



# Southwest Economy



## Maquiladoras, Mexico's Engine of Trade, Driven to Navigate Evolving Demand

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# Lorie K. Logan: New Dallas Fed President's Observations, Outlook

Lorie K. Logan began her tenure as the 14th president and CEO of the Federal Reserve Bank of Dallas on Aug. 22, 2022. She launched her Federal Reserve career as a financial analyst at the Federal Reserve Bank of New York in 1999.

Most recently, Logan was manager of the System Open Market Account for the Federal Open Market Committee (FOMC) and an executive vice president of the New York Fed. In that role, she managed the Federal

Reserve's securities portfolio as it grew to more than \$8 trillion and led the implementation of FOMC monetary policy.

As Logan assumed her new duties at the Dallas Fed, she participated in a virtual town hall, answering questions about her background and priorities for the Eleventh Federal Reserve District. The following are excerpts from that event, edited for clarity and presented by topic:

## On Lessons Handling Crises:

In the Fed's response to the pandemic, particularly in March and April 2020, I really relied upon experiences that I had working at the Fed during earlier crisis periods, including 9/11 and the financial crisis.

One of the most valuable lessons was the importance of the central bank clearly communicating that it's open for business, and that it's available to provide liquidity to financial markets. Simple communication of that role is essential for providing confidence to financial markets and economic participants. While working at the Fed on 9/11, I recall that communications were incredibly important to boosting confidence during that difficult period.

Another lesson that I've taken from my experience managing crises is the importance of innovation; no two crises are the same, and economic and financial conditions change over time.

## On Moving to Texas:

There were a number of things that really excited me about the opportunity to lead the Dallas Fed—the overall size and diversity of the economy in the region and its influence on the nation as a whole. This district has a very dynamic economy, and the communities that make up the district are essential contributors to the nation's economy as a whole.

Another thing that excited me was the ability to bring my experience leading large teams and implementing monetary policy

and operations to the leadership position of the Dallas Fed. I want to build upon the work that we already do in serving the community as well as leverage the district in providing services to the Federal Reserve System more broadly.

## On Most Urgent Task:

Bringing inflation down is our most urgent task because it's causing hardships for businesses and households around the world. ... As president of the Dallas Fed, and as a Fed policymaker, [I believe] our No. 1 priority has to be to restore price stability.

## On the Eleventh District:

I really want to learn more about what's driving the [economic] outperformance here in the district. How can we help make that economic performance more distributed and broader across stakeholders nationally and in the region? What type of information can we take from that experience to influence national policy discussions?

## On Technological Change:

I've focused on technological innovation in the financial sector and, in the last several years, on the way in which that innovation is changing financial services and broadening inclusion to a larger set of [people] in our country. Understanding what's driving investment and innovation and technology here in the Eleventh District will be another key area of focus for me, one that I'm excited to learn more about.



# Maquiladoras, Mexico’s Engine of Trade, Driven to Navigate Evolving Demand

By Jesus Cañas

**ABSTRACT:** Mexico’s maquiladoras, an important generator of manufacturing and employment activity along the U.S.–Mexico border, confront a changing landscape. Evolving global trade patterns, reflecting stressed supply chains and increasing electric vehicle production, will test maquiladora agility and growth prospects.

**T**he role of Mexican maquiladoras—large, mostly foreign-owned plants engaging in labor-intensive assembly of intermediate and final goods for export—has evolved over the years, though the basics remain the same.

Most inputs are imported duty-free from the U.S. or another country. U.S. tariffs are applied only to the value that is added by assembly on products sent back across the border.

However, more than two years removed from the onset of the COVID-19 pandemic, the maquiladora operating environment has changed. Global trade, including chronic input shortages and the specter of a worldwide economic slowdown, poses tough challenges. Moreover, longstanding auto assembly and parts businesses, making up the largest portion of maquiladora output, confront a transition to electric vehicles that require new and different manufacturing processes.

## Manufacturing for Export

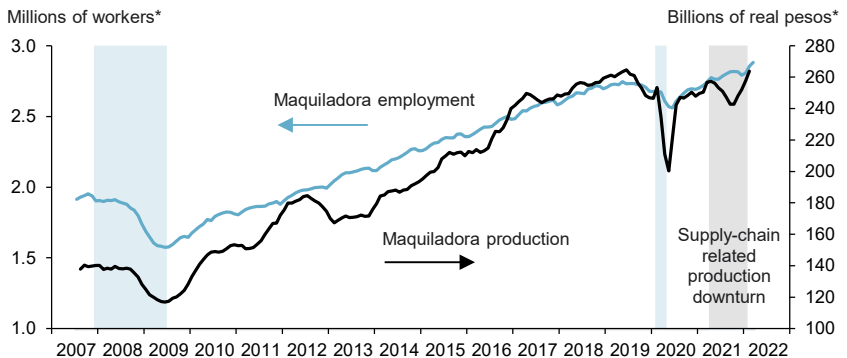
Rules adopted in 2007 merged the maquiladora industry and a program for homegrown exporters into what is currently known as the Manufacturing, Maquila and Export Service Industry Program.<sup>1</sup> The more familiar name, “maquiladora,” is used here. In 2021, maquiladoras accounted for 58 percent of Mexico’s manufacturing GDP (as well as a majority of the country’s manufacturing exports) and 48 percent of industrial employment.

For perspective, manufacturing represented 19 percent of Mexico’s overall GDP and 19 percent of employment. In the U.S., manufacturing accounts for 11 percent of GDP and 8.4 percent of employment.

Besides auto parts and automobiles, maquiladora production includes electronics, medical devices, aircraft parts and machinery. Maquiladoras also sell engineering services.

CHART  
1

Maquiladora Activity Poised to Resume Upward Trend



\*Seasonally adjusted.

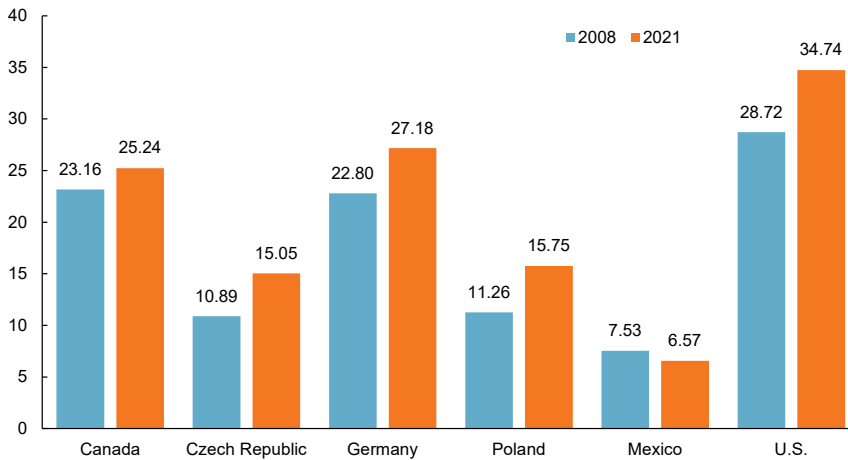
NOTES: Employment data are through March 2022. Production data are three-month moving averages through February 2022. Blue shaded bars indicate National Bureau of Economic Research-designated U.S. recessions.

SOURCES: National Institute of Statistics, Geography and Informatics (Instituto Nacional de Estadística, Geografía e Informática); author’s calculations.

**CHART**  
**2**

**Low Mexico Wages Continue Attracting Foreign Manufacturers**

Real dollars per hour\*



\*Adjusted for purchasing power parity for full-time work and all industries.  
SOURCES: Organization for Economic Cooperation and Development; author's calculations.

Following adoption of the North American Free Trade Agreement (NAFTA) in 1994, maquiladora activity became increasingly correlated with U.S. manufacturing production and, thus, susceptible to recessions and expansions north of the border.

When there is a pickup in U.S. consumer demand for refrigerators, televisions, washing machines or automobiles, production orders reach Mexican maquiladoras. They specialize in the relatively labor-intensive side of production, while the U.S. engages in the more capital-intensive part of the process.

By spreading production costs across borders and taking advantage of lower labor costs in Mexico, firms can produce at a lower average unit cost, which leads to greater competitiveness in both global and domestic markets and to lower prices for consumers.<sup>2</sup>

International competitors, notably Chinese manufacturers, have pressured the maquiladora sector, much as they have done to U.S. manufacturing. In the early 2000s, a U.S. recession and increased competition from China following the country's entry into the World Trade Organization forced the maquiladora industry to downsize and cut employment.<sup>3</sup> The industry was again tested during the Great Recession of 2007–09 and later amid the onset of the pandemic in 2020.

After the Great Recession, maquiladora employment took more than three years to recover, while production required a year and a half to return. By comparison, U.S. manufacturing has not yet recovered. Employment remains 5.2 percent below pre-Great Recession levels, while production lags behind by 2.9 percent.

In the wake of the pandemic in 2020, supply-chain issues particularly affected the automotive sector, reducing new orders and sending the maquiladora industry into another production downturn, the recovery from which required nine months (*Chart 1*). Employment was virtually unaffected, reflecting the difficulty of firing and then rehiring workers in Mexico.

**Wages and Productivity**

Of the many reasons for factories to locate in Mexico, proximity to the U.S. and preferential tariffs predominate. Mexico has 13 free-trade agreements with 50 countries—including the United States–Mexico–Canada Agreement (USMCA), the 2020 successor to NAFTA. There are also preferential considerations granted to maquiladoras.

Mexico has a plentiful labor supply, with an economically active population of 58 million. Relatively low labor costs remain a primary factor prompting foreign companies—mainly from

the U.S.—to locate manufacturing operations in Mexico. The country's average hourly wage was \$6.57 in purchasing-power-adjusted dollars in 2021, significantly lower than in other advanced economies such as Canada, \$25.24; Germany: \$27.18; and the U.S., \$34.74. Mexican wages trailed comparable eastern European economies such as Poland, \$15.75, and the Czech Republic, \$15.05 (*Chart 2*).

Such wage differences reflect much more than differences in labor costs; they also indicate more capital-intensive production and higher productivity among workers in the high-wage countries. Mexico's low-cost labor and low-productivity growth is the product of less worker schooling and training combined with a large informal sector (relatively untaxed with little government oversight), lack of access to credit, government red tape and a poor business climate.<sup>4</sup>

Mexico's gross domestic product per worker (in constant U.S. dollars calculated at purchasing power parity to ensure an accurate comparison) increased at an annual rate of 0.3 percent from 2010 to 2021. This is well below the average for the Czech Republic (1.4 percent) and Poland (2.6 percent) over the same period. Comparable GDP-per-worker growth was 1.3 percent in the U.S and 0.9 percent in Canada.<sup>5</sup>

**U.S. Border Spillovers**

Most maquiladora employment remains concentrated in Mexican border states (though plant proximity to the U.S. has not been a government requirement for many years). Together, the Mexican states bordering Texas (from east to west: Tamaulipas, Nuevo Leon, Coahuila and Chihuahua) plus the other border states of Sonora and Baja California represent 62 percent of total maquiladora employment.

Four of the top five maquiladora states border Texas. Historically, the economic benefits of these large industrial complexes have spilled over into neighboring Texas cities, creating jobs in manufacturing, warehousing, transportation, logistics, real estate and services.<sup>6</sup>

States adjacent to Texas tend to produce automobile-related parts

and components, while those near California and Arizona specialize in consumer and business electronics.<sup>7</sup>

The industry concentration in northern Mexico has created an economic development divide that generally separates the northern and southern regions. In the north, where 30 percent of the population lives in poverty, the informal sector accounts for 40 percent of jobs. In the hardscrabble south, 57 percent of the population lives in poverty, the highest concentration in Mexico, and about 70 percent of the labor force works in the informal sector.<sup>8</sup>

### Seeking New Opportunities

Maquiladoras have slowly shifted from low-skill, low-wage production

toward high-wage, high-productivity operations. China's entry into the World Trade Organization in 2001 hastened this evolution as lower-end production moved overseas.

The shift to higher productivity over the past several decades provides insight into where the industry is headed. The top five fastest-growing sectors—absent the period of pandemic disruption—are transportation equipment, paper, plastics and rubber products, fabricated metal products and primary metals manufacturing. This manufacturing activity generally boasts higher wages and higher labor productivity than the national average (*Table 1*).

Rubber and metal products manufacturers bend, form and weld metal

and plastic parts used in the production of components and finished products for U.S. automakers. Paper manufacturing represents just 1.6 percent of total employment but has grown rapidly with the booming U.S. e-commerce business that boosted demand for boxes and other packaging.

By comparison, low-wage employment has declined, affecting sectors such as textiles and fabrics and apparel and accessories manufacturing.

### Autos' Leading Role

Maquiladoras' future will likely include their biggest industry—auto parts manufacturing and auto assembly. U.S. and Mexico have a long history of motor vehicle production that preceded the maquiladora program.

NAICS		Employment 2021	Share of total maquiladora employment (%)	Change in employment 2008-19 (%)	Average labor productivity growth 2008-19 (%)	Hourly compensation wage, 2021 (\$)	Hourly compensation wage, 2021 ppp (\$)
	Total nation	2,791,909		40.8	2.2	4.76	9.60
336	Transportation equipment	932,093	33.4	96.9	2.4	4.95	9.99
322	Paper	44,916	1.6	89.0	3.0	4.51	9.11
326	Plastics & rubber products	191,702	6.9	66.7	2.1	4.29	8.66
332	Fabricated metal products	148,898	5.3	53.1	2.8	4.93	9.95
331	Primary metal mfg	89,060	3.2	47.9	4.3	6.64	13.40
333	Machinery, except electrical	110,811	4.0	46.7	1.6	5.40	10.90
339	Miscellaneous manufactured commodities	215,179	7.7	46.4	1.2	5.09	10.29
323	Printed matter and related products	16,440	0.6	38.1	1.8	3.98	8.04
316	Leather & allied products	24,169	0.9	35.7	3.6	3.79	7.66
337	Furniture & fixtures	40,563	1.5	31.6	-0.2	4.16	8.40
325	Chemicals	64,496	2.3	26.2	2.4	4.93	9.95
312	Beverages & tobacco products	38,524	1.4	14.5	0.7	5.88	11.88
334	Computer & electronic products	366,471	13.1	12.6	-1.7	4.87	9.84
311	Food & kindred products	125,261	4.5	10.1	3.2	3.98	8.03
327	Nonmetallic mineral products	55,712	2.0	9.2	3.0	4.26	8.61
335	Electrical equipment, appliances & components	190,712	6.8	6.0	2.0	4.58	9.24
321	Wood products	9,531	0.3	0.6	2.6	3.57	7.21
314	Textile mill products	14,137	0.5	-7.0	-0.2	3.79	7.65
313	Textiles & fabrics	32,518	1.2	-13.1	0.9	3.02	6.09
315	Apparel & accessories	80,716	2.9	-34.4	0.9	2.44	4.92

NOTE: The table refers to IMMEX statistics (Mexico's Manufacturing, Maquila and Export Service Industry Program); ppp stands for purchasing-power-parity-adjusted dollars. SOURCES: National Institute of Statistics, Geography and Informatics (Instituto Nacional de Estadística, Geografía e Informática); author's calculations.

Ford became the first entrant in Mexico when it began assembling Model Ts in Mexico City in 1925. General Motors and Chrysler built their initial Mexican assembly plants in the 1930s. Although the maquiladora program set the stage for U.S.–Mexico market integration, the auto industry did not take full advantage until the 1980s.<sup>9</sup>

During the decade, Mexico shifted its auto industry policy toward export promotion. Vehicle manufacturers responded by opening modern and competitive plants, representing the beginning of the process of integrating Mexico into North America’s auto industry.<sup>10</sup> Broader North American vehicle production consolidation came with NAFTA in 1994.

Transportation equipment manufacturing represents one-third of maquiladora employment and production and 3.6 percent of Mexico’s GDP. Besides cars, SUVs, buses and trucks, the sector includes all related manufacturing—engines and engine parts, electronics, steering and suspension components, brake systems, transmission and power-train components, seating and interior trim.

Transportation production employment growth averaged 9 percent per year from 2008 to 2021, while output as a percentage of total manufacturing increased from 9 percent in 2008 to 12 percent in 2021.

This expansion contributed to Mexico becoming a global leader in internal combustion engine vehicle manufacturing—No. 7 in total world vehicle production and No. 1 in Latin America.<sup>11</sup> Additionally, Mexico is No. 4 in automotive parts exports worldwide and the top supplier of autos and auto parts to the U.S. (*Chart 3*).

The transition to electric vehicles poses a challenge to Mexico’s transportation equipment manufacturing leadership. Almost 1.8 million electric vehicles were registered in the U.S. in 2020, more than three times as many as in 2016.<sup>12</sup> Detroit’s Big Three automakers have announced plans for electric vehicles to represent 40 to 50 percent of new vehicle sales by 2030.

Manufacturing internal combustion and electric vehicles is fundamentally different. Electric vehicles are mechanically simpler, with many fewer parts than a traditional internal combustion unit. For example, a typical electric motor used to power an electric vehicle has three parts. By comparison, a typical four-cylinder internal combustion engine has 113 moving parts. A gearbox for an internal combustion engine vehicle has 27 moving parts; its electric vehicle counterpart has 12. Overall, an electric vehicle powertrain has 79 percent fewer moving and “wear” parts—meaning fewer parts to manufacture.<sup>13</sup>

Industry experts anticipate that from 2020 to 2025, a large share of automo-

tive component demand will shift toward electric powertrains, batteries, advanced driver assistance systems, sensors, infotainment and communication at the expense of conventional components such as transmissions, brakes, axles, exhaust systems, steering and fuel systems (*Chart 4*).<sup>14</sup>

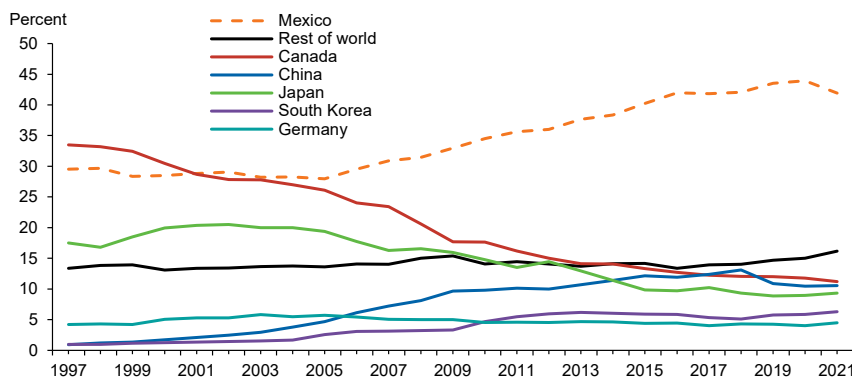
Still other vehicle technology changes, such as more computer software and advances in autonomous driving, have accelerated a convergence of automotive manufacturing and technology, transferring significant supplier value from parts and components to software.

As a result, technology and consumer electronic companies are entering the automotive value chain. Japan’s Sony and China’s Baidu—neither traditional automakers—have announced plans to manufacture electric vehicles.

Studies undertaken of these developments’ impact on the European Union predict net automotive manufacturing job losses should a complete transition to electric vehicles occur. The European Association of Automotive Suppliers, for example, estimates a net job loss of 275,000 positions (about 8 percent of the total) because the 226,000 new jobs generated by growth in electric vehicle components will be insufficient to offset the roughly 500,000 jobs lost among automotive suppliers.<sup>15</sup> However, official reports by the European Commission show a much less severe impact on aggregate employment.<sup>16</sup>

### CHART 3

Mexico Leads as Source of U.S. Motor Vehicle Parts Imports



NOTES: The chart shows shares of U.S. Motor Vehicle and Motor Vehicle Parts Imports (NAICS 3363) by country of origin. Data for 2022 are annualized through April.  
SOURCE: U.S. International Trade Commission.

### Electric Vehicle Pivot

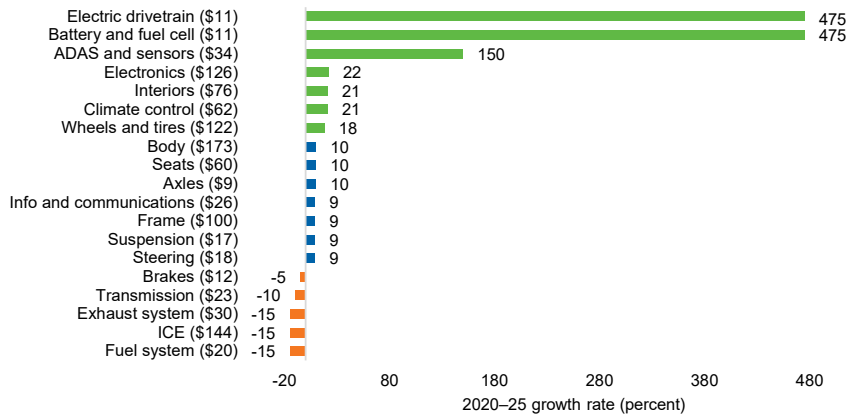
The U.S.–Mexico manufacturing relationship reflects decades of production integration, with large, specialized industries spreading costs across borders. As U.S. automakers plan their conversion to electric vehicle production, they are instituting changes in their Mexican subsidiaries.

General Motors announced in 2021 that it will invest \$1 billion in its factory in Ramos Arizpe, Coahuila, to produce two electric Chevrolet SUVs in 2023. GM plans to offer 30 all-electric vehicles by 2025.<sup>17</sup> Ford recently began producing the Mustang Mach-E in Cuautitlan in the state of Mexico and announced two additional midsize



**CHART**  
**4**

**Electric Vehicle Parts to Become More Critical to Auto Production**



NOTES: Green bars indicate growing, blue bars indicate stagnant and orange bars indicate declining segment sizes from 2020 to 2025. 2020 market sizes are in parentheses and in billions of dollars. ADAS is advanced driver assistance systems typically used in collision avoidance. ICE refers to internal combustion engines.  
SOURCE: Data and analysis are from "The Road Ahead: Auto Suppliers Navigate New Terrain," by Jason Coffman, Raj Iyer and Ryan Robinson, Insights from Deloitte's 2021 Automotive Supplier Study, Deloitte, 2021.

electric crossovers will be built in the same plant.

Additionally, several electric vehicle parts manufacturers are believed to be looking at Mexican operations to support production for the U.S. market. China's Contemporary Amperex Technology, the world's biggest maker of batteries for electric vehicles, is considering plant sites in Ciudad Juárez, Chihuahua, and in Saltillo, Coahuila, to potentially supply Tesla and Ford—a possible \$5 billion investment.<sup>18</sup>

While the maquiladora industry has quickly adapted to changes in technology and those arising from business cycles, the shift to electric vehicles is different, creating demand for new types of auto parts with possible competition from new market entrants.

**Post-COVID Opportunity**

Maquiladoras may benefit from the much-discussed reshoring or near-shoring of manufacturing arising from pandemic supply disruptions and simmering trade disputes with China.

Aggregate data don't yet show clear evidence of a shift in U.S. imports from Asia and Europe to Canada and Mexico. Average import shares are about the same now as before the pandemic. Near-shoring won't happen overnight, but Mexico could potentially

capitalize from such an opportunity in the medium to long term.

The USMCA has applied new pressure to maquiladoras. It is more restrictive in some respects than NAFTA, particularly involving the automotive sector. It imposes restrictions on the origin of steel, aluminum and vehicle parts and new requirements governing labor and wages.

The new rules-of-origin and higher-wage requirements will increase production costs that, in turn, imply higher prices, reduced output and a decrease in consumer surplus in North America. Projections indicate the USMCA negatively affects all countries in North America, though Mexico stands to sustain the biggest loss to auto production and GDP.<sup>19</sup>

Mexican government policies pose another challenge for maquiladoras. For example, recent changes in electricity generation rules favoring the state-run utility over cheaper power sources could raise costs for businesses. Labor market regulations are also changing, pushing up labor costs.

Additionally, challenges to private sector and foreign investment in Mexico are increasing, something that is especially problematic given the country's weak public investment.

These and other changes could signal a departure from what has been an

investment-friendly environment since NAFTA, dimming Mexico's prospects in what has become an increasingly volatile global business environment.

*Cañas is a senior business economist in the Research Department at the Federal Reserve Bank of Dallas.*

**Notes**

<sup>1</sup> See "Mexican Reform Clouds View of Key Industry," by Jesus Cañas and Robert W. Gilmer, Federal Reserve Bank of Dallas *Southwest Economy*, May–June, 2007, <https://fraser.stlouisfed.org/title/southwest-economy-6378/may-june-2007-608958/spotlight-609493>. IMMEX is the Spanish acronym for the Manufacturing, Maquila and Export Service Industry Program.

<sup>2</sup> "Intra-Industry Trade with Mexico May Aid U.S. Global Competitiveness," by Jesus Cañas, Aldo Heffner and Jorge Herrera Hernández, Federal Reserve Bank of Dallas *Southwest Economy*, Second Quarter, 2017, <https://fraser.stlouisfed.org/title/southwest-economy-6378/second-quarter-2017-609001/intra-industry-trade-mexico-may-aid-us-global-competitiveness-609788>.

<sup>3</sup> "The Maquiladora's Changing Geography," by Jesus Cañas and Robert W. Gilmer, Federal Reserve Bank of Dallas *Southwest Economy*, Second Quarter, 2009, <https://fraser.stlouisfed.org/title/southwest-economy-6378/second-quarter-2009-608969/maquiladora-s-changing-geography-609568>.

<sup>4</sup> For more information, see "Productivity Growth in Mexico: Understanding Main Dynamics and Key Drivers," by Leonardo Iacovone, Rafael Muñoz Moreno, Eduardo Olaberria and Mariana de la Paz Pereira López, World Bank, 2022, <https://openknowledge.worldbank.org/handle/10986/37190>.

<sup>5</sup> For more information see International Labor Organization statistics on labor productivity, <https://ilostat.ilo.org/topics/labour-productivity/#>.

<sup>6</sup> "Texas Border Cities Illustrate Benefits and Challenges of Trade," by Jesus Cañas, Federal Reserve Bank of Dallas *Southwest Economy*, Fourth Quarter, 2016, <https://fraser.stlouisfed.org/title/southwest-economy-6378/fourth-quarter-2016-608999/texas-border-cities-illustrate-benefits-challenges-trade-609778>.

<sup>7</sup> See note 3.

<sup>8</sup> "Mexico's Four Economies Reflect Regional Differences, Challenges," by Jesus Cañas and Emily Gutierrez, Federal Reserve Bank of Dallas *Southwest Economy*, Third Quarter, 2015, <https://fraser.stlouisfed.org/title/southwest-economy-6378/third-quarter-2015-608994/mexico-s-four-economies-reflect-regional-differences-challenges-609738>.

<sup>9</sup> "Estimating Foreign Value-Added in Mexico's Manufacturing Exports," by Justino De La Cruz, Robert

*(Continued on the back page)*

# Supply Chains Slowly Mend as Texas Firms View Normalization in 2023

By Christopher Slijk and Emily Kerr

**ABSTRACT:** Since the COVID-19 pandemic began in early 2020, disrupted global supply chains have strained Texas businesses trying to meet strong demand. Initial supply shortages affecting primarily manufacturers and retailers intensified and broadened, impacting firms across most industries. Many Texas firms don't expect supply-chain normalization until 2023, though the latest data suggest conditions are improving.

The onset of the COVID-19 pandemic in spring 2020 brought massive disruption to economies across the world, with shelter-in-place mandates sidelining many businesses, especially those whose staff could not work from home. Layoffs and furloughs were widespread, and efforts to mitigate the spread of the virus impacted many aspects of everyday life and consumer decision-making.

Supply chains and the manufacturing they served quickly became strained, causing shortages and helping drive prices higher. But after enduring more than two years of these challenging conditions, Texas businesses appear to have pivoted, finding solutions that not only mitigated some of the impact of shortages but better positioned operations against future disruptions.

## Stimulus-Fed Demand

An unprecedented wave of stimulative fiscal and monetary policies

followed the pandemic's initial impact, including supplemental unemployment benefits and stimulus checks, which propelled incomes above pre-pandemic levels. This windfall, coupled with reduced expenditures on services—travel, dining out and entertainment—led to a rapid rebound in goods spending on items such as housing, food, clothing and cars.

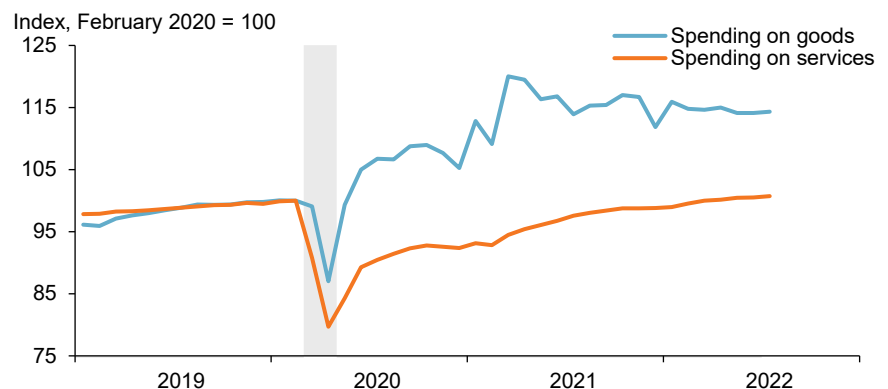
Spending on goods was exceeding pre-pandemic levels by mid-2020 (*Chart 1*). Services spending lagged behind, hampered by lockdowns, more people working from home and other constraints.

Most businesses struggled to keep up with the surging goods demand, as the dislocation resulting from idled factories and snarled logistics could not be resolved quickly. Manufacturers' production lines were hampered by social distancing measures and shortages of raw materials and intermediate goods.

Ports became congested with backlogged cargo, and insufficient trucking

CHART  
1

U.S. Goods Consumption Rebounds, Exceeds Prepandemic Levels



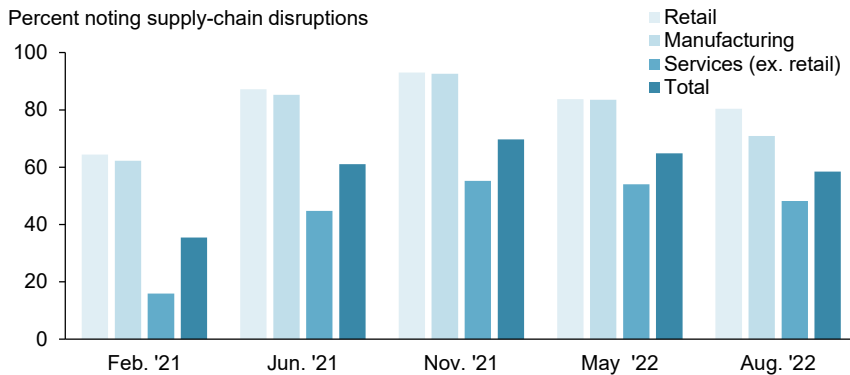
NOTES: Shaded area denotes U.S. recession. Data are seasonally adjusted and represent inflation-adjusted spending relative to February 2020.

SOURCE: Bureau of Economic Analysis.



**CHART  
2**

**Supply-Chain Issues Began Among Manufacturers, Retailers Before Spreading**



NOTE: Firms were asked "Are you experiencing supply-chain disruptions or delays?"  
SOURCE: Federal Reserve Bank of Dallas, Texas Business Outlook Surveys.

and rail capacity made it difficult for businesses to receive and ship products. Construction contractors struggled to get the materials and supplies needed, resulting in long delays on projects and lost opportunities. Retailers faced rapidly dwindling inventories and an inability to adequately restock.

**Texas Hit Hard**

Texas, with its large economy and outsized export and manufacturing footprint, became increasingly hard hit by these supply-chain disruptions. Producers in Texas were left trying to catch up on prior orders while also filling the rapidly expanding backlog of new orders spurred by the additional demand. Retailers faced a similar pinch. By February 2021, a majority of Texas manufacturers and retailers in the Dallas Fed Texas Business Outlook Surveys (TBOS) faced supply-chain disruptions or delays (*Chart 2*).

These firms were particularly displeased about shipping delays, extremely long lead times for components and issues with suppliers. One computer manufacturer remarked in the July 2022 TBOS: "We are seeing some lead times out as long as 57 weeks. This is four to five times more than we have seen on parts historically."

While supply-chain woes were initially limited to the manufacturing and retail sectors—only 16 percent of nonretail services firms reported

supply disruptions in February 2021—eventually they spread.

By June 2021, a majority of firms and nearly 45 percent of services firms indicated they experienced supply-chain issues, with businesses unable to source computers or paper and restaurants having trouble getting some foods and supplies. Soon, well over half of services firms reported supply constraints, a condition that persisted into mid-2022.

**Global Supply Woes**

Years of globalization trends led to extensive reliance on worldwide, integrated supply chains when the pandemic hit. Firms dependent on international suppliers quickly realized

they were especially susceptible to disruptions.

About half of Texas firms depend on foreign suppliers, and earlier this year, 93 percent of those companies experienced supply-chain disruptions versus 34 percent with solely domestic suppliers, according to TBOS.<sup>1</sup>

This insulation among firms with on-shore sourcing partly eroded this year. By May, the share of domestic supply-chain firms experiencing disruptions had risen 8 percentage points to 42 percent, while the share of international supply-chain firms experiencing disruptions had fallen 6 percentage points to 87 percent.

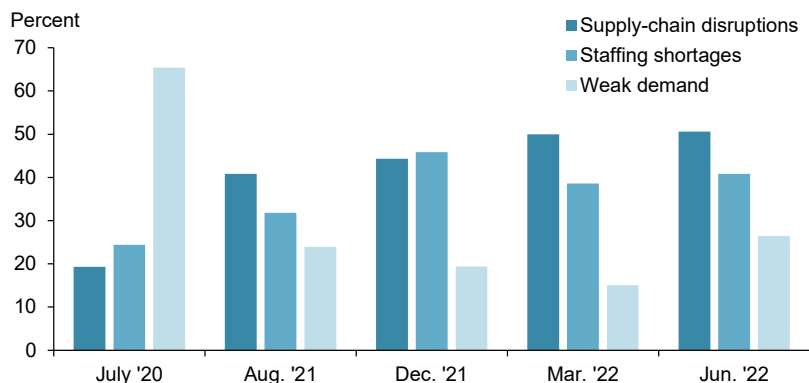
**Supply Limits Curb Revenue**

The constriction of supply chains has become more than an inconvenience; a majority of businesses note it is a tangible constraint on their revenue. This is a marked shift from the early days of the pandemic when weak demand was the top restraint and only a minority of TBOS respondents mentioned supply chains (*Chart 3*).

Supply-chain disruptions became the top limitation in August 2021 and still hold the No. 1 spot, with half of firms citing them as a primary factor restraining revenues. The share is even higher among manufacturers and retailers, at more than 70 percent. Staffing shortages continue to have a widespread impact on businesses' revenues.

**CHART  
3**

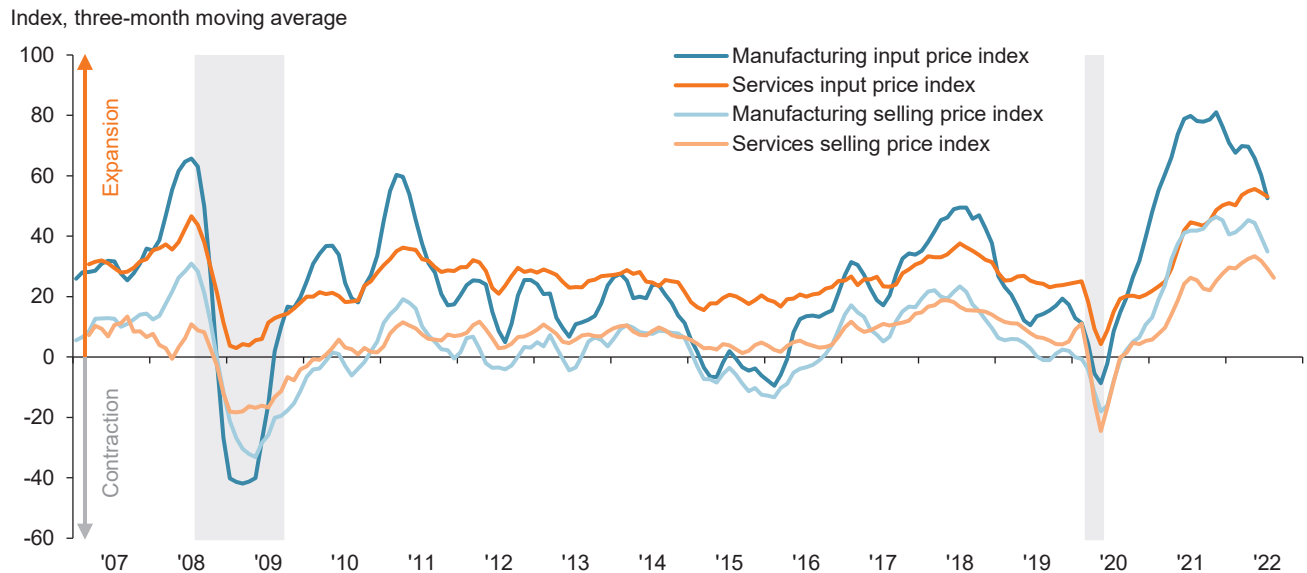
**Supply-Chain Difficulties Became Firms' Top Revenue Constraint in Mid-2021**



NOTES: Firms were asked "What are the primary factors restraining your firm's revenues?" The top three responses are shown.  
SOURCE: Federal Reserve Bank of Dallas, Texas Business Outlook Surveys.

**CHART  
4**

**Input Cost Inflation Reached Record Highs During Pandemic**



NOTES: Gray bars represent Texas recessions. Data are seasonally adjusted.  
SOURCE: Federal Reserve Bank of Dallas, Texas Business Outlook Surveys.

The pandemic brought about an unusual dynamic. As incomes rose, spending on services was inhibited, and excess demand flowed into goods consumption. Meanwhile, the pandemic sidelined workers and hampered production, transportation and distribution, leading to supply-chain disruptions that are taking years to unwind.

This disparity between supply and demand is perhaps most apparent in automotive sales. Vehicle producers faced severe constraints on production—first due to pandemic restrictions and COVID mitigation measures at auto plants, then because of shortages of semiconductor chips and other necessary components.

As a result, auto dealers found themselves receiving far fewer new vehicles. At the same time, demand for vehicles surged in the months following the onset of the pandemic as consumers began receiving federal stimulus payments.

Auto dealers were quickly drained of both used- and new-car inventories, leading to surging prices and a prolonged period of missed sales opportunities. One Texas dealer summarized the difficulty facing the industry, saying in November 2021, “Supply-chain is-

sues, primarily chips, have crippled the automobile business. Currently, our new-car inventory is in single digits—it’s normally 150–200 cars.”

**Historic Price Spike**

Another notable business impact from supply shortages is an unprecedented increase in input costs and selling prices. As businesses vied for limited available goods, they had to pay more to secure what they needed. Input price growth among Texas firms surged to record levels, first in manufacturing and later in services (*Chart 4*).

Input prices rose an astounding 9.9 percent in 2021, on average, soaring above the 2.7 percent average cost increase in 2020, according to TBOS.<sup>2</sup> Cost pressures have since peaked and are now moderating. The manufacturing input price index fell to 34.4 in August, its lowest reading since fall 2020.

The services input price index is coming down more slowly, trending lower from its peak in March 2022. Despite the moderating pace of input cost inflation, firms project those prices will rise 9.7 percent in 2022 because of relatively large increases in the first half of 2022.

Rapidly rising input costs and rising wages amid persistent worker shortages have pushed selling prices higher. Many firms have noted that they could more readily pass rising costs on to customers, aided by increased public awareness of market conditions.

TBOS firms noted an average selling price increase of 6.9 percent in 2021, up significantly from 1.1 percent in 2020. Firms expect prices to rise 7.1 percent in 2022, though much of this surge has already occurred.

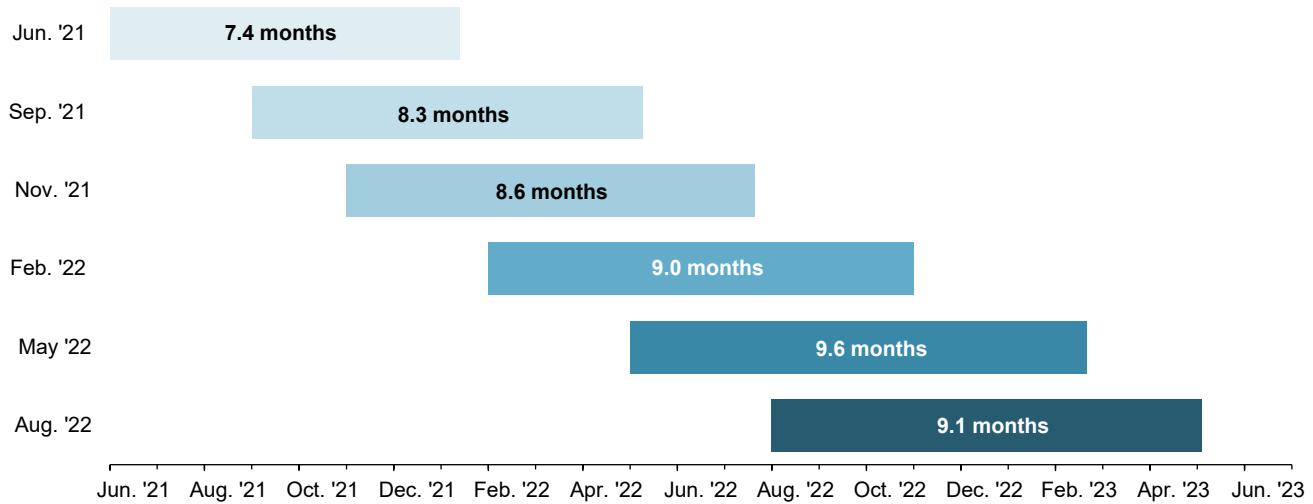
**Normalization in 2023**

At the beginning of the pandemic, businesses and policymakers held out hope that supply-chain disruptions were transitory and would quickly resolve as economies rebounded from the initial lockdowns. That scenario didn’t occur, and expectations for supply-chain normalization have been repeatedly pushed further out.

In June 2021, when TBOS survey respondents were first asked when they expect their supply chain to normalize, the average response was just over seven months (by early 2022). The latest data, from August 2022, show that supply chains are not anticipated to

**CHART**  
**5**

**Time Frame for Supply-Chain Normalization Finally Falling**



NOTE: Results are shown as a weighted average of responses to the question "When do you expect your supply chain to return to normal?" with the survey vintage shown on the vertical axis and aligned to the month the question was posed on the horizontal axis.  
SOURCE: Federal Reserve Bank of Dallas, Texas Business Outlook Surveys.

normalize for more than nine months, well into 2023 (Chart 5).

Across industries, retailers—particularly auto dealers—have the longest average time horizon for expected supply-chain normalization, at 10.0 months, pushing into second quarter 2023. Health and education services has the shortest horizon at 7.7 months.

Overall, what began with a broad expectation that supply chains would take just six to eight months to return to normal has become a multiyear headwind with diminishing hope for a comprehensive resolution in the near future.

**Mending Supply Chains**

Even as expectations for a return to normal seem further out of reach, there are some tentative signs that the worst has passed and that supply-chain constraints have begun unwinding. Forty-three percent of businesses reported an improvement in August, exceeding the share reporting worsening shortages (24 percent) for the first time since the pandemic’s initial economic effects in 2020.<sup>3</sup>

In manufacturing, where the pace of production has lagged demand for most of the pandemic, growth in unfilled orders has abated, signaling that

backlogs are no longer increasing. Delivery time decreased in August for the first time since mid-2020. Also, retail inventories have begun rebuilding after a two-year downward trend that began with the pandemic.

Looking beyond Texas, the logjam at the two busiest U.S. ports (Los Angeles and Long Beach, California)—which peaked in fall 2021 with a record number of ships waiting offshore to be unloaded—is unwinding. There’s been a steady rise in handled inbound containers this year, and both ports posted record cargo volumes in July. Also, the New York Fed’s Global Supply Chain Pressure Index shows diminishing delays involving containerized cargos since April.<sup>4</sup>

**Gaining Supply Resiliency**

Texas businesses pivoted as supply chains deteriorated, with a majority adjusting their supply sources, mostly bringing on additional vendors rather than being reliant on just one.<sup>5</sup> Onshoring also accelerated, as some businesses sought U.S.-made products to avoid long transit delays and to have more assurance of supply timing.

Other companies increased inventory, carrying more inputs to create

a buffer. These changes often mean higher costs to businesses but are intended to reduce future supply-chain vulnerability.

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*Kerr is a senior business economist in the Research Department at the Federal Reserve Bank of Dallas.*

**Notes**

<sup>1</sup> See the Texas Business Outlook Surveys special questions, Feb. 28, 2022, accessed Aug. 30, 2022, [www.dallasfed.org/research/surveys/tbos/2022/2202q.aspx](http://www.dallasfed.org/research/surveys/tbos/2022/2202q.aspx).

<sup>2</sup> See the Texas Business Outlook Surveys special questions, June 27, 2022, accessed Aug. 30, 2022, [www.dallasfed.org/research/surveys/tbos/2022/2206q.aspx](http://www.dallasfed.org/research/surveys/tbos/2022/2206q.aspx).

<sup>3</sup> See the Texas Business Outlook Surveys special questions, Aug. 29, 2022, accessed Aug. 30, 2022, [www.dallasfed.org/research/surveys/tbos/2022/2208q.aspx](http://www.dallasfed.org/research/surveys/tbos/2022/2208q.aspx).

<sup>4</sup> For more information, see Global Supply Chain Pressure Index, Federal Reserve Bank of New York, accessed Aug. 30, 2022.

<sup>5</sup> See note 1.



*A Conversation with Pol Antràs*

## Globalization Remains a Force Despite Pandemic, Political Strains

*Pol Antràs is the Robert G. Ory Professor of Economics at Harvard University. He discusses international trade flows and what the evidence suggests about the world economy and the accompanying debate about whether an era of deglobalization may be at hand.*

### Q. What is globalization?

Globalization is a very broad term that means many things in many fields. In economics, it means that some markets that cleared at the national level are now clearing at the global level. If it's goods or services markets, then that would be trade integration, the flow of goods and services across countries.

We can also think of globalization as the integration of labor markets. The increase of migration flows is a manifestation of globalization. Or, you can think of integration in capital markets, which are more global because firms and individuals are investing further away from their local markets.

We have learned in the past few years that globalization is not a linear process. We may have some phases where globalization is on the rise and other phases where globalization is retreating.

### Q. Is the world entering an era of deglobalization?

I think there is a potential for the world to enter a deglobalization phase, but the data as of today show very few signs of deglobalization.

Since the Great Recession, you could see a very mild decline in the ratio of world trade to world GDP, but it is completely explained by China moving up the value chain and industrializing. As

China develops, it has transitioned from being the assembly factory of the world where countries send components. China now produces some of those components and does not import them. Because China is a humongous economy and is importing less, the world-trade-to-GDP ratio is lower.

### Q. Have we gone through deglobalizing phases in the past?

I don't think we are deglobalizing, but if that were the case, this is not the first time. The inter-war period between World War I and World War II was a significant deglobalization period, accompanied by economic depression. There was a lot of animosity that generated nationalistic policies that reduced integration.

### Q. Are reshoring and near-shoring picking up momentum?

I see very little evidence of reshoring or near-shoring. I am not saying it's not happening; some firms have reported closing down offshore operations and obviously, some firms are moving around, but we have not seen this happen at a scale large enough to show up in aggregate statistics.

The implications of shutting down foreign operations and opening them in the U.S. depend on what motivates those

decisions. If China continues industrializing and wages increase to the point that U.S. companies decide to reshore because the cost of labor in China is too high, this may generate new jobs in the U.S., and the process may be less disruptive.

However, it is very different if deglobalization is the result of the aggravation of geopolitical forces. In that case, firms may leave China because they worry they can no longer operate there. This scenario would lead to smaller increases in jobs in the U.S. because these firms will see their global value chains disrupted by geopolitical tensions, and they are not necessarily going to do better in this so-called deglobalizing phase.

In both scenarios, we would tend to have consumers pay higher prices as the price of imports from China will go up.

### Q. Is technology spurring or slowing globalization?

I believe that as of today and for the next 20 years, technology will remain a factor that will foster globalization. If deglobalization occurs, it will not be driven by technology. Technological change has tended to benefit interactions at a long distance.

There are many technologies in the last few decades that have tended to spur globalization. Think about the ICT [Information and Communications Technology] revolution, or shipping containers or blockchain, for example. These are technologies that likely reduce transaction costs and facilitate suppliers at a long distance, which fosters globalization.

You may say, "Sure but what about automation, industrial robots and 3D printing?" Robots tend to substitute for labor, so if I can produce something with robots, why should I hire foreign labor? But we are far away from a world where robots can take care of all manufacturing.

The bulk of robots are used for assembly. Robots may be very good at putting a car together, but they may not be good at manufacturing a car engine or all other components that go into the assembly process like the electronic components and brake sys-



► *I believe that as of today and for the next 20 years, technology will remain a factor that will foster globalization. Technological change has tended to benefit interactions at a long distance.*

tems. Given that all those components are produced worldwide, we are still going to need trade.

The way I think of automation is as an increase in productivity that allows firms to assemble products much more efficiently. It increases the optimal scale of operation, which increases the demand for components. So conceptually, automation may well increase the extent to which firms rely on foreign components for production. Empirically, every study I have seen points to the complementarity between automation and imports; firms that automate appear to increase their imports.

### **Q. Supply chains faltered in the pandemic. Will companies hold larger inventories in the future?**

I think firms will take a close look at what happened and make sure they are better prepared for shocks going forward. Playing around with inventory is a relatively easy thing to do, and this is not new. There is work showing that as the U.S. has increased trade with China, firms in the U.S. have held more inventory.

There is a lot of talk about firms taking a more drastic approach following COVID, not relying on a single supplier, for example, and increasing diversification of their supplier base. That sounds appealing, but I don't think that will be doable for many companies. There is good reason why firms rely on a single supplier. It takes a lot of resources for suppliers to customize inputs for their buyers. Spreading that production among many potential suppliers will lead to increased fixed costs and would not be economically efficient.

### **Q. How has globalization affected inequality across countries and within countries?**

The increase in globalization in the '80s, '90s and 2000s went hand in hand with increases in inequality in the countries that were liberalizing. That does not mean that world inequality went up. Globalization lifted millions of individuals out of poverty. Globalization generated faster growth in low-income economies, so even though inequality was growing in those countries, the faster growth contributed to an overall global decrease in inequality.

There is a lot of debate about exactly why inequality grew within countries. One reason is that individuals and firms that are more likely to benefit from globalization are relatively skilled individuals or highly productive firms, so that globalization has benefited people who even before globalization were already better off. There is evidence that this has been partly driven by trade but also by technology.

The technological development that fostered globalization had an additional direct impact on inequality. The ICT revolution, for example, was very important for the growth of global value chains but also affected workers who did not have the right skills. People with computer skills became more valuable, increasing wage inequality and the skill premium.

### **Q. If trade is a net positive but still creates winners and losers, how can we compensate the losers?**

It is not entirely clear to me. I am convinced economists should spend more time thinking about distributional

effects and contributing to the design of policies that alleviate the negative impacts of globalization.

Does it make sense to differentiate a worker who loses his job due to import competition from China from a worker in Louisiana who loses his job because a company in Tennessee found a better way of doing business? We have to have some kind of unemployment protection but need better ways to weather these shocks.

Folks that face a negative shock tend to be pushed down [in] the income distribution and pay lower taxes. It is puzzling to me that in the past 30 years, despite the increase in inequality due to technological change and globalization, tax progressivity in the U.S. has fallen quite dramatically.

We should have active labor market policies, which are not about writing checks to people when they lose their jobs but rather are about retraining displaced workers. I am talking about well-run employment offices with high-skilled individuals who match displaced workers with job opportunities.

# Big Federal Stimulus, Home-Value Spike Won't Ease Next Slump

By Jason Saving

**ABSTRACT:** A series of very large federal transfers coupled with rapid home-price appreciation bolstered state and local revenue in Texas, softening the economic impact of COVID-19 on vulnerable populations. Ultra-low interest rates and a historic housing boom that aided state and local government operations are fading, suggesting Texas policymakers may encounter additional difficulties during the next downturn.

In March 2020, the Texas and U.S. economies entered a short but deep recession from which it would take over two years to recover. Payroll employment fell at a historically unprecedented pace in second quarter 2020, throwing millions of people out of work. Many businesses shut down or curtailed operations, all to slow the spread of COVID-19.

The abrupt action prompted a short but very abrupt recession with a historically low number of available jobs. The downturn affected everyone, especially women and people of color.

A historic wave of mostly federal fiscal support, largely deficit-financed, subsequently aided individuals, schools, businesses, and state and local governments. The federal assistance propelled the national debt to new heights. Surging property taxes from rising home prices helped boost property tax revenue, providing a secondary lifeline.

Now, as the country contemplates the possibility of another economic

downturn, this recent experience raises a question: To what extent are local, state and national governments well-prepared over the near term to provide economic support? Financial backstops employed during the pandemic—the product of borrowed money and rapidly increasing home valuations—may not be as readily accessible.

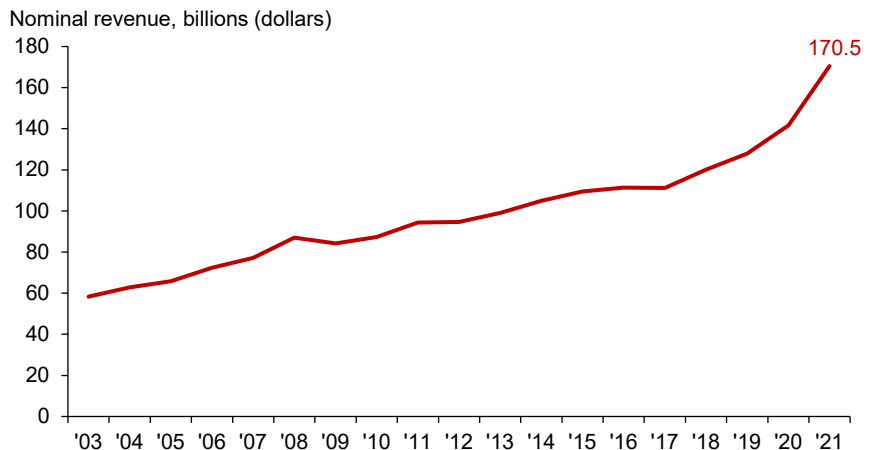
## Rising Texas Revenue

Typically, state government revenues fall during recessions. In the pandemic recession, however, Texas revenue rose. State revenue growth actually accelerated from 6.5 percent in 2019 to 10.6 percent in 2020, despite COVID-19 dramatically contracting economic activity. Revenue grew by an even larger 20.4 percent in fiscal 2021, covering the 12 months ended Aug. 31, 2021 (*Chart 1*).

The 2020–21 nominal revenue growth of \$42.5 billion almost equaled the \$43.7 billion by which revenue grew in the preceding 10 years, even though those earlier years were COVID-free,

CHART  
1

Texas State Revenue Surges During COVID-19 Era



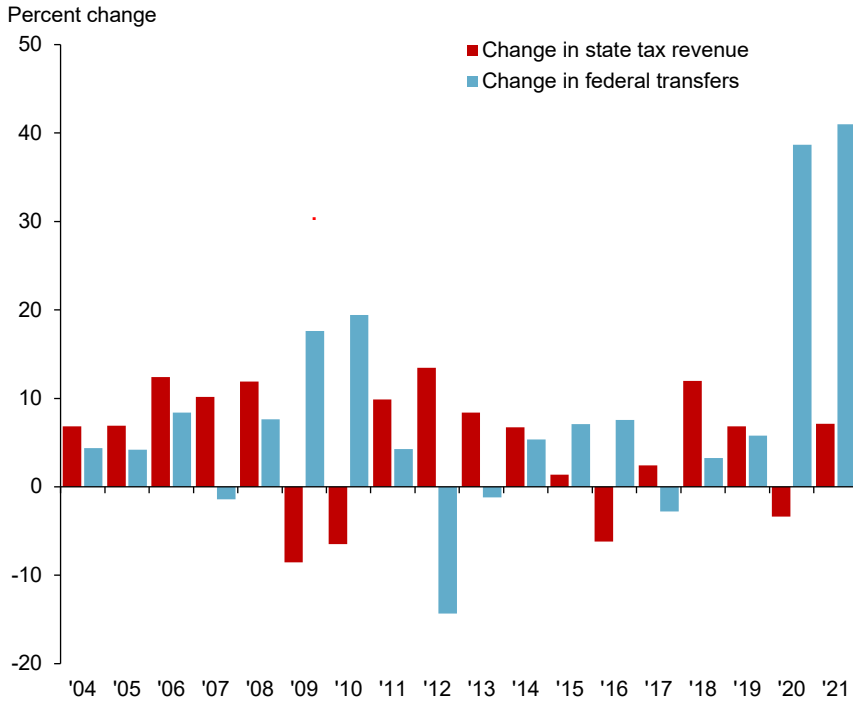
NOTES: Data begin in 2003. COVID-19's impact began in late February 2020.

SOURCE: Texas Comptroller of Public Accounts.



**CHART**  
**2**

Federal Transfers to Texas Rise in 2020, 2021



NOTE: Texas fiscal year starts in September of the preceding calendar year.  
SOURCES: Texas Comptroller of Public Accounts; author's calculations.

and the Texas economy was routinely described as “robust” during that time.

Federal transfers propelled the Texas revenue rise. While state tax revenue actually fell 3 percent (\$2.0 billion) from fiscal 2019 to fiscal 2020, the federal contribution to Texas revenue rose by an unprecedented 38.6 percent (\$16.2 billion) to more than make up the difference (*Chart 2*).<sup>1</sup> Then in fiscal 2021, federal transfers jumped an additional 40.9 percent (\$23.8 billion), while state tax revenue increased by a more modest 7.1 percent (\$4.1 billion).

In each of those two fiscal years, federal transfers supplanted state taxes to become the primary funding source for Texas.

To understand how unusual this is, it’s instructive to look at federal transfers as a share of Texas revenue over time. Historically, just less than half of Texas revenue comes from taxes (such as the sales tax), while one-third comes from federal transfers, much of which is earmarked for efforts such as

the Medicaid low-income health coverage program that is administered at the state level but funded jointly by states and the federal government.

But as the severity of COVID-19 became clear, the federal government launched an unprecedented array of stimulus measures designed in part to bolster the fiscal capacity of state and local governments. These programs are largely responsible for the federal transfer surge.

**Home-Price Impact**

Real estate valuations provided additional support to Texas government efforts to weather the pandemic-era fiscal storm. In contrast to the state government, which is constitutionally prohibited from assessing a statewide property tax on Texas residents, local jurisdictions’ assessment and collection of property tax fund their operations.

School districts are perhaps the most prominent, spending this revenue on public schools and educating

students. But numerous other public entities also receive and spend property tax revenue—including hospital districts, community college districts, emergency-response districts and water districts—without which, local residents would potentially lose access to vital public services.

During the national 2002–07 housing boom, Texas home prices remained relatively flat as national prices soared and then retrenched.<sup>2</sup> Historically, Texas home values have escaped most—though not all—boom-and-bust cycles, limiting the extent to which city and county government coffers are subject to property tax volatility.

But in a break from prior patterns, Texas home prices fully participated in the 2012–21 national boom. And because Texas levies are set as a percentage of home valuations, local jurisdictions have shared the gains in the form of higher property tax revenue. Exact figures are unavailable, but data from the state comptroller’s office indicate local property tax revenue rose roughly 20 percent between 2017 and 2021.<sup>3</sup>

While home prices didn’t rise at the same pace in every jurisdiction, a look at the state’s largest metro areas illustrates just how rapidly they accelerated in recent years (*Chart 3*).<sup>4</sup>

Between 2000 and 2011, the average price of single-family homes rose at an annual rate of 2 percent in Dallas–Fort Worth, 3 percent in Houston, 4 percent in San Antonio and 2.6 percent in Austin. Over the next eight years, those rates roughly doubled to 6.3 percent in DFW, 4.7 percent in Houston, 4.8 percent in San Antonio and 5.8 percent in Austin.

Single-family home prices spiked in 2020–21, rising at annual rates of 13.3 percent in DFW, 10.6 percent in Houston, 12.0 percent in San Antonio and 19.9 percent in Austin.

How and why home prices appreciate is complicated. Many economic factors contribute, making it difficult to compare one period with another and draw inferences about what is likely to happen today. And there are many factors, from a strong business climate to plentiful domestic and international

migration, that likely prop up home demand in Texas more than in the U.S. as a whole.

However, the economic literature on housing markets is very clear that, barring a dramatic increase in supply, home-price appreciation slows when interest rates rise.<sup>5</sup> And we are in such an environment today, with the Fed raising rates five times through September 2022 and Chairman Jerome Powell pledging at the Jackson Hole meeting in August to apply monetary policy as “forcefully” as is needed to lower inflation even if doing so “bring[s] some pain to households and businesses.”

### Revenue Outlook

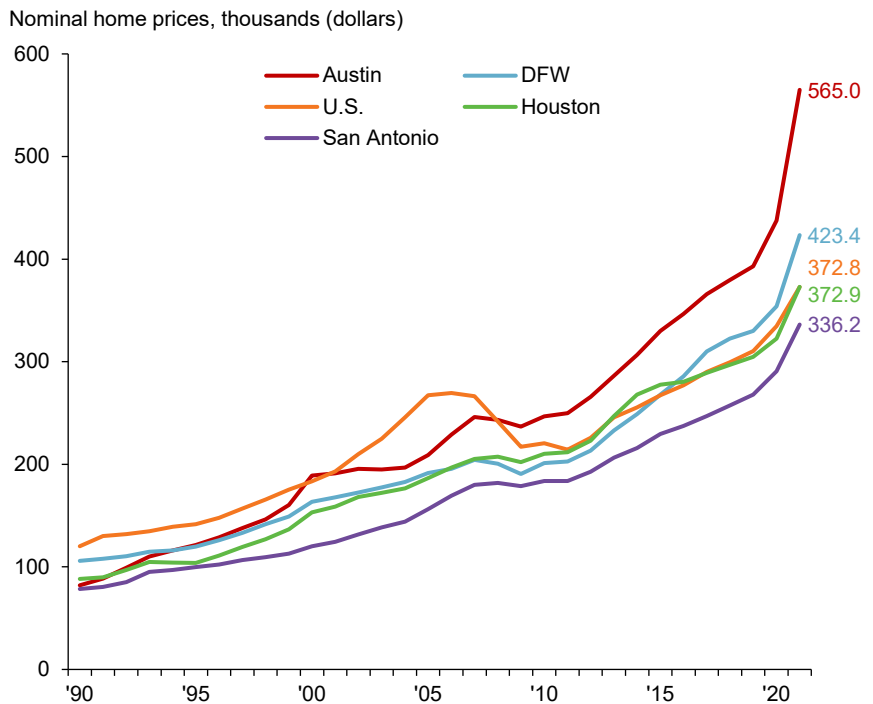
If historically anomalous home-price appreciation is unlikely to continue, what about historically anomalous federal transfers to states and localities? The fiscal stimulus programs designed to combat the economic impact of COVID-19 were always designed to be targeted, timely and temporary, just as similar but smaller programs during the Great Recession had been.<sup>6</sup>

Most pandemic relief measures that elevated federal transfers to Texas in 2020 and 2021 have ended. It’s unlikely they will be resurrected in subsequent years—at least not without a substantial reassessment of how large government should be during normal economic times.

The funding of those federal transfers also poses future challenges. Orthodox public finance suggests accumulating government surpluses during expansions, which can then be used to fund above-normal levels of government services during recessions without accumulating debt. But during the eight-year expansion leading up to COVID-19, the federal government did not run a surplus in any of those years and actually accumulated real debt at a historically rapid peacetime pace.

From the end of the Vietnam War in the mid-1970s to the Great Recession (December 2007–June 2009), the federal government incurred average

## CHART 3 Home Prices Soar Across the State



NOTE: U.S. and Texas data include only existing single-family homes.  
SOURCES: Texas Real Estate Research Center; Multiple Listing Service.

deficits equal to 2.5 percent of GDP (Chart 4).

It is not surprising that deficits during the Great Recession and its immediate aftermath would exceed this level, and they did, at an average of 8.4 percent of GDP from 2009 to 2012. But during the expansion years of 2013–19, they remained somewhat above the long-run average rather than falling below it. Deficits again soared during the COVID-19-era to breach the peacetime record previously set during the Great Recession.

To understand the future path of fiscal policy, it’s important to remember that the nation’s annual deficits must be serviced by interest payments. While debt incurred since the Great Recession was financed at historically low interest rates, current and future deficits likely won’t be.

The Congressional Budget Office (CBO) expects the average interest rate for federal debt to rise from 1.8 percent today to 3.1 percent in 2032 and 5.2

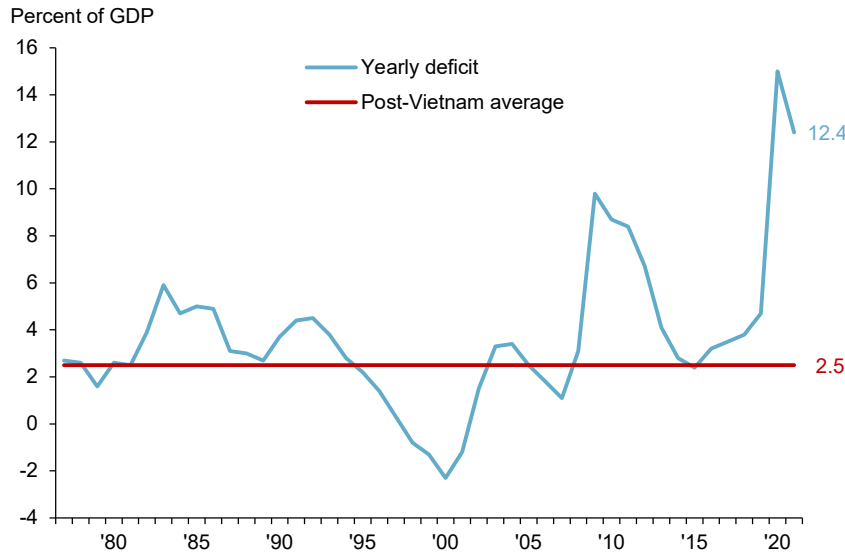
percent in 2052. Coupled with an expectation that future federal deficits will remain above their historic average of 2.5 percent of GDP in perpetuity, the CBO projects that federal interest payments as a share of GDP will more than quadruple over the next three decades, rising from 1.6 percent today to 7.2 percent in 2052.<sup>7</sup>

Economic research indicates that government’s “fiscal space”—the capacity to respond to recession through fiscal stimulus as occurred during the COVID-19 outbreak—is lower when a substantial portion of tax revenue is committed to servicing previously accumulated debt.<sup>8</sup> Even without the recent run-up in federal debt, historically large fiscal stimulus from the federal government to states and localities was destined to decline going forward.

Economic theory also suggests the reduction in fiscal space caused by the nation’s large and growing federal debt could at the margin reduce the magnitude of stimulus during future

**CHART**  
**4**

**Federal Deficits at or Above Long-Run Average Since 2007, Spiking in 2020**



SOURCE: Congressional Budget Office.

recessions. That, in turn, could mean resources will be harder to come by when recessions occur for both state and local governments and the underserved individuals who will most need assistance.

Over the last few years, the fiscal capacity of state and local governments in Texas has been bolstered by federal transfers, whose impact on the federal budget was lessened by historically low interest rates that also supported rapid home-price appreciation.

As those unusual circumstances run their course, Texas would be expected to return to a more traditional fiscal setup in which state tax revenues are again the primary driver of state spending and where local governments no longer experience double-digit yearly increases in their property tax bases.

**Throttling Down Spending**

Though there are reasons to believe above-normal spending growth at the state and local level won't persist over the longer term, it's worth noting that Texas job growth consistently exceeded the national average by about a percentage point before the onset of COVID-19.

The fundamental factors that supported Texas' relatively rapid growth—

a favorable business climate, readily available housing, and higher-than-average domestic and international migration—haven't changed.<sup>9</sup>

Yet longer-term challenges remain in the areas of education, health and infrastructure that will help determine how quickly the state economy grows in the future and the extent to which all Texans can fully participate in the prosperity that growth brings.<sup>10,11,12</sup> More broadly, the state's ability to navigate these challenges may well determine how nimbly Texas can emerge from the next economic downturn.

*Saving is a senior economist and advisor in the Communications and Outreach Department at the Federal Reserve Bank of Dallas.*

**Notes**

<sup>1</sup> "COVID-19's Fiscal Ills: Busted Texas Budgets, Critical Local Choices," by Jason Saving, Federal Reserve Bank of Dallas *Southwest Economy*, Third Quarter, 2020, [www.dallasfed.org/research/swe/2020/swe2003/swe2003b.aspx](http://www.dallasfed.org/research/swe/2020/swe2003/swe2003b.aspx).

<sup>2</sup> "Texas Property Taxes Soar as Homeowners Confront Rising Values," by Jason Saving, Federal Reserve Bank of Dallas *Southwest Economy*, Third Quarter, 2018, [www.dallasfed.org/~media/documents/research/swe/2018/swe1803c.pdf](http://www.dallasfed.org/~media/documents/research/swe/2018/swe1803c.pdf).

<sup>3</sup> "As Texas Home Values Skyrocket, State Officials Wrestle with How to Slow Property Tax Increases," by Joshua Fechter, *Texas Tribune*, April 22, 2022, accessed Sept. 2, 2022, [www.texastribune.org/2022/04/22/texas-property-taxes-explained/](http://www.texastribune.org/2022/04/22/texas-property-taxes-explained/).

<sup>4</sup> "Around the Region: Texas Home Prices Rose at Record Pace in 2021," by Luis Torres, Federal Reserve Bank of Dallas *Southwest Economy*, Second Quarter, 2022, [www.dallasfed.org/research/swe/2022/swe2202/swe2202f.aspx](http://www.dallasfed.org/research/swe/2022/swe2202/swe2202f.aspx).

<sup>5</sup> For more on how housing market turbulence can be monitored, see "Real-Time Market Monitoring Finds Signs of U.S. Housing Bubble," by Jarod Coulter, Valerie Grossman, Enrique Martinez-Garcia, Peter C.B. Phillips and Shuping Shi, Federal Reserve Bank of Dallas *Dallas Fed Economics*, March 29, 2022, [www.dallasfed.org/research/economics/2022/0329.aspx](http://www.dallasfed.org/research/economics/2022/0329.aspx).

<sup>6</sup> "Can the Nation Stimulate Its Way to Prosperity?" by Jason Saving, Federal Reserve Bank of Dallas *Economic Letter*, vol. 5, no. 8, August 2010, accessed Sept. 2, 2022, <https://fraser.stlouisfed.org/title/economic-letter-6362/nation-stimulate-way-prosperity-607641>.

<sup>7</sup> This is the assumption made by the Congressional Budget Office in creating its long-run forecasts. Were fiscal policymakers to opt for lower deficits, the long-run fiscal outlook would become more favorable.

<sup>8</sup> "U.S. Budget Deficits Shrink but Longer-Run Issues Remain," by Jason Saving, Federal Reserve Bank of Dallas *Economic Letter*, vol. 9, no. 3, March 2014, accessed Sept. 2, 2022, <https://fraser.stlouisfed.org/title/economic-letter-6362/us-budget-deficits-shrink-long-run-issues-remain-607691>.

<sup>9</sup> "Keys to Economic Growth: What Drives Texas?" by Jason Saving, Federal Reserve Bank of Dallas *Southwest Economy*, First Quarter 2009, <https://www.dallasfed.org/~media/documents/research/swe/2009/swe0901c.pdf>.

<sup>10</sup> "Texas K-12 Education Spending Set to Rise, but Who Will Pay?" by Jason Saving, Federal Reserve Bank of Dallas *Southwest Economy*, Third Quarter 2019, <https://www.dallasfed.org/~media/documents/research/swe/2019/swe1903d.pdf>.

<sup>11</sup> "Texas Health Coverage Lags as Medicaid Expands in U.S.," by Jason Saving and Sarah Greer, Federal Reserve Bank of Dallas *Southwest Economy*, Fourth Quarter, 2015, [www.dallasfed.org/~media/documents/research/swe/2015/swe1504b.pdf](http://www.dallasfed.org/~media/documents/research/swe/2015/swe1504b.pdf).

<sup>12</sup> "Budget Balancing Act: Health and Education Stretch Texas Resources," by Jason Saving, Federal Reserve Bank of Dallas *Southwest Economy*, Third Quarter, 2014, [www.dallasfed.org/~media/documents/research/swe/2014/swe1403b.pdf](http://www.dallasfed.org/~media/documents/research/swe/2014/swe1403b.pdf).



# Texas Exports Reach New Record Despite Strong Dollar

By Mytiah Caldwell, Jesus Cañas and Luis Torres

**T**exas remains the nation's top exporter, setting records each month despite the recent appreciation of the dollar. A strong dollar can be bad for business because it makes U.S. goods more expensive overseas.

The Texas trade-weighted value of the dollar provides a measure of the exchange rate helpful to understanding the state's trade activity. The index captures changes in the exchange rates that most affect Texas' exports. It weights the U.S. dollar exchange rate with various countries based on Texas' share of exports to them. It is a "real" measure because it also adjusts the exchange rate for different rates of inflation among Texas' trading partners.

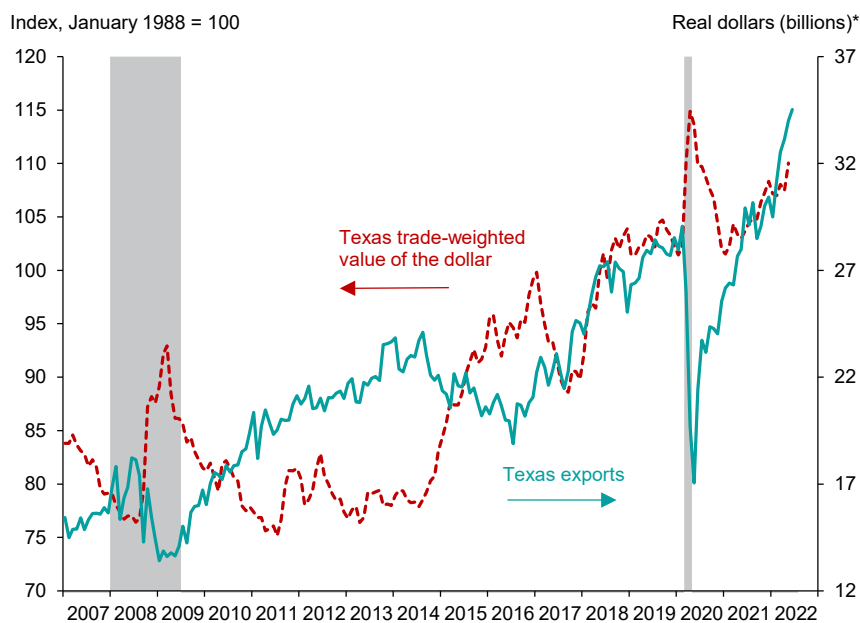
## Strong Dollar Impact

An increase in the index represents an appreciation of the currency, causing Texas exports to be costlier relative to its major trade partners. An index decrease reflects a depreciation of the currency and causes Texas exports to be less expensive and, holding other things constant, increases the demand for Texas exports (*Chart 1*).

Exchange rates are affected by interest rate differentials between locations, in this case, Texas and the countries where it exports; current economic conditions; growth prospects and inflation. These factors impact the flow of capital between countries and the demand and supply of domestic currency relative to foreign currency.

The dollar's current strength and that of the Texas trade-weighted value of the dollar is likely a function of rising interest rates to fight inflation; global investors moving assets to the perceived safety of the U.S. in the face of uncertainty created by the Ukraine-Russia conflict; and strong global demand for oil and gas.

**CHART 1** Texas Exports Increase Despite High Value for the Texas Trade-Weighted Dollar



\*Seasonally adjusted.

NOTES: Texas trade-weighted value of the dollar index is shown through April 2022. Texas exports are through May 2022. Gray bars indicate recessions.

SOURCES: Census Bureau; Bureau of Labor Statistics; Dallas Fed.

## Texas Trade Grows

The Texas trade-weighted value of the dollar has risen 1.6 percent this year after gaining 6.3 percent in 2021. By comparison, a similarly weighted index of the U.S. dollar has climbed 7.3 percent in 2022.

Texas has been the top exporter among U.S. states since 2002, with exports rising 9.3 percent per year in real (inflation-adjusted) terms to \$342 billion in 2021. During the first half of 2022, Texas exported \$195 billion in goods, close to three times as much as California, the second-highest exporting state.

In 2021, the top five Texas exports were oil and gas (28.6 percent); petroleum products (14.7 percent); chemicals

(13.7 percent); computer and electronics products (13.4 percent); and transportation equipment (6.2 percent).

Texas exports 55 percent of its goods to its top five trading partners: Mexico (32.7 percent), Canada (7.7 percent), China (5.7 percent), South Korea (5 percent) and Brazil (3.8 percent).

The Dallas Fed produces a trade-weighted value of the dollar for every state.<sup>1</sup> The index is adjusted for each country's inflation rate to best represent the purchasing power of the dollar relative to the foreign country.

## Note

<sup>1</sup> Real Trade-Weighted Value of the Dollar by U.S. State, Federal Reserve Bank of Dallas, [www.dallasfed.org/research/econddata/rtwvd.aspx](http://www.dallasfed.org/research/econddata/rtwvd.aspx).

# Around the Region: Office Markets Slowly Emerge from Pandemic Slump

By Laila Assanie

**T**he pandemic seismically shifted work from the office to home, particularly during its initial lockdown phases. Even when these limits and capacity restrictions eased and economic activity rebounded, office space demand remained soft and vacancy rates climbed.

Overall, Texas employment is 4.1 percent above its prepandemic peak. By sector, employment is 13.5 percent above the prepandemic peak in information, 12.8 percent higher in professional and business services, and 8.1 percent higher in financial activities.

Despite the rapid recovery in office-type employment, the return-to-office has been slow and overall office market improvement has been modest. Workers are reluctant to come back and have demanded more flexible work schedules. As a result, employers continue evaluating in-person work and concomitant space needs.

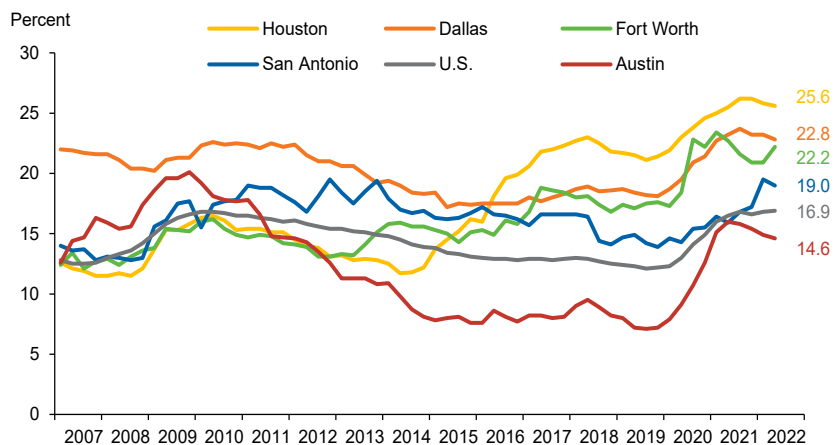
## Sluggish Recovery

Office vacancies rose nationwide and in all major Texas metros throughout 2020 after a sizable portion of the office workforce shifted to teleworking (*Chart 1*). Among major Texas metros, Austin vacancies increased the most, rising 5.4 percentage points. By comparison, U.S. vacancies rose 2.7 percentage points.

The office vacancy rate rose 4.6 percentage points in Fort Worth, 3.3 percentage points in Dallas, 3.2 percentage points in Houston and 1.6 percentage points in San Antonio in 2020. The increases were partly a result of tenants shrinking their footprint. Office rents were flat to down, and sublease space climbed as companies reeling from the pandemic recession strained to reduce expenses and gave up space they no longer needed.

Even though the U.S. and Texas economies gained traction, and employment growth was off the charts in 2021, office markets remained weak.

**CHART 1** Texas Office Vacancy Rate Peaks, Trends Downward in 2022



NOTE: Data are through second quarter 2022.  
SOURCE: CBRE Econometric Advisors.

The rise of the delta and initial omicron variants heightened uncertainty despite broad availability of COVID-19 vaccines, often pushing back return-to-office plans.

Net absorption in Texas office markets was flat to negative in the first three quarters of 2021. Vacancies rose in 2021, albeit at a slower rate than in 2020, restraining rents and construction.

Office market fundamentals wavered for some time before gaining momentum in late 2021 and into 2022. In the first half of 2022, vacancies have inched lower in most major Texas metros, except Fort Worth and San Antonio, where conditions remain weak.

Overall, office rents and leasing activity have edged higher as more employees return to the office and employers gain a better grasp of new, flexible work models.

## Looking Ahead

While a recovery is underway, sublease availability still looms large in some Texas metros. In Dallas-Fort Worth, 9.4 million square feet of sublease space, or 4.1 percent of the metro's total inventory, was available as of second quarter 2022.<sup>1</sup>

Houston's office vacancy rate, though declining, remains close to a 22-year high, and sublease space in the metro has inched up to 7.6 million square feet, or 12.4 percent of the total space available on the leasing market.<sup>2</sup>

With employers shrinking their footprint and a flight-to-quality trend prevalent, backfilling older office buildings offering limited amenities will be more challenging, and planned office-to-residential conversions will help soften the blow only slightly.

With plentiful space available for leasing, conditions will likely remain favorable for tenants in the near term, keeping the pace of recovery moderate, particularly in less-desirable locations.

*Assanie is a senior business economist in the Research Department at the Federal Reserve Bank of Dallas.*

## Notes

<sup>1</sup> "Dallas/Fort Worth Office Market Figures Q2 2022," CBRE Research, accessed Sept. 1, 2022, [www.cbre.com/insights/figures/dallasfort-worth-office-market-figures-q2-2022](http://www.cbre.com/insights/figures/dallasfort-worth-office-market-figures-q2-2022).

<sup>2</sup> "Houston Office Market Figures Q2 2022," CBRE Research, accessed Sept. 1, 2022, [www.cbre.com/insights/figures/houston-office-market-figures-q2-2022](http://www.cbre.com/insights/figures/houston-office-market-figures-q2-2022).

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## Maquiladoras, Mexico's Engine of Trade, Driven to Navigate Evolving Demand

(Continued from page 7)

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<sup>10</sup> "The Growing Importance of Mexico in North America's Auto Production," by Thomas H. Klier and James M. Rubenstein, Federal Reserve Bank of Chicago *Fed Letter*, no. 310, May 2013.

<sup>11</sup> For additional information, see the Mexican Association of the Automobile Industry, "Importancia de la Industria Automotriz," accessed Aug. 29, 2022, [https://amia.com.mx/publicaciones/industria\\_automotriz/](https://amia.com.mx/publicaciones/industria_automotriz/).

<sup>12</sup> See "Global EV Outlook 2021," International Energy Agency, April 2021, [iea.org/reports/global-ev-outlook-2021](https://www.iea.org/reports/global-ev-outlook-2021).

<sup>13</sup> See "UBS Evidence Lab Electric Car Teardown—Disruption Ahead?" UBS Global Research, May 2017, <https://neo.ubs.com/shared/d1wkuDIEbYPjF/>.

<sup>14</sup> "Caution Ahead: Transformation and Disruption for Automotive Suppliers," *Deloitte Insights*, August 2019,

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<sup>15</sup> "An Electric Vehicle-Only Approach Would Lead to the Loss of Half a Million Jobs in the EU," European Association of Automotive Suppliers, June 2021, <https://clepa.eu/mediaroom/an-electric-vehicle-only-approach-would-lead-to-the-loss-of-half-a-million-jobs-in-the-eu-study-finds/>.

<sup>16</sup> "Stepping Up Europe's 2030 Climate Ambition: Investing in a Climate-Neutral Future for the Benefit of Our People," European Commission staff impact assessment, European Union, Brussels, September 2020, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020SC0176>.

<sup>17</sup> See "GM to Invest \$1 Bln in Mexico to Build Electric Vehicles," by Sharay Angulo and David Shepardson, Reuters, April 29, 2021, [reuters.com/business/autos-transportation/general-motors-make-1-bln-electric-auto-investment-mexico-2021-04-29/](https://www.reuters.com/business/autos-transportation/general-motors-make-1-bln-electric-auto-investment-mexico-2021-04-29/).

<sup>18</sup> See "Tesla's Chinese Battery Maker Is Scoping Out Factory Sites in Mexico," by Eric Martin, Gabrielle Coppola and Maya Averbuch, Bloomberg, July 17, 2022, [bloomberg.com/news/articles/2022-07-18/electric-battery-news-catl-seeks-mexico-site-for-tesla-ford](https://www.bloomberg.com/news/articles/2022-07-18/electric-battery-news-catl-seeks-mexico-site-for-tesla-ford).

<sup>19</sup> For more, see "Mexico's Higher Costs Under USMCA May Potentially Offset Gains from China-Related Trade Spurt with U.S.," by Daniel Chiquiar, Jesus Cañas, Armando Aguirre and Alfonso Ceballos, Federal Reserve Bank of Dallas *Southwest Economy*, First Quarter, 2020, <https://fraser.stlouisfed.org/title/southwest-economy-6378/first-quarter-2020-609012/mexico-s-higher-costs-usmca-may-potentially-offset-gains-china-related-trade-spurt-us-609865>.



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