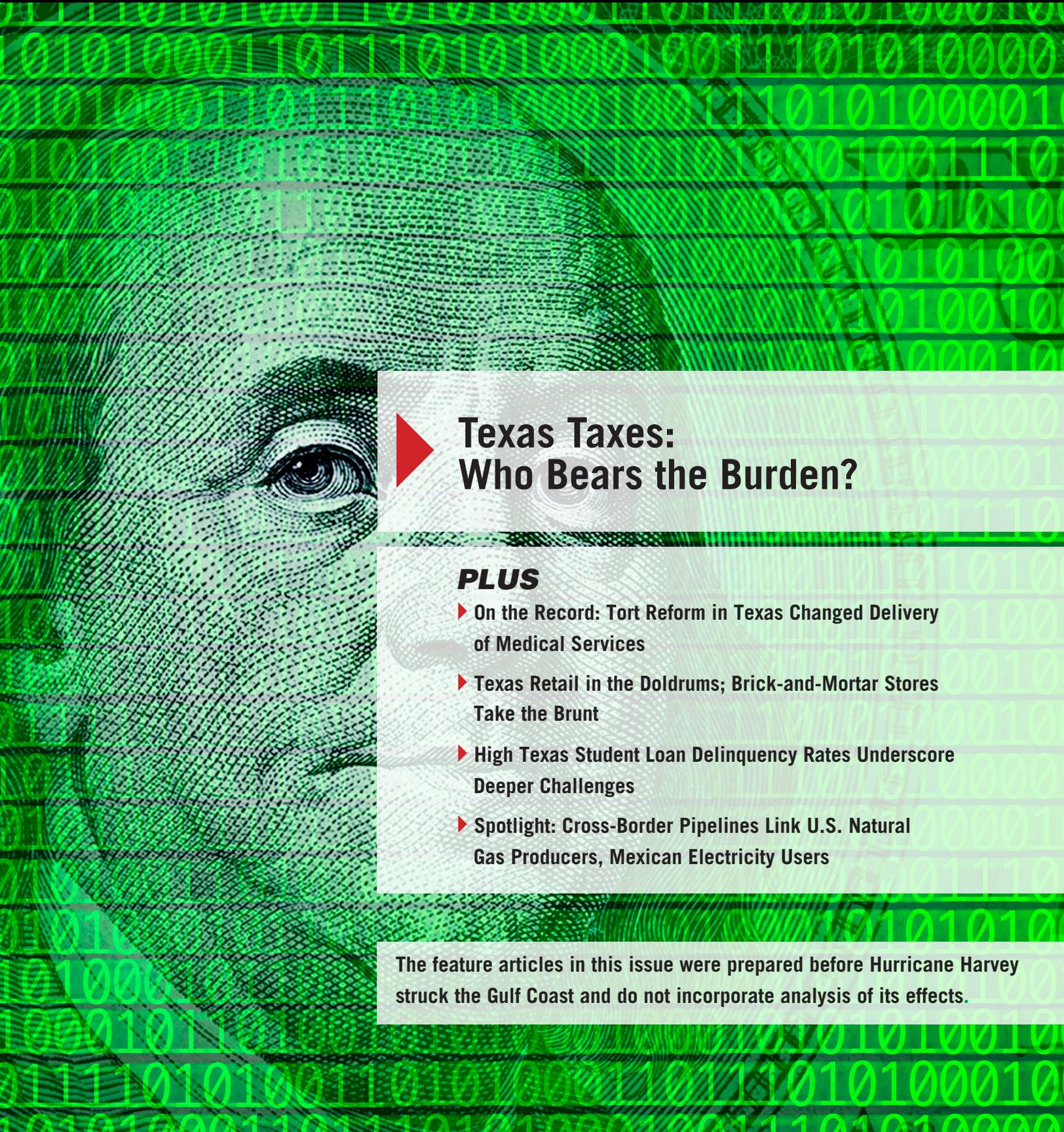


Southwest Economy



Texas Taxes: Who Bears the Burden?

PLUS

- ▶ On the Record: Tort Reform in Texas Changed Delivery of Medical Services
- ▶ Texas Retail in the Doldrums; Brick-and-Mortar Stores Take the Brunt
- ▶ High Texas Student Loan Delinquency Rates Underscore Deeper Challenges
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The feature articles in this issue were prepared before Hurricane Harvey struck the Gulf Coast and do not incorporate analysis of its effects.



▶ *Although Hurricane Harvey is likely to be among the most expensive natural disasters in U.S. history, we are highly optimistic that Houston and the surrounding area will successfully recover and return to the robust trend growth it experienced before the storm.*

In the aftermath of the devastation caused by Hurricane Harvey, our attention at the Federal Reserve Bank of Dallas has been focused on doing all we can to help those affected. Our thoughts and prayers are with all those impacted by the storm as well as all those confronting the difficult work of cleanup, recovery and rebuilding. We are extremely proud of our employees throughout the Eleventh District and particularly our Houston Branch staff who worked tirelessly to maintain essential services, ensure the health and safety of our Houston-area employees and work closely with first responders to serve members of the Greater Houston community.

Our team of economists has been closely tracking daily developments as well as assessing the potential economic cost and impact of the storm on the national and regional economies. Houston and the surrounding Gulf Coast area represents over one-third of the Texas economy and more than a quarter of its jobs; it is home to a very substantial refining and petrochemical industry, and approximately 8 percent of the nation's exports pass through its seaports from Beaumont to Houston to Brownsville.

Although Hurricane Harvey is likely to be among the most expensive natural disasters in U.S. history, we are highly optimistic that Houston and the surrounding area will successfully recover and return to the robust trend growth it experienced before the storm. Houston has consistently been among the fastest-growing metropolitan areas in the nation. Its strong economic foundation is built on a robust energy industry, both upstream and downstream, numerous leading corporations, as well as a world-class medical complex and outstanding universities. Houston is also home to a diverse and high-skilled workforce and superb business and community leadership.

In this difficult time, the Dallas Fed will continue working to provide insight and outreach through our economic analyses and publications. We remain active participants and leaders in the communities we serve. The spirit of the people across our region has historically been our greatest asset and will serve as a source of strength as we confront and successfully overcome the challenges that lie ahead.

A handwritten signature in black ink that reads "Robert S. Kaplan". The signature is written in a cursive, flowing style.

*Robert S. Kaplan
President and Chief Executive Officer
Federal Reserve Bank of Dallas*



Texas Taxes: Who Bears the Burden?

By Jason Saving

ABSTRACT: Texas' reliance on sales and property taxes makes its revenue-raising methods more regressive than those in most other states. Texas lawmakers, facing increasing demands for services, confront a desire to maintain the state's attractiveness to business even as inequities continue in how the taxpaying burden is shared.

In recent years, income inequality has become an increasingly prominent issue nationally and in Texas.

Statistics suggest a significant number of people face financial stress in their day-to-day lives. Texas has more inequality than the median U.S. state, a poverty rate 1.6 percentage points above the national average and the highest rate of residents lacking insurance (*Chart 1*).

When it comes to state and local taxes, Texas' burden is widely viewed as relatively low and attractive. Yet such a characterization may not hold for everyone, especially those at the lower end of the income distribution. Lawmakers balance competing interests when determining optimal tax policy.

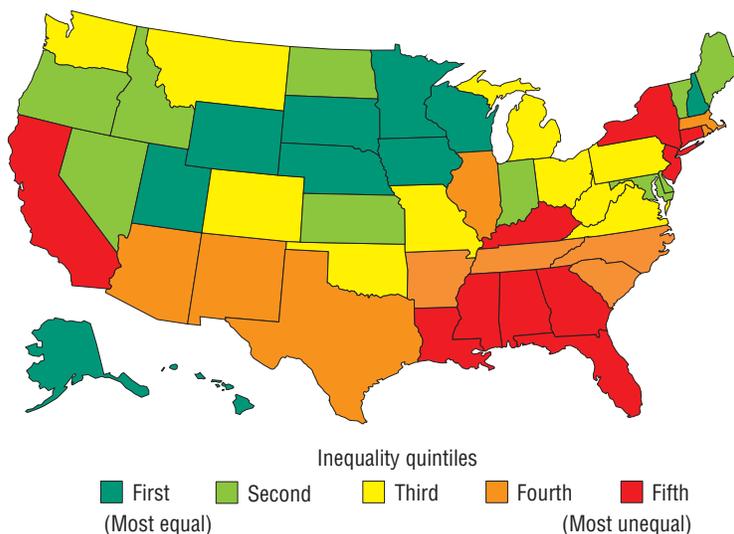
Understanding the state and local tax burden—both how large it is on average and who bears it—is necessary to evaluate the current tax structure.

Taxes Texans Pay

While Texas assesses a wide variety of taxes on its residents and businesses, the largest by far is the state sales tax, which now provides nearly 60 percent of state tax revenue (*Chart 2*). The sales tax applies to most goods and some services purchased in the state. The tax rate is relatively steep—the 12th highest in the nation—because Texas does not have an income tax.¹

Texas also assesses a variety of other taxes that are functionally similar to the sales tax. The motor vehicle sales tax (9.5 percent) is a sales tax on cars, fuel taxes (7.2 percent) are a sales tax on gasoline, and some of the state's industry taxes are tied at least in part to how much of a particular good or service is purchased. All told, most state tax revenue comes from sales taxes in some form or fashion.² A key economic feature of sales taxes is that they come from what

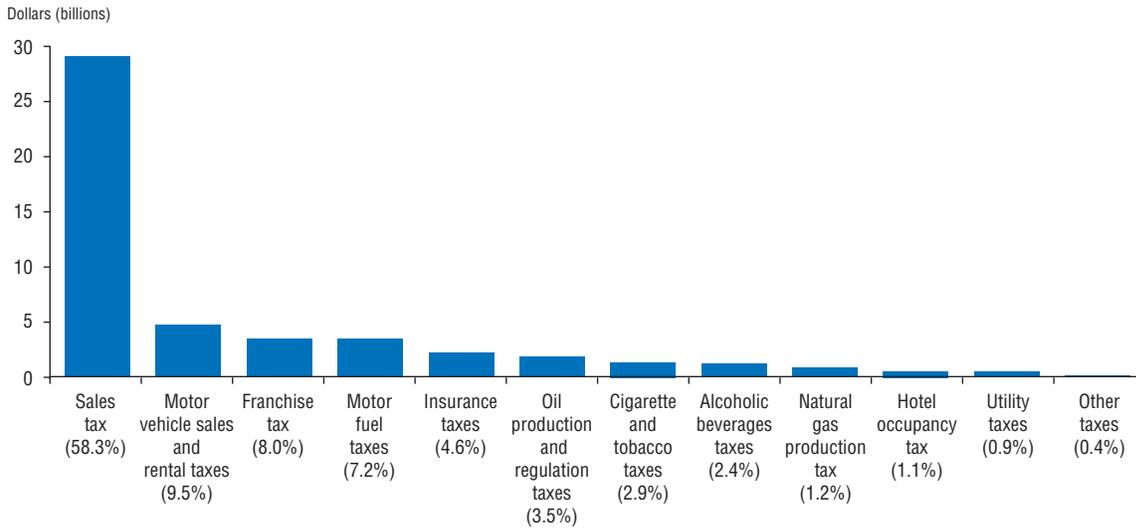
Chart 1 Texas Income Inequality Above Median, Below Other Large States



NOTE: Map is based on calculation of the Gini coefficient, a widely used measure of inequality.
SOURCE: Census Bureau, 2016 data.

**Chart
2**

General Sales Tax, Smaller Sales Taxes Provide Most of Texas' Tax Revenue



NOTES: Data are taxes paid to the state for fiscal year 2016. Values in parentheses reflect shares of total tax collection.
SOURCE: Texas Comptroller of Public Accounts.

people consume rather than what they earn. Thus, sales taxes provide more of an incentive for individuals to save and provide a relatively stable income stream for state government (because an individual's consumption will typically vary less than their income in any given year).

Sales taxes are, accordingly, regarded as among the most efficient forms of revenue generation. A side effect is that people who are able to save a lot face a lower sales tax burden as a share of income. There are also issues with how best to collect the sales tax in the age of e-commerce, though efforts are underway to address these concerns.³

The property tax is the other significant tax Texans pay. By law, the state cannot impose or collect property tax, though local jurisdictions can and do. School district levies are perhaps the most noticeable, but cities, counties, hospital districts, community college districts, water districts, development/improvement districts, emergency-services districts and other special-purpose districts can also assess property taxes.⁴

While property taxes might seem inefficient because they exclude those who don't own property, studies sug-

gest renters pay as well in the form of higher apartment rents. Moreover, high property taxes cannot easily be avoided because moving from one jurisdiction to another can be costly.

Property taxes are an assessment on housing capital, and research suggests wealth taxes could potentially discourage wealth accumulation—though the effects are muted when it comes to housing because of numerous offsetting tax benefits and because one cannot easily do without housing. It's also possible, as with sales taxation, that high-income people can mitigate their tax liability by doing less of what is being taxed—in this case, living in a lesser house.

About 40 percent of Texans' state and local tax burden went to property taxes in fiscal year 2014, the latest year for which data are available. While this is not quite as large as the 50 percent for sales and use taxes, it is still a large proportion of the overall tax burden. It also reflects Texas' average property tax rate of 1.9 percent, the sixth highest in the nation and almost double the 1 percent national average.⁵

If property taxes are only assessed at the local level, why are they higher in Texas than in most other states?

Localities provide services that are intensively used by residents on a daily basis, such as public schools, public hospitals, roads and public parks. Texas has historically delegated more power to localities than most other states. A corollary to this is that Texas transfers a relatively small amount of state revenue to localities, requiring them to raise revenue themselves.

Assessing the Tax Burden

With high sales and property tax rates, one might expect Texas taxpayers to shoulder a high average burden. Yet this is not the message conveyed by site-selection firms and chambers of commerce, which routinely cite Texas' low tax regime as a reason for businesses to relocate to the state.

Just how low is the Texas tax burden? The annual per capita state and local tax burden of \$4,067 is about 15 percent below the national average, while income is only 2 percent below the average (*Chart 3*). Relative to the nation's other two largest states, the gap is even starker: Texas stands 26 percent below California and 52 percent below New York.

While the average burden in Texas is low, not all portions of the tax bill

are. The local share of Texas' per capita tax burden is slightly higher than the national average and, perhaps surprisingly, higher than the local burden in California. This in part reflects Texas' heavier reliance on local jurisdictions and public policy choices in California, such as Proposition 13, which have somewhat limited local taxes in favor of state taxes. (A similar debate played out in Texas in 2015, when the state reduced school property taxes but held school districts harmless by providing offsetting transfers from state tax revenue.)

To be sure, there is no single correct answer for what a state's tax burden should be or how much of it should be borne by localities rather than the state. If a state wishes to offer an expansive array of services of a much higher quality than in other states, a higher-than-normal tax burden may be necessary. Individuals wouldn't be incentivized to move elsewhere if they found the improved government services worthwhile.

Likewise, if a state wishes to delegate substantial responsibilities to the local level, it may be desirable for a higher share of taxes to be raised by local jurisdictions so that they can sync desired public services with needed tax rates.

However, these choices may significantly affect the distributional impact of state and local taxes. With Texas tax revenue largely comprised of sales taxes but localities relying to a substantial degree on property taxes, pushing government responsibilities toward localities would likely put greater emphasis on the property tax vis-à-vis the sales tax.

The consequences would be potentially significant if the property tax were highly regressive—that is, the poor shouldering a larger share of taxes as a percentage of their income. Similarly, shifting responsibility from localities to the state would put greater emphasis on the sales tax and thereby potentially shift who bears the greatest burden.

Paying the Piper

State and local taxes in the United States are on average slightly regres-

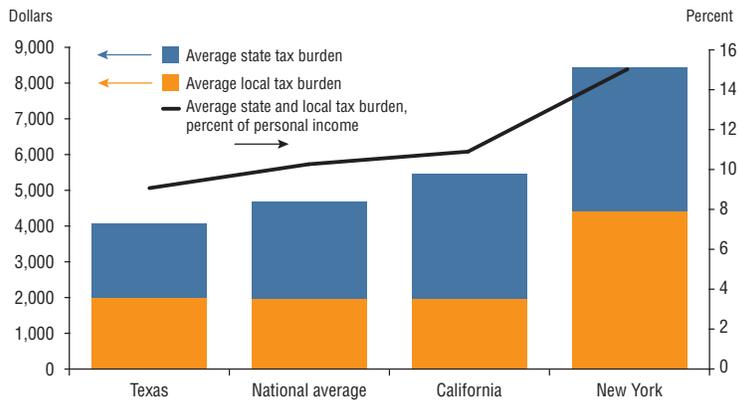
sive. Families earning less than \$19,000 per year—the lowest fifth of the income distribution—pay about 10.9 percent of their income in state and local taxes (Chart 4). This declines to 9.4 percent for the middle fifth of the population and to 6.7 percent for the top fifth, those earning more than \$93,000 per year.

At first glance, it might seem surprising that state and local taxes have this pattern, but two factors help explain it. First, economic research suggests income redistribution is most

efficiently performed at the national level because high-income individuals can more readily “vote with their feet” and leave states or (especially) localities whose tax burdens on the rich are high.

Second, state and (especially) local governments tend to provide easily visible services for which a “user fee” model may appear appropriate, in contrast to the federal government's focus on sometimes less-visible services such as national defense. Of course, these factors don't imply that state and local

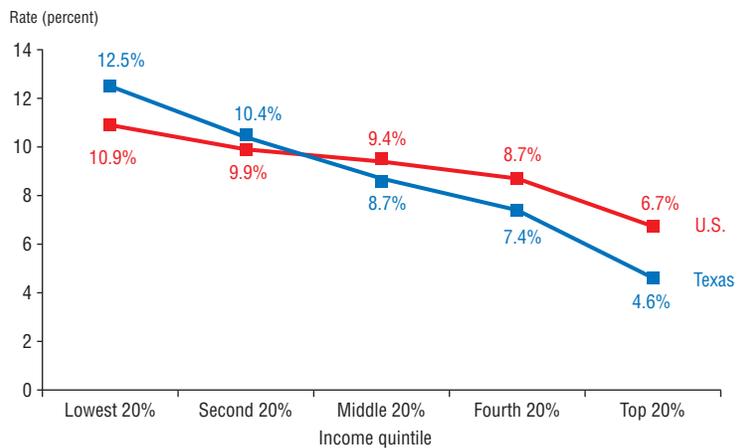
Chart 3 Texas Per Capita Tax Burden Lower than National Average



NOTES: Per capita calculations are made using averages of quarterly population and income data from fourth quarter 2013 through third quarter 2014.

SOURCES: Census Bureau; Bureau of Economic Analysis; author's calculations.

Chart 4 Texas Tax Burden More Unequal than National Average



NOTES: Each point represents state and local taxes paid as a share of household income in that quintile. Net tax rates are derived from sales and excise, property and income tax rates, after the federal deduction offset.

SOURCES: Institute on Taxation and Economic Policy; author's calculations.

taxes should be regressive—only that, other things being equal, one would expect the federal government to do more redistribution than states and localities.

How does Texas' tax progressivity compare with the national average? Texans in the lowest fifth of the income distribution pay 12.5 percent of their income in state and local taxes, which is about 2 percentage points above the national average, as seen in Chart 4.⁶ This declines to 8.7 percent for the middle fifth of the population and 4.6 percent for the top fifth, which pays about 2 percentage points less than the national average.

Overall, the state's tax system is less equal across income quintiles than the national average. A key reason is the state's reliance on the sales tax, which as a share of income is 8.6 percent for those in the bottom quintile but only 2.2 percent in the top quintile (Chart 5). The property tax burden as a share of income is almost identical across the five quintiles, hovering around 3 percent, except for the poorest quintile at 3.8 percent.

Put another way, Texas' two main taxes work at cross-purposes as far as progressivity is concerned—cuts to one

tax inevitably change how progressive the overall tax system becomes. The passage of time can do this as well, though. When property values rise rapidly, for example, one could reasonably expect the state and local tax burden in Texas to become somewhat less regressive (though perhaps larger overall) as property tax payments gradually become a larger share of individual tax burdens.

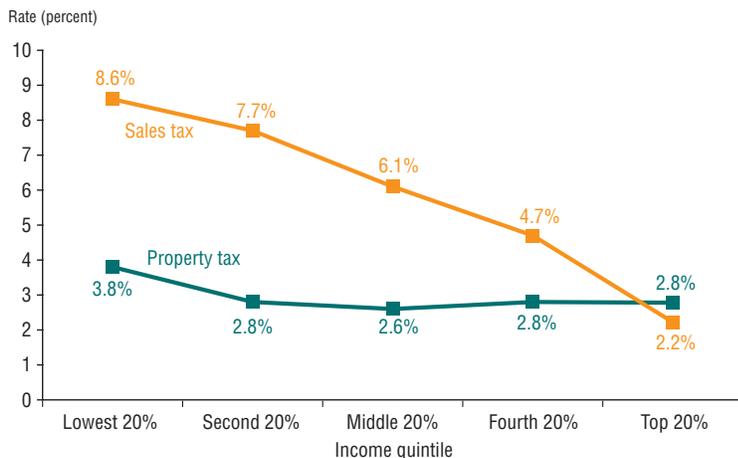
The Texas tax system is different from systems in most other states in one other respect. Sales and property taxes together account for nearly 90 percent of Texans' state and local tax burden, compared with just less than 70 percent nationally (Chart 6). The reason: Texas' lack of a state income tax.

While income tax rate structures vary widely across the 45 states that tax income, marginal rates commonly start at 0 percent and top out at 13.3 percent (in California). Some localities (like San Francisco) also impose local income taxes on high earners. As a result, the average state income tax collects only 0.2 percent of income from families in the poorest quintile but 3.7 percent from those in the richest quintile—making the tax vastly more progressive than average state sales and property taxes (Chart 7).

This helps explain why states with income taxes have more progressive tax regimes than those without. There are, however, consequences to consider. For example, economic research suggests income taxes are relatively inefficient because they contain built-in disincentives to save and invest.⁷ The income tax is also a more volatile revenue source than the sales tax, creating large windfalls during times of plenty but significant shortfalls during recessions. Furthermore, there is the ever-present risk that high earners will leave relatively high-income-tax states.

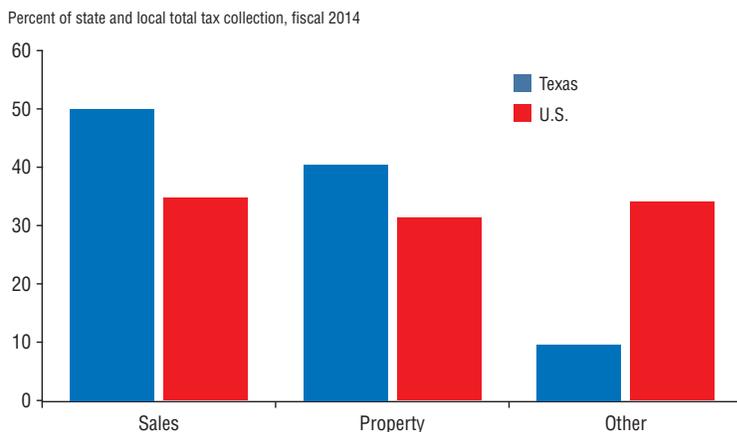
This balancing act does not happen in Texas, which outlawed income taxation in Article 8 of its constitution and has maintained the ban despite periodic attempts to reconsider it. The inevitable consequence is that the state's tax system is relatively regressive, with all the pluses and minuses that entails.

Chart 5 | Distributional Impact of Sales, Property Taxes Differs Greatly in Texas



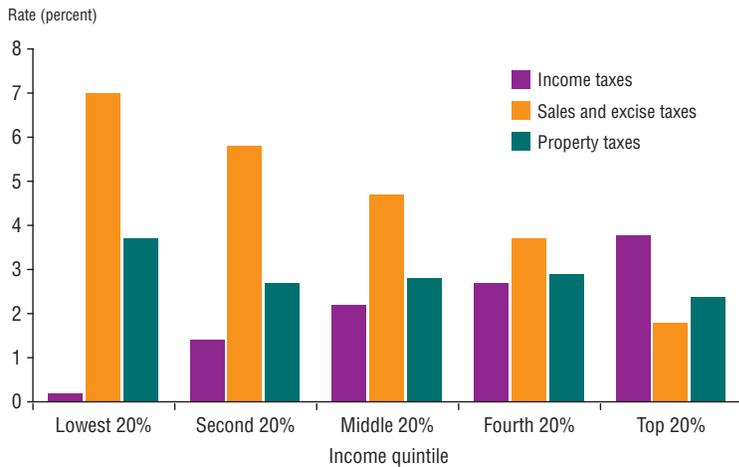
NOTE: Each point represents taxes paid as a share of household income in that quintile.
SOURCES: Institute on Taxation and Economic Policy; author's calculations.

Chart 6 | Texas Relies More on Sales, Property Taxes than U.S. Overall



SOURCE: Census Bureau.

Chart 7 State Income Taxes More Progressive than Sales and Property Taxes



NOTE: Share of income paid in tax by quintile and type of tax.

SOURCES: Institute on Taxation and Economic Policy; author's calculations.

Implications and Challenges

Texas imposes a relatively low per-capita tax burden on citizens but a relatively large portion of that burden on low-earning households. In recent years, both sides of that tradeoff have been called into question.

Texas faces significant challenges from the combination of demographic changes, middle-of-the-pack school quality rankings, a state highway system that receives average grades from civil-engineering groups, and the highest percentage of people without health insurance in the nation. Lawmakers could address these issues through some combination of raising taxes, devising more efficient ways to provide state services and passing public policies to foster faster economic growth.

Dealing with these challenges may also provide an opportunity to reassess the distributional burden of Texas taxes. In doing so, conflicting values will no doubt collide in Texas just as they have in other states.

On the one hand, the state's lowest-performing schools disproportionately serve the poor, who are also more likely than other Texans to lack health insurance.⁸ This suggests many of the state's challenges are borne disproportionately by the poor. On the other hand, the combination of low taxes

and relatively favorable treatment of high-earning families has likely helped bring jobs and economic activity to the state. To some degree, changing the tax system to impose a heavier burden on the highest-earning quintile could discourage working and job creation and thereby risk shrinking the available economic pie.

States and the nation face a fundamental tax dilemma—the trade-off between the quintessential Texas and American values of equality and growth.

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

Notes

¹ The statewide sales tax is 6.25 percent. Localities may add another 2 percentage points.

² For more on state revenue sources, see "Budget Balancing Act: Health and Education Stretch Texas Resources," by Jason Saving, *Southwest Economy*, Third Quarter, 2014.

³ See "Texas Retail in the Doldrums; Brick-and-Mortar Stores Bear the Brunt," by Amy Jordan, *Southwest Economy*, Third Quarter, 2017.

⁴ All told, more than 3,900 local government entities collect property taxes in Texas. Payments are based on the assessed value of property, though there are exceptions for land that is used for certain purposes (such as agriculture, which is sometimes eligible for taxation at a lower rate) or owned by certain classes of people (such as the elderly, who are sometimes eligible to freeze their payment levels).

⁵ See "How High Are Property Taxes in Your State?" by Jared Walczak, Tax Foundation, Aug. 13, 2015, taxfoundation.org/how-high-are-property-taxes-your-state.

⁶ Data used for these comparisons is taken from "Who Pays? A Distributional Analysis of the Tax Systems in All 50 States, Fifth Edition," Institute on Taxation and Economic Policy, January 2015.

⁷ Income taxes may also discourage work.

⁸ See "Texas Health Coverage Lags as Medicaid Expands in U.S.," by Jason Saving and Sarah Greer, *Southwest Economy*, Fourth Quarter, 2015.

A Conversation with Ronen Avraham

Tort Reform in Texas Changed Delivery of Medical Services

Ronen Avraham is the Thomas Shelton Maxey Professor in Law at the University of Texas Law School, where his primary academic interest is the economic analysis of torts and health care law. He created and published the *Database of State Tort Law Reform*, now in its fifth edition. Avraham is a board member of the American Law and Economics Association.

Q. What is medical malpractice law and why is it so important to the health care system?

Medical malpractice is a branch of tort law, a body of law that assigns civil liability to parties for committing acts that cause some harm to others. Medical malpractice law is a subarea of this field and deals with medical accidents stemming from health care providers' negligent behavior. Specifically, it deals with wrongdoing to patients in various health care settings—for example, in hospitals and clinics.

Medical malpractice law serves as the stick with which the legal “market” disciplines health care providers. These laws should be promulgated with the goal of achieving optimal deterrence in the hope that providers will avoid negligent delivery of care. Other desired goals motivating policymakers include ensuring that victims are compensated for any tortuous injuries.

Operating in the backdrop of this policy discussion is the persistent myth that medical malpractice has a big impact on total health care costs. However, decades of empirical evidence suggests the impact is miniscule at best—likely less than 3 percent.

Q. What did Texas do to address growing medical malpractice lawsuits and settlements? Why?

In 2003, Texas amended its tort laws, making it more difficult for victims of medical malpractice to file lawsuits for

negligent delivery of care. The changes to Texas tort law happened because a coalition of interested parties—doctors, hospitals and insurers—convinced lawmakers that tort reform would have wide-ranging benefits, including lowering health care costs and increasing access to doctors. Many people claimed that doctors, fearing liability, were electing to either move their practices out of Texas or overtreating patients as a means to protect themselves from future liability, a phenomenon called “defensive medicine.”

Q. Has medical malpractice reform/tort reform in Texas succeeded in lowering health care costs and increasing access to doctors?

The empirical studies of which I am aware have failed to show such an effect. It is important to note that there are at least two principal reasons why medical malpractice reform cannot even in theory make more than a dent in total health care costs.

First, tort reform does not eliminate all litigation. Rather, it only reduces it. Moreover, litigation costs reflect only a small percentage of total health care costs. So, even eliminating all medical malpractice litigation in the U.S will not reduce these high costs burdening the system. Second, proponents of limiting liability for doctors argue that protecting doctors from liability may reduce costs by removing doctors' incentives to perform defensive medicine.

What proponents overlook, however, is that limitation of liability might at the same time increase costs by creating incentives to overtreat patients in order to maximize doctors' reimbursements. Why? Because by reducing the risk of liability, doctors have incentives to perform costly procedures that they might not have performed before for fear of liability—some bypass surgeries, for example. We call this phenomenon “offensive medicine.” In practice, both effects are at work and, therefore, one should not be surprised that reforms did not reduce overall costs by much.

Q. So what benefits have there been as a result of the medical malpractice reform? Did health insurance premiums go down?

Studies have repeatedly shown that tort reform, especially caps on noneconomic damages, reduce litigation significantly, likely in the area of 30 percent. But that in and of itself is not a benefit to society, as money that hospitals save from reduced litigation comes from uncompensated, innocent injured victims. The research has also shown, however, that some tort reform—primarily the caps on noneconomic damages—reduce health insurance premiums by up to 2 percent, with the reduction concentrated among health insurance plans that are not managed-care plans. The reduction in price leads to a small increase in health insurance coverage, primarily among price-sensitive groups.

Q. The legislative process took decades. Why was tort reform so contentious?

Tort reform morphed into a partisan issue with the main political parties taking opposite sides. Also, for many years, no good empirical evidence regarding the impact of the law on the delivery of care existed. Therefore, people could make all sorts of arguments without being able to support them or have them disproven. Luckily, over the past decade or two, empirical evidence on the real impact of tort reform has started accumulating. As a result, it is easier for legislatures to engage in evidence-based legal reform.



▶ *“Improving patient safety just a little can help significantly reduce malpractice lawsuits.”*

Q. Has the quality of medical care changed? Is the supply of doctors in traditionally underserved areas affected?

No solid evidence of which I am aware suggests much has changed. In Texas, the best studies—done by my colleague [University of Texas Law School professor] Charles Silver and his coauthors—have shown that the supply of doctors to rural areas did not increase appreciably after 2003. The state as a whole also gained doctors at the same rate it did before lawsuits against doctors were restricted in 2003. When one controls for the historical rate of growth in physician supply, there does not appear to have been any effect of the 2003 tort reform on the number of doctors attracted to the state. Nor have I seen evidence that costs declined. A Texas-focused study found no evidence of reduced spending in Texas post-reform and some evidence that physician spending rose in Texas relative to control states.

Q. What have other states done to help doctors and curb costs? How have their choices played out?

Some states have experimented with “apology laws”—doctors approach their patient and assume some level of responsibility for an accident and offer to work with patients on fixing what has been broken. Empirical evidence suggests that such an approach, indeed, was successful in reducing litigation. But in my view, this approach misses the point. The best way to reduce medical malpractice litigation—and to protect both doctors’ and patients’ interests—is to reduce medical malpractice. Period.

If negligence does not happen, there should be no suits filed. Therefore, efforts should be geared toward improving the

health care delivery and not to artificially reducing litigation. One of the biggest problems of the health care system is that care is not delivered at satisfactory levels across the nation. Successfully addressing this issue will simultaneously reduce litigation by eliminating bad care, as opposed to the current approach of simply erecting legal barriers to keep patients from filing suit against negligent health care providers. Indeed, a recent study found the hospitals that fare badly in various patient safety indicators developed by the government were subject to more malpractice lawsuits. Improving patient safety just a little can help significantly reduce malpractice lawsuits.

Q. How did the Affordable Care Act (ACA) include medical malpractice reform? Has it worked to limit rising health care costs?

The ACA primarily enabled various pilot projects, which is a great thing in and of itself. To properly overhaul the legal landscape, we need more evidence on what actually works. To my knowledge, there are no existing studies showing any significant and conclusive results [regarding the impact of the ACA]. The Center for Medicare & Medicaid Innovation hasn’t run any pilot projects on medical malpractice reform.

The ACA did not reduce the rate at which health care spending grew. It increased it. The primary driver was Medicaid expansion, which added hundreds of billions of dollars in health care spending and would have required hundreds of billions more to continue.

The extension of private insurance coverage to more than 10 million people who were previously uninsured drove up spending, too. Both results were predictable. The more people who are covered by government programs and private insurance, the more that is spent on medical services. The conclusion from all this is that one needs to look not only at costs but also at benefits. The ACA provided basic health care to millions of disadvantaged fellow Americans.

Q. Where might the Legislature look to further change laws regarding medical practices in Texas?

I believe technology should be better integrated into health care delivery, and laws should facilitate (or at least enable) such progress. One way to do that is to shield doctors from medical malpractice liability, provided they utilize modern decision-aids-based components, such as artificial intelligence and deep learning [an advanced use of artificial intelligence for decision-making]. Eliminating liability from doctors in such a way, I think, would strongly incentivize them to leave the 20th century and join others delivering health care in line with advances made in the 21st century. By incentivizing doctors to deliver better care, I am sure medical accidents will decrease, and litigation will decrease naturally as well.

Q. Are there other industries, where state lawmakers might want to similarly consider a wide-ranging review of laws governing them?

Of course, there are. Such a review can occur basically everywhere—from increasing competition in the health care system, to introducing competition among automobile dealerships markets from online sellers, to rethinking our privacy rights in an era where everything is online, to shaping our banking and bankruptcy laws to prevent another meltdown, to conceptualizing antidiscrimination laws in the big-data era, to rethinking employment and welfare laws in a world where robots can do so much. Ask any law professor in this country, and he or she will tell you what is wrong with the law in his or her area. Beyond teaching, faculty members in top law schools study existing legal regimes and imagine ways to improve them and make the world a better place.

Texas Retail in the Doldrums; Brick-and-Mortar Stores Take the Brunt

By Amy Jordan

ABSTRACT: Texas retailers have confronted a pair of challenges. First, the 2015–16 oil bust depressed personal income, while a stronger dollar weakened demand for goods along the border. Second, amid the Texas economy’s recovery, brick-and-mortar retailers have been losing business to internet sales.

The traditional retail industry has been challenged in recent years. Consumption, primarily a function of income, drives retail sales. And in Texas, weak retail sales have been in line with flat income growth, by-products of the oil bust and ensuing economic slowdown.

Sales among the state’s retailers declined from the second half of 2015 through 2016—the first sustained drop since the Great Recession.¹ Real (inflation-adjusted) personal income per capita stagnated in 2015–16 after advancing 4 percent in 2014.

There are indications that improving consumer incomes are boosting consumption this year, and with it, retail sales. But difficulties remain, particularly from a rise in e-commerce.² National chains along with regional and local retailers are closing stores as consumers increasingly go online.³

Slipping Retail Sales

Retail sales represent the dollar amount consumers spend at stores, restaurants, auto dealers, gas stations and nonstore—internet or mail-order—retailers.⁴ The Census Bureau estimates national retail sales monthly after surveying about 12,000 such businesses.⁵

The Federal Reserve Bank of Dallas estimates Texas monthly retail sales based on Texas Comptroller of Public Accounts data on state quarterly sales tax receipts and monthly allocations of sales tax collections to local taxing entities, such as cities and counties.

Quarterly real Texas retail sales fell steeply with the energy slump—the most significant declines on a year-over-year basis were in first quarter 2016 at 5.5 percent and in second quarter 2016 at 6.9 percent (*Chart 1*).⁶ Sales turned positive in first quarter 2017, rising 1.0 percent, consistent with

a sharp pickup in state job and wage growth in 2017.⁷

Nationally, retail sales rose from the second half of 2015 through 2016 at a slightly slower pace than in 2014 but still above the longer-run trend rate of growth. Consumers nationally, like those in Texas, benefited from lower gasoline prices during the oil bust. Gasoline prices fell from a high of \$3.71 per gallon in April 2014 to \$2.04 in January 2015, reaching a low of \$1.72 in February 2016.

Consumers spend 2.4 percent of their household income on gasoline on average, so large declines in fuel costs increase real income and spur spending on other items. However, Texas is a large oil and natural gas producer, so the negative effects on energy producers outweigh the consumer benefits of lower pump prices. The oil bust resulted in massive job losses in the state’s energy and manufacturing sectors; from peak to trough, those high-paying industries shed 174,000 jobs. As a result, retail spending softness was pronounced in regions with larger concentrations of employment in the energy and manufacturing industries.

In addition, Mexican visitors’ purchases in Texas became more expensive amid U.S. dollar appreciation against the peso, damping retail sales, particularly in stores along the border. A respondent to the Dallas Fed’s Texas Retail Outlook Survey highlighted these contemporaneous realities, stating: “The strong dollar continues to negatively impact us in our border stores. Our oil patch stores continue to decline more than the rest of the chain.”⁸

The peso reached a low of just less than 22 per dollar in January 2017, down from 15 per dollar in January 2015. It strengthened to 18

pesos per dollar by July 2017, which should support retailing in Brownsville, El Paso, Laredo and McAllen.⁹

Retail sales in these border metros incurred slight to significant declines during fourth quarter 2016, the most recent data available show. El Paso's real retail sales were down 0.3 percent from fourth quarter 2015, with more substantial drops in Brownsville (8.5 percent), McAllen (9.4 percent) and Laredo (14 percent). The statewide net decline was 0.6 percent.

Comparisons of regional and national sales are complicated because all local consumer activity isn't completely measured. Texas retail sales data are based on reports from state sales- and use-tax permit holders; companies without a physical presence in the state need not obtain a permit.

In fact, the U.S. Supreme Court ruled in 1967 that states could not require out-of-state businesses to collect and remit sales and use taxes while conducting business in the state solely through common carriers such as the U.S. Postal Service. This became known as the physical-presence rule and was affirmed by the court in 1992. Thus, internet and mail-order sales by retailers with no physical presence in Texas—for example, stores or warehouses—are not fully captured.

Weak Employment Growth

Texas' retail sector accounts for 1.3 million jobs and the food services industry an additional 1.1 million positions. The two make up 19 percent of total state employment—about the same relative size as in the nation.

Slowing activity among retail establishments and a shift to the internet has suppressed retail job growth and even prompted some cutbacks, particularly among traditional outlets. Department stores and stores selling clothing and accessories, health and personal care items, sporting goods and hobby goods all cut jobs on net during the first half of 2017, while electronics and appliance stores added jobs at the fastest rate of all retail categories and nonstore retailers continued increasing positions (*Table 1*).

In Texas, slowing retail employment growth has followed slumping sales, with the rate of job growth sliding from 2.7 percent in 2015 to 1.5 percent in 2016 and to -0.7 percent in the first half of 2017. Nationally, retail employment grew just over 1 percent per year in 2015 and 2016 and declined slightly through the first half of 2017.¹⁰

Bucking the trend of declines in the retail trade workforce, food service

industry employment continued increasing, up 5.1 percent in 2015, 2.7 percent in 2016 and 3.9 percent in the first half of 2017.

Shopping Moves Online

Many consumer behavior trends affect retail sales but none more than online shopping, which in first quarter 2017 accounted for 8.5 percent of total retail sales nationally—double the 4.2

Chart 1 Texas Real Retail Sales Decline amid Energy Bust



*Calculated from quarterly real retail sales in 2016 dollars; change is year over year.
NOTE: Gray bars represent U.S. recessions; blue bar represents the oil bust period.
SOURCES: Census Bureau; Texas Comptroller of Public Accounts; Federal Reserve Bank of Dallas.

Table 1 Texas Retail Employment Growth Varies by Type of Retailer

	2015 percent change	2016 percent change	1H 2017 percent change
Total retail	2.7	1.5	-0.7
Electronics and appliance stores (3.4%)	-1.2	0.0	2.3
Other general merchandise (13.6%)	2.8	3.7	1.4
Nonstore retailers (1.8%)	8.0	4.7	1.4
Furniture and home stores (3%)	3.4	-2.8	-0.5
Building material and garden equipment dealers (7.9%)	2.4	3.0	-1.5
Food and beverage stores (18%)	4.2	2.7	-1.7
Gasoline stations (6.5%)	3.6	-0.1	-2.1
Miscellaneous store retailers (4.9%)	2.0	-1.1	-3.2
Health and personal care stores (5.7%)	-0.2	7.2	-3.4
Department and clothing stores (17.2%)	1.7	-0.3	-3.6
Sporting goods and hobby stores (3.6%)	-1.2	-1.6	-7.3

NOTES: Table shows the annual (December/December) percent change. First half 2017 is the June/December annualized percent change. Numbers in parentheses are the share of total retail employment in that specific retail category.
SOURCES: Texas Workforce Commission; seasonal and other adjustments by the Federal Reserve Bank of Dallas.

► *The square footage under contract for construction of stores and restaurants in Texas has steadily fallen since 2015 and dropped 10 percent in 2017 from the prior year.*

percent share at the beginning of 2010—according to Census Bureau data. Online sales replace those at brick-and-mortar stores and represent a loss in sales tax revenue for state and local governments.

Given the limited data available on online sales to Texas residents, the Dallas Fed’s Texas Retail Outlook Survey (TROS) fills an important gap. TROS is a monthly survey of about 80 Texas wholesalers and retailers that asks about retail sales revenue, including online sales.

Respondents are queried how their internet sales companywide have changed from the prior month. Their responses are used to construct diffusion indexes, where positive values represent increasing sales and negative values decreasing sales. A higher positive index number indicates faster growth. While respondents are located in Texas, they may do business in other states as well and, therefore, the internet sales measure also likely captures some out-of-state online sales activity.

Internet sales, TROS shows, are increasing at a faster rate than companywide sales, with the internet sales index pushing above the companywide sales index in mid-2016 (Chart 2). This is in line with national e-commerce data. The survey measure of companywide internet sales indicates continuing increases

every quarter since the second half of 2013, while companywide sales declined slightly in third quarter 2016 but otherwise increased.¹¹

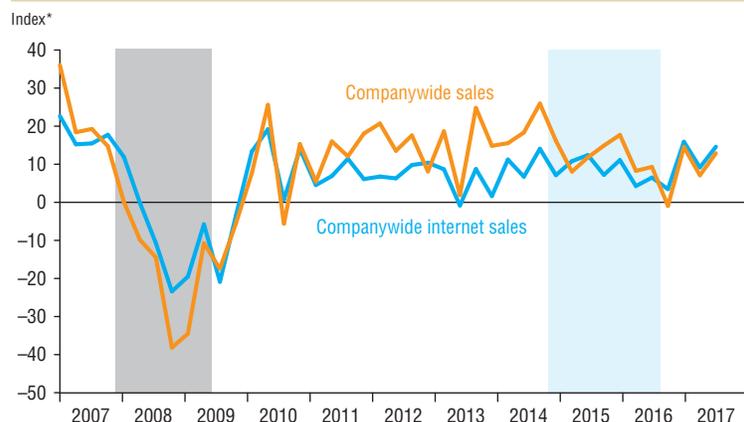
Store Construction Slows

As online spending grows at the expense of brick-and-mortar stores, store closings have followed, impacting malls and other shopping centers in small and large cities nationwide.¹² City leaders have increasingly worked to help fill vacant spaces—either with other retailers or nonretail tenants.¹³

Meanwhile, construction of new facilities is slowing. The square footage under contract for construction of stores and restaurants in Texas has steadily fallen since 2015 and dropped 10 percent in 2017 from the prior year (Chart 3). Store and restaurant construction has also accounted for a shrinking share of the value of total nonresidential construction in Texas.

In 2012, construction of stores and restaurants amounted to 10 percent of the value of all nonresidential construction projects; by the first part of 2017, that share had slipped to 7.8 percent. This decline has broader implications. Slowing construction in the stores-and-restaurants category means reduced demand from this sector for construction workers and materials.

Chart 2 | Internet Sales Increasing Faster than Companywide Retail Sales Among Texas Retailers

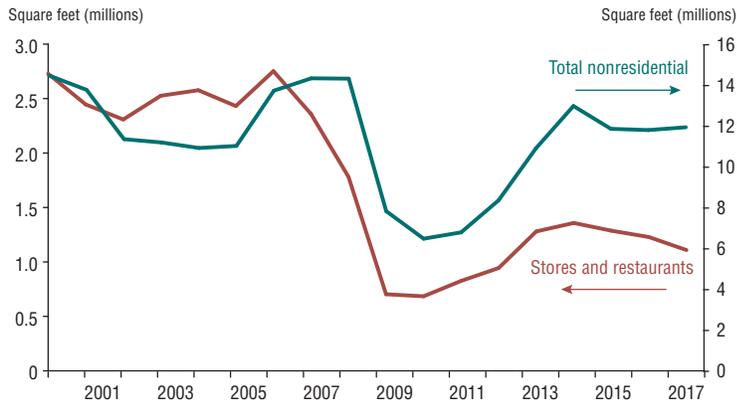


* Quarterly average; seasonally adjusted.

NOTE: Gray shaded bar represents U.S. recession; blue shaded bar represents the oil bust period.

SOURCE: Federal Reserve Bank of Dallas.

Chart 3 Store, Restaurant Square Footage Under Contract for Construction Declines in Texas



SOURCES: Dodge; Federal Reserve Bank of Dallas.

E-Commerce Gains Expanding

While the regional economic effects of the shift to online sales appear negative—with fewer retail stores and jobs and less construction and tax revenue—there are some advantages. Online shopping represents a big benefit to consumers, who can save money and time by easily comparing prices across retailers and avoiding the drive to physical locations. And in some cases, retail job losses are offset by the expansion of internet retailer distribution and service facilities.

E-commerce is growing at a faster rate than traditional retail sales. This trend will continue, with internet sales making up an increasing share of total retail sales. To survive, traditional retailers can further adapt the in-store customer experience and combine it with an online presence.

Jordan is an assistant economist in the Research Department at the Federal Reserve Bank of Dallas.

Notes

- ¹ Texas retail sales declined in third quarter 2013—a one-quarter drop and not a sustained slump.
- ² U.S. general merchandise, apparel and accessories, furniture and other retail sales have declined since first quarter 2016, while e-commerce sales continue rising and account for an increasing share of total retail sales, according to Census Bureau data.
- ³ A study from retail think tank Fung Global Retail and Technology states that traditional retailers are struggling

due to pressure from the growth of e-commerce, consumers' shift to online shopping and dwindling mall traffic. www.fungglobalretailtech.com/research/deep-dive-retail-x-factor-the-store.

- ⁴ A specific breakout of Texas retail sales excluding restaurants is not available.
- ⁵ There are more than 1 million retail establishments in the U.S., according to the Census Bureau.
- ⁶ Retail sales figures for both Texas and the U.S. refer to real (inflation-adjusted) retail sales in 2016 dollars. U.S. retail sales are deflated using the CPI-U, the Consumer Price Index for all urban consumers from the Bureau of Labor Statistics (BLS); Texas retail sales are deflated using the Texas CPI from the BLS and Dallas Fed.
- ⁷ See "Texas Economy Shifting into Second Gear in 2017," by Keith R. Phillips and Christopher Slijk, Federal Reserve Bank of Dallas *Southwest Economy*, First Quarter 2017, www.dallasfed.org/research/swe.aspx.
- ⁸ Dallas Fed Texas Retail Outlook Survey, Sept. 27, 2016, www.dallasfed.org/research/surveys/-/media/Documents/research/surveys/tssos/2016/1609/tssos1609.pdf.
- ⁹ See "Dollar-Sensitive Mexican Shoppers Boost Texas Border Retail Activity," by Roberto A. Coronado and Keith R. Phillips, Federal Reserve Bank of Dallas *Southwest Economy*, Fourth Quarter 2012, www.dallasfed.org/research/swe.aspx, and "Exported Retail Sales Along the Texas–Mexico Border," by Roberto A. Coronado and Keith R. Phillips, *Journal of Borderlands Studies*, vol. 22, no. 1, spring 2007.

¹⁰ U.S. retail employment was down an annualized 0.6 percent through June 2017.

¹¹ Similar to the companywide internet sales index, the companywide retail sales index largely reflects Texas retail sales but may also capture out-of-state retail sales. We call these indexes companywide revenue and internet revenue in our survey; also see the Texas Retail Outlook Survey sample survey form, www.dallasfed.org/-/media/Documents/research/surveys/TSSOS/documents/tros_form.pdf?la=en.

¹² For examples of impacted malls, see "Cities Look to Regenerate Activity at Old Malls," by Michael Weiss, Federal Reserve Bank of Dallas *Southwest Economy*, Third Quarter 2014, www.dallasfed.org/research/swe.aspx.

¹³ The city of Athens, Texas, hired a retail consultant in 2016 to fill in retail and restaurant gaps. The city learned this year that J.C. Penney would close its store in Athens, www.dallasnews.com/business/retail/2017/03/17/jc-penney-lists-138-store-closings-including-9-texas.

High Texas Student Loan Delinquency Rates Underscore Deeper Challenges

By Wenhua Di and Stephanie Gullo

ABSTRACT: Texas student loan borrowers have lower debt balances but higher delinquencies than the national average. Debt loads have increased in recent years, further challenging Texas students, who are already more likely than their counterparts nationally to work while in school.

Repaying student debt is a growing challenge for many who pursue a college education. About 58 percent of Texas students and 48 percent of their counterparts nationally relied on loans to finance their studies during the 2014–15 academic year.¹

Student loan delinquency has been the highest among all major types of consumer loans in Texas and the nation. Serious delinquencies—loans that are over 90 days late or severely derogatory, indicating repayment problems—accounted for about 13.4 percent of the outstanding student loan balance in Texas in March 2017 and 11.1 percent nationally.^{2,3}

High and rising loan balances alone do not explain student loan delinquencies. Factors such as income and family resources, willingness to take on debt, college preparedness, attendance, failure to complete programs, types of educational institutions attended and labor market conditions contribute to student loan borrowing and repayment performance.

Behind Texas Delinquencies

About 44 million Americans have outstanding student loans. The \$1.35 trillion owed is the largest portion of nonmortgage debt and accounts for 11 percent of total U.S. household debt (*Chart 1*).⁴ While Texas consumers hold a much higher level of auto debt and lower level of home-related debt than the national average, the share of student loans in the debt portfolio is about the same as in the U.S. The median balance of Texas student loan borrowers is \$14,964, compared with the U.S. median, \$16,184.

There are a variety of ways to measure the level of student loan repayment difficulties. One can view the share of the delinquent balance

relative to total owed, the proportion of delinquent borrowers compared with all borrowers, and the shares of delinquent balances or borrowers relative to those who are in repayment of the debt.⁵

For both Texas and the U.S., loan performance has deteriorated throughout the past decade (*Chart 2*). Texas consistently has a higher delinquency rate by every measure relative to the nation.

Student loan borrowers typically take out multiple loans each school year, sometimes with different terms and different servicers. A borrower's status is determined by the worst-performing loan. Thus, the delinquency rate based on total balance is usually lower than that of the total number of borrowers.

Additionally, delinquency rates based on balance or consumers in repayment are much higher than those based on the totals because many student loan borrowers are not yet repaying loans because they are still in school, in the grace period after graduation, or in deferment or forbearance.⁶

A total of 39 percent of loan balances and 56 percent of borrowers are in repayment in Texas. Considering only the student loan balance in repayment, the estimated serious delinquency rate is 34 percent in Texas and 29 percent for the nation. In other words, more than one-third of Texas student loan borrowers currently in repayment are at least three months behind on payments.

Rising Debt Levels

Studies show that higher-balance student loan borrowers tend to default less, counter to the suspicion that increasing debt necessarily leads to repayment problems. A White House Council of Economic Advisers report

in 2016 showed that over a three-year period after entering repayment, the default rate was 24 percent for those borrowing \$5,000 or less, 19 percent for those borrowing from \$5,001 to \$10,000 and 7 percent for those who borrowed more than \$40,000. Among all defaulters, two-thirds borrowed less than \$10,000 and only 4 percent borrowed more than \$40,000.⁷

Still, students have become more indebted over the past decade. The share of Texas borrowers with more than \$40,000 in student loans nearly doubled from 10.6 percent in March 2007 to 20.7 percent in March 2017. During the period, the proportion of Texas borrowers owing \$100,000 or more increased from 1.8 percent to 4.7 percent, compared with a rise nationally from 2 percent to 5.5 percent. The Texas and national increases were largely driven by debt for graduate school.⁸

Graduate students on average borrow three times as much in direct federal loans every year than undergraduates. They are also more likely to repay loans after graduation.

Repayment Problems

A top reason for borrower distress is inability to complete school; ironically, it can be related to taking out too few student loans rather than too many.⁹ Some students, especially those with limited college experience—first-generation students, immigrants and adult students—may be unaware of financial aid and seek to minimize the risk of borrowing, obtaining insufficient financial backing.

Some students' decision not to borrow enough money—often while attempting to work their way through school—leads to failure to complete their studies. Although college graduation rates for first-time freshmen at Texas public universities has significantly improved over the past two decades, minority students, especially black students, remain far behind their white, non-Hispanic counterparts.¹⁰

More than a quarter of undergraduate students in Texas were age 25 or older in fall 2014. Most undergraduate

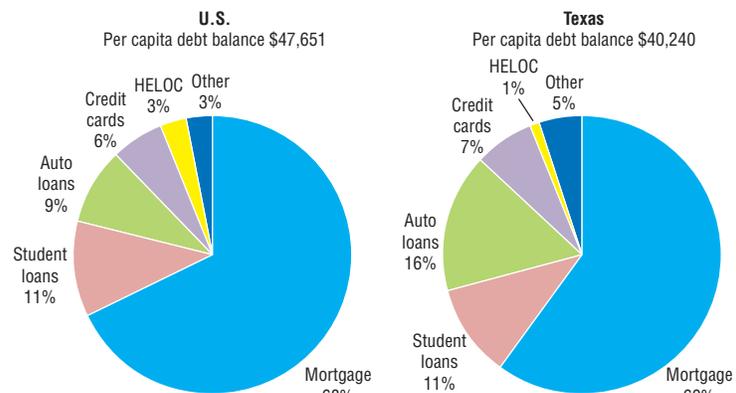
students in Texas enrolled in two-year institutions and of those attending such schools, two-thirds did so on a part-time basis. Meanwhile, Texas high school students trail their counterparts nationally in college readiness.

Another complicating factor is a lack of health insurance.¹¹ The state has the highest percentage of population without coverage, making some students more likely to drop out because

of illness-related financial shocks involving themselves or family members.

Still others are unable to find well-paying jobs after graduation, sometimes after borrowing too much relative to their earning potential. For example, students may borrow thousands of dollars and go to a for-profit school to learn a trade rather than attending a community college for similar training at a much lower cost.¹²

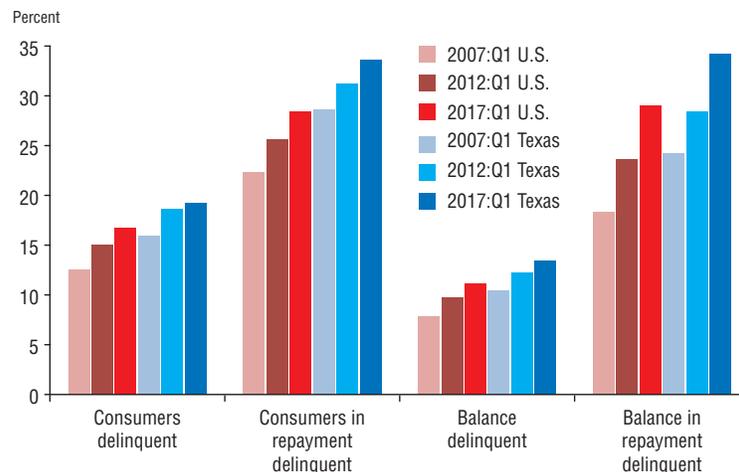
Chart 1 More Than One-Tenth of Consumer Debt Is Student Loan Debt



NOTES: Percent of total debt balance based on 5 percent sample of all consumers with credit. U.S. includes the 50 states and Washington, D.C. HELOC refers to home equity line of credit. Mortgage includes home equity installment loans.

SOURCE: Federal Reserve Bank of New York Consumer Credit Panel/Equifax.

Chart 2 Texas Student Loan Borrowers Perform Worse than the Nation

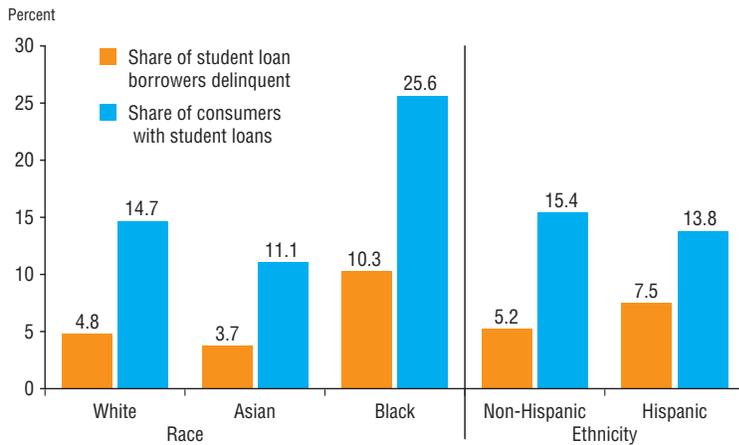


NOTE: Based on 1 percent sample of consumers with a credit report.

SOURCE: Federal Reserve Bank of New York Consumer Credit Panel/Equifax.

Chart 3

Student Loan Borrowers' Debt Profile Varies by Race, Ethnicity Among U.S. Mortgage Holders



NOTE: Data for March 2017.

SOURCE: Home Mortgage Disclosure Act—Credit Risk Insights Servicing McDash/Equifax match data.

Difficult Repayment Terms

The terms of some student loan programs are complicated, leaving borrowers in the dark about their choices and obligations or relief plans if they get into trouble. About 90 percent of student loans originated are direct federal loans. There are four types for undergraduates and three types for graduate students.¹³ The federal government offers nine repayment plans from which borrowers can choose—four without loan forgiveness and five income-driven plans that allow payment to be adjusted according to borrowers' discretionary income and loan forgiveness.¹⁴

There are also complaints about outside servicers who work on behalf of the government collecting payments. Some borrowers say they are not providing accurate information and prompt assistance, especially involving enrollment in income-driven repayment plans, which might help avoid defaults.¹⁵

Overall, student loan borrowers tend to have lower credit scores than nonborrowers, although this difference is not necessarily a consequence of indebtedness but a reflection of the credit profiles of those unable to repay loans. Defaulting federal loan borrowers may also have wages, tax refunds or Social Security payments garnished

and cannot have their student loan discharged even in bankruptcy unless they can prove overwhelming debt burden.

Broader economic consequences arise from student debt problems. Heavily indebted students may reduce savings and consumption, delay home or car purchases or family formation, or put off starting a business.¹⁶ Delinquencies or defaults impair credit and limit future borrowing capacity.

Differing Debt Patterns

Credit reports highlight but do not explain higher Texas student loan delinquencies. Income and demographic differences vis-à-vis the rest of the nation play a role, as evidenced in a unique dataset that includes credit bureau data and demographic information for consumers with mortgages.¹⁷

Among mortgage holders, middle-income consumers are more likely than high- or low-income consumers to have a student loan. This may be because grant aid is less available and family resources to fully fund education are inadequate.

Borrowers in the lower-income quintile are more likely to be late with student loan payments. Because a narrower group of borrowers have sufficient credit standing to obtain a mortgage, their overall delinquency rate is much

lower than that in the credit bureau data. The median loan balance is greater in the higher-income quintiles and relatively less in the lower-income quintiles.

Texas has a higher poverty rate than the nation. There is a greater percentage of student loan borrowers among middle- and low-income consumers in Texas than in the nation. Among all income quintiles, however, the median of Texas student loan balances is lower than those nationally, while the Texas delinquency rate is higher except among the top 20 percent income group.

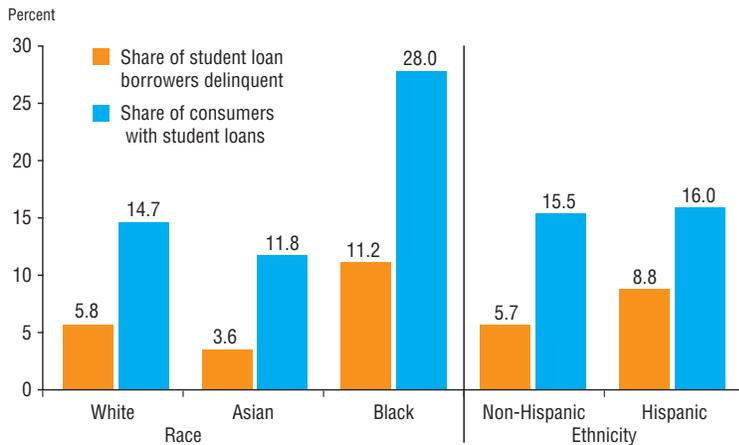
Borrowing and repayment among mortgage holders also varies by race and ethnicity (*Chart 3*). Nationally, black consumers are more likely to hold student loans and also more likely to be delinquent than white and Asian borrowers.¹⁸ Hispanic consumers are less likely to borrow but more likely to be delinquent than non-Hispanic consumers. When it comes to the amount owed, black borrowers have a higher median balance than Asian borrowers; whites have the lowest. Non-Hispanics have a higher median balance and lower delinquency rate than Hispanic borrowers.

A greater percentage of Hispanics borrowing has thus contributed to higher Texas loan delinquencies.

Hispanics make up 23 percent of borrowers in Texas—14 percentage points higher than nationally. Texas debt patterns are similar to those in the nation, apart from Texas Hispanics' greater willingness to take out student loans (*Chart 4*). Texas' delinquency rates exceed those of the nation for all race and ethnic groups, except for Asians. Among the Texas mortgage holder group, the median balance of Hispanic student loan borrowers totaled \$15,367—\$4,255 lower than that of non-Hispanic borrowers.

Studies show that black and Hispanic students more often work full time during college, possibly affecting graduation chances.¹⁹ Asian and Hispanic immigrant groups, meanwhile, may be less willing to take on debt for cultural reasons, possibly leading to underfunding and subsequent repayment problems.

Chart 4 Among Mortgage Holders, Hispanics More Likely to Have Student Loans than Non-Hispanics in Texas



NOTE: Data for March 2017.

SOURCE: Home Mortgage Disclosure Act—Credit Risk Insights Servicing McDash/Equifax match data.

Student Loan Impact

Although Texas tuition and fees are lower than colleges nationally, a higher percentage of Texas students rely on loans, especially federal loans, to fund their education.²⁰ For many, the debt allows acquisition of skills and knowledge, leading to financial independence and professionally fulfilling lives that might otherwise be unattainable. When debt is properly managed, borrowers are on track to building good credit as well as promising careers.

However, many borrowers cannot handle their debt. Delinquency and defaults are especially high among lower-income and minority groups despite availability of a variety of income-based repayment relief programs. Additional research could examine the factors underlying these borrowing and debt performance patterns. In the meantime, schools can offer financial counseling to help students handle debt, while loan servicers should work to assist and inform borrowers regarding their loan obligations.

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

Notes

¹ “State of Student Aid and Higher Education in Texas,” by Chris Fernandez, Carla Fletcher and Kasey Klepfer, Texas Guaranteed Student Loan Corp., January 2017, www.tg.org/research/state-of-student-aid-in-texas/.

² “Student Loans Part 1: Get the Numbers Right,” by Wenhua Di and Emily Ryder Perlmeter, Texas Consumer Credit Series, Federal Reserve Bank of Dallas, December 2014, www.dallasfed.org/cd/FinAccess/ConsumerCredit/2014/1202.aspx.

³ Based on the March 2017 Federal Reserve Bank of New York Consumer Credit Panel/Equifax (CCP/Equifax) data. Loans that are 90 days late, 120 days late or severely derogatory are considered seriously delinquent. Severely derogatory loans are defined as loans that are in any stage of delinquency combined with reports of repossession or charge off.

⁴ See note 3.

⁵ The trade-line data in Federal Reserve Bank of New York Consumer Credit Panel (CCP)/Equifax allow various measures of student loan delinquencies; see note 2.

⁶ The majority of student loan borrowers do not need to make payment while in school and during a grace period (six or nine months) after graduation. Loan servicers can also grant deferment and forbearance to borrowers to post or reduce payment.

⁷ Loan balance is measured at the time the borrower entered repayment in 2010–11. Investing in Higher Education: Benefits, Challenges and the State of Student Debt, Figure 27, White House Council of Economic Advisers, 2016.

⁸ “Is a Student Loan Crisis on the Horizon?” by Beth Akers and Matthew M. Chingos, Brown Center on Education Policy, The Brookings Institution, June 24, 2014.

⁹ “Trends in Student Aid 2016,” by Sandy Baum, Jennifer Ma, Matea Pender and Meredith Welsh, The College Board, 2016.

¹⁰ Texas Higher Education Coordinating Board, www.txhighereddata.org/Interactive/Accountability/UNIV_Success.cfm?FICE=445566.

¹¹ “Young, Uninsured and in Debt: Why Young Adults Lack Health Insurance and How the Affordable Care Act Is Helping,” by Sara R. Collins, Ruth Robertson, Tracy Garber and Michelle M. Doty, The Commonwealth Fund, June 2012, www.commonwealthfund.org/~media/files/publications/issue-brief/2012/jun/1604_collins_young_uninsured_in_debt_v4.pdf.

¹² “Trends in Community Colleges: Enrollment, Prices, Student Debt and Completion,” by Jennifer Ma and Sandy Baum, Research Brief, College Board, April 2016.

¹³ Undergraduate students with financial need can borrow via direct subsidized loans. Both undergraduate and graduate students can borrow unsubsidized direct loans. Those with exceptional financial need can get Perkins loans from schools. Parents can borrow PLUS loans for undergraduate students, and graduate students can borrow PLUS loans for themselves. See more details at <https://studentaid.ed.gov/sa>. For other loans available for Texas students, see “Student Loans Part 2: Borrowing for a Future,” Wenhua Di and Emily Ryder Perlmeter, August 2015, www.dallasfed.org/cd/FinAccess/ConsumerCredit/2015/0801.aspx.

¹⁴ Borrowers in the income-driven plans can have the remaining balance forgiven after 20–25 years of payment. Some of them can also apply for the Public Service Loan Forgiveness if they work in qualified public service jobs and have the remaining balance forgiven after 10 years of on-time payment.

¹⁵ “Annual Report of the CFPB Student Loan Ombudsman,” Consumer Finance Protection Bureau, 2016, https://s3.amazonaws.com/files.consumerfinance.gov/f/documents/102016_cfpb_Transmittal_DFA_1035_Student_Loan_Ombudsman_Report.pdf.

¹⁶ “Student Loan Relief Programs: Implications for Borrowers and the Federal Government,” by Wenhua Di and Kelly Edmiston, *The ANNALS of the American Academy of Political and Social Science*, vol. 671, no. 1, 2017, pp. 224–48.

¹⁷ Based on a unique dataset matching the Equifax data and the Home Mortgage Disclosure Act (HMDA) data. The match is done in two steps: a match of Equifax with Black Knight Financial Services (formerly known as Lending Processing Services and McDash) by Equifax and a match of confidential HMDA with McDash by the Federal Reserve Board.

¹⁸ Roughly 74 percent of the sample with student loans were white, 11 percent were black, 4 percent were Asian, less than 0.5 percent were Native American, less than 0.5 percent were multiracial, and 10 percent did not report race.

¹⁹ “Student Aversion to Borrowing: Who Borrows and Who Doesn’t,” by Alisa F. Cunningham and Deborah A. Santiago, Institute for Higher Education Policy, December 2008.

²⁰ See note 1.

Cross-Border Pipelines Link U.S. Natural Gas Producers, Mexican Electricity Users

By Rachel Brasier and Jesse Thompson

Mexican energy reforms have opened the door to shale gas from the United States—and imports are booming. U.S. natural gas production reached a record high in July 2015, largely due to increased shale drilling since 2010 in the Marcellus field in the northeastern U.S. and the Permian and Eagle Ford basins in Texas. The supply boom, which far outpaced domestic demand growth, led to a surfeit of natural gas and a roughly two-thirds drop in prices.

Meanwhile in Mexico, reforms that began in 2014 broke the monopoly held by the state energy company, Pemex, on electricity generation. The changes also emphasized cleaner fuels, such as natural gas, and promoted rental of pipeline capacity to private enterprise. As a result, Mexico emerged as an attractive destination for excess U.S. gas supplies.

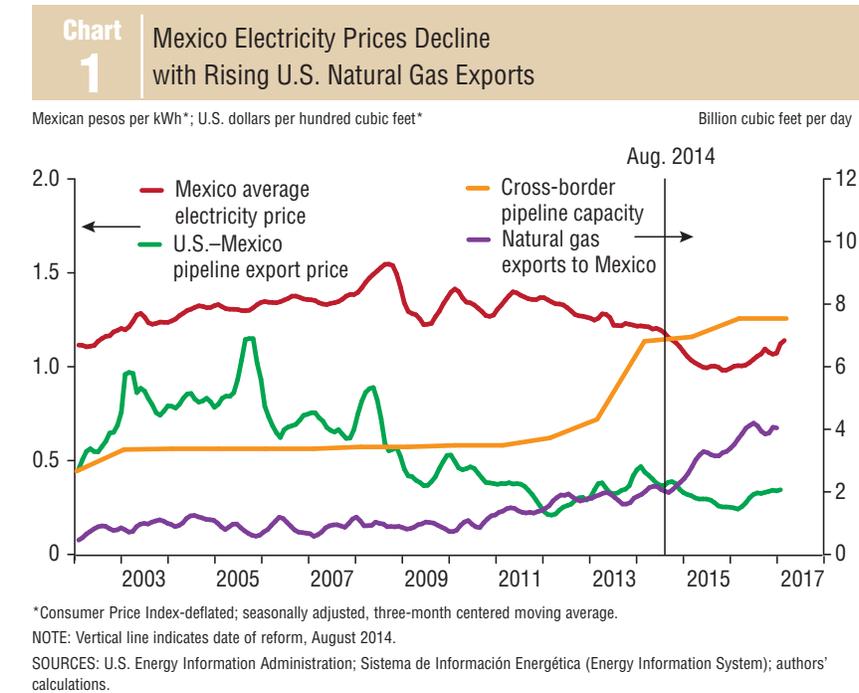
Export Infrastructure Developed

Natural gas prices averaged over \$8 per thousand cubic feet from 2004 to 2008—before the shale gas boom from hydraulic fracturing, or fracking, took off in 2010. Liquefied natural gas (LNG) import terminals had been built in anticipation of a need for less-expensive foreign natural gas for domestic consumption.

Plans changed when U.S. gas prices sank to around \$3 under the weight of new gas production from shale deposits. Firms took another look at the LNG terminals they'd been building and began reversing the flow of gas—turning LNG import terminals into export facilities and building new pipelines from newly active areas such as the Eagle Ford. (*For more on LNG exports, see "Go Figure" on page 19.*)

A portion of the expansion involved Mexico. The total capacity of all U.S.–Mexico pipelines was 3.7 billion cubic feet per day (bcf/d) in 2011. It grew to 7.8 bcf/d last year and is expected to double by 2019.

U.S. natural gas exports to Mexico,



reflecting the new pipeline capacity, increased from 1.4 bcf/d in 2011 to 3.8 bcf/d in 2016.¹ In 2016, more than 1 billion cubic feet of U.S. natural gas exports per day on average moved through Rio Grande City, Texas, where the NET Mexico pipeline connects with Mexico's Los Ramones project. This represents only half of the Los Ramones pipeline's capacity to transport U.S. natural gas from the Eagle Ford to Nuevo León, Mexico, and beyond to San Luis Potosí, deep in the country's interior.

Natural Gas Use Rises

Mexico seeks to more fully realize the advantages of this trade by increasing access farther from the border to relatively inexpensive U.S. natural gas supplies. Pipelines under construction will add an estimated 3.8 bcf/d of capacity to the Mexican side of the network, bringing additional natural gas from the Texas border to central Mexico.

Much of that gas is used for electricity generation, substituting for more expensive and polluting fuels. The industrial sector consumes more

electricity than any other, although residential and service sector use is growing fast. Deregulation allowed changes in natural gas prices to be passed through to Mexican customers, and this can be seen in inflation-adjusted market prices for electricity in Mexico (*see chart*).

Several potential obstacles could slow the growth in natural gas exports to Mexico. The country is working to promote greater use of wind and solar energy. Also, Mexico itself has one of the world's largest natural gas reserves—an estimated 545 trillion cubic feet, mainly in the northern Burgos region along the U.S. border.

If natural gas prices warrant and regulations further ease, U.S. hydraulic fracturing and horizontal drilling technology may flow across the border, and Mexico could experience a shale-gas production boom of its own—potentially shifting demand from U.S. natural gas to U.S. oilfield services.

Note

¹Texas exported over 3.1 bcf/d of natural gas to Mexico in 2016—16 percent of its total marketed production.

LNG Markets Unleashed: How Texas Stands to Benefit

Design: Darcy Taj; Content: Kunal Patel

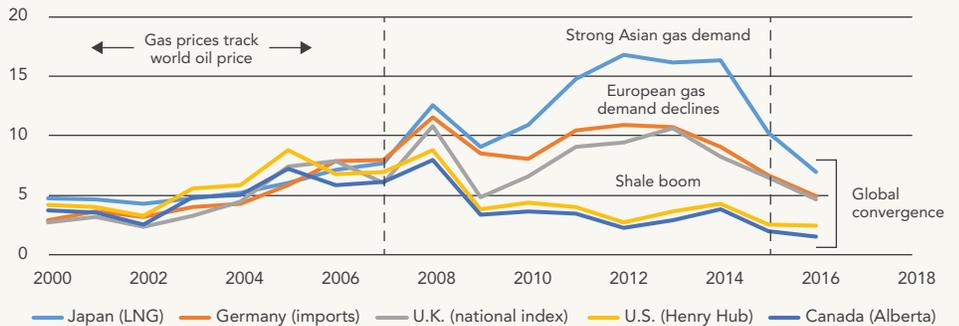
LNG

(liquefied natural gas)

is becoming a global commodity, approaching a more unified price. Liquefying natural gas allows it to be shipped to multiple destinations all over the world.

Natural gas prices in major world markets are converging

Dollars per million BTU (MMBtu)

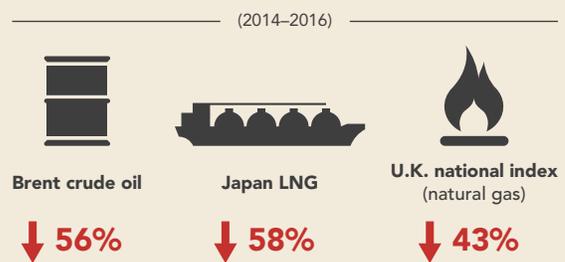


What's behind the price convergence?

LNG trade volume is rising, with **more short-term transactions** relative to traditional, long-term contracts.

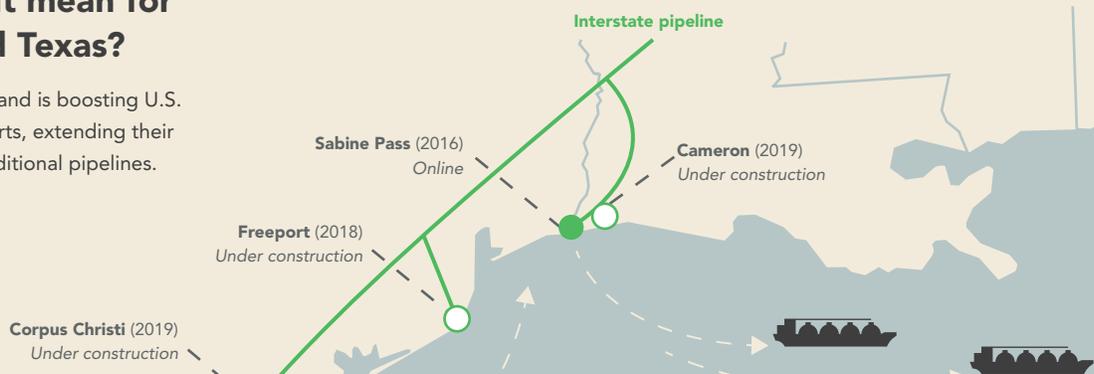


Lower crude oil prices are softening gas prices. Contracts in Asia and Europe traditionally link natural gas prices to oil.



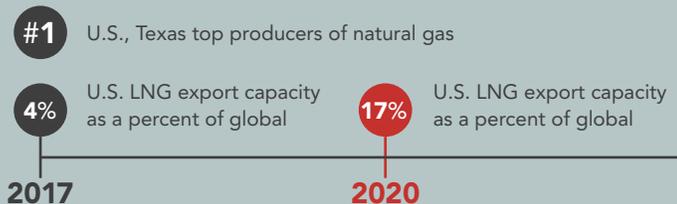
What does it mean for the U.S. and Texas?

Growing global demand is boosting U.S. and Texas LNG exports, extending their reach far beyond traditional pipelines.



NOTES: Both Japan LNG and Germany (imports) prices are based on a cost+insurance+freight basis (average prices). U.K. national index refers to National Balancing Point. Short-term trade is cargoes under contract with a duration of four years or less. LNG plants shown as "under construction" will enlarge U.S. processing capacity.
SOURCES: BP Statistical Review of World Energy 2017; GIIGNL—International Group of LNG importers—www.giignl.org; German Federal Office of Economics and Export Control; ICIS Heren Energy Ltd.; Energy Intelligence Group, *Natural Gas Week*; Energy Information Administration; Bloomberg; author's calculations.

More places, more often



SNAPSHOT

Employers' E-Verify Use Slows Growth of Unauthorized Workforce

E-Verify is a federal system that since 2003 has allowed employers across the country to digitally check eligibility documents provided by the workers they hire.

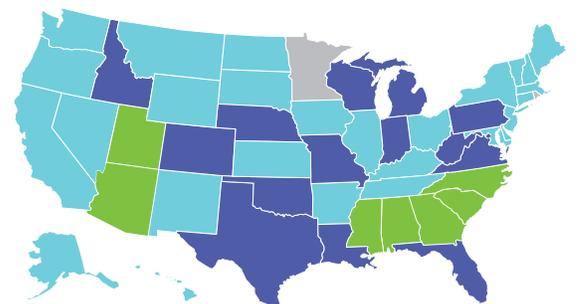
The system is intended to deter the hiring of unauthorized immigrants. E-Verify mandates were in effect in 21 states as of December 2016. A new Dallas Fed report, "Digital Enforcement," studies the effects of E-Verify in the seven states where E-Verify has been mandatory for all or almost all employers: Alabama, Arizona, Georgia, Mississippi, Utah, North Carolina and South Carolina.

In five of the seven states, the number of likely unauthorized immigrants and/or the number of likely unauthorized immigrant workers is substantially lower than would have been otherwise expected, suggesting that universal E-Verify led to a much smaller unauthorized immigrant population and workforce than if the policy had not been enacted.

—Adapted from "Digital Enforcement," a special report of the Federal Reserve Bank of Dallas, September 2017

Map

More than One-Third of States Required E-Verify in 2016



■ No E-Verify requirement ■ Public sector/government contractors
■ All employers ■ Rescinded/expired all or in part

NOTE: Mandates are as of December 2016.

SOURCES: Data compiled from legal firms, other research, advocacy organizations and personal communications with government officials; "E-Verify 3.0, Self-Check, and I-9 Changes on the Horizon," LawLogix by Hyland, May 11, 2010, www.lawlogix.com/e-verify; "Immigration," Troutman Sanders, www.troutmansanders.com/immigration.

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