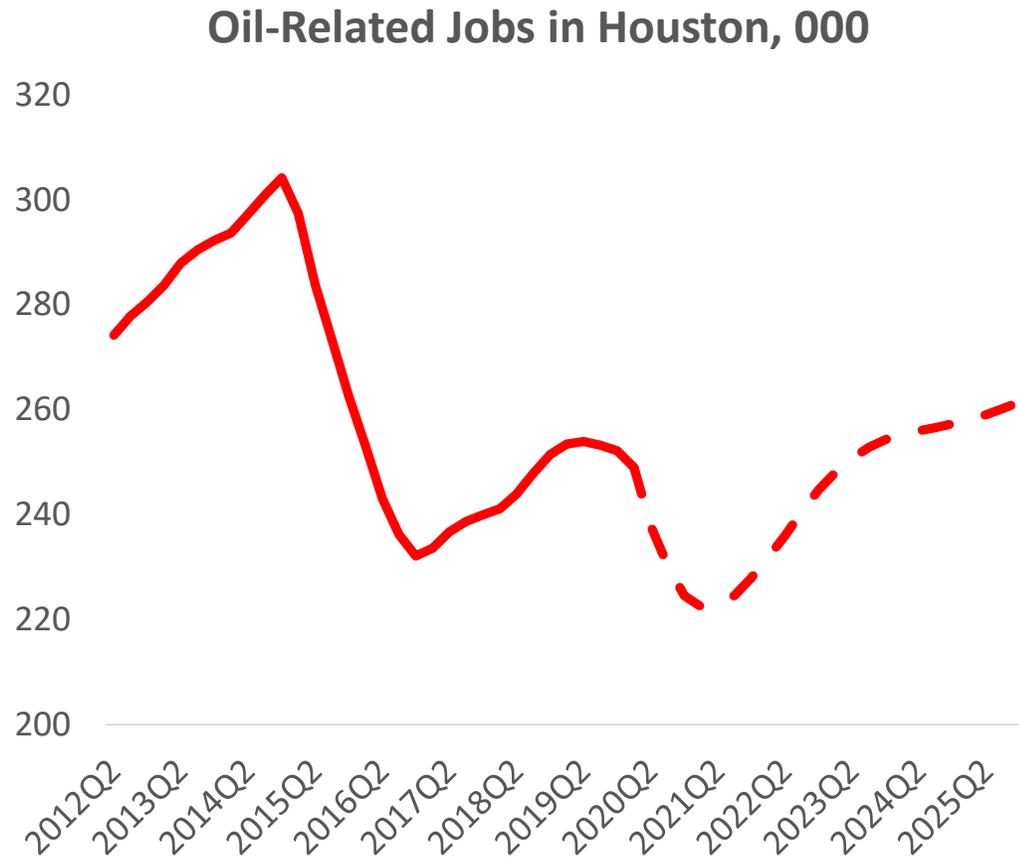
We Had Our 1980's Moment in 2015-16, When We Lost 77,300 Jobs to the Fracking Bust (Houston Oil Jobs in Boom and Bust)



- The 2015-16 Fracking Bust was a speculative bubble that burst, and initially looked much like the early 1980's
- We saw oil prices fall from \$100 to \$30 in 2015-16; the rig count fell from 2000 to 400; local upstream job losses were 77,300.
- *Only 18,700 of those Houston oil jobs returned by 2019Q4*
- With a new downturn. the rig count fell 25% in 2019, and Houston oil jobs fell by 5,000 in the first quarter of this year
- The industry is lean as we enter this downturn, with few speculative excesses to wring out.

*Texas Workforce Commission estimates. Oil-Related Jobs = Oil Producers and Services, Machinery, and Fabricated Metal

Houston Already Lost 5,000 Oil-Related Jobs Since 2019Q2, Now Loses Another 26,500



-- There are parallels to what happened to total U.S. and Houston jobs because of the virus

-- The stay-home orders and social distancing caused demand for oil to evaporate and created an enormous glut that is felt until later this year

-- By fall, the fundamentals of the oil market should begin to be felt again

-- The fundamentals for oil are not yet all that welcoming, however, as we assume oil prices linger near \$40 per barrel through much of 2021

-- The U.S. economy and the global economy recovery begins from low levels

-- Oil prices near \$40 per barrel are likely into 2021, and if they should improve, U.S. capital spending will still be limited by continued industry-wide balance sheet repair

-- Expect short-term oil-related losses of 31,500 jobs in Houston, with no recovery before 2022 when prices return to near \$60-\$65 per barrel

Factors that Drive Houston's Job Growth Since 1990

<i>Houston Drivers (%/year)</i>	2.0%
--U.S. Growth	1.2%
--Oil	0.6%
--Trend	0.2%
<i>U.S. Job Growth</i>	1.2%
<i>Houston w/o oil</i>	1.4%
<i>Current Payrolls in Houston</i>	3,200,000
<i>Payrolls w/o oil since 1990?</i>	2,800,000

Lesson? Oil brings both fast growth and volatility to Houston's economy. Diversification is a formula for slow growth. Should we just learn to fasten our seatbelt?

What About Houston?

- *Pull it all together for Houston's job growth?*
 - U.S./Houston recession begins in 2020Q2
 - Oil prices fall to \$40 per barrel for 6-8 quarters from 2020Q2 to 2022Q2
 - Double recovery as recession ends in 2021Q1 and oil price is back at \$60-\$65 in 2022Q3
 - The deeper and longer the downturn, the faster and longer the recovery
- *Important assumptions?*
 - Monetary and fiscal policy can really fill the stay-home and social distancing employment gap left by COVID-19
 - There is not permanent damage to the American oil industry due to the long period of oil prices at or below \$40 per barrel
 - Houston's economy slowly returns to its long-run annual growth rate for payroll employment growth of 2.0 percent

After the Troubles?: A Nice Recovery in Houston's Payroll Employment

Year	Annual Net New Jobs (000)	% Growth Q4/Q4	
2018	82.9	2.7	
2019	57.7	1.9	A sub-par year as oil disappoints
2020	-83.2	-2.6	Recession/Oil (-58,200) plus soc. dist.(-25,000 in Q4)
2021	40.5	2.3	No effects of virus remain, recovery from U.S. recession
2022	103.5	3.3	Oil price returns to \$60-\$65, joins national recovery
2023	92.5	2.9	Economy still looking to get back to long-run trend
2024	81.9	2.5	Houston payrolls slowing toward trend rates
2025	78.6	2.3	
2026	79.6	2.3	
<i>Avg.</i> 2020-26	56.1	1.7	Houston's long-term growth has been about 2.1 percent

Outlook for Houston's Residential Real Estate

- *Single-family housing*
 - Interest rates are down, but employment checks and credit requirements have become much more stringent
 - Stay-home orders make it hard to show a house now. It is no surprise that early data say existing home sales for April may be down 30 to 40 percent
 - New home sales, in contrast, stabilized in early April and have risen week by week. Builders are making deals
- *Multi-family apartments*
 - Apartment Data Services shows April Class A rents are down \$22 per month or 1.4 percent, with only 173 net units absorbed for the month
 - After the Great Recession, the Fracking Bust, and Harvey move-ins and move-outs, the bumpy ride continues for apartments in 2020

Outlook for Houston's Commercial Real Estate

- *Retail*

- Retail stands at the center of the storm for social distancing and stay-home orders. How many stores will not reopen? How many landlords are left without tenants and rents?
- Malls were already badly hurt before the virus, and they are joined by big boxes and restaurant chains in using Chapter 11 to fend off creditors and shed locations

- *Office*

- Local office space never recovered from building 18.6 million square feet in 2015-16 and absorbing only 3.6 million
- The current vacancy rate of 21.5 percent can only get worse with local recession and a collapse in oil prices

- *Industrial*

- A healthy warehouse market was deteriorating badly in late 2019, with vacancy and availability rising rapidly, and 18 million square feet of construction in the pipeline
- This is the only sector to find some advantage in the virus, as warehouse operations have become more essential, with growing e-commerce needs, supply chain diversification, and less reliance on foreign suppliers. It still swims upstream against recession and low oil prices

Summary and Conclusions

- This will be a longer and harder downturn than many initially thought, both for the U.S. economy and oil markets
- The next couple of quarters will see depression-era statistics, with initial claims for unemployment already at 30 million for the U.S. and past 250,000 for Houston. Houston's unemployment rate should surpass 10% this month. The numbers turn around quickly as people return to work and social distancing ends
- We could end 2020 in Houston with a Q4/Q4 loss of about 83,200 jobs: 58,200 to recession and oil and 25,000 to continued social distancing through the fourth quarter
- Low oil prices bring a loss of 31,500 oil-related jobs in Houston that don't return before 2022 or as oil prices again rise toward \$60-\$65/b
- Recovery from U.S. recession comes in early 2021, later joined by higher oil prices in 2022. Houston's economy follows in early 2021, and joined by higher oil prices recovers very rapidly before slowly falling back to its strong historic growth path
- Risks to the outlook are high all around. On the positive side, a miracle drug or new treatment returns life to normal in a matter of weeks. On the negative side, crisis in Europe or elsewhere in the global economy take us all another big step down



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Please visit our website for the slide presentation
www.bauer.uh.edu/irf

**Our fall symposium will be held on Monday,
November 9, 2020 at the Hyatt Regency Hotel.
Registration information will be sent out in mid-
September 2020**

For Houston, The 1980's and 2015-16 Look Alike in Oil-Job Losses, But Not In Total Payrolls

	The 1980's			Fracking Bust		1980's By Month	Fracking Bust By Month
	Oil Jobs	Payrolls		Oil Jobs	Payrolls		
Phase I	-74.6	-147.8	Phase I	-77.3	-8.2	Mar 82 -Dec 83	Dec 14-Dec 16
Interim	4.7	45.0	Interim	22.2	220.7	Dec 83-Nov 84	Dec 16-Apr 19
Phase II	-52.7	-108.2	Phase II	-31.1	-89.0	Nov 84-Mar 87	Apr 19-Feb 21
Jobs Lost*	-122.6	-211.0	Change	-86.2	123.5	Mar 82-Mar 87	Dec 14-Feb 21

*This is jobs lost from the peak (March 82, December 2014) to trough (Mar 87, Feb 21)