



Federal Reserve
Bank of Dallas

SECOND QUARTER 2021

Southwest Economy



Federal COVID-19 Relief Aided Consumer Debt, Though Immigrant Texans Derived Less Benefit

PLUS

- ▶ Texas Winter Deep Freeze Broke Refining, Petrochemical Supply Chains
- ▶ On the Record: Texas Restaurants Find Change on Postpandemic Menu
- ▶ Banks Face New Challenges as Texas Rebounds from COVID-19 Shock
- ▶ Spotlight: Oil Patch Productivity Rises; Jobs Vanish
- ▶ Go Figure: Women Took Brunt of Pandemic Job Loss as Priorities Shifted to Home



President's Perspective

Rob Kaplan, president and CEO of the Dallas Fed, regularly speaks and writes on the factors that affect economic growth in the nation and Eleventh District. Here are some of his recent thoughts on key issues:

On Asset Purchases

"We should gently ease off the accelerator so we don't have to press on the brakes down the road."

Interview with CNBC—May 27, 2021

On the Labor Market

"We wish to suggest that policymakers should be cognizant of a range of supply factors that may currently be weighing on employment. These factors may not be particularly susceptible to monetary policy."

"We would expect that many of these factors will fade as the year progresses—increasing the number of job seekers and potentially reducing labor market tightness. However, it is also possible that labor supply will increase less than expected. It is our view that this possibility should be kept in mind as policymakers assess the appropriate stance of monetary policy."

Excerpt from "The Labor Market May Be Tighter than the Level of Employment Suggests," Dallas Fed Economics—published May 27, 2021

On Inflation Expectations

"What you don't know, depending on how long [heightened inflation] goes on, is whether that starts to get embedded in inflation expectations. And you worry that inflation expectations start to get to be more elevated. And then you are getting them elevated to a level that is not consistent with anchoring them at 2 percent. That's the part I'm concerned about; this is a risk for me."

Virtual event with the University of Texas McCombs School of Business—May 14, 2021



Federal COVID-19 Relief Aided Consumer Debt, Though Immigrant Texans Derived Less Benefit

By Wenhua Di and Chloe Smith

ABSTRACT: U.S. and Texas residents shored up their household finances during the COVID-19 recession. The prevalence of various federal-level assistance programs helped boost savings and broadly reduce debt. Among mostly immigrant groups, this tendency was less pronounced, likely due to legal and socioeconomic barriers.

For many families and businesses, loans and government relief programs were a buffer against the financial shock COVID-19 delivered.

As a result, lending and consumer loan performance were little affected despite the pandemic's arrival in March 2020.

However, communities with a larger share of immigrants didn't realize the full benefit of these programs. In terms of credit activity, areas in Texas with a larger share of immigrants underperformed those with a lesser concentration. The difference possibly reflects lack of access to relief programs and reduced participation in the credit market.

Stability in Recession

Overall, consumer credit conditions withstood the pandemic-caused recession, remaining mostly stable in 2020, according to an analysis of the New York Fed Consumer Credit Panel (CCP)/Equifax—a representative sample of adults in the U.S. with a credit history or public-record information.¹ The number of Texans in the credit panel grew by 2.2 percent in the 12 months ended in January 2021 (*Table 1*).

The average credit score (Equifax Risk Score) increased nine points in Texas during the period. The share of consumers obtaining auto loans or having bank-issued credit card debt dropped slightly from levels before the pandemic. The number of mortgage borrowers grew 2.6 percent, slightly more than the increase in total consumers.

This recession was different from previous ones in another respect: Reported loan performance did not worsen. On the contrary, delinquency rates decreased for all main consumer loan types, especially mortgages.² The number of delinquent mortgage borrowers dropped 57 percent in the 12 months ended in January 2021. Auto loan delinquencies declined 5.7 percent, and bank card delinquencies fell 2.3 percent.

The average auto loan balance increased 5 percent, while mortgage balances rose 6 percent. The average balance for bank-issued credit cards dropped 11 percent.

The loan performance improvement coincided with large-scale government stimulus packages, which provided cash to consumers, extra unemployment insurance benefits to laid-off and furloughed workers, and automatic loan deferral for federal student loan and some mortgage borrowers. Many consumers used the extra cash to pay down debt and for savings.³

Additionally, the Federal Reserve and some government programs provided financial institutions abundant liquidity and flexibility and encouraged them to work with consumers on loan accommodations. Borrowers receiving forbearance or similar accommodations were not generally considered delinquent for credit reporting purposes.⁴

Widespread Forbearance

A recent study found that forbearance and loan relief weren't concentrated only among lower-income borrow-

ers. The impact was also noted among higher-risk borrowers and those with higher loan balances, as well as consumers living in more COVID-19-impacted areas.⁵ Texas was among the states with highest mortgage forbearance rates in the study. The timely relief helped reduce negative spillover effects typical in economic recessions.

The average mortgage balance grew before COVID-19, a trend that continued as home prices rose during a period of limited house inventories (*Chart 1, panel A*). Auto sales paused during the March COVID-19 lockdown and recovered rapidly in the following months. Credit card delinquency began before the pandemic and continued as borrowers could pay down more debt on average.

As loan accommodations peaked in June 2020, mortgage delinquencies fell by one-half and have remained low since mid-2020 (*Chart 1, panel B*). Auto loan delinquencies initially declined, then headed back up near year-end 2020. Credit card delinquency rose in early 2020, dropped through June and then flattened out.

These trends, however, may be concealing a more difficult experience among immigrant groups.

TABLE 1 Credit Conditions Stable During Peak of Pandemic in Texas

	Jan. 2020	Jan. 2021	Change (%)
No. of consumers (millions)	22.26	22.74	2.2
Average Equifax Risk Score	681	690	1.3
Share borrowing (%)		Change in number of borrowers (%)	
Any loan	75.8	75.1	1.2
Auto loan	38	37.2	0
Bank-issued credit card	55.9	55.3	1.1
Mortgage	22.2	22.3	2.6
Loan delinquency (%)		Change in number of delinquent borrowers (%)	
Any loan type	19.3	17.9	-5.3
Auto loan	15.7	14.8	-5.7
Mortgage	4.2	1.8	-57
Bank-issued credit card	15.3	14.8	-2.3
Average balance for borrowers (\$)		Change in amounts (\$)	
Auto loan	28,435	29,852	1,417
Bank-issued credit card	6,247	5,542	-705
Mortgage	122,536	130,195	7,659

SOURCES: New York Fed Consumer Credit Panel (CCP)/Equifax; authors' calculations.

Immigrant Community Clusters

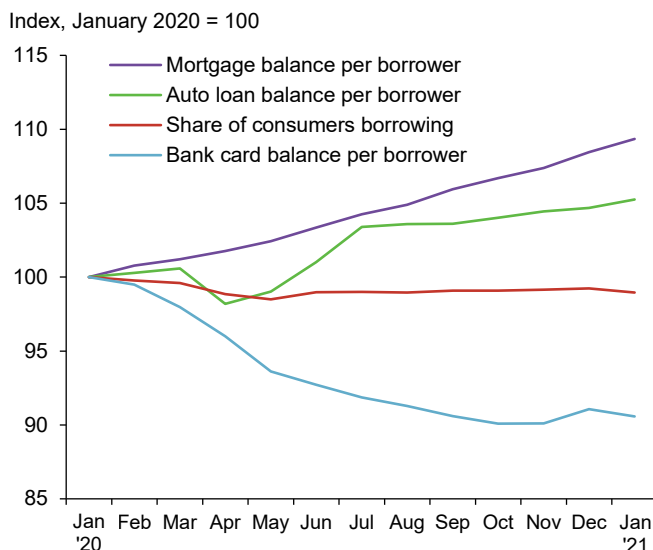
Texas had a population of 4.9 million foreign-born individuals, and the state ranked No. 2 in the number of such residents in the U.S. in 2018—not surprising given Texas' size, long southern border and employment opportuni-

ties.⁶ Texas also has the eighth-highest share of foreign-born residents and the second-highest share and population of Mexican immigrants.

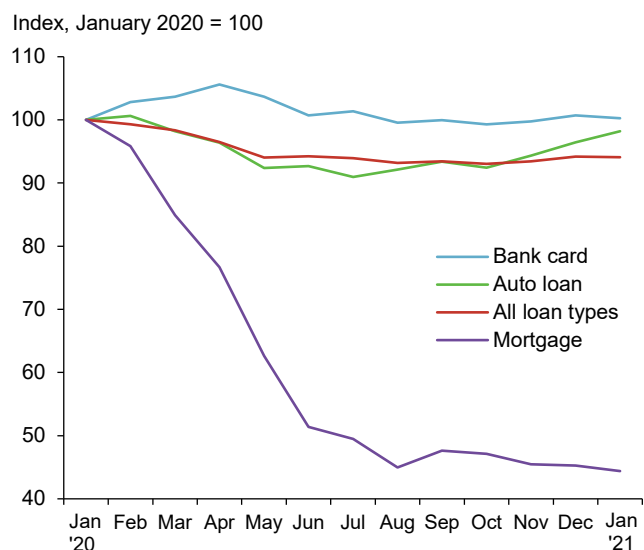
Although immigrants live throughout Texas, they are concentrated in census tracts in cities and near the

CHART 1 Mortgage, Auto Balances Rise; Delinquency Rates Stabilize in Texas

A. Consumer loan borrowing



B. Share, borrower delinquency



SOURCES: The New York Fed Consumer Credit Panel (CCP)/Equifax; authors' calculations.

Mexican border (*Chart 2*).⁷ The state's immigrant workers account for 22 percent of the labor force and 24 percent of essential workers.⁸

Immigrant COVID-19 Activity

Immigrant communities, particularly Hispanic ones, missed out on the government's efforts to sustain families' finances. Pandemic-related lockdowns and consumer reticence were particularly notable among accommodations and food service businesses. Moreover, immigrants living in poorer conditions were more likely to contract COVID-19.⁹

The CCP/Equifax data do not contain demographic identifiers that allow direct identification of immigrants. However, information is available on communities with high shares of foreign-born residents (*Chart 3*). Communities with higher shares of immigrants did well during 2020 but not to the extent of areas with lower shares.

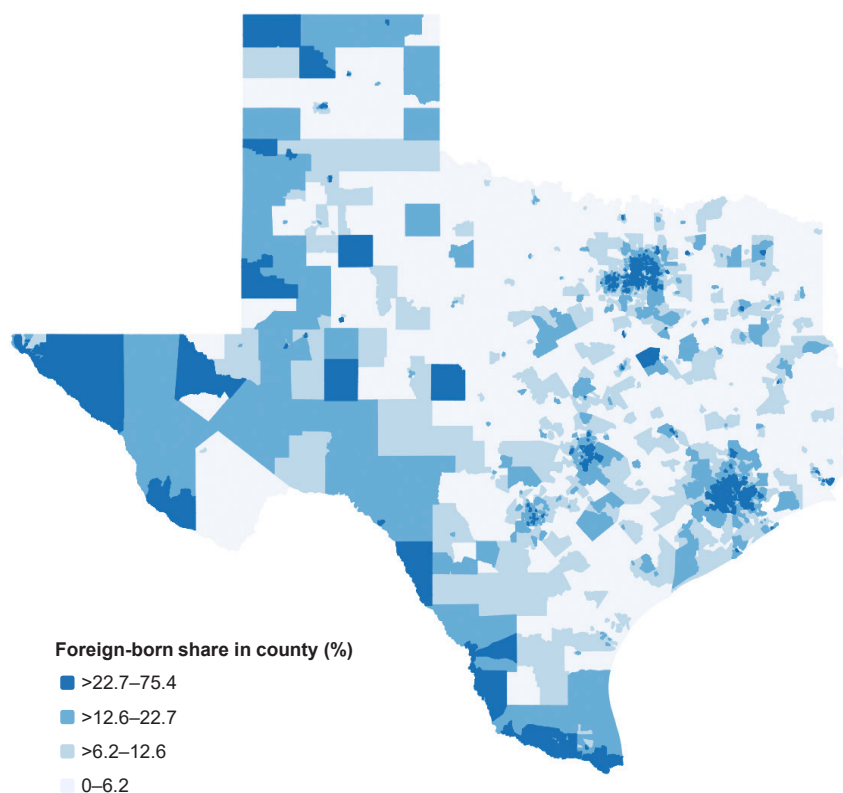
For consumers included in the CCP/Equifax data, those living in tracts with greater shares of immigrants were less likely to take on consumer loans.¹⁰ Soon after COVID-19 struck, however, the share of immigrants borrowing increased and trended with other groups throughout the year. For those tracts with the greatest immigrant share, 68.1 percent of consumers in CCP/Equifax had taken on consumer loans in January 2020; a year later, only 66.7 percent had, a tendency depicted in *Chart 3*, panel A, which is normalized to January 2020.

Delinquencies in high-immigrant areas declined, though not to the same extent as in communities with fewer immigrants, as seen in *Chart 3*, panel B. There were differences based on the type of debt. Higher-immigrant-share communities took on relatively more mortgage loans and less bank-issued-card debt. Mortgage loan performance tended to improve, while auto and credit card borrowings were little changed.

While average credit scores improved as the tract immigrant share generally increased, those with the

CHART 2

Immigrant Populations Concentrated in Cities, Along Border



SOURCE: American Community Survey, 2014–18, IPUMS/National Historical Geographic Information System.

largest immigrant share improved more slowly.

Why the Gap?

There are several reasons why high-immigrant communities didn't perform as well. Immigrant households tend to have lower income and wealth, and in Texas, about 37 percent of immigrants have no health insurance.¹¹ About 1.6 million Texans, or one-third of immigrants, were undocumented in 2017.¹²

During the pandemic, many immigrants were ineligible for stimulus checks and the enhanced unemployment benefits. The Coronavirus Aid, Relief, and Economic Security (CARES) Act—a \$2.2 trillion measure that took effect in March 2020—also excluded households from stimulus if a member used an individual taxpayer identi-

fication number in place of a Social Security number when filing a joint tax return. Because many immigrants live in mixed-status families, an estimated 879,000 citizens and legal immigrants in Texans were excluded under those CARES Act provisions.¹³

Thus, nearly half of Texas immigrants could not collect the initial stimulus if they otherwise qualified. While the subsequent relief packages retroactively granted those stimulus payments to immigrant families, that delayed aid was not reflected in the data for 2020.¹⁴

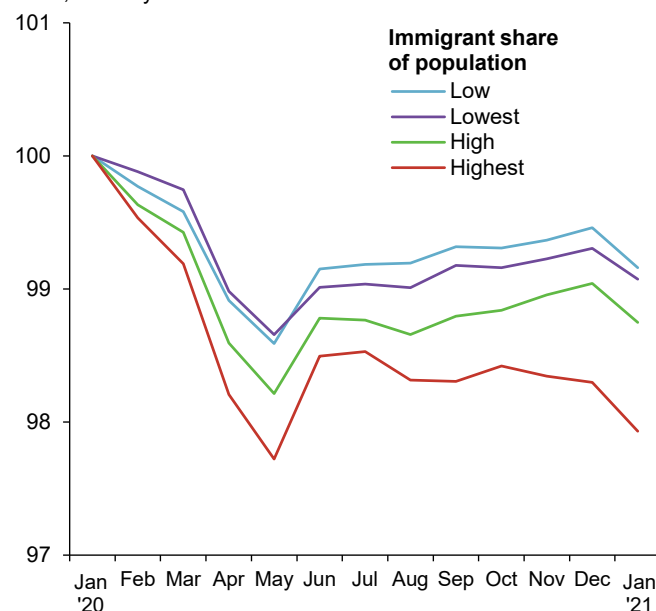
The differing credit experiences may also be partially attributed to factors that affected immigrants' participation in the credit market and the chance to receive lender accommodation. Throughout 2020, consumer credit standards tightened, and consumers

CHART 3

Borrowing Declines Most, Delinquency Improves Least in Immigrant Communities in Texas

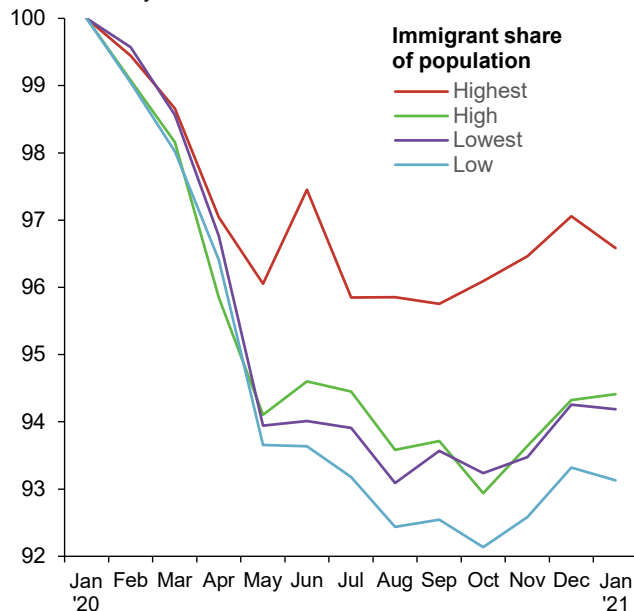
A. Percent borrowing

Index, January 2020 = 100



B. Borrower delinquency

Index, January 2020 = 100



Average values

Immigrant share (%)	Share of borrowers (%)		Borrower delinquency (%)	
	Jan. 2020	Jan. 2021	Jan. 2020	Jan. 2021
Lowest (0–13)	76.1	75.4	18.5	17.3
Low (13–23)	75.9	75.2	20.5	19.0
High (23–39)	73.3	72.4	22.0	20.6
Highest (>39)	68.1	66.7	19.5	18.7

NOTES: Borrower delinquency is the percent of borrowers behind in loan payments. Values are weighted by census tract population.

SOURCES: New York Fed Consumer Credit Panel (CCP)/Equifax; authors' calculations.

with nonprime credit scores found it harder to obtain loans; the share of borrowers decreased.¹⁵

Immigrants with a relatively short credit history in the U.S. are more likely to fall into the nonprime category. The limited improvement in loan performance and creditworthiness may also indicate a lower rate of loan accommodation among immigrants. To get such assistance, borrowers must make a request and work with lenders to reach a

loan payment modification agreement. Immigrants may be less familiar and more uncomfortable with this process.

Additionally, if consumers have not participated in the credit market, they don't exist in the credit data and lack a history needed for future borrowing. Thus, some consumers subsequently found themselves involuntarily excluded from the market.

This behavior pattern involving borrowing and loan performance is also

apparent if census tracts are chosen based on limited English proficiency or on estimated undocumented immigrant shares.¹⁶

Although the CCP/Equifax primary sample is assembled based on prevalence of Social Security numbers and does not represent undocumented consumers per se, the immigrant consumer experience can be affected by undocumented family members. For example, language skills and how con-

sumers communicate with financial institutions are important variables.

Communities with a higher share of immigrants tend to have lower income, but lower income alone cannot explain the observed trends. This becomes apparent when comparing census tract groups by median income levels instead of foreign-born share. The lowest-income tracts borrowed more at the beginning of the pandemic and improved credit scores the fastest, unlike communities with high-immigrant populations.

Greater Recovery Challenge

Although loan performance has been stable in Texas since the onset of COVID-19, the pandemic affected some communities more than others. Immigrants have higher shares of workers in critical industries and at-risk occupations and have been more vulnerable to the financial and health effects of the pandemic.

This is largely due to less access to health insurance, government assistance and consumer credit. Texas communities with a high share of immigrants have experienced greater challenges in their attempts to move past the economic hardships of the pandemic.

Di is a senior research economist in the Research Department at the Federal Reserve Bank of Dallas.

Smith is a research analyst in the Research Department at the Federal Reserve Bank of Dallas.

Notes

¹ We use the “primary” consumers of the CCP/Equifax, a 5 percent representative sample of adults in the U.S. with a credit history or public-record information.

² Loan accommodation is more prevalent for mortgages than auto loans and credit cards. Student loans are not included in the comparison because the repayment of all federal student loans, which account for about 90 percent of student loans, has been deferred until Sept. 30, 2021.

³ “Update on How Households Are Using Stimulus Checks,” by Olivier Armantier, Leo Goldman, Gizem Koşar and Wilbert van der Klaauw, *Liberty Street Economics*, Federal Reserve Bank of New York, April 7, 2021, <https://libertystreeteconomics.newyorkfed.org/2021/04/an-update-on-how-households-are-using-stimulus-checks.html>.

⁴ Interagency Statement on Loan Modifications and Reporting for Financial Institutions Working with Customers Affected by the Coronavirus (Revised), Board of Governors of the Federal Reserve System et al., April 7, 2020, www.federalreserve.gov/newsevents/pressreleases/files/bcreg20200407a1.pdf.

⁵ Consumers typically make a forbearance request to lenders, who then decide whether to approve the request based on the type of loan and borrower situation. See “Government and Private Household Debt Relief During COVID-19,” by Susan F. Cherry, Erica Xuewei Jiang, Gregor Matvos, Tomasz Piskorski and Amit Seru, National Bureau of Economic Research, NBER Working Paper no. 28357, January 2021, www.nber.org/system/files/working_papers/w28357/w28357.pdf.

⁶ “Facts on U.S. Immigrants, 2018; Statistical Portrait of the Foreign-Born Population in the United States,” by Abby Budiman, Christine Tamir, Lauren Mora and Luis Noe-Bustamante, Pew Research Center, Aug. 20, 2020, www.pewresearch.org/hispanic/2020/08/20/facts-on-u-s-immigrants/.

⁷ Census tracts represent small geographic areas with an average of 4,000 residents who are considered relatively homogeneous in terms of demographics and economic conditions. Data are from the American Community Survey (2014–18) retrieved from the Integrated Public Use Microdata Series (IPUMS), National Historical Geographic Information System.

⁸ The Cybersecurity and Infrastructure Security Agency, a part of the Department of Homeland Security, defines essential workers as those employed in sectors that ensure “continuity of functions critical to public health and safety, as well as economic and national security.” About two-thirds of all industries are deemed essential. Major categories include health services, infrastructure, food supply chain, energy, communication, finance, utility, transportation and defense.

⁹ “Immigrants, the Economy and the COVID-19 Outbreak,” released by the Joint Economic Committee, Vice Chair Rep. Don Beyer, June 30, 2020, www.jec.senate.gov/public/_cache/files/9e9c9042-6ff9-4f6c-8d65-fbe2625d2143/immigrants-the-economy-and-the-covid19-outbreak-final1.pdf.

¹⁰ Communities are ranked by foreign-born share of the population; from 0 to 12.6 percent (bottom half), 2.6 percent to 22.7 percent (50th to 75th percentiles), 22.7 percent to 39.1 percent (75th to 95th percentiles) and 39.1 percent to 75.4 percent (top 5th percentile). Instead of plotting the trends of aggregate shares of borrowers and delinquencies in each group, indexes were first calculated for each tract, with a weighted average index obtained for each group. Thus, unobserved differences inherent to the tracts before January 2020 would not affect the comparison.

¹¹ Data are from the 2019 American Community Survey.

¹² “Mexicans Decline to Less than Half the U.S. Unauthorized Immigrant Population for the First Time,” by Jeffrey S. Passel and D’vera Cohn, Pew Research Center, June 12, 2019, www.pewresearch.org/fact-tank/2019/06/12/us-unauthorized-immigrant-population-2017/.

¹³ “Mixed-Status Families Ineligible for CARES Act Federal Pandemic Stimulus Checks,” Migration Policy Institute, May 2020, www.migrationpolicy.org/content/mixed-status-families-ineligible-pandemic-stimulus-checks.

¹⁴ The December 2020 Budget Bill extended the second-round stimulus payment to these individuals and led them to retroactively apply for the first-round payment. See H.R. 133, www.congress.gov/116/bills/hr133/BILLS-116hr133enr.pdf. These families are eligible to receive the third round of checks authorized by the March 2021 American Rescue Plan Act.

¹⁵ Net Percentage of Domestic Banks Tightening Standards on Consumer Loans, Credit Cards, Federal Reserve Bank of St. Louis economic data, accessed May 7, 2021, <https://fred.stlouisfed.org/series/DRTSCLCC#0>.

¹⁶ We estimate the share of undocumented immigrants through the following: First, calculate the share of foreign-born residents born in Mexico/Hispanic countries who have a high school education or less and who arrived in the U.S. after 1980 (based on the American Community Survey at the Public Use Microdata Area level); multiply the share by tract-level foreign-born population; and then divide by the tract population. See “Unauthorized Immigrant Totals Rise in 7 States, Fall in 14,” by Jeffrey S. Passel, D’vera Cohn and Molly Rohal, Pew Research Center, Nov. 18, 2014, www.pewresearch.org/hispanic/wp-content/uploads/sites/5/2014/11/2014-11-18_unauthorized-immigration.pdf.

A Conversation with Emily Williams Knight

Texas Restaurants Find Change on Postpandemic Menu

Emily Williams Knight is president and CEO of the Texas Restaurant Association (TRA). It represents the state's \$52.4 billion restaurant industry and its more than 43,000 food and beverage outlets. This summer, she will join the National Restaurant Association as its chief collaboration officer and executive vice president of industry relations. Knight discusses how the dining industry survived COVID-19 and the changes that have occurred.

Q. The pandemic has been traumatic on high-contact sectors such as restaurants. How was the restaurant industry in Texas affected?

It is important to first understand where the industry stood before the pandemic. Going into 2020, growth was phenomenal, and Texas eating and drinking establishments expected their best year in history. That all changed on March 19, 2020. In the six weeks following the broad shutdown, more than 750,000 employees were laid off or furloughed out of the estimated 1.3 million employees in the industry.

Today, as we look back, 2020 saw a \$17 billion revenue loss; 160,000 employees are still not working, and about 9,000 restaurants have closed for good.

When the pandemic shut down everything, we initially thought everyone [in the industry] was going to be hit very hard. What we saw was that the impact across the spectrum of restaurant businesses varied, and we actually began to see bright spots, led by many restaurants' ability to quickly pivot or take advantage of existing operational capabilities.

Quick-service restaurants finished 2020 very strong—many with record years—due to strong demand for to-go, and some casual dining survived with

a shift to increased takeout. However, as you move more toward fine dining, the negative impacts of the pandemic were felt more, as those tend to get less demand from delivery and rely more on convention and business traffic, which came to a halt.

Q. How important was the federal Payroll Protection Program (PPP) to the food-service industry?

The entire PPP package and [subsequent] multiple rounds were crucial to the survival of restaurants. The average restaurant has very little cash on hand—usually enough to support operations for 14 days. Most were not prepared for the sudden halt to operations.

We estimated that when the shutdown began, only 34 percent of restaurants could generate any revenue, and that was through delivery, drive-thru and carryout only.

PPP offered a safety net by providing grants to cover payroll and rent costs and, subsequently, for PPE [personal protective equipment] and to retrofit establishments to meet the changing business model of off-premise and outdoor dining. Additionally, through employee-retention tax credits, restaurants received additional financial relief.

However, the first round was not without its challenges in execution, conditions and high demand. Most of our small restaurants were left out as they didn't have lending relationships, did not have the formalized operations to navigate the initial [PPP] rollout or faced a language barrier.

We stepped in to support many of these restaurants through partnerships with banks and chambers to ensure they were aware of the conditions and had that direct access to banks they may not have had. This included the translation of marketing materials and required documentation to ensure awareness and access for Spanish-speaking restaurant owners in Texas.

These efforts have been especially successful for the second round of PPP and with the recent launch of the Small Business Administration Restaurant Revitalization Fund (RRF). To highlight the continued demand and need for such programs, the recently launched RRF received 186,000 applicants nationally within its first 36 hours.

Q. What long-lasting impacts will this event have on restaurants? How will restaurants do business differently post-COVID than they did pre-COVID?

The investment in technology will be the most significant change. It is estimated that the industry saw five years of technology gains in a 12-month period. To survive, many restaurants needed to quickly adopt technology to support online and contactless payments. These restaurants also saw the need to expand delivery services, with many choosing to sign agreements with third-party delivery services.

In addition, the to-go business is expected to continue. As the economy reopens and restaurants fill up, to-go business has not dropped. This is and will be supported by innovations that came out of the pandemic, like the ability to add grocery [sales] to restaurant offerings. For example, alcohol-to-go was signed into law during this past [Texas] legislative session.

The evolution of delivery and virtual kitchens is also something we are watching. These large commissaries



► *[The year] 2020 saw a \$17 billion revenue loss; 160,000 employees are still not working and about 9,000 restaurants have closed for good.*

where restaurants can rent space are leading to change and growth in the industry. The ability to rent kitchen space allows for consolidation of space and smaller footprints, even for dine-ins [that lease out part of their kitchens], and provides a lower barrier of entry into the restaurant industry by dramatically reducing the upfront investment.

As to-go and delivery look to remain a strong revenue generator, those services operate out of any of these kitchen operations without the need for on-site dining space.

Q. We hear about labor market tightness in your industry despite a high overall unemployment rate. What are restaurants telling you about difficulties finding workers?

Access to labor is probably the largest crisis we are facing outside of COVID. TRA members were polled in early May, and 91 percent reported openings they cannot fill. This is extraordinarily high for an industry where previous highs were around 65 to 70 percent.

We are seeing this due to multiple factors. To start, much of the workforce left the industry and found employment in areas that saw significant growth, like logistics or grocery. The current additional federal UI [unemployment insurance] benefit is also driving people to make a rational choice for their family when it comes to returning to work.

The vaccine, the stimulus and the supplemental [federal] unemployment benefit of \$300 are certainly major factors. If one does not have to pay for child care and can be home earning about the same amount, they will tend to make the choice not to return to work.

Given our workforce is 55 percent women, the availability and affordability of child care must be addressed to begin resolving the current labor challenges we face.

Q. A national \$15-an-hour minimum wage has been proposed. How would that affect Texas restaurants?

A national minimum wage of \$15 an hour has varying regional effects due to differences in the cost of living. In Texas, which has a lower-than-average cost of living, \$15 an hour represents a much higher real wage than in California and New York, where the cost of living is much higher.

That specific proposal would have had a unique effect on the restaurant industry, as it also included the elimination of the tip credit. The proposal would have led tipped personnel, who currently have a minimum wage paid by the employer of \$2.13 per hour, to have the same minimum wage as everyone else. [Currently, if a tipped employee does not make at least the \$7.25-per-hour federal minimum wage after tips, the employer must pay the difference.]

If this had passed, many restaurants would likely have eliminated the need for tips, as prices would have needed to increase to account for the wage adjustments. The TRA had many discussions with tipped workers about the proposal, and many were against it since they saw it as likely reducing their overall wages.

We know we have to have a conversation about what wages need to be going forward, especially as the industry evolves following the pandemic. For now, we can see that the market is driving up real wages across the country.

Q. What are some lessons learned during this historic period for the restaurant industry?

Our food-service supply chain is really challenged, and we expect this to be the case into late 2022. The grocery store and the restaurant supply chains are different, and we need to rethink how to create a more fluid supply chain.

When restaurants opened back up, there was no easy way to shift [the supply chain] from the grocery back to us. This is very important to address in order to protect our food system.

Consumer demands are evolving, and the need for more technology and automation is only growing. For example, the ability to order from your table via your phone and have the food delivered to your table is becoming more of a reality and requirement.


Moving forward, restaurants must first embrace technology and then begin looking at how the workforce will coexist with technology to provide a new, but still great, customer experience. The restaurant industry represented 51 percent of the food dollar before the pandemic, and that only dropped to about 48 percent at the height of the pandemic.

The economic impact of that volume of food and beverage is on top of the 1.3 million direct industry jobs in Texas.

I will say this: Texans love restaurants, I know we will recover, and we are coming out of this smarter and more innovative. I am surely betting on restaurants.

Texas Winter Deep Freeze Broke Refining, Petrochemical Supply Chains

By Jesse Thompson



ABSTRACT: It may take the Texas petrochemical industry until year-end 2021 to fully recover from the record cold that triggered power outages and supply disruptions in mid-February. Production of basic petrochemical products used in a range of intermediate and consumer goods was interrupted, breaking supply chains already strained by COVID-19 and leading to price pressures and scores of product shortages.

The record-breaking Arctic cold that flowed deep into Texas in mid-February hit the Texas refining and petrochemical sectors as hard as any hurricane and with less warning. Operations did not fully return until early April and sustained lasting damage.

The weather disruption tightened motor fuel supplies, created shortfalls of petrochemicals and slowed Texas exports. The impacts to supply chains have contributed to rising producer price inflation, and the challenges of restocking those supply chains are expected to persist through much of 2021.

Power Producer Struggles

The deep and persistent cold drove up heating demand across a broad swath of the nation. Texas power producers struggled to meet surging demand. Failure to winterize electricity generation infrastructure contributed to power shutdowns.¹ Fearing a collapse of the power grid infrastructure, the agency overseeing it, the Electric Reliability Council of Texas, initiated rolling blackouts affecting most Texas residents and businesses.

Among those affected by the double-barrel challenge of cold and loss of electric power were many energy producers and pipeline operators that feed natural gas to electricity generators and industry. The unusual cold even led to instances where the water co-produced with oil and gas in wells froze, reducing the flow of gas available to power generators. Texas natural gas production ultimately fell by 45 percent.

The petrochemical and refining sectors of Texas rely on natural gas and co-produced natural gas liquids—mainly ethane and propane—not only for heat needed during manufacturing, but also for raw materials used in many of their

products and processes. The combined effect of electricity blackouts, declines in the supply of raw materials and the intense cold itself forced a rapid shut-down of refinery and chemical plant facilities that required weeks to unwind.

Hurricane-Scale Outages

The Energy Information Administration's report on the Gulf Coast region covers Texas, Louisiana and New Mexico. The region is home to more than half of U.S. operable refining capacity—Texas alone accounts for nearly one-third.

The volume of crude oil processed by these Gulf Coast refiners in February fell to a low of 3.9 million barrels per day (mb/d) on a weekly basis, down from an average of 7.8 mb/d the month before. The roughly 50 percent drop was comparable in magnitude to the weekly impacts of hurricanes Ike (2008) and Harvey (2017). Crude processing recovered to 8.0 mb/d by the end of March 2021 (*Chart 1*).

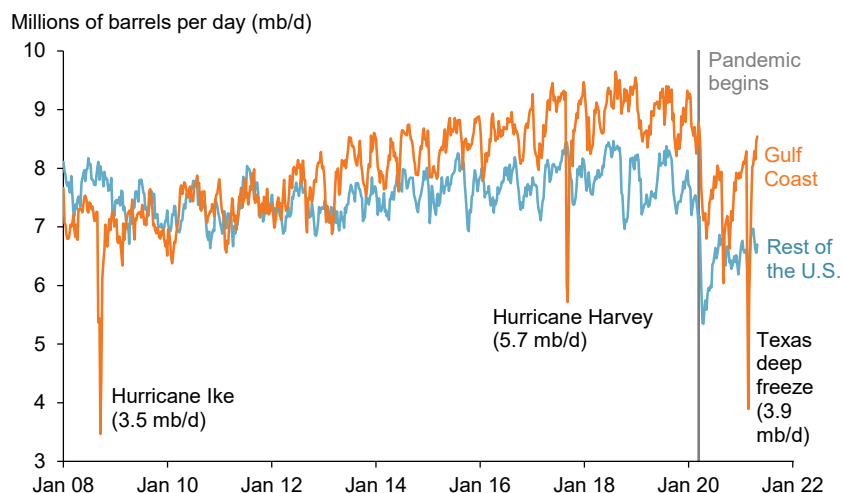
Limited mobility during the freeze and a dip in exports helped reduce the immediate effects of the lost supply on U.S. markets. However, the subsequent drop in refiner output amid increasing U.S. consumption following a pandemic lull reduced domestic gasoline and diesel “days of supply”—inventories divided by consumption—to comparatively low five-year average levels. Gasoline fell to 27 days of supply at the end of March, while diesel was at 36 days.

Chemical Output Hit Harder

Refineries typically need as little as 24 hours' notice to safely shut down—usually in preparation for an oncoming hurricane in the Gulf of Mexico, whose development may have been

CHART 1

Texas Freeze Causes Major Hurricane-Scale Drop in Refiners' Crude Oil Processing



NOTES: Data are weekly. Numbers in parentheses are lows driven by severe weather along the Gulf Coast.
SOURCE: Energy Information Administration.

tracked for over a week. Many chemical facilities need three to five days to stop operations due to the complex interconnections, continuous processes, high temperatures, pressures and the materials involved.

Chemical plants produce a variety of substances from the ingredients for chlorine-based disinfectants and plastic bottles to fertilizers, pesticides and packaging.

Texas is home to roughly three-quarters of basic U.S. chemical production capacity. The largely intermediate goods produced enter supply chains around the country and the world. Most of these goods go through multiple intermediate stages of processing before becoming a final consumer product.

The capital-intensive chemicals manufacturing industry (excluding pharmaceuticals) directly employed 67,100 Texans at the start of 2021, but job multipliers for the industry indicate as many as 4.6 times that number are indirectly supported downstream in supply chains, construction and maintenance, logistics, engineering and other sectors, according to the American Chemistry Council.

The unexpected and long-duration cold, sudden power loss and disruption

of natural gas liquids supplies precluded a normal, orderly shutdown. This caused more damage that took longer to identify and repair. For example, in some cases, firms could only identify damaged seals in one part of a plant after completing and testing repairs to other components.

Even facilities outside of Texas—or ones not directly affected by the freeze and blackouts—had to cut output in February and March, declaring *force majeure* in many cases due to shortages of important intermediate petrochemical inputs.

Some producers of polycarbonate resin could not meet production orders. Polycarbonate resin is used to make products such as car bumpers, headlight lenses and the transparent dividers installed over the past year by many businesses to protect customers and employees from exposure to COVID-19.

The auto industry was particularly affected. Toyota and Honda, already confronting COVID-19-related semiconductor shortages and port congestion, faced significant operational challenges. Firms either halted or slowed production at facilities in Mexico, the U.S. and Canada because of a lack of petrochemical components. Honda suspended North American operations for a week

in March.² Among key shortfalls were polyvinyl chloride (PVC) used for dashboards and other vehicle parts.

As much as 80 percent of U.S. basic organic chemicals capacity was offline after the storm, and up to 60 percent was still offline in mid-March, according to estimates from Wood Mackenzie, an energy industry consultancy. Capacity was largely restored by April.

Industrial production of chemicals had surpassed prepandemic levels by the end of 2020 (Chart 2). The index fell 8 percent in February, the largest one-month decline since January 1972. Chemicals is the single-largest industry group in the U.S. industrial production index, with a weight of 13.7 percent.

The average number of chemical railcar loadings—a timelier barometer of chemical plant operations—fell 28 percent during the week ended Feb. 20. That, too, marked the steepest one-week drop since 1988, when the weekly series from the American Association of Railroads began. By mid-April, U.S. chemical railcar loadings had returned to prefreeze—and prepandemic—levels, reflecting the resumption of near-normal operations.

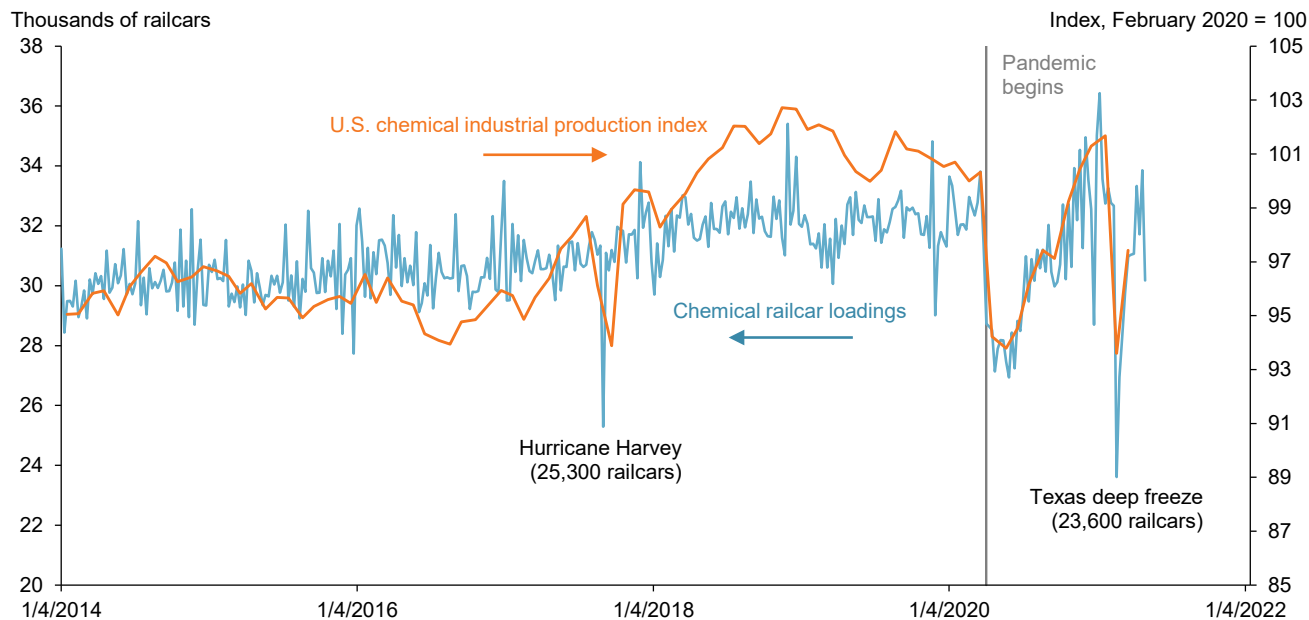
The real (inflation-adjusted) value of Texas chemical, plastic and rubber product exports—which made up nearly 17 percent of Texas exports in the three months before the freeze—fell by more than one-fifth in February 2021, the largest one-month drop since the global commodities bust of 2008. The value of refined product exports (petroleum and coal products) declined over 5 percent.

Petrochemical Price Surge

Gulf Coast chemical prices exceeded prepandemic levels at the end of 2020 due to rebounding product demand and rising crude oil prices (Chart 3). Moreover, producers, wary of a growing second wave of coronavirus globally, had slowly rebuilt inventories of intermediate product that were depleted following hurricanes Laura (August 2020) and Beta (September 2020). This kept industry inventories seasonally tight at the start of 2021.

CHART 2

U.S. Chemical Railcar Loadings Plummet During Freeze



NOTES: Railcar data are weekly loadings. Industrial production data are monthly. Numbers in parentheses are weekly railcar lows caused by severe weather along the Gulf Coast.
SOURCES: Association of American Railroads; Federal Reserve Board.

The price of ethane—a key raw material for petrochemicals—has been relatively stable since summer 2020.

Intermediate product prices, however, have skyrocketed. The Gulf Coast price of ethylene surged 78 percent from December 2020 to March 2021. The increase pushed high-density polyethylene prices up to 75 cents per pound in March, a 61 percent jump. Ethylene feeds into myriad consumer products such as Styrofoam cups, plastic bottles, packaging and auto parts.

Rising Producer Prices

The increased chemical prices and related disruptions to supply chains added upward pressure to U.S. producer price indexes (PPIs).

The basic organic chemicals index (which tracks the prices of processed intermediate goods and includes ethylene) rose 10.4 percent from February to March 2021 (Chart 4).

Plastics and resins (which include polyethylene) increased 9.1 percent in March. Both were the fastest monthly rates of increase on record for these series, which began in 2011. The broader chemicals and allied products

PPI logged its highest monthly growth since August 1974.

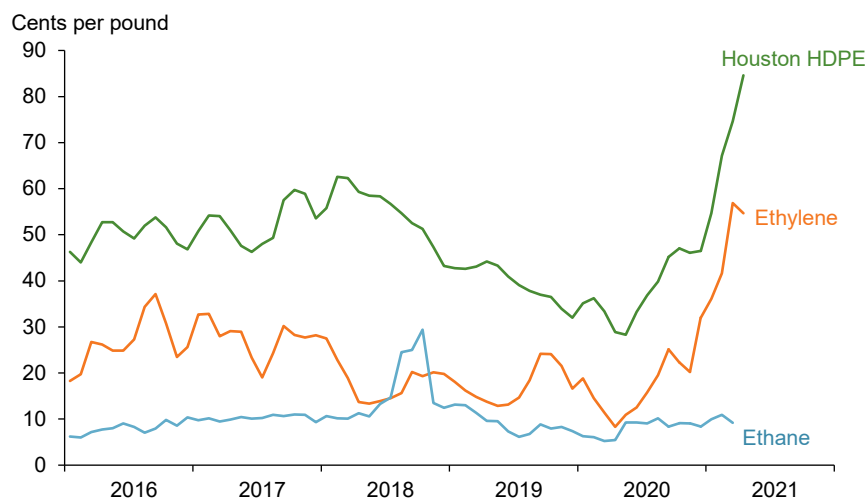
Lingering Effects in 2021

Even with chemical production back to prepandemic levels, supply chains aren't yet fully restored.

Consumer demand during the pandemic proved resilient as households ordered more to-go boxes from restaurants, demanded more personal protective equipment and required more packaging for online shopping orders. This helped offset lower demand for

CHART 3

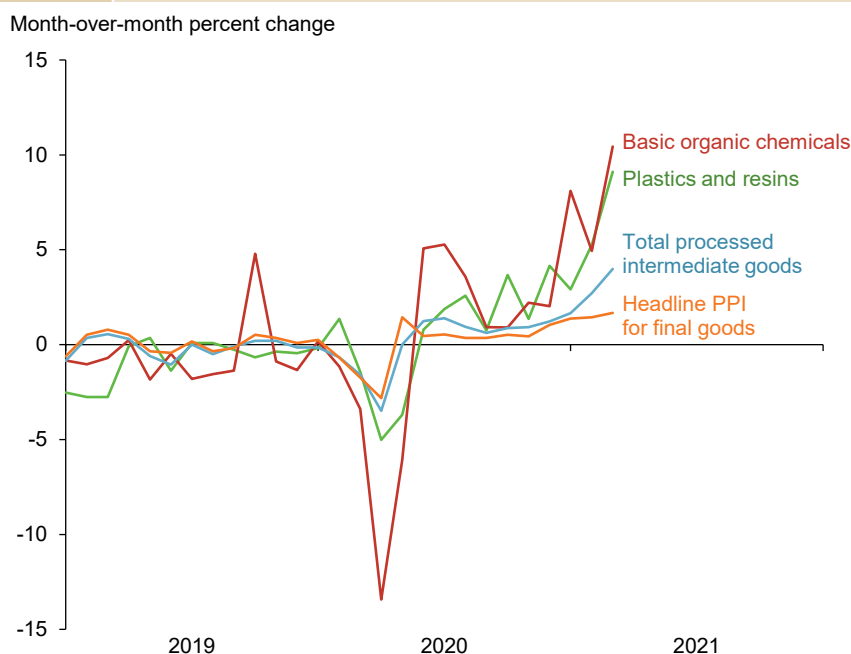
Gulf Coast Intermediate Chemical Prices Surge with Plants Offline



NOTES: The ethane price is the Mont Belvieu ethylene feedstock cost. HDPE is short for high-density polyethylene. Ethylene and HDPE prices are Gulf Coast and Houston assessments, respectively.
SOURCES: Bloomberg; PolymerUpdate.com; Muse; Stancil & Co; author's calculations.

CHART 4

Chemical Indexes Contributing to Rising Producer Price Inflation



NOTES: Growth rates are not annualized. Total processed intermediate goods, plastics and resins, and basic organic chemicals are "processed intermediate goods" indexes, while PPI is the Producer Price Index, a measure of inflation at the wholesale level.

SOURCE: Bureau of Labor Statistics.

products such as motor oil additives and tire rubber, where consumption fell as people stayed home.

With little spare production capacity across the chemical sector, most new production will go to meeting new orders—likely keeping inventories thin throughout supply chains. The lack of wiggle room should support recent high prices or even lead to still-higher prices should demand increase further.

The pandemic has produced lingering logistical challenges in shipping. International shipping costs have skyrocketed in spot and contract markets, particularly for trans-Pacific crossings. This is in part because the number of vessels in service has not fully recovered from 2020 lows, when lockdowns initially curtailed demand.

Shipping containers were left misallocated as the logistics of pandemic lockdowns limited the backhaul of empty containers used for moving bags of resins and other substances. Recurring coronavirus lockdowns affecting ports and businesses around the world may continue constraining shipping and container capacity, further chal-

lenging the restocking of chemical supply chains and broadly contributing to higher import costs.

Reaching Market Balance

Refiners and petrochemical producers' optimism grew as the economy strengthened in second quarter 2021 and COVID-19 vaccines became more plentiful. Industry officials say they remain wary about additional lockdowns arising from recurring illness in large demand centers such as India.

Forecasts for global crude and natural gas liquids consumption from the International Energy Agency were revised upward, and chemical industry contributions to the U.S. Purchasing Managers Index grew strongly as outlooks improved.³

Restocking inventories and fortifying supply chains will be challenging, although petrochemical industry executives believe that full normalization could occur by year-end 2021.⁴ More production from new capacity coming online—\$5.7 billion worth in Texas, according to the American Chemistry Council—could help some product

markets if it is brought into operation early enough in 2021. However, higher-than-normal production rates through the fall and improved global shipping and logistics environments will likely be needed.

The 2021 hurricane season in the Gulf of Mexico provides another variable. The ability to gain control over COVID-19 is also an unknown. Whatever occurs, the near-term impact of the Texas deep freeze on the chemical industry is expected to reverberate through supply chains across industries for the rest of the year. When these transitory factors fade, upward industry price pressures are expected to dissipate.

Thompson is a senior business economist in the Houston Branch of the Federal Reserve Bank of Dallas.

Notes

¹ "Cost of Texas' 2021 Deep Freeze Justifies Weatherization," by Garret Golding, Anil Kumar and Karel Mertens, Federal Reserve Bank of Dallas *Dallas Fed Economics*, April 15, 2021, www.dallasfed.org/research/economics/2021/0415.

² "Toyota Partially Halts North American Auto Production on Plastics Shortage," by Adam Yanelli, Independent Commodity Intelligence Services, March 18, 2021, www.icis.com/explore/resources/news/2021/03/18/10619129/toyota-partially-halts-north-american-auto-production-on-plastics-shortage.

³ "March 2021 Manufacturing ISM Report on Business," Institute for Supply Management (ISM), April 2021, www.ismworld.org/supply-management-news-and-reports/reports/ism-report-on-business/pmi/March/; and "ISM-Houston Business Report on Business," by Ross S. Harvison, ISM, March 2021, www.ism-houston.org/ism-houston-business-report-2021-04-12.

⁴ Eleventh District Beige Book, April 14, 2021, www.dallasfed.org/research/beige/2021/bb210414.aspx; "Texas Petrochemical Production is Still Thawing," by Alexander H. Tullow, *Chemical and Engineering News*, March 21, 2021, <https://cen.acs.org/business/petrochemicals/Texas-petrochemical-production-still-thawing/99/i11>; and "U.S. PPG Expects Most Product Inflation to Subside in H2 2021, After Q1 Rise," by Deniz Koray, Independent Commodity Intelligence Services, March 16, 2021, www.icis.com/explore/resources/news/2021/04/16/10629279/us-ppg-expects-most-product-inflation-to-subside-in-h2-2021-after-q1-rise.

Banks Face New Challenges as Texas Rebounds from COVID-19 Shock

By Amy Chapel, Kory Killgo and Kelly Klemme



ABSTRACT: The banking industry faced significant challenges from the COVID-19 pandemic in 2020, with profitability declining to levels not seen since the 2008–09 financial crisis. While strong economic growth during 2021 is expected as the economy reopens, some credit deterioration and losses are still possible as fiscal stimulus and national forbearance programs end.

Like much of the rest of the U.S. economy, the banking industry is finding its way after dealing with COVID-19 challenges in 2020. These included declining profitability—largely a product of lower net interest margins and greater loan loss provision expense.

Since the pandemic became widespread in March 2020, asset quality has deteriorated only slightly, holding up mostly because of loan forbearance. However, this support may simply push some credit-quality issues into the second half of 2021. While banks increased their allowance for loan and lease losses, credit quality remains a risk this year, particularly as exceptional government support ends.

For much of 2020, banks benefited from unprecedented public sector support—including historical levels of fiscal stimulus and the Paycheck Protection Program (PPP), which helped businesses maintain payrolls during the downturn. Regulators also encouraged banks to work with affected customers and offer loan forbearance.

Though many of these measures bolstered the economy, aggregate loan growth stalled in 2020 after excluding lending through PPP, in which most banks participated.

The Federal Reserve also played a significant role with its purchases of government securities to stimulate the economy and ensure smooth functioning of financial markets. These purchases increased bank balances at the Federal Reserve. When the Federal Reserve purchases government securities (Fed asset purchases) to support the economy, it credits the account of a bank or a bank customer with the cash. This activity has implications for banking system liquidity and capital.

In the case of banking system liquidity, Fed asset purchases can create deposits at banks, thus increasing their liquidity. When it comes to bank capital, Fed asset purchases can boost the size of the overall banking system's balance sheet, reducing capital adequacy. Thus, in addition to facing possible strains from loan losses and pressured capital adequacy in 2021, banks will likely continue to confront headwinds to profitability from low interest rates and excess liquidity.

Sharply Lower Profits

The return on average assets for Eleventh District banks fell from 1.32 percent in 2019 to 0.89 percent in 2020—the lowest return since 2009 (*Chart 1*).¹ U.S. banks experienced an even steeper decline, from 1.30 percent to 0.72 percent—the lowest since 2010.

The decline in profitability was primarily driven by higher provision expense—which more than doubled from 2019 to 2020 for both district and U.S. banks—and by lower net interest margins.² Provision expense is the amount banks set aside to cover loan losses; provision expense gets added to a bank's allowance for loan and lease losses, or loan loss reserves.³ While the loan loss reserve is a buffer against expected losses, additions to it reduce profitability.

Net interest margins can fluctuate based on changes in interest rates—both rates paid on deposits and rates charged on loans. It can also vary with changes in the volumes of deposits and earning assets, such as loans and securities.

Interest rate changes were mainly responsible for the decline in net interest margins in 2020. They declined as the economic outlook weakened, as

evidenced by cuts to the federal funds rate in early 2020 and a flattening of the Treasury curve—a reduction in the difference in interest rates investors demand for short- and long-term Treasury obligations.

This affected the rates banks charged borrowers on their loans as well as the deposit rates banks paid to customers. Rates charged on loans fell faster than those paid on deposits. The drop in net interest margins was also due, to a lesser extent, to a surge in the

quantity of deposits, causing banks to pay out more in interest to customers despite falling interest rates.

Deposits at commercial banks nationally totaled \$17.7 trillion at year-end 2020—23 percent higher than at year-end 2019 (*Table 1*). The annual growth in deposits was significantly greater than any year since 1973, when data collection began. The surge in deposits added to banks' liquidity and can be attributed to the pandemic support measures, with significantly higher U.S. household savings and Fed asset purchases both contributing.

Loan Volume Declines

A decline in interest income caused by lower loan volume further pressured net interest margins. Loan growth—outside of PPP loans—stalled nationally and in the district in 2020. Excluding PPP loans, total loans contracted year over year in fourth quarter 2020—the first such decline since 2011—falling 0.54 percent for district banks and 0.59 percent for U.S. banks (*Chart 2*).

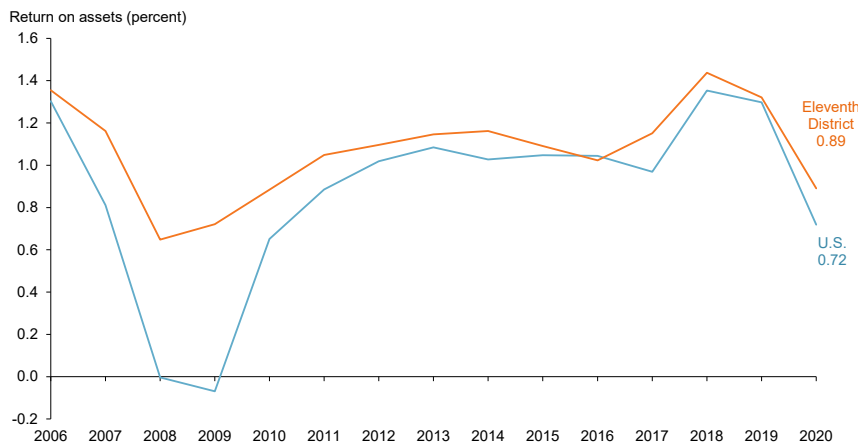
Aggregate loan growth, inclusive of PPP loans, was positive in 2020. Now that the PPP has ended, many of those loans will be forgiven under terms of the law creating the federal assistance effort or, in some cases, they will be repaid. Should loan demand remain sluggish as the economy improves, banks could feel pressure to search for other opportunities to deploy their excess liquidity, such as buying securities.

Bigger Balance Sheets

Banks' total assets grew despite soft loan conditions because of public sector intervention. Among Eleventh District banks in 2020, assets increased \$105 billion, or 19 percent, compared with 17 percent for all U.S. banks, as seen in *Table 1*.

Bank balance-sheet growth in 2020 can be attributed to PPP loans, growth in reserve balances at the Federal Reserve due to Fed asset purchases, and increased holdings of investment securities. District banks experienced larger balance-sheet growth than their national counterparts. Increases in the size of bank balance sheets act to

CHART 1 Eleventh District, U.S. Bank Profitability Declines in 2020



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

TABLE 1 PPP, Fed Balances and Securities Fuel Banking System Balance-Sheet Growth

	Change, Dec. 31, 2019–Dec. 31, 2020			
	Eleventh District banks		U.S. banks	
	Dollars (billions)	Percent	Dollars (billions)	Percent
Total assets	105	19	3,223	17
PPP	23	–	406	–
Loans (excl PPP)	-\$2	-0.5	-62	-0.6
Investment securities	40	31	1,127	28
Balances due from Federal Reserve Banks	67	152	1,594	103
Other	-23	-63	158	6
Total liabilities	100	21	3,109	19
Deposits	97	21	3,273	23
Wholesale funding	-0.1	-0.6	-343	-32
Other	3	29	179	19
Equity capital	5	8	114	5

NOTE: PPP refers to the Paycheck Protection Program.

SOURCES: Federal Financial Institutions Examination Council, Reports of Condition and Income; Federal Reserve H.4.1 Release.

weaken banks' leverage ratios—a measure of a bank's core capital relative to its total assets.⁴

Bank reserves at the Federal Reserve are likely to continue to increase in 2021 as a result of additional Fed asset purchases—part of the Federal Reserve's ongoing response to the pandemic—and stimulus funds moving from the Treasury to taxpayers, who, in turn, increase deposit balances at banks.

Assessing Asset Quality

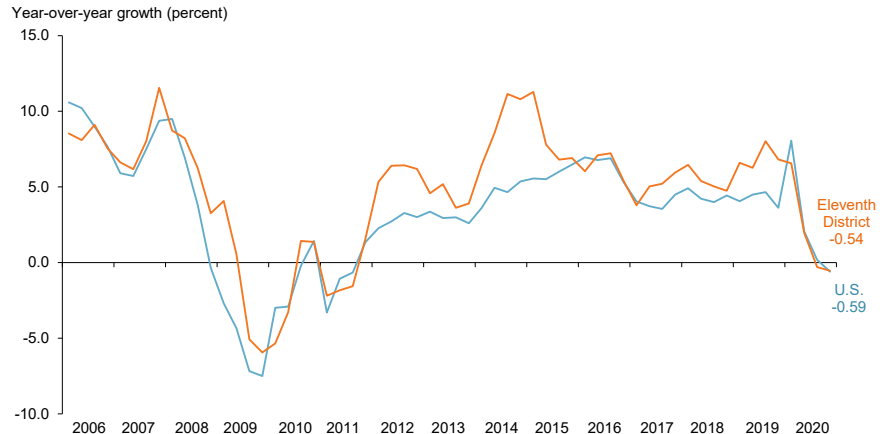
Credit quality largely held up in 2020, despite a sharp recession and historical levels of unemployment that would normally be consistent with a sharp deterioration in asset quality. Personal bankruptcies actually fell during the pandemic, while corporate bankruptcies rose but have remained well below 2008–09 levels.

The noncurrent loan rate—the percentage of loans past-due 90 days or more or on nonaccrual status (not generating interest)—ticked up to 1.21 percent nationally and 0.91 percent in the district in 2020, still well below financial-crisis levels. The increase in the noncurrent loan rate was primarily due to increases in noncurrent residential real estate loans, followed by increases in noncurrent commercial real estate (CRE) loans, both nationally and in the district (*Chart 3*).

During prior downturns, high CRE-related losses contributed to bank failures and constrained bank lending. Banks with less than \$100 billion in total assets may be particularly vulnerable to such losses because they are more concentrated in CRE relative to larger banks. Within CRE, the retail and hotel segments have been stressed the most during the pandemic. However, risk of future deterioration in office and even multifamily segments, combined with sizable bank exposures to these sectors, could lead to credit losses.

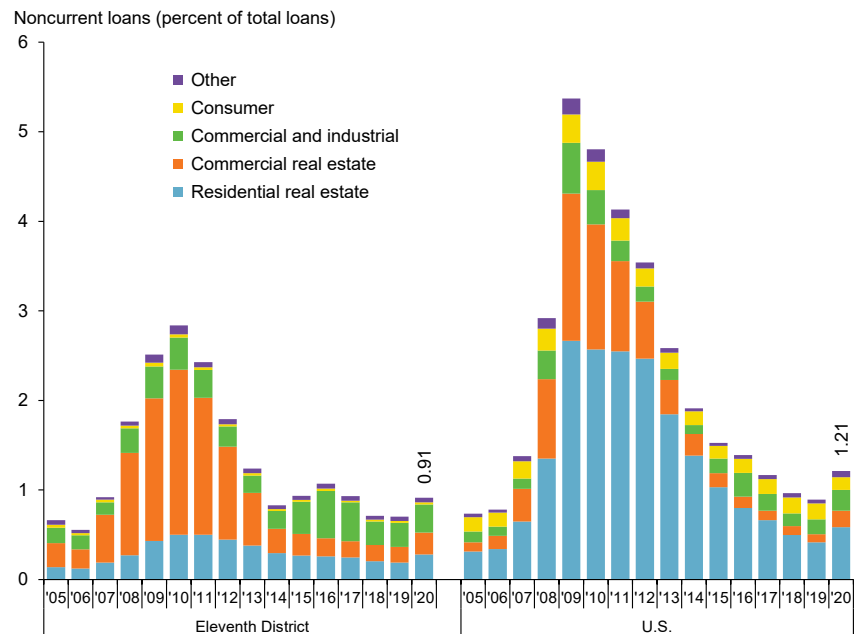
While bank CRE losses have risen only marginally during the pandemic, they tend to lag the deterioration of commercial mortgage-backed securities (CMBS)—packages of commercial mortgage loans sold to investors and not backed by a U.S. government-spon-

CHART 2 Excluding Paycheck Protection Program, Bank Loan Growth Stalls



NOTE: Data have been adjusted to exclude Paycheck Protection Program loans.
SOURCE: Federal Financial Institutions Examination Council, Reports of Condition and Income.

CHART 3 Noncurrent Loan Rates Rise Slightly in 2020



NOTES: Data have been adjusted to exclude Paycheck Protection Program loans. Noncurrent loans are ones in which payments are 90 days or more past due or not generating interest. C&I refers to commercial and industrial loans.
SOURCE: Federal Financial Institutions Examination Council, Reports of Condition and Income.

sored enterprise such as Fannie Mae or Freddie Mac.⁵

Credit deterioration within the CMBS market has been more evident during the pandemic. The delinquency rate on loans in CMBS securitizations—30 days or more past due—rose

from just 2 percent pre-pandemic (March 2020) to a peak of 10.3 percent in June and stood at 6.5 percent in April 2021, according to Trepp, a provider of mortgage data.

Other measures of risk for loans in CMBS securitizations, including watch

lists and special servicing for troubled loans, are also elevated. The share of CMBS loans on watch lists, indicating possible credit concerns, stood at 25.7 percent in April 2021, up significantly from 8.5 percent in March 2020. The share transferred into special servicing, designed to help resolve troubled loans, was 9.0 percent in April 2021, also up notably from 2.7 percent in March 2020. CMBS credit deterioration could signal trouble ahead for banks' CRE credit quality.

The limited deterioration in banks' asset quality is largely a result of extensive government and Federal Reserve support to households and businesses in response to the pandemic. Additionally, the Coronavirus Aid, Relief, and Economic Security (CARES) Act gave banks greater latitude to work with affected customers, offering forbearance—including payment deferrals, fee waivers and extension of payment terms—on outstanding loans.

Banks' loan balances in forbearance under the CARES Act totaled 2.8 percent of all loans (excluding PPP) nationally as of fourth quarter 2020. This share was down from 5.8 percent in second quarter 2020, an improvement that banks largely attributed to customers resuming normal payments once their deferral period ended.

Loan balances remaining in forbearance could negatively affect banks' asset quality if they become noncurrent.

Potential Loan Losses

While the economy is set to grow quickly this year, concern remains that once pandemic relief measures end, delinquent loans and loan losses might increase. This could occur if businesses and consumers in forbearance are unable to resume loan payments or because of structural changes in the economy permanently affecting certain industries, such as retail, hospital-ity and office construction.⁶

While the banking sector was generally well-capitalized before the pandemic, scenario analysis can provide insight about the potential impact of higher loan losses on bank capital levels.

The Federal Reserve Bank of Dallas has developed an internal capital calculation tool that translates a set of loan loss rates into an estimate of banks' risk-based and leverage capital ratios.⁷ The resulting capital ratios under a given loan loss scenario can help determine if an institution could become undercapitalized—at least one capital ratio falling below regulatory minimums.

Using this tool, one can consider the impact of two potential scenarios of loan loss (loans that default) over

a one-year horizon. One is a baseline scenario that stresses all loan categories using a loss rate—loans that default as a share of total loans—of 1.5 percent. The other is a downside scenario using loss rates derived from regulators' 2020 large-bank stress tests.⁸

Table 2 shows the one-year loss rates—the share of total loans that default in one year—for each scenario. For reference, the peak one-year loss rates from the financial crisis and the average of bank regulators' 2013–19 large-bank stress test loss rates by major loan type are also shown.

Nationally, only 3 percent of banks are estimated to become undercapitalized in the baseline scenario. Banks becoming undercapitalized may face restrictions on their growth, capital distributions and merger transactions. The share of all U.S. banks estimated to become undercapitalized increases to 10 percent in the downside scenario.

Within the Eleventh District, 2 percent of banks could become undercapitalized in the baseline scenario, increasing to 8 percent in the downside scenario. Given continued economic improvement this year, it is unlikely loan loss rates for all loan categories will be as high as those in the downside scenario. However, it is possible that some loan categories could experience stress once public sector support expires.

TABLE 2 Loan Loss Rates May Rise with Added Stress Scenario Analysis, One-Year Loan Loss Rates (Pct.)							
	First-lien residential	Jr. lien/ HELOC	C&I	CRE	Credit card	Other consumer	Other loans
Baseline scenario	<div style="text-align: center;"> ← 1.5 → </div>						
Downside scenario	0.95	1.40	3.35	5.60	9.90	2.85	1.80
Financial crisis peak	2.01	4.25	2.94	2.92	12.89	3.73	0.82
Large-bank stress tests average (2013–19)	1.61	3.00	2.79	3.41	6.55	2.52	1.40

NOTES: The large-bank stress tests' average one-year loan loss rates are from bank regulators' 2013–19 Dodd-Frank Act Stress Tests. HELOC refers to home equity line of credit; C&I refers to commercial and industrial loans; CRE refers to commercial real estate loans.

SOURCES: Federal Reserve Bank of Dallas; Dodd-Frank Act Stress Tests; Federal Financial Institutions Examination Council, Reports of Condition and Income.

Looking Ahead

While strong economic growth is anticipated in the second half of 2021 as the economy reopens, some credit deterioration and losses are possible as fiscal support and forbearance programs end.

There is significant uncertainty about potential loan losses at banks, but scenario estimates indicate moderate possible impacts on bank capital in 2021. Banks also face continued pressure on net interest margins absent a rebound in loan demand and a sustained, steeper Treasury curve.

Chapel is a macro-surveillance manager, Killgo is a financial industry analyst and Klemme is a data scientist in the Banking Supervision Department at the Federal Reserve Bank of Dallas.

(Continued on back page)

Oil Patch Productivity Rises; Jobs Vanish

By Garrett Golding and Sean Howard

The oil and gas industry's shale revolution, a product of technical breakthroughs and high oil prices more than a decade ago, transformed global energy markets and sparked an economic boom in parts of Texas and New Mexico.

But after major oil price busts in 2014 and 2020, the same engineering prowess that helped the industry thrive has been driven to find efficiencies to lower operating costs. The result: Fewer workers are needed to produce the same oil and gas output.

The region's oil and gas firms employ fewer people today than at the beginning of the shale oil boom 11 years ago, even as oil production quadrupled (Chart 1).

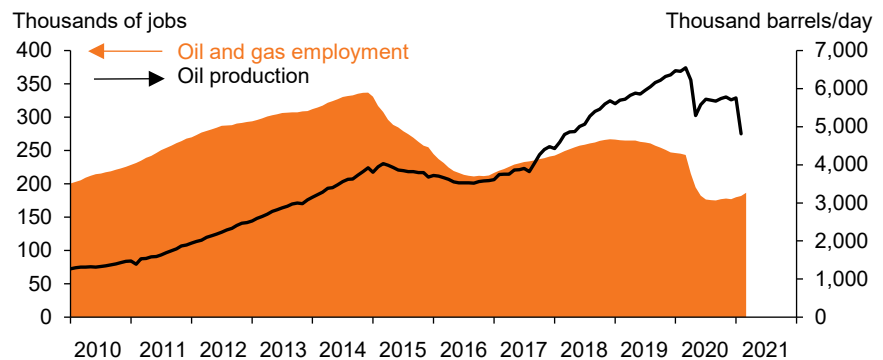
Boom Years Growth

As domestic oil production surged between 2010 and 2014, so did hiring. More than 900 rigs operated across Texas and New Mexico during the first half of 2014 when the benchmark West Texas Intermediate oil price held above \$100 per barrel.

Companies in the two states employed more than 330,000 people at the time. Prices crashed in the second half of that year, and by 2015, drilling activity and capital spending collapsed—289 oil production and service companies went bankrupt, and 120,000 energy jobs were lost. The rig count plummeted below 200 by mid-2016.

Companies unleashed a series of improvements to make wells more productive and cut costs starting in 2015.¹ This lowered the breakeven prices for shale wells and allowed production to recover quickly after the downturn. Texas and New Mexico oil production grew 14 percent between December 2014 and December 2017, while industry employment dropped 29 percent.

CHART 1 Oil and Gas Industry Productivity Improves in Texas, New Mexico as Head Counts Decline



NOTE: Oil and gas employment includes jobs data for (1) oil and gas extraction in Texas; (2) support activities for oil and gas in Texas; and (3) mining and logging in New Mexico, which includes the oil and gas industry.
SOURCES: Bureau of Labor Statistics; Federal Reserve Bank of Dallas.

These developments were apparently insufficient to satisfy investor demands to improve free cash flow and to return capital.² Company payrolls shrank again, the rig count declined throughout 2019 and, counterintuitively, oil production surged.

Further Belt Tightening

Oil prices crashed again last year, as a price war erupted between Saudi Arabia and Russia, and demand slumped because of COVID-19. A wave of industry consolidation swept the sector and led to more cost cutting.

Technology is redefining operational roles. Though automation is in the early stages of deployment on drilling rigs, it is decreasing personnel requirements. Remote monitoring of wells and other facilities, which proliferated with COVID-19 workplace restrictions, further lessened employment needs.

These kinds of adaptations have shifted the workforce and cost structure of oil and gas companies. In an analysis of 14 independent exploration and

production companies, general and administrative costs fell from \$2.96 per barrel of oil equivalent on average in 2018 to \$2.10 in 2020. These expenses on average exceeded \$4 among these companies at the start of the last decade.

Job opportunities in the oil patch face a compounding squeeze. Companies require fewer employees for more output while a slower pace of field activity takes hold.

However, since most companies are as lean as they have ever been, another period of low prices is unlikely to yield further widespread job losses. Conversely, if prices surge higher, few operators are expected to act as aggressively as they would have in the past and drill more wells and hire more workers.

Notes

¹"Spotlight: Permian's Shale-Era Oil Production Rises Even as Rig Count Falls," by Emma Marshall and Jesse Thompson, Federal Reserve Bank of Dallas *Southwest Economy*, First Quarter, 2020.

²"Shale Firms Pump Up Dividends as Industry Focus on Returns Grows," by Ernest Scheyder, Reuters, March 25, 2018.

Women Took Brunt of Pandemic Job Loss as Priorities Shifted to Home

Design: Olu Eseyin; Content: Camila L. Holm, Yichen Su

Working women fared worse than men in the pandemic—a reversal from the Great Recession

Job loss by gender: Great Recession vs. Pandemic

Decline in monthly employment rate,
Jan. 2008–Jan. 2010

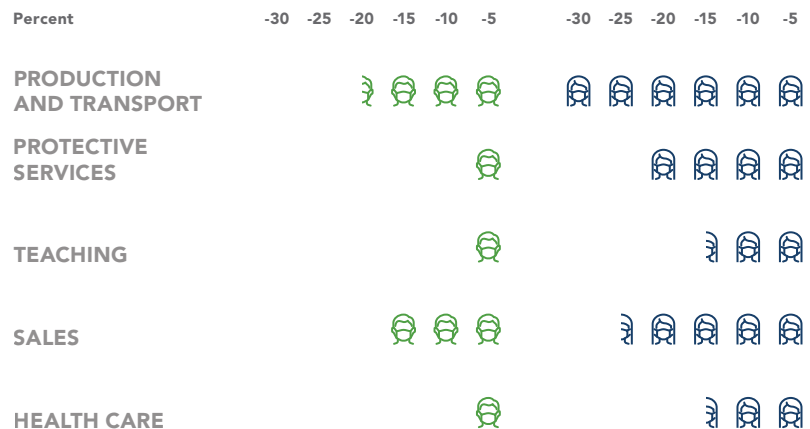
Decline in monthly employment rate,
Jan. 2020–May 2020



JANUARY–MAY 2020

Employment declined more for women than for men—including in many essential services.

Icons show percent decline by occupational category.



Employment declined significantly more for women than for men with young children.

Icons show percent decline in employment rate.



Data suggest family demands disproportionately fell on working women during the pandemic, limiting their ability to work.

NOTES: Individuals who have children are defined as those who have at least one child in the household. Single individuals are those not currently married or those without a spouse present. The sample is restricted to men and women who are age 25–64.
SOURCE: Bureau of Labor Statistics, Current Population Survey.

Banks Face New Challenges as Texas Rebounds from COVID-19 Shock

(Continued from page 13)

Notes

¹ Data for Eleventh District institutions have been adjusted for structure changes such as mergers, acquisitions and relocations. The district comprises Texas, northern Louisiana and southern New Mexico.

² Net interest margin is the difference between a bank's interest income (loan and securities yields) and interest expense (deposit and other borrowing costs) weighted by average earning assets.

³ Allowance for loan and lease losses (ALLL) increased, partly due to the adoption of the current expected credit loss (CECL) model by some institutions in early 2020, but not many Eleventh District banks adopted CECL in 2020. Other increases in ALLL were due to normal provisioning for loan losses.

⁴ A bank's core capital includes assets that can be easily

liquidated if the bank needs capital in the event of a large unexpected loss or financial crisis. PPP loans were excluded from bank leverage ratios if they were funded with Payment Protection Program Liquidity Facility borrowings from a Reserve Bank.

⁵ Due to their structure, CMBS loans can be more difficult to modify or defer than bank loans.

⁶ "COVID-19 Slammed into Texas, Leaving Long-Lasting Impacts," by Emily Kerr, Judy Teng and Keith Phillips, Federal Reserve Bank of Dallas *Southwest Economy*, First Quarter 2021.

⁷ Capital estimates are equal to beginning capital plus cumulative pre-provision net revenue (PPNR) minus cumulative loan losses, taxes and dividends. PPNR is based on current-quarter net interest income, the average

of the most recent four quarters for noninterest expense and the average of the four quarters prior to PPP for noninterest income. A tax rate of 21 percent is applied to institutions with PPNR greater than loan losses. Dividends are equal to the sum of the most recent four quarters.

⁸ The downside scenario uses loan loss rates based on the Dodd-Frank Act Stress Test (DFAST) December 2020 Severely Adverse scenario. For purposes of this article, published nine-quarter DFAST loan loss rates are converted to four-quarter loss rates. See www.federalreserve.gov/publications/files/2020-dec-stress-test-results-20201218.pdf.



Federal Reserve
Bank of Dallas

Southwest Economy

is published by the Federal Reserve Bank of Dallas. The views expressed are those of the authors and should not be attributed to the Federal Reserve Bank of Dallas or the Federal Reserve System.

Articles may be reprinted on the condition that the source is credited to the Federal Reserve Bank of Dallas.

Southwest Economy is available on the Dallas Fed website, www.dallasfed.org.

Marc P. Giannoni, Senior Vice President and Director of Research
Pia Orrenius, **Keith R. Phillips**, Executive Editors
Michael Weiss, Editor
Kathy Thacker, Associate Editor
Dianne Tunnell, Associate Editor
Justin Chavira, Digital Designer
Olumide Eseyin, Digital Designer
Emily Rogers, Digital Designer
Darcy Taj, Digital Designer

Federal Reserve Bank of Dallas
2200 N. Pearl St., Dallas, TX 75201