



TEXAS

“Texas' economy stayed on the path to recovery, but momentum slowed to start the year. On top of data revisions revealing steeper job losses in 2020 than initially estimated, employment growth decelerated in January as COVID-19 cases and initial jobless claims spiked after the holidays. **Hiring continued in the service-providing, construction, and retail sectors, but manufacturing payrolls contracted.** The state's housing market remained healthy with robust demand, upward-trending construction levels, and low foreclosure rates despite high delinquency amid federal protection policies. Additionally, energy prices and export values rose, suggesting better trade conditions. Although extreme winter weather in February put a damper on overall activity, the shock should be temporary. **Improvement should resume in March with the third fiscal stimulus package approved and ongoing vaccine distribution.”** - Mar 2021 - Outlook for the Texas Economy - Real Estate Research Center - TAMU

AUSTIN

“The Austin economy continued to expand in February, albeit at a slower pace. The Austin Business-Cycle Index grew at a moderate clip. **While jobs were added at a healthy pace, the unemployment rate increased slightly.** COVID-19 hospitalizations declined further since peaking in mid-January, and regional consumer spending has been strong. Existing-home sales weakened sharply in February, likely impacted by Winter Storm Uri.” - Apr 2021 - Austin Economic Indicators - Dallas Fed

UNITED STATES

“February data were broadly weak, dragged down by unusually adverse weather. Payroll data suggest a strong rebound in March.

Spending on business equipment dropped in February. Shipments of nondefense capital goods ex-aircraft fell 1%. They were still up 8% over the year.

Housing activity faltered in February. House starts fell 10%, with multi-family starts down more than single-family starts.

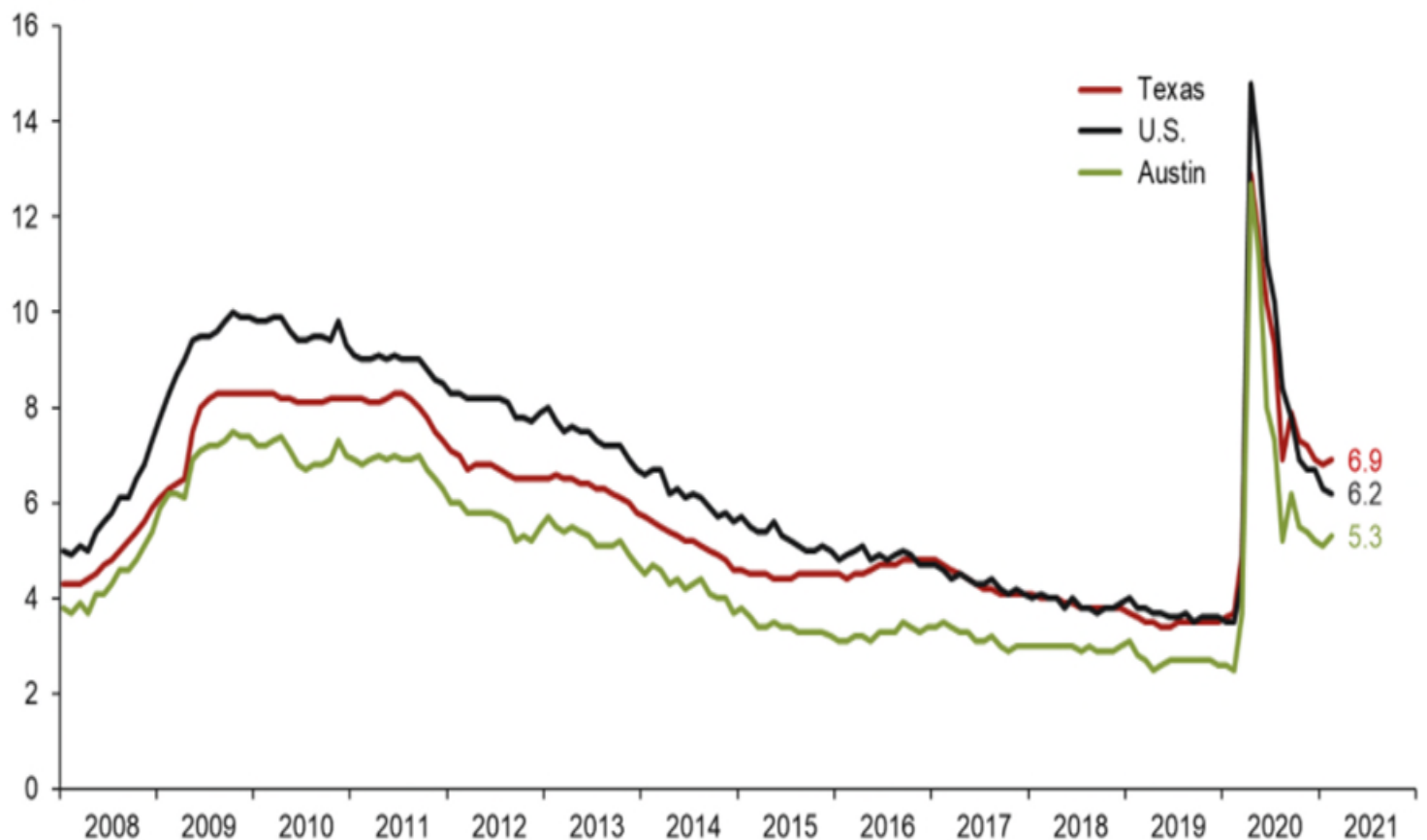
Labor market conditions improved in March, with payroll employment rising substantially and the unemployment rate falling.” - April 2021 - U.S. Economy in a Snapshot - NY Fed

JOBS - UNEMPLOYMENT RATES – AUSTIN MSA, TEXAS, U.S.

“Austin’s unemployment rate ticked up to 5.3 percent in February from 5.1 percent in January. This is well below the state’s jobless rate of 6.9 percent and the nation’s 6.2 percent.” – Apr 2021 – Austin Economic Indicators – Dallas Fed

Unemployment Rate

Percent*



*Seasonally adjusted.

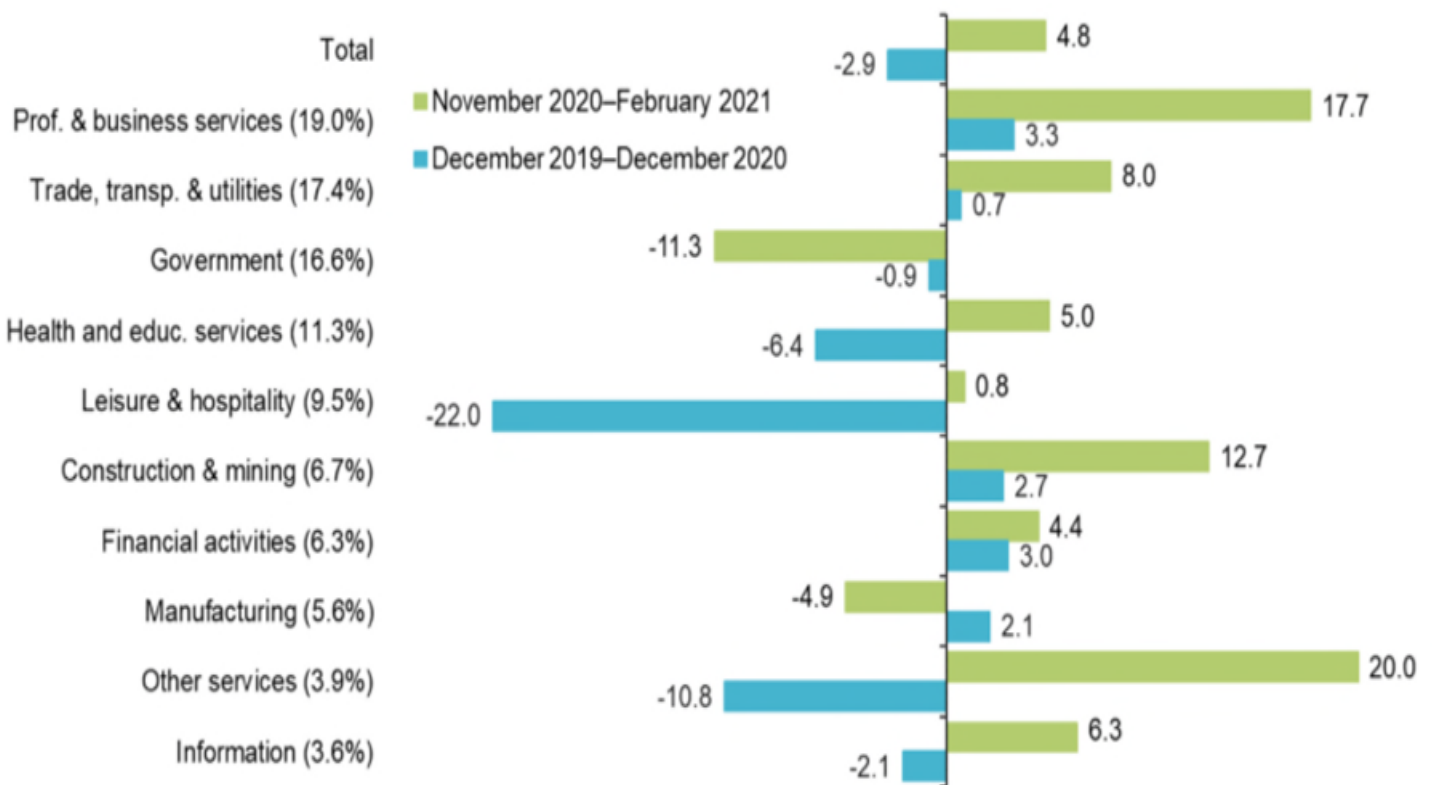
SOURCE: Bureau of Labor Statistics.

Provided by Federal Reserve of Dallas – Austin Economic Indicators – Apr 2021

JOBS – EMPLOYMENT GROWTH RATE – AUSTIN

“Austin payrolls grew an annualized 4.8 percent, or by 12,915 net jobs, in the three months ending in February. The ‘other services’ sector led the job expansion (20.0 percent, or 9,145 jobs), followed by professional and business services (17.7 percent, or 8,390 jobs) and construction and mining (12.7 percent, or 2,180 jobs). Two sectors declined—government (-11.3 percent, or 5,585 jobs) and manufacturing (-4.9 percent, or 800 jobs). As of February, 76.3 percent of the 135,520 jobs lost at the onset of the pandemic in March and April of last year have been recovered.” – Apr 2021 – Austin Economic Indicators – Dallas Fed

Employment Growth



NOTE: Data show seasonally adjusted and annualized percentage employment growth by industry. Numbers in parentheses represent the share of total employment and may not sum to 100 due to rounding.

SOURCE: Bureau of Labor Statistics; Texas Workforce Commission; adjustments by the Dallas Fed.

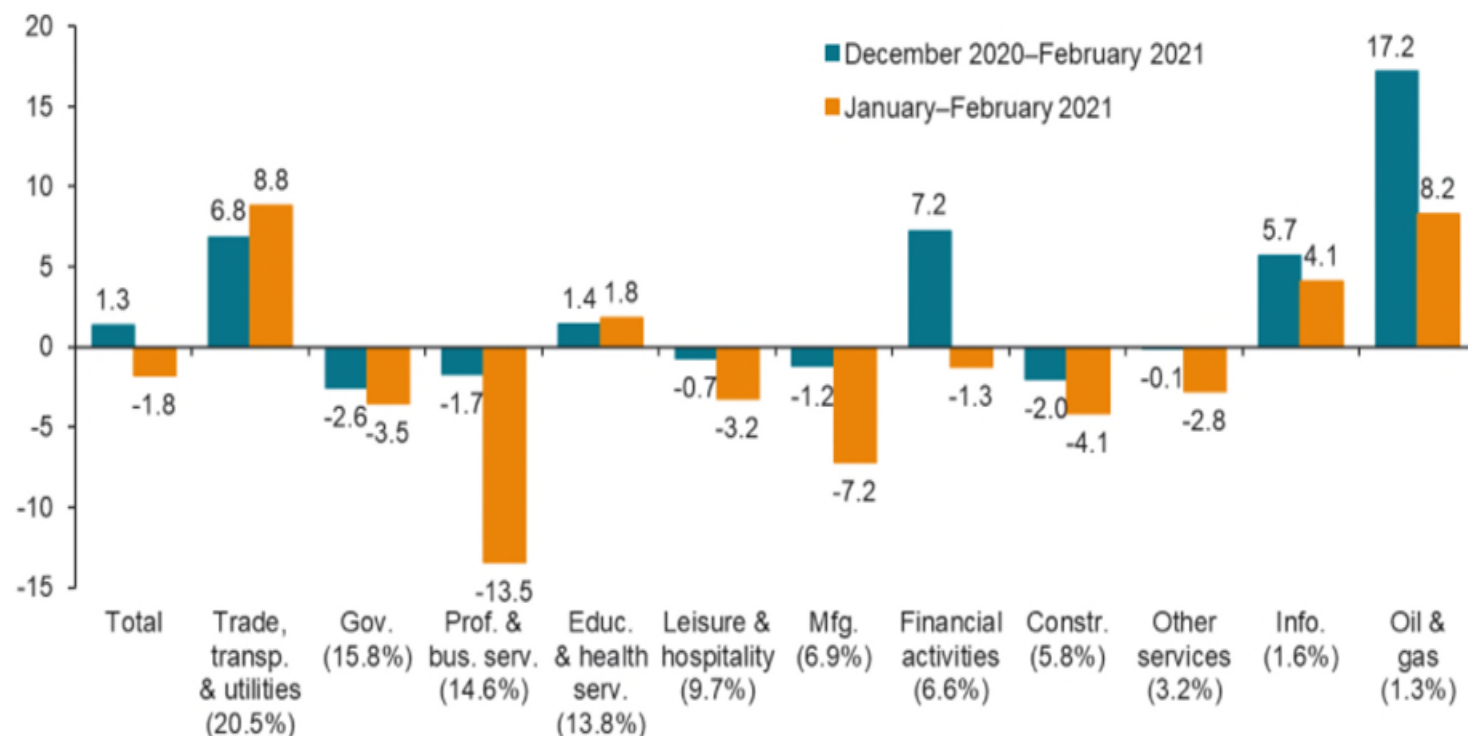
Provided by Federal Reserve of Dallas – Austin Economic Indicators – Apr 2021

JOBS – EMPLOYMENT GROWTH RATE – TEXAS

“Texas employment fell an annualized 1.8 percent in February after climbing an upwardly revised 4.5 percent in January. The February decline occurred due to Winter Storm Uri, which nearly shut down activity in the state for about a week. February marks the first month of employment declines since the onset of the pandemic in March and April last year. Despite the contraction, February employment remains above year-end 2020 levels. While payrolls dipped in many sectors, oil and gas and trade, transportation and utilities both added jobs at a rate of over 8 percent. Information and education and health services jobs climbed 4.1 and 1.8 percent, respectively. Since December, growth has been strongest in the oil and gas sector, which has expanded 17.2 percent.” – Mar 2021 – Texas Economic Indicators – Dallas Fed

Employment by Sector

Percent change*



*Seasonally adjusted, annualized rate.

NOTE: Numbers in parentheses represent the share of total employment in February 2021.

SOURCE: Bureau of Labor Statistics; Texas Workforce Commission; adjustments by the Dallas Fed.

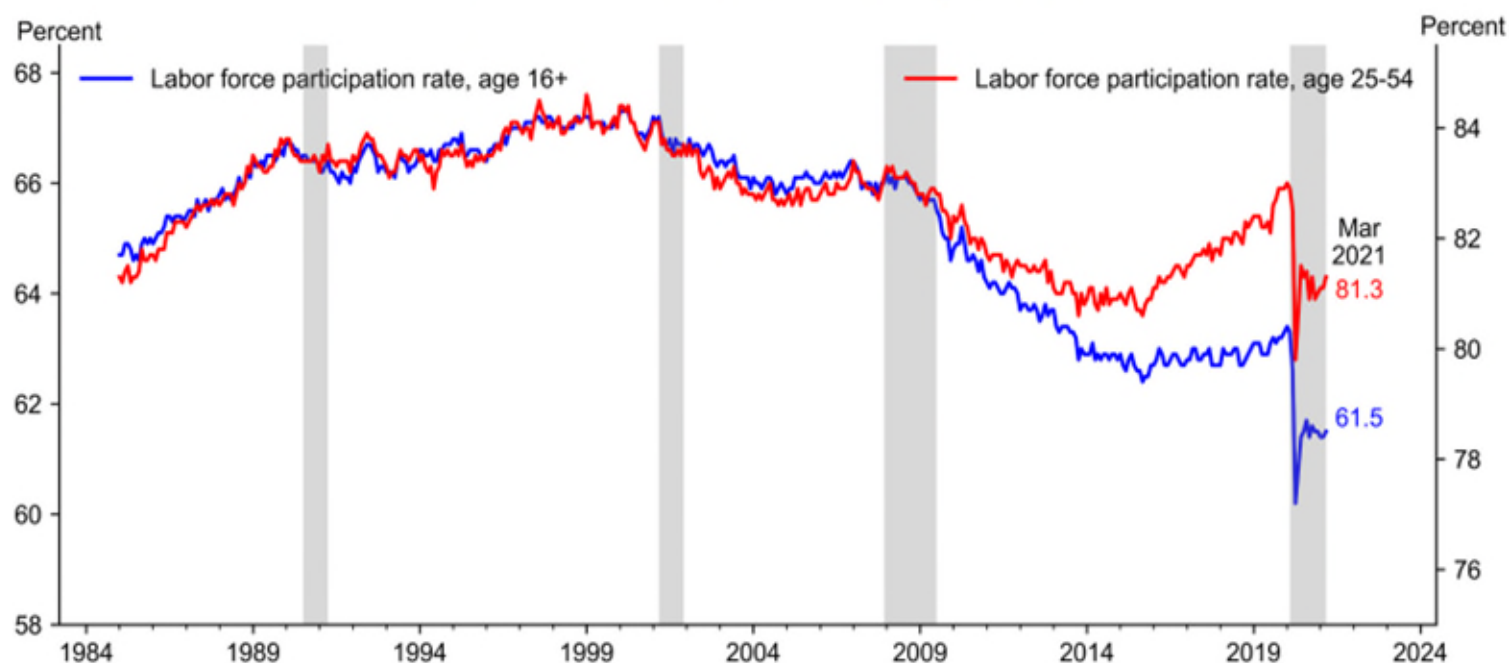
JOBS – LABOR PARTICIPATION RATE IN THE U.S.

“The labor force participation rate changed little at 61.5 percent in March. This measure is 1.8 percentage points lower than in February 2020. The employment-population ratio, at 57.8 percent, was up by 0.2 percentage point over the month but is 3.3 percentage points lower than in February 2020.

The number of persons employed part time for economic reasons, at 5.8 million, changed little in March but is 1.4 million higher than in February 2020. These individuals, who would have preferred full-time employment, were working part time because their hours had been reduced or they were unable to find full-time jobs.

The number of persons not in the labor force who currently want a job was about unchanged at 6.9 million in March but is up by 1.8 million since February 2020. These individuals were not counted as unemployed because they were not actively looking for work during the last 4 weeks or were unavailable to take a job.” – April 2021 – News Release – Bureau of Labor Statistics

Labor Force Participation



SOURCES: Bureau of Labor Statistics.

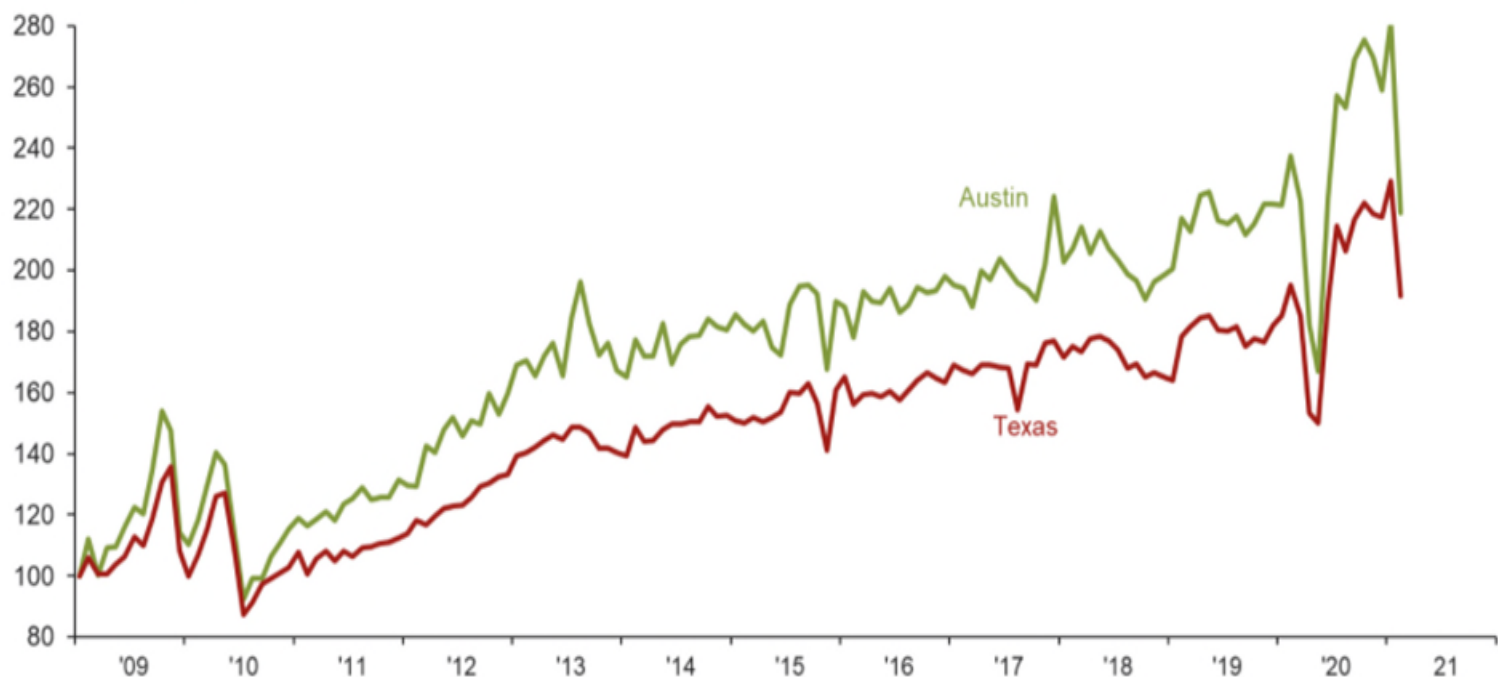
Provided by Federal Reserve of Dallas – U.S. Economy Charts – Apr 2021

HOUSING – EXISTING HOME SALES – AUSTIN MSA

“Total Texas housing sales plummeted 16.1 percent in February as Winter Storm Uri swept across the state, causing widespread power and water outages. Before the freeze, however, sales were at record levels and should rebound in March as indicated by the Texas Real Estate Research Center's single-family sales forecast. The number of new homes added to the Multiple Listings Service (MLS) was also negatively affected by the wintry weather, exacerbating the limited supply issue. Building permits and housing starts decreased on a monthly basis but remained elevated overall, which bodes well for construction activity this year. Additionally, improved economic growth and inflation expectations contributed to rising mortgage interest rates, the continuation of which may slow the current breakneck pace of sales. Depleted inventory is the greatest challenge to Texas' housing market, assuming the pandemic remains contained.” – Apr 2021 – Texas Housing Insight

Existing-Home Sales

Index, January 2009 = 100*



*Seasonally adjusted.

NOTE: Data measure sales of residential units (single family, condominiums and townhomes).

SOURCE: Multiple Listing Service; Real Estate Center at Texas A&M University; adjustments by the Dallas Fed.

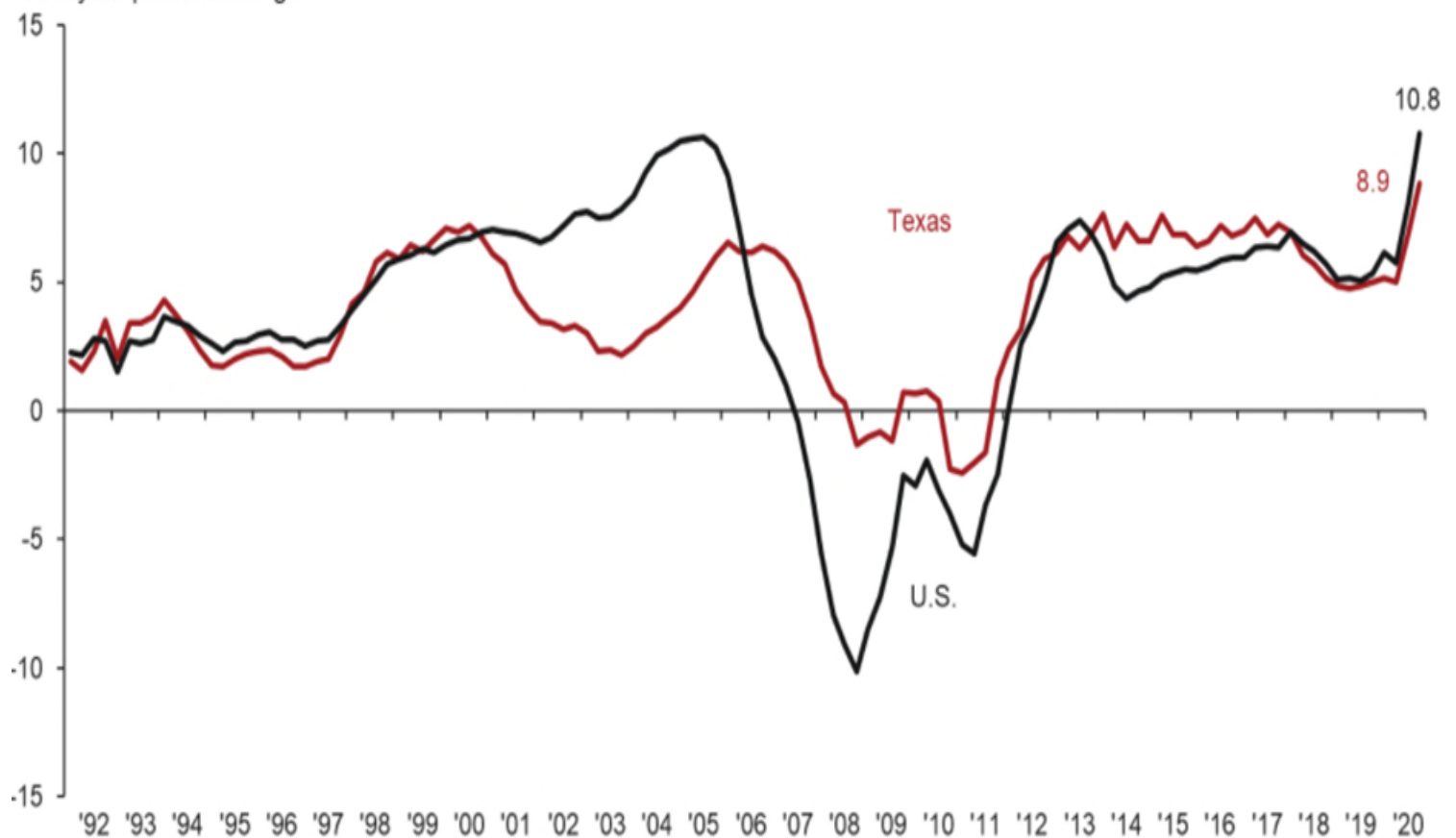
Provided by Federal Reserve of Dallas – Austin Economic Indicators – Apr 2021

HOUSING PRICES – TEXAS and U.S.

“With the onset of the COVID-19 pandemic, the demand for housing soared as inventories remained tight. As a result, home prices saw robust growth last year. **Year over year in the fourth quarter, U.S. and Texas home prices grew at record-high rates, surpassing the annual rates seen during the housing boom.** Near-term demand is expected to remain solid, which, along with tight inventories and rising material costs, suggests that state and U.S. home prices will likely continue to see rapid increases.” – Mar 2021 – Texas Economic Indicators

Home Prices

Year/year percent change*



*Seasonally adjusted.

SOURCE: Federal Housing Finance Agency.

Provided by Federal Reserve of Dallas – Texas Economic Indicators – Mar 2021

TEXAS QUARTERLY APARTMENT REPORT

The graph below was included in the Texas Quarterly Apartment Report prepared by the Texas Real Estate Research Center in April 2021.

“Actual vacancy in Austin continued its trend upward to 10.4 percent in 4Q2020. Effective rent growth proceeded to decline to -2.6 percent in the overall Austin apartment sector. Additional data provided by Real Page Inc. show that 96.5 percent of multifamily renters made full or partial rent payments in 4Q2020, which is 2.4 percent higher than the national average. This suggests that regardless of the increase in vacancy, Austin is still outperforming other markets across the United States.”



“[U]nits under construction declined further in 4Q2020 as vacancy rates continued to trend upward and effective rent growth continued to diminish. This trend may carry on in the future as, according to the U.S. Bureau of Census, Austin dropped from second to seventh in the United States for number of 5+ multifamily unit building permits submitted from 3Q2020 to 4Q2020.” – Texas Quarterly Apartment Report

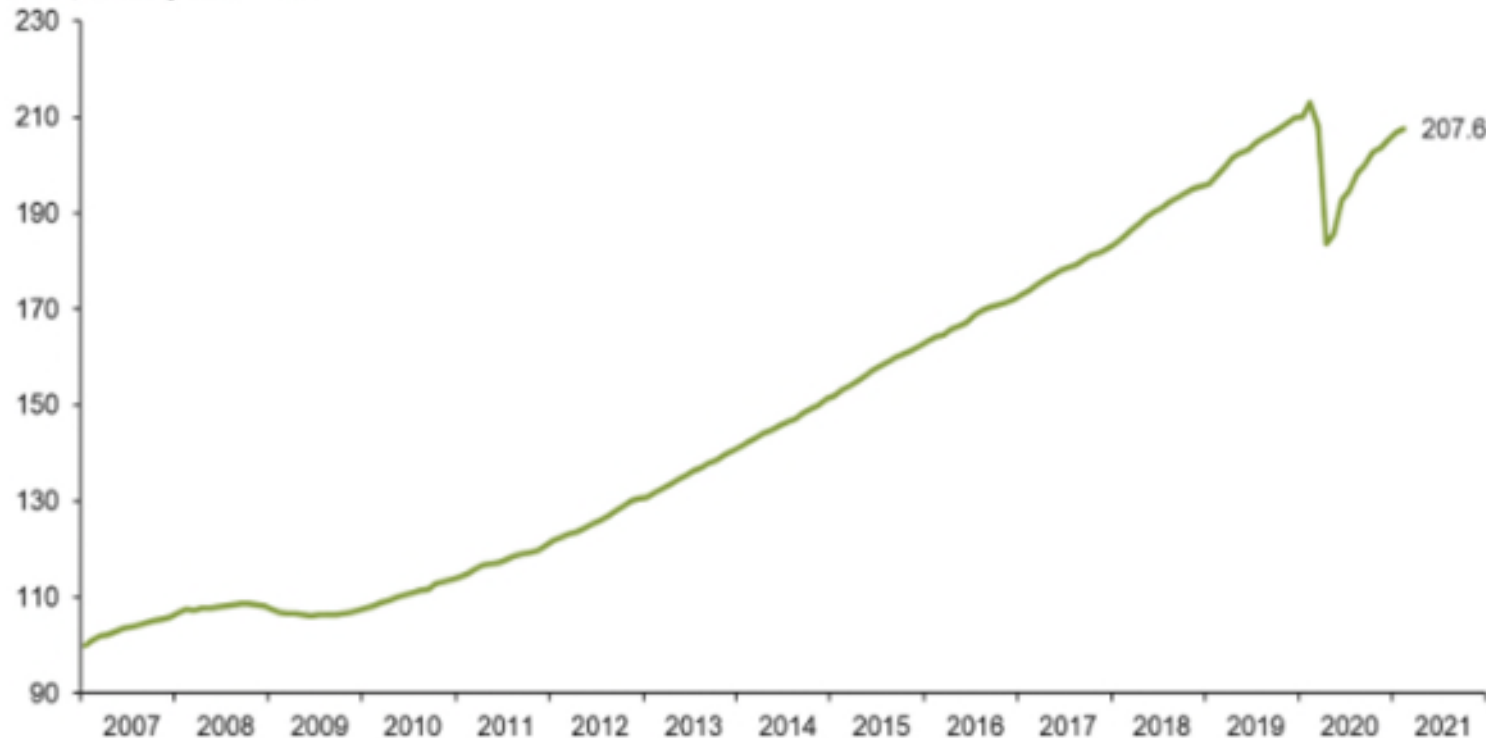
Class A properties represent highest quality apartments. “They are usually less than 10 years old and are often new, upscale apartment buildings. Average rents are high, and they are generally located in desirable geographic areas.” – multifamilypro.com

BUSINESS CYCLE INDEX – AUSTIN MSA

“The Austin Business-Cycle Index – a broad measure of economic activity – expanded an annualized 4.9 percent in February, lower than the 9.2 percent in January and 9.8 percent in December. **This marked the 10th consecutive month of growth, which suggests a continued but slowing recovery in the Austin economy.**” – Jan 2021 – Austin Economic Indicators – Dallas Fed

Austin Business-Cycle Index

Index, January 2007 = 100



SOURCE: Dallas Fed.

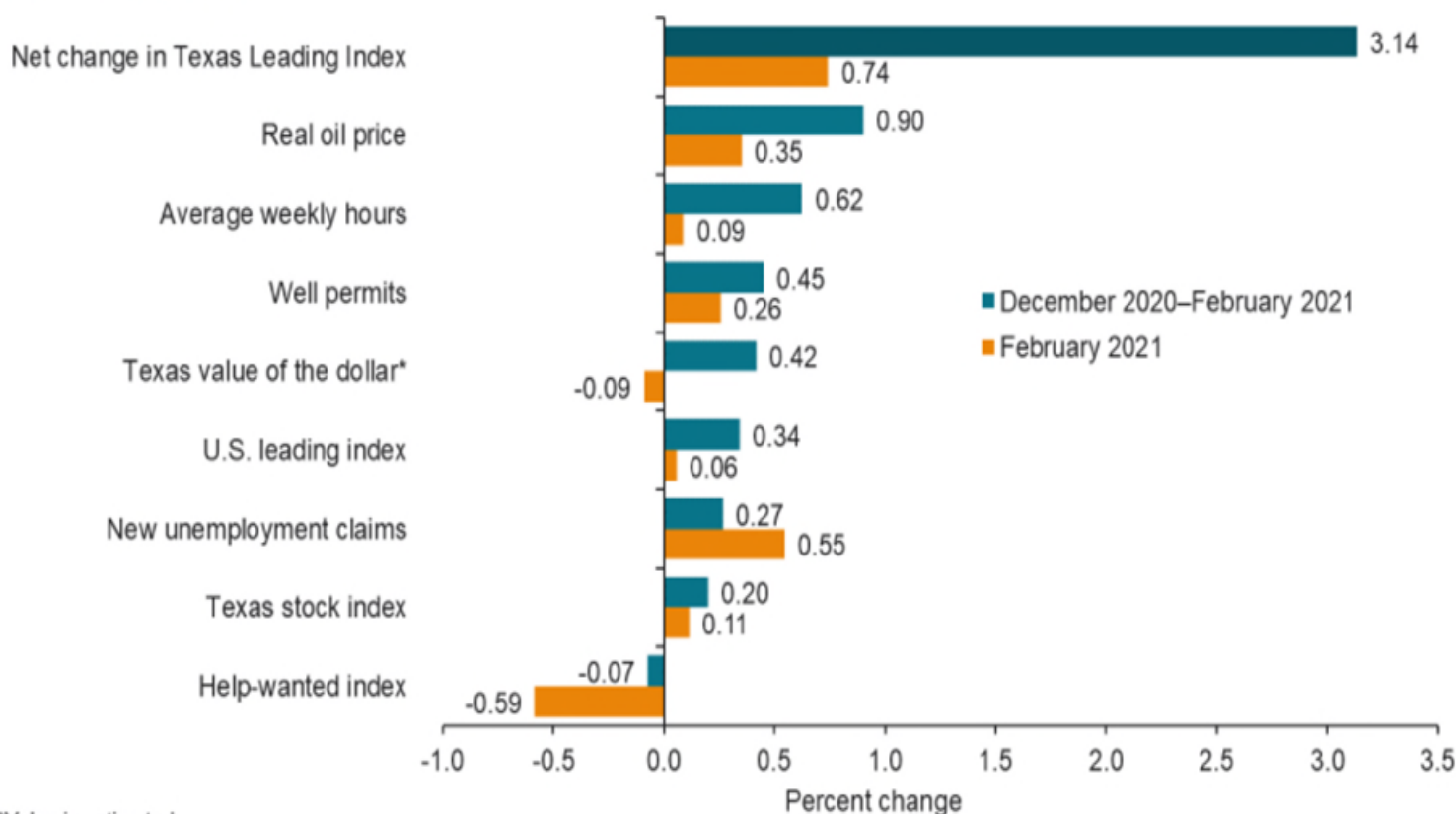
Provided by Federal Reserve of Dallas – Austin Economic Indicators – Apr 2021

Business Cycle Indexes are meant to reflect broad movements in local economic conditions. The Dallas Fed states that “the [local area] indexes are constructed based on the aggregated movements in the local area unemployment rate, nonagricultural employment, inflation-adjusted wages, and inflation-adjusted retail sales. The weights of the components are statistically optimized for each metropolitan area in order to best capture the underlying cyclical movements in the local area economy.”

LEADING INDEX – TEXAS

“The Texas Leading Index sheds light on the future of the state's economy. **February marks the 10th month in a row in which the index has grown, though it remains below the February 2020 prepandemic level.** This February, growth in the index was driven by a decline in new unemployment claims, an increase in real oil prices and an increase in well permits. Monthly growth in the leading index was hampered by the change in the Texas value of the dollar, as well as the help-wanted index, which was also a net drag on the three-month change in the leading index. All other components have boosted the index over the three-month period. **Growth in the index was robust over the three months ending in February, largely due to rapid expansion in December.** Growth slowed in January and February, though it remained positive.” – Mar 2021 – Texas Economic Indicators – Dallas Fed

Texas Leading Index



*Value is estimated.

NOTE: Data are seasonally adjusted. Shown are the net contributions to the change in the Texas Leading Index.

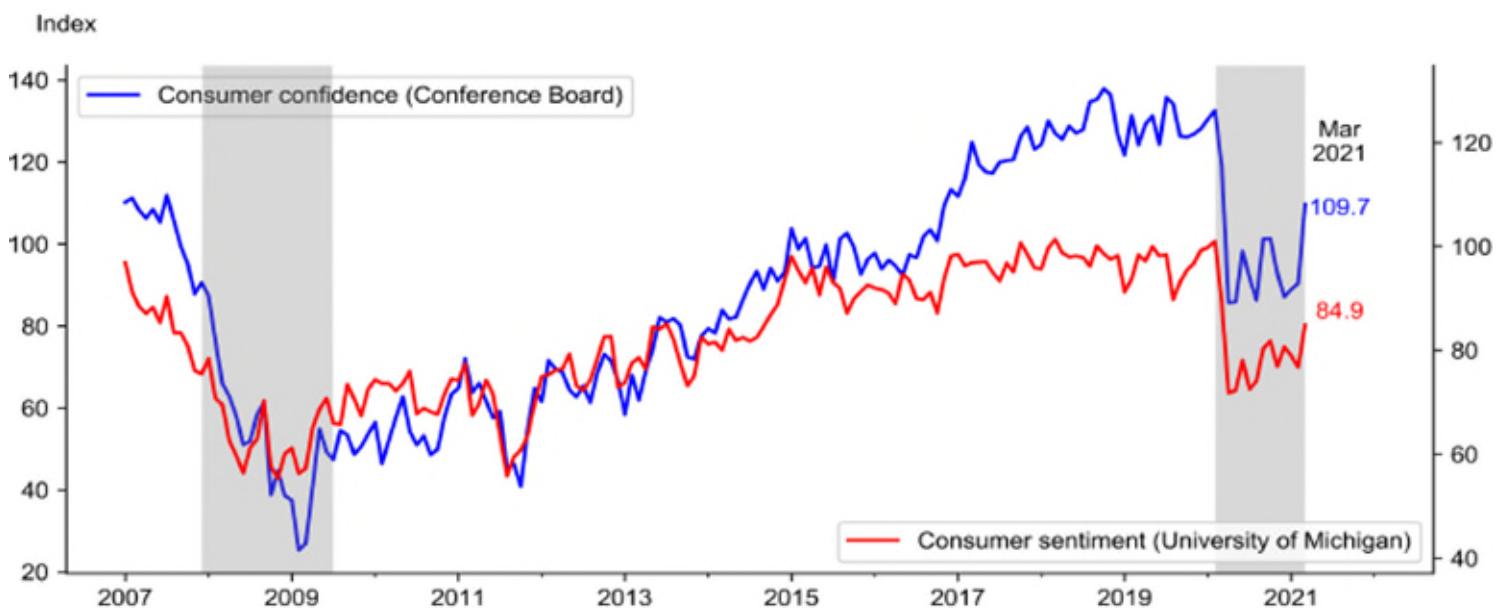
SOURCE: Dallas Fed.

CONSUMER CONFIDENCE AND SENTIMENT – U.S.

“Consumer Confidence increased to its highest level since the onset of the pandemic in March 2020,” said Lynn Franco, Senior Director of Economic Indicators at The Conference Board. “Consumers’ assessment of current conditions and their short-term outlook improved significantly, an indication that **economic growth is likely to strengthen further in the coming months**. Consumers’ renewed optimism boosted their purchasing intentions for homes, autos and several big-ticket items. However, concerns of inflation in the short-term rose, most likely due to rising prices at the pump, and may temper spending intentions in the months ahead.” – Mar 30, 2020 – The Confidence Board

Surveys of Consumers, Chief economist, Richard Curtin, commented **“Consumer sentiment continued to rise in late March, reaching its highest level in a year due to the third disbursement of relief checks and better than anticipated vaccination progress.** As prospects for obtaining vaccination have grown, so too has people's impatience with isolation, as those concerns were voiced by nearly one-third of consumers in March, the highest level in the past year. The majority of consumers reported hearing of recent gains in the national economy, mainly net job gains. **The data clearly point toward robust increases in consumer spending.”**

Consumer Confidence



SOURCES: University of Michigan; The Conference Board.

Provided by Federal Reserve of Dallas – U.S. Economy Charts– Apr 2021

U.S. consumer **confidence** index (CCI) is defined as “**the degree of optimism on the [current] state of the economy** that consumers are expressing through their activities of savings and spending.” – Wikipedia

U.S. consumer **sentiment** is defined as “**the indicator of the future course of the national economy.**” – Investopedia

CREDIT AND DEBIT CARD SPENDING – TRAVIS COUNTY vs. TEXAS

“Except for a dip in late November 2020 and during Winter Storm Uri in mid-February, consumer spending (measured by credit and debit card spending) has surpassed January 2020 levels in Travis County since late July. **As of March 14, 2021, spending in the county that includes Austin was up a strong 31.2 percent relative to January 2020, while spending in Texas was up 4.9 percent.**” – Apr 2021 – Austin Economic Indicators – Dallas Fed

Credit and Debit Card Spending

Percent change relative to January 2020



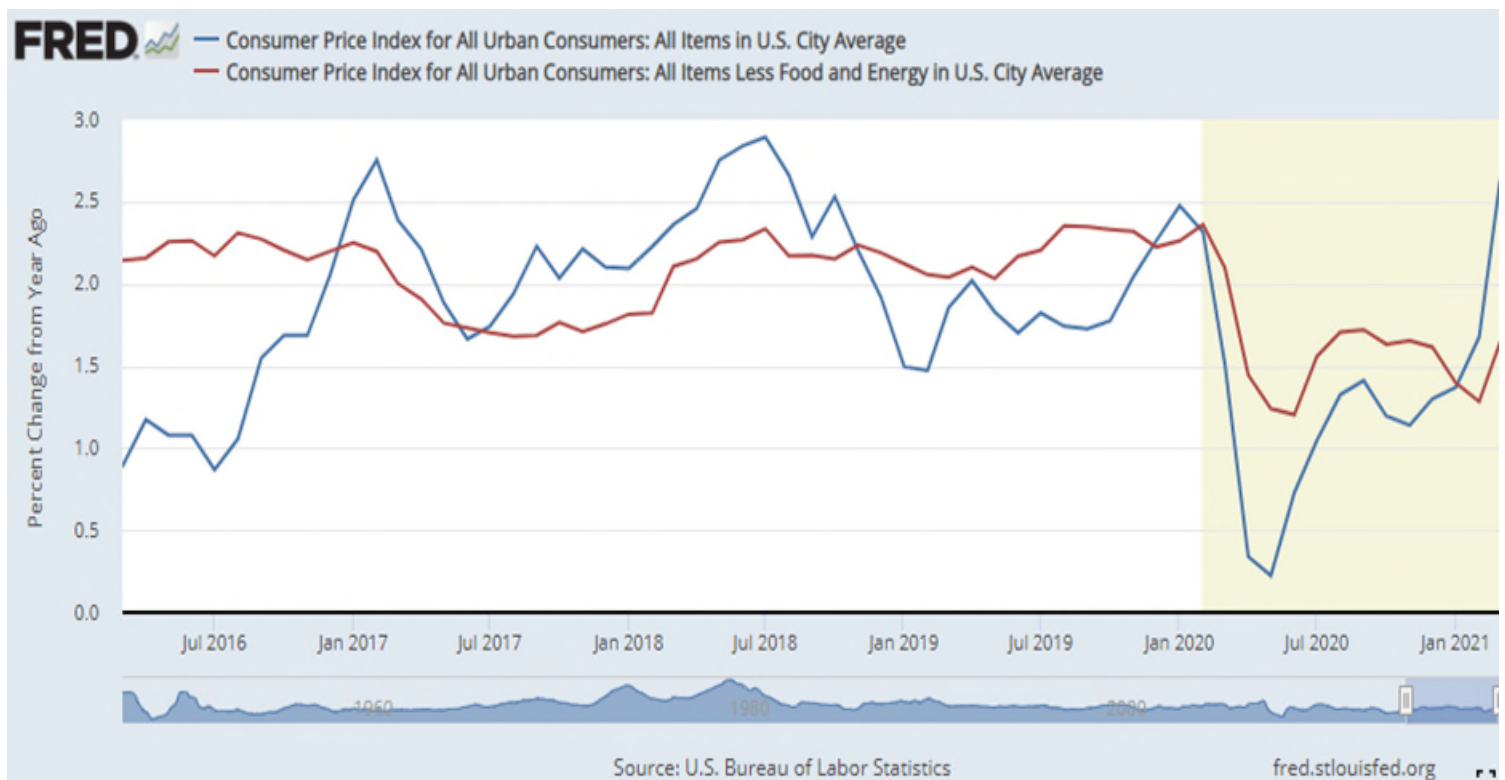
NOTE: Data are daily through March 14, 2021. Travis County includes Austin.
SOURCE: Affinity Solutions.

Provided by Federal Reserve of Dallas – Austin Economic Indicators – Apr 2021

CONSUMER PRICE INDEX

“The all items index rose 2.6 percent for the 12 months ending March, a much larger increase than the 1.7-percent reported for the period ending in February. The index for all items less food and energy rose 1.6 percent over the last 12 months, after increasing 1.3 percent over the 12 month period ending in February. The food index rose 3.5 percent over the last 12 months, while the energy index increased 13.2 percent over that period.” – Apr 2021 – Economic News Release - Bureau of Labor Statistics

Consumer Price Index - 12 Month Percentage Change



Source: Bureau of Labor Statistics, not seasonally adjusted, 1982-84=100 Provided by the St. Louis Fed

According to the Bureau of Labor Statistics (BLS), “There are a variety of CPI numbers generated each month. In the graph above, two numbers are compared. The first is the **Official CPI Number** that is reported to the media. It is the broadest and most comprehensive CPI and is called the **All Items CPI for All Urban Consumers**. The second one is called the **All items less food and energy**.” The BLS mentions that “Some users of CPI data use this index because food and energy prices are relatively volatile, and these users want to focus on what they perceive to be the ‘core’ or ‘underlying’ rate of inflation.”

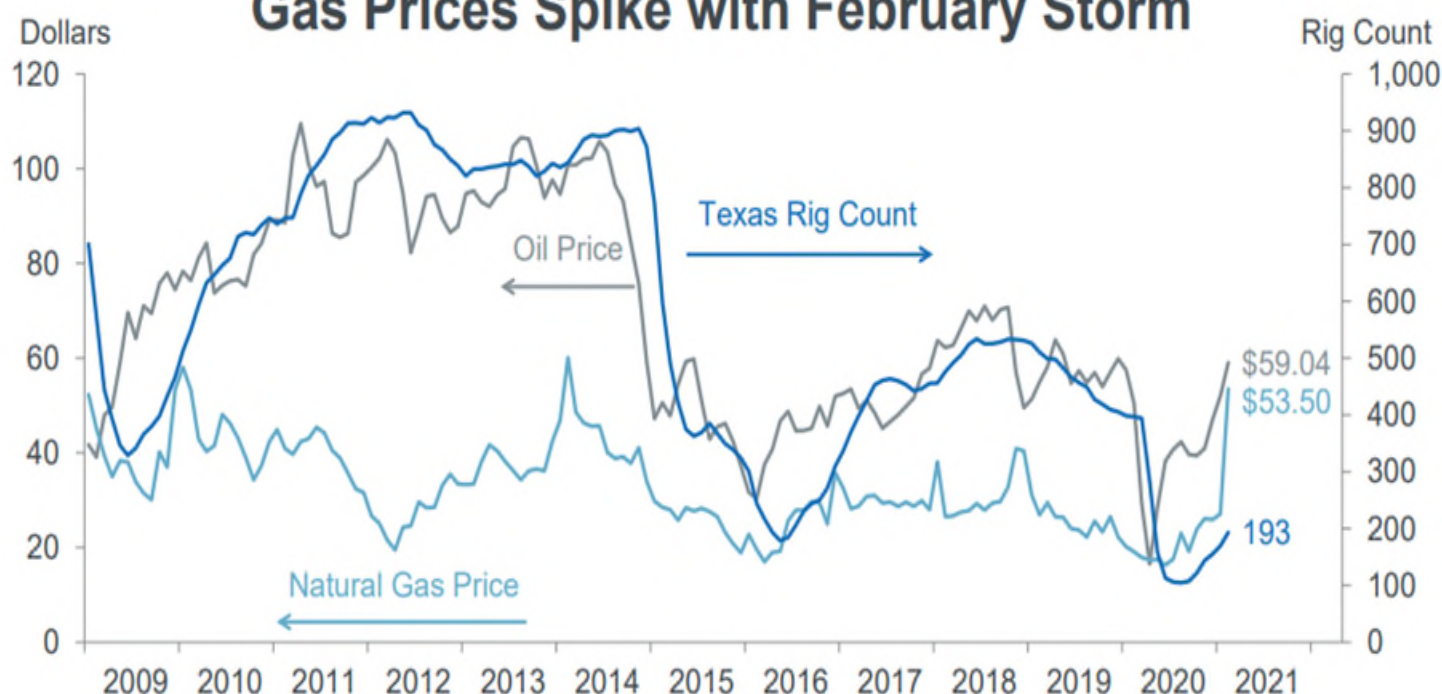
OIL AND NATURAL GAS

“Surging oil prices in February have raised hopes that the worst may be over for oil markets, though recent evidence suggests that the recovery will not last.”

“As it becomes harder for market participants to find crude oil in the spot market, the front-month oil futures price increases, especially with production responses from the U.S. and OPEC+ subdued for the time being.”

“At the same time, the high likelihood of OPEC+ eventually increasing production explains why longer-dated oil futures prices have not increased nearly as much. **There is every reason to suspect that the recent surge in the spot price of oil may prove short-lived, since OPEC+ is unlikely to tolerate price levels that would allow the U.S. shale oil sector to fully recover.**” – Apr 2021 – Oil Market’s Tightening in February Seemingly Defies Fundamentals – Lutz Kilian and Michael D. Plante – Dallas Fed Energy

Drilling Activity Picks up on Energy Price Increases, Natural Gas Prices Spike with February Storm



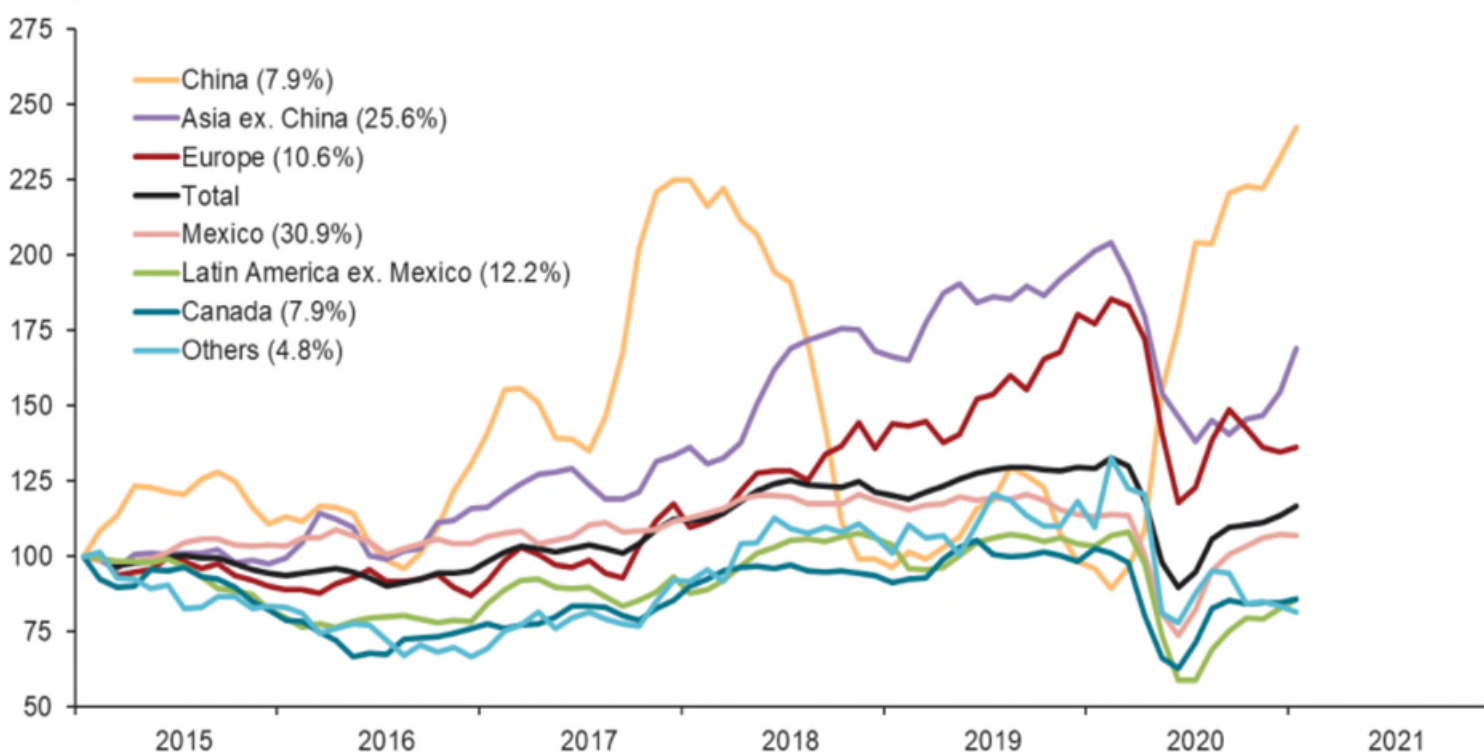
NOTES: Oil price is dollars per barrel. Natural gas series is dollars per million Btu, multiplied by 10. Data through Feb. 2021.
SOURCES: Wall Street Journal; Baker Hughes; U.S. Energy Information Administration.

TEXAS EXPORTS BY REGION

“The three-month moving average of Texas exports climbed for the seventh month in a row in January 2021. The three-month average of Texas exports to China climbed 4.2 percent in January, while exports to the rest of Asia jumped 9.4 percent. Relative to December, Texas export growth strengthened in January in all major regions except Mexico, led by exports to Asia. Outside of Mexico, Texas exports to the rest of Latin America rose 3.9 percent in January. Texas exports outside the major regions dipped in January.” – Mar 2021 – Texas Economic Indicators – Dallas Fed

Texas Exports by Region

Index, 2015 = 100*



*Three-month moving average; real dollars, seasonally adjusted.

NOTE: Numbers in parentheses refer to the share of January 2021 Texas exports.

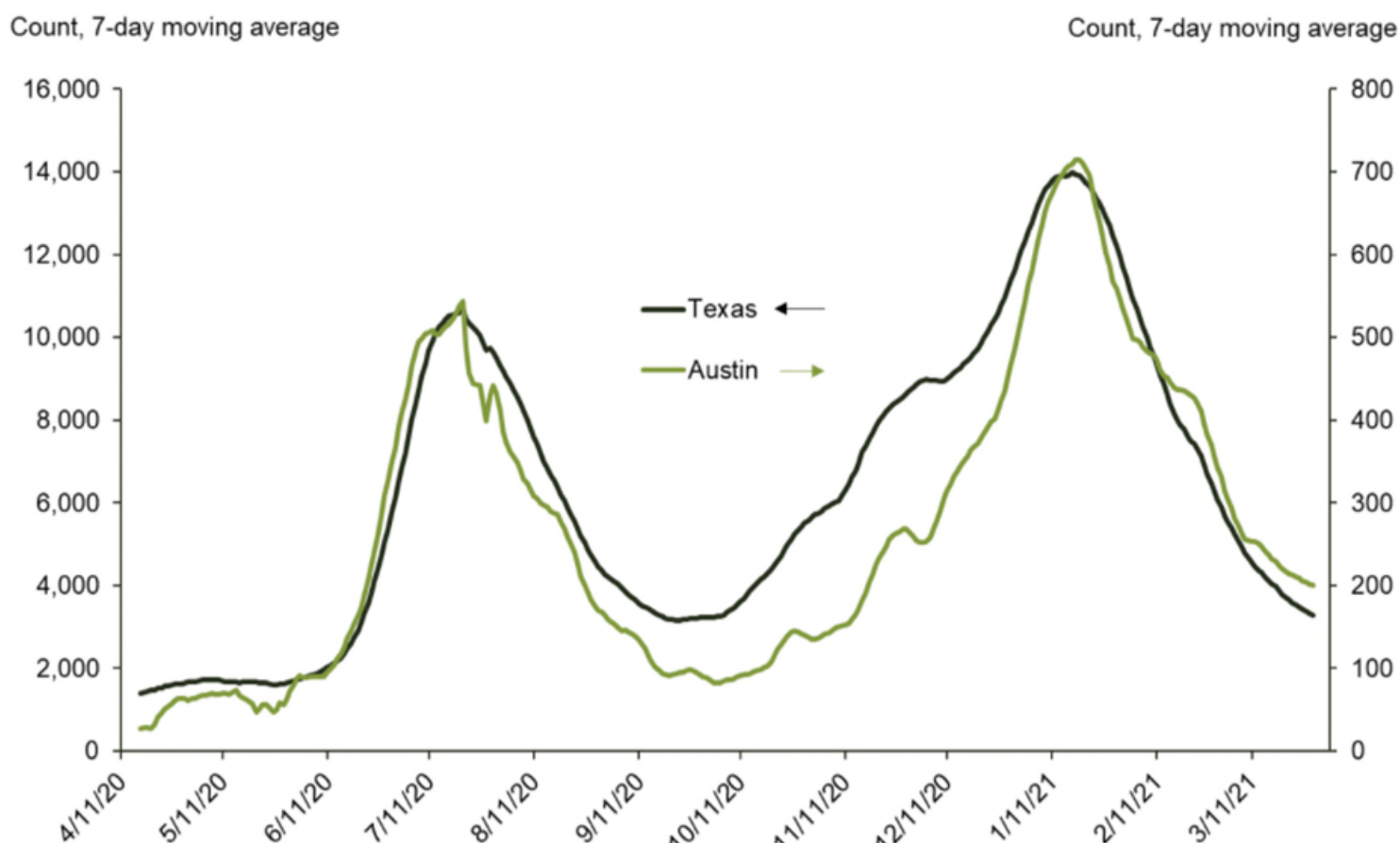
SOURCE: Census Bureau; Bureau of Labor Statistics.

Provided by Federal Reserve of Dallas – Texas Economic Indicators – Mar 2021

COVID-19 HOSPITALIZATIONS

“The number of individuals currently hospitalized with COVID-19 in Austin has trended downward since peaking Jan. 18 at 714. At the state level, the number currently hospitalized peaked Jan. 17 at 13,977. As of March 29, 201 people were hospitalized in Austin and 3,287 in Texas.” – Apr 2021 – Austin Economic Indicators – Dallas Fed

COVID-19 Hospitalizations



NOTE: Data for Austin refer to the area covered by the Austin Trauma Service Area. All data are daily, seven-day moving averages through March 29, 2021.

SOURCE: Texas Department of State Health Services.

TEXAS CONSUMER LOAN DELINQUENCY

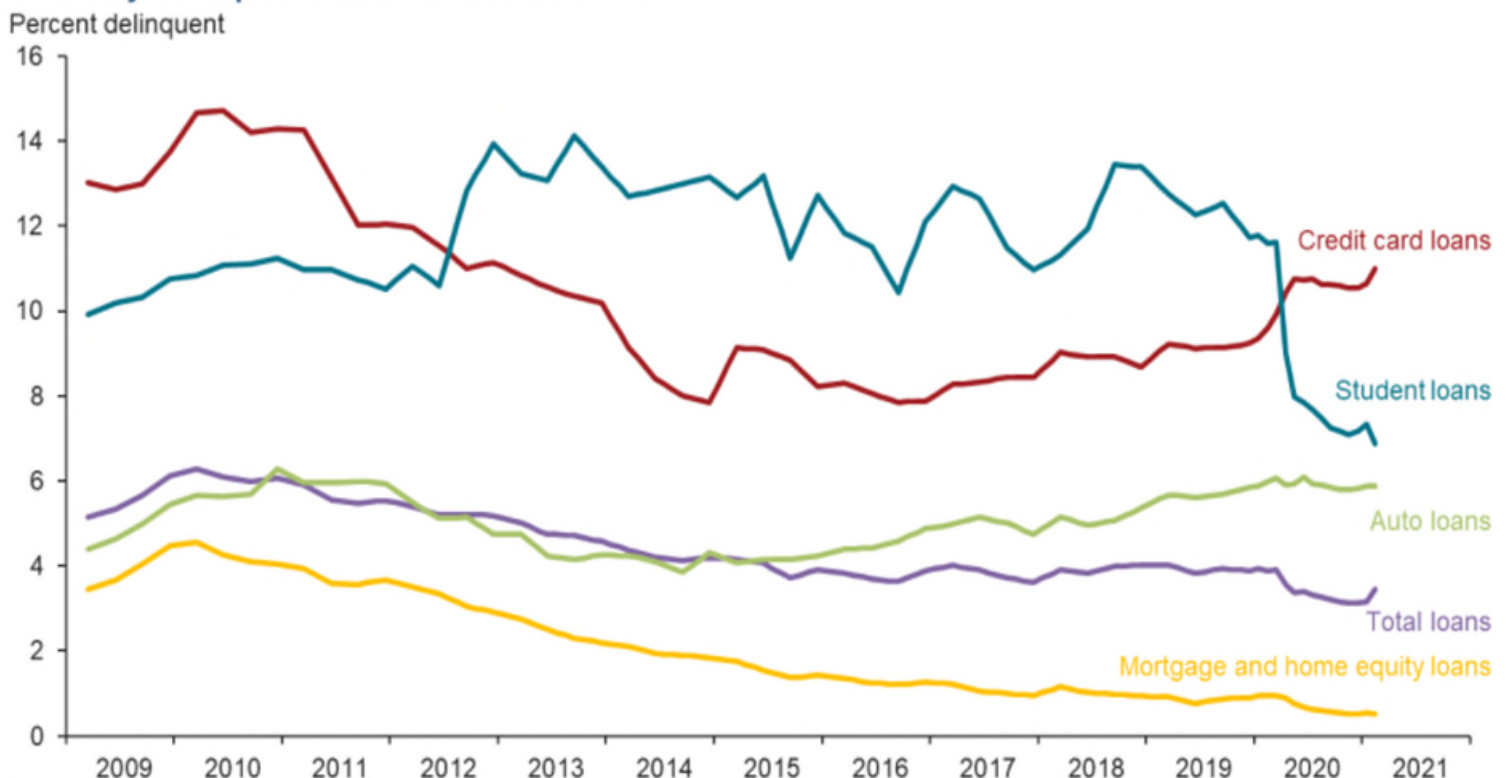
“Despite nonessential business closures for part of 2020 that caused many Texans to lose their jobs, the number of Texans who were 90 or more days late in making loan payments declined throughout last year. This decline was aided by strong fiscal support from the government and a moratorium on student loans and mortgages.

In an analysis of the Survey of Consumer Expectations, the New York Fed reported that **the average household used over one-third of stimulus check payments to pay down debt.**

The strongest decline was in student loan delinquencies, which slipped below credit card delinquencies for the first time since 2012. In late March 2020, federal student loans were put into forbearance, and that pause in payments has been extended through Sept. 30, 2021.

Credit card loan delinquencies have increased during the pandemic and climbed 0.3 percentage points in February.” – Apr 2021 – Texas Economic Indicators – Dallas Fed

Seriously Delinquent Texas Consumer Loans



NOTE: Data are through February 2021. Seriously delinquent loans are loans that are 90-plus days late.

SOURCE: Federal Reserve Bank of New York Consumer Credit Report; Equifax.

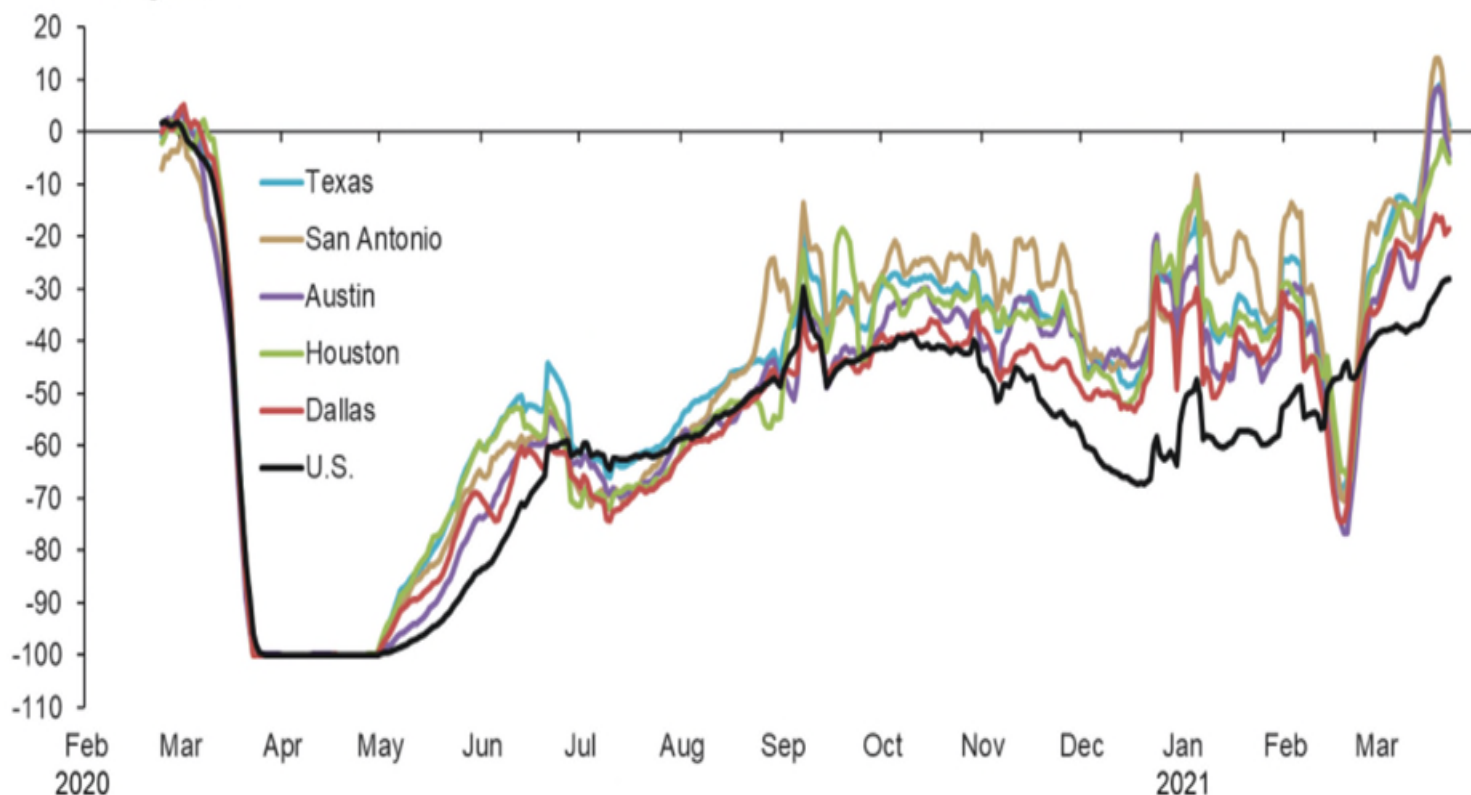
Provided by Federal Reserve of Dallas – Texas Economic Indicators – Apr 2021

DINING OUT

“In mid-February, Winter Storm Uri hit Texas, causing residents across the state to stay home and businesses to temporarily close. As a result, the number of Texans dining at restaurants statewide dropped to its lowest level since late May 2020. Less than a week after the cold snap, restaurant dining recovered to its pre-winter-storm level. **On March 10, Texas lifted its mask mandate and restaurant capacity restrictions, and the state surpassed its prepandemic level for seated restaurant dining a week later.** While the major metros lag behind Texas in the most recent data, San Antonio and Austin jumped in mid-March, possibly because of increased tourism with schools on spring break.” – Mar 2021 – Texas Economic Indicators – Dallas Fed

Dining Out

Percent change from 2019*



*Seven-day moving average.

NOTE: Data are through March 23, 2021. Data refer to the percent change in seated diners from the same day in 2019 at restaurants on the OpenTable network across all channels: online reservations, phone reservations and walk-ins.

SOURCE: OpenTable.

Provided by Federal Reserve of Dallas – Texas Economic Indicators – Mar 2021

U.S. ELECTRICITY GENERATION

ELECTRICITY GENERATION HAS NOT GROWN WITH OUTPUT

“Electricity generation in 2019, before the pandemic, was near that produced in 2007. For comparison, electricity output grew at a 1.75% annual rate in the decade leading up to the Great Recession. Real GDP in 2019 was around 20% higher than it was in 2007.

Flat demand has been fairly broad based. **Electricity generation rose just 1% from 2007 to 2019, with residential usage up 3%, commercial usage up 2%, and industrial usage down 2%.**

Electricity generation and GDP both fell around 3% in 2020.” – Apr 2021 – U.S. Economy in as Snapshot – Federal Reserve – New York

U.S. Electricity Generation

Billions of kilowatt hours, 12-month sum



Source: Energy Information Administration via Haver Analytics.

Provided by Federal Reserve of New York – U.S. Economy in a Snapshot – Apr 2021

U.S. ELECTRICITY GENERATION

THE COMPOSITION OF ENERGY FOR ELECTRICITY HAS CHANGED

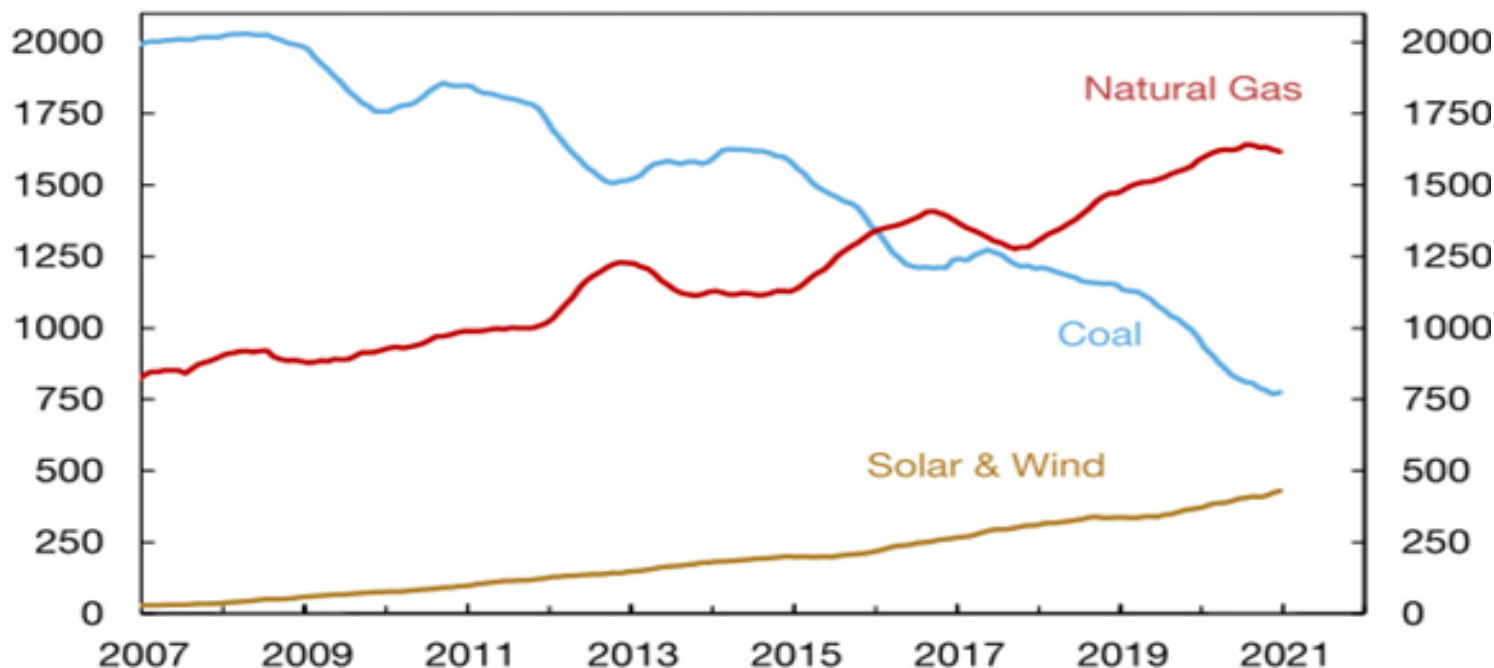
“Coal accounted for roughly half of the energy used to produce electricity in 2007. **Coal's share fell from 48% in 2007 to 19% in 2020.**

Natural gas gained market share at coal's expense. It's share doubled since 2007 to 40%. Nuclear and hydroelectric have maintained their shares.

Wind and solar have increased their market share. **Wind's share rose from 4.7% in 2015 to 8.4% in 2020. Solar's share rose from 0.6% to 2.3%.** Together, these two energy sources have steadily increased their share of generation at a rate of 1 percentage point a year since 2015.” – Apr 2021 – U.S. Economy in as Snapshot – Federal Reserve – New York

Electricity Generation by Source

Billions of kilowatt hours, 12-month sum



Source: Energy Information Administration via Haver Analytics.

IN-DEPTH – NON-FUNGIBLE TOKENS

“If you’ve seen the abbreviation NFT floating around the internet in recent days, you’re not alone. That’s because non-fungible tokens have suddenly become all the rage in the digital space.

Some have been selling for millions of dollars. Some are being released [as] music albums. But what, exactly, is a non-fungible token?” – Mar 2021 – Hacked



This is 'Dragon,' an NFT on CryptoKitties that sold for more than \$900k. | Source: CryptoKitties Provided by Hacked

WHAT IS NON-FUNGIBLE TOKEN (NFT)?

“A non-fungible token (NFT) is a unit of data stored on a digital ledger, called a blockchain, that certifies a digital asset to be unique and therefore not interchangeable. NFTs can be used to represent items such as photos, videos, audio and other types of digital files.

Access to any copy of the original file, however, is not restricted to the buyer of the NFT. While copies of these digital items are available for anyone to obtain, NFTs are tracked on blockchains to provide the owner with a proof of ownership that is separate from copyright.” – Apr 2021 – Wikipedia

Another explanation is that “NFTs are digital art or collectibles that are authenticated or ‘minted’ using blockchain technology and then purchased using cryptocurrencies such as Ethereum. A digital ledger, which anyone can access, tracks who owns a given NFT, and ensures that the NFT can’t be duplicated or tampered with. Owning an NFT does not mean you own the copyright to a given asset, but it does grant you bragging rights.” – Mar 2021 – WSJ

IN-DEPTH – NON-FUNGIBLE TOKENS

WHAT EXACTLY DO YOU GET WHEN ONE BUYS AN NFT?

“When you buy an NFT for potentially as much as an actual house, in most cases you're not purchasing an artwork or even an image file. Instead, **you are buying a little bit of code that references a piece of media located somewhere else on the internet.**” – Mar 2021 – Vice

Another way to look at it, “The underlying thing that you're buying is code that manifests as images,” said Donna Redel, who teaches courses on crypto-digital assets at Fordham Law School. “You're buying a different format of art.”

“But note that **when you buy an NFT, you're usually not getting the copyright or trademark to the item.** And just because you own an NFT doesn't mean there aren't endless other versions of that thing on the Internet. There will be. It's the Internet.

Still, NFT enthusiasts say owning a piece of code in a blockchain has shown itself to be an incredibly valuable thing.” – Mar 2021 – National Public Radio



A work called Nyan Cat by Chris Torres sold for \$590,000 recently. It's part of growing interest in digital assets, known as nonfungible tokens, or NFTs, that are generating millions of dollars in sales every day. Chris Torres

IN-DEPTH – NON-FUNGIBLE TOKENS

EXAMPLES OF NFTs

DIGITAL ART – “Digital art was an early use case for NFTs, because of the ability of blockchain technology to assure the unique signature and ownership of NFTs. Digital artwork entitled ‘Everydays - The First 5000 Days’, by artist Mike Winkelmann, also known as Beeple, sold for US\$69.3 million in 2021.”

GAMES – “NFTs can also be used to represent in-game assets, such as digital plots of land, which are controlled by the user instead of the game developer. NFTs allow assets to be traded on third-party marketplaces without permission from the game developer. In February 2021, Axie Infinity recorded a sale of \$1.5 million for digital land titles in a single sale.”

MUSIC – “Musicians can tokenize their work on blockchains using non-fungible tokens. On March 3, 2021, rock band Kings of Leon announced plans to release the first album as an NFT, by way of their forthcoming release *When You See Yourself*. The NFT went on to generate a reported \$2 million in sales, roughly a quarter of which was donated to charity.” – Apr 21 – Wikipedia



Beeple's work is the most expensive NFT ever sold
Image credit: Christie's

IN-DEPTH – NON-FUNGIBLE TOKENS

EXAMPLES OF NFTs (CONT'D)

FILM – “The motion picture industry has been slower to react to the boom in NFTs, in part owing to the technical challenges of storing digital movies - which are typically very large in size - onto blockchain technology, which is designed for smaller file sizes. On March 13, 2021, Adam Benzine's Oscar-nominated documentary *Claude Lanzmann: Spectres of the Shoah* became the first motion picture, documentary and Academy Award-nominated film to be minted and auctioned as an NFT, via the Rarible platform.” – Apr 21 – Wikipedia

FASHION - “The recent sale of three collaborative NFT sneakers by Rtfkt, a digital design studio and the teenage artist Fewocious, netted \$3.1 million.”

“What’s truly notable, however is that Rtfkt’s shoes can’t be worn. They can’t even be touched or held. At least not yet. These virtual rainbow-colored sneakers were released digitally as NFTs or nonfungible tokens.” – Mar 2021 – WSJ

COLLECTIBLES – “NFTs can represent collectibles like card collections but in a digital format. In February 2021, a LeBron James slam dunk NFT card on the NBA Top Shot platform sold for \$208,000.

In 2020, 125,000 non-fungible token trading cards featuring images from William Shatner's personal life and career from the 1930's to today, were sold in nine minutes on the WAX Blockchain.” – Wikipedia



PHOTO: RTFKT STUDIOS Provided by WSJ

IN-DEPTH – NON-FUNGIBLE TOKENS

EXAMPLES OF NFTs (CONT'D)

SPORTS – “Athletes are starting to take advantage of the NFT boom in various ways. In September 2019, NBA player Spencer Dinwiddie tokenized his contract so that others can invest into it. In addition, Dapper Labs, a blockchain technology-based company, has collaborated with the NBA to create ‘N.B.A Top Shot’, a marketplace for digital highlight clips.” - Wikipedia



Source: NBA Top Shot Provided by CNBC

“The most popular and perhaps most confounding NFT market is NBA Top Shot. It has minted unlikely millionaires and left many scratching their heads as it processed more than \$250 million in sales from 100,000 buyers over the last month alone.

For a generation accustomed to playing daily fantasy sports and gambling on their phones, there is nothing particularly odd about paying exorbitant sums of money for otherwise free NBA highlights.

The peculiar but lucrative subculture of Top Shot reminds others of a similar hit from the same company, Dapper Labs, in which people collected virtual cats instead of NBA highlights. CryptoKitties was a fad that was mostly forgotten after a few crazy weeks in 2017.

Now the idea is roaring back in part because **Top Shot is built for a different audience: the average NBA fan.** Dapper Labs cut deals to give the league and its players a slice of every transaction—the company takes a 5% fee—with the goal of reaching casual basketball consumers and not just blockchain evangelists. It’s working. Instead of swapping jerseys after games, NBA players are exchanging Top Shot moments.” – Mar 2021 – WSJ

IN-DEPTH – NON-FUNGIBLE TOKENS

WHY DO PEOPLE COLLECT NFTs?

“Why don't people just right-click on an image instead and save it to their desktop? That's free. True. But like with other collectables, whether it's baseball cards, rare books or fine art, **having an original is special.**

Take CryptoPunks, pixelated avatars that have fetched millions of dollars. Sure, you could download one of the alien avatars, but collectors would not consider it authentic. A real alien CryptoPunk costs, on average, \$900,000.



Source: CryptoPunks Provided by Bloomberg

To be clear, there's no visual difference between an original and a copied version. And to make it even more confusing, not all NFTs are originals. Many are the digital equivalent of a reprint. But in this case, the reprint has what is essentially a unique bar code, or ‘token,’ on the blockchain, which is a type of decentralized record-keeping system. In other words, instead of one institution, like a bank, having a ledger of transactions, a blockchain uses a vast network of computers that all hold each other accountable on a shared public record.

That makes it hard to remove an NFT from the Web entirely. It also means there's a way to trace an NFT's origin and transaction history.” – Mar 2021 – National Public Radio

“It’s easier to understand through another kind of collectible. **A baseball card is a few cents of ink and paper, but the most valuable ones are limited in supply, reflect an experience and come with a guarantee of authenticity.** Top Shot moments have the same forces working in their favor.

‘It’s the story, the scarcity, the joy you get as a collector,’ Levy said. ‘It’s not the ability to hold it in your hand.’” – Mar 2021 - WSJ

IN-DEPTH – NON-FUNGIBLE TOKENS

HOW DO YOU MAKE AN NFT?

“Log on to one of the NFT marketplaces and upload a file. This process is called ‘minting’ an NFT.

You'll usually be asked if it's a one of a kind, if there are multiple copies or if it's part of a collection. (A quick glance at an NFT marketplace shows just how easy the process is — maybe too easy. Some people are trying to sell tweets and even colors as NFTs.)

Once you're done, collectors can start bidding.

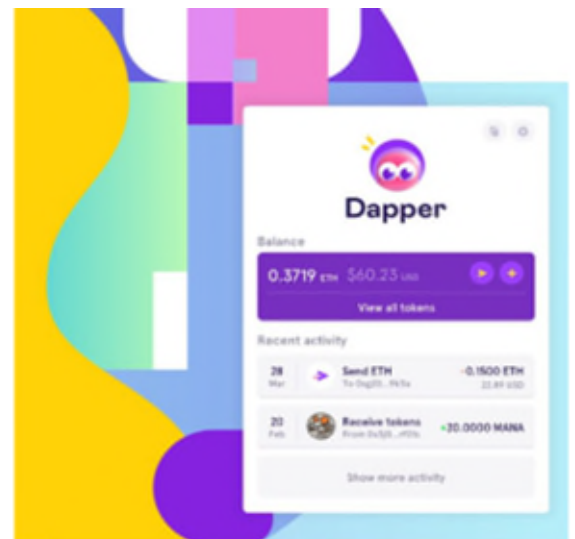
Digital artists can build a royalty into their NFTs, even for future sales, which is why many artists see promise in NFTs: It can cut out the middleman and open up a new way to make money.” - Mar 2021 – National Public Radio

HOW DO YOU BUY AN NFT?

GET A WALLET

“Laid your eyes on an NFT you want to have? Nice! Then first, you'll need a wallet, which is a tool you add to your browser to interact with the blockchain.

A marketplace or NFT platform (like CryptoKitties) usually recommends a certain wallet. CryptoKitties advises using Dapper, while Gods Unchained swears by MetaMask. So, do your own research to find out which suits you or the NFT best. Once you set up your wallet, you can connect it with the marketplace of your choice; most marketplaces will guide you on that.” – Aug 2020 – Coin Ranking



Wallet Dapper Provided by Coin Ranking

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HOW DO YOU BUY AN NFT? (CONT'D)



A CryptoKitty Provided by CNN

FILL YOUR WALLET

“Since Ethereum is the most popular blockchain for NFTs, we’ll continue with buying Ether; that’s the next thing you have to do. Because you have a wallet now, but it’s still empty...

Buy Ethereum on an exchange, using your wallet address. This address is a unique identifier for your wallet and is like a name you can share freely with others. Your private key is your password and is just for you; always keep it to yourself.

Examples:

public key 0xC2E8CF98622D33006175B78989035C7c9061d3F9

private key 2a1086bf45ab87712ad64ccb3b10217737f7faacbf2872e88fdd9a537d9fe299

SHOP

Have Ether in your wallet? Congrats, you’re ready to purchase your first NFT! Note that you have to pay a fee for every transaction on the Ethereum blockchain. (This is to reduce spam on the network.), on top of the NFT price. So, after you put in your order, your transaction is often in a pending state. This can take minutes, but sometimes it might take even days. After the pending, the NFT is officially yours, which you’re now able to see and check within your wallet.

YOUR NFT ON COINRANKING

After the transaction, your NFT will appear immediately on Coinranking, including information like the trading price and the issuance date (date of creation). All the information you’ll need, in one place. (At the moment, NFTs of CryptoKitties, Rarible, Gods Unchained, MakersPlace & Decentraland are listed, and more are about to be added.)” – Aug 2020 – Coin Ranking

IN-DEPTH – NON-FUNGIBLE TOKENS

WHAT ARE THE RISKS?

VALUATION - “Buying an NFT, like any collectable, is a risky bet on the value going up. If there is no demand for the NFT you buy then you could end up paying a large amount for something that declines in value or that you cannot sell.” – Mar 2021 – The U.S. Sun

STORAGE - “NFT sales are recorded using blockchain technology, which proves ownership. But the actual NFTs are created and stored through marketplaces and platforms, such as Open Sea or Rarible. If these platforms closed, there is no guarantee that you would be able to access the work. That is less secure than if you had physical art hanging on a wall or real-life trading cards that can't just disappear.” – Mar 2021 – The U.S. Sun

“An important point to reiterate is that while NFT artworks can be taken down, the NFTs themselves live inside Ethereum.” – Mar 2021 - Vice

REGULATION - “There is no regulation of NFTs so there is a lot of trust required. You need to trust that the NFT you are buying is a unique piece of work and hasn't been copied from elsewhere or you could face a copyright claim.” – Mar 2021 – The U.S. Sun

“The lack of regulator or ombudsman also means there is no one to investigate your complaint, or hold companies to account, when something goes wrong.” – Mar 2021 – The U.S. Sun

OTHER - “Bit rot is a real thing: image quality deteriorates, file formats can't be opened anymore, websites go down, people forget the password to their wallets.” – Mar 2021 - The Verge

IN-DEPTH – NON-FUNGIBLE TOKENS

WHAT IS THE ENVIROMENTAL IMPACT?

“Determining the environmental impact of NFTs is a DIY affair. Yet no peer-reviewed research has been done by academics and the methodology being used by different parties varies widely.” – Apr 2021 – ARTnews

“NFTs most likely do not have a direct, causal relationship with CO2 emissions, because they are just making use of the underlying blockchain that Ethereum is already running.” – Apr 2021 – ARTnews

“The computing power required to operate the underlying blockchain system of NFTs is immense.” - Mar 2021 – National Public Radio



Scott Barbour/Getty Images

“Ethereum alone is responsible for 96,200,000 tons of CO2 since its inception; this is equivalent to the combined annual carbon emissions of the 84 least carbon intensive countries around the globe. But how much of that can NFTs be blamed for?” – Apr 2021 – ARTnews

“To calculate a direct relationship, one would have to calculate if NFTs have caused a shift in demand for the overall Ethereum network — the entire technology that keeps track of all Ethereum transactions. Demand for minting NFTs, as during the recent boom, might raise the price of Ethereum gas — the term for the extra computing power needed to mint — and thus encourage more miners to put more resources into mining, worsening its environmental cost, according to Nic Carter, founder of the crypto-asset venture firm Castle Islands.” – Apr 2021 – ARTnews

IN-DEPTH – NON-FUNGIBLE TOKENS

WHAT IS THE ENVIROMENTAL IMPACT? (CONT'D)

“Despite how buzzy NFTs are, they represent a very small portion of Ethereum transactions overall. Carter’s data company Coin Metrics tracked 1.2 million Ethereum transactions the day we spoke; only 30,000 of those constituted NFT transactions — ‘an aggressive estimate,’ Carter cautioned. A specialist at Nifty Gateway told ARTnews that NFTs make up about 1 percent of the Ethereum network. For this reason, Andrew Bonneau, a carbon market advisor for Offsetra, seriously doubts the possibility that NFTs are driving much extra demand in mining.

‘Certainly, the speculative value of Ethereum is a bigger driver of how much mining is occurring,’ Bonneau said. In other words, the rising price of Ethereum currency is more of a motivator to put resources into mining.

Though carbon emissions vary by marketplace, Bonneau estimates that, on average, **a single NFT (edition of one) should take responsibility for about 90 kilograms of CO2** — the equivalent of an hour of international commercial jet flight.” – Apr 2021 – ARTnews



IN-DEPTH TOPICS LOCATED ON THE COUNTY AUDITOR'S WEBPAGE

5G Network	4 th Qtr 2018
Afterpay	4 th Qtr 2020
Alibaba	3 rd Qtr 2017
Bitcoin	4 th Qtr 2016
Cashless Society	4 th Qtr 2017
Chatbots	1 st Qtr 2019
Deep Sea Mining	3 rd Qtr 2020
Facial Recognition	1 st Qtr 2018
Labor Participation Rate	4 th Qtr 2015
Libra, Calibra, Facebook	2 nd Qtr 2019
Money Market Fund Reform – New Rules	3 rd Qtr 2016
Natural Gas – U.S. 3 rd Largest Exporter of LNG	4 th Qtr 2019
Negative Interest Rate Policy (NIRP)	2 nd Qtr 2016
New Silk Road	2 nd Qtr 2017
Non-Fungible Tokens	1 st Qtr 2021
Pandemic – Possible Impact	1 st Qtr 2020
Quantitative Easing	1 st Qtr 2016
Repurchase Agreements – Repo Market in Crisis	3 rd Qtr 2019
Small Business Reorganization Act	2 nd Qtr 2020
Texas Imports and Exports	2 nd Qtr 2018
Universal Postal Union	3 rd Qtr 2018

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