

# Southwest Economy



## Energy Bust Depresses, Doesn't Sink Texas State Budget

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▶ *As we look to 2017, we expect to see global consumption and production of energy move toward balance, and we expect to see excess inventories stabilize and then begin to decline.*

We have much to be thankful for this holiday season. Despite headwinds from a weak energy sector and a stronger dollar, the Texas economy continues to grow. Federal Reserve Bank of Dallas economists estimate that Texas job growth will register approximately 1.6 percent in 2016. Texas continues to benefit from continued migration of people and firms, which has helped diversify the state's economy.

Partly as a result of this diversification, it appears that the state's finances will come through the energy downturn in better shape than first feared. In this issue of *Southwest Economy*, Jason Saving revisits Texas finances in advance of the upcoming legislative session. According to "Lingering Energy Bust Depresses, Doesn't Sink Texas State Budget," the downturn in oil and gas prices has cost the state about \$3.5 billion in lost severance tax revenue. The broader economic slowdown has also led to a shortfall in sales tax revenue and other tax income as well as slower growth of the state's rainy-day fund. As a result, the state will start the upcoming legislative cycle with a substantially diminished surplus with which to meet pending health, education and infrastructure needs.

While challenging, this fiscal situation still puts Texas in far better condition than most energy-producing states. Roberto Coronado and Marycruz De León, in their article, "New Mexico Recovery Lags amid Energy, Government Sector Weakness," describe how New Mexico, which includes a portion of the oil-and-gas-rich Permian Basin, benefited from the post-Great Recession oil boom and has been hurt in the subsequent bust. Severance taxes declined from 20 percent of state tax receipts to just 8.6 percent in the latest fiscal year.

While energy states have had to manage the boom-bust cycle of oil prices, we see better times ahead. As we look to 2017, we expect to see global consumption and production of energy move toward balance, and we expect to see excess inventories stabilize and then begin to decline. As this process unfolds, we expect oil prices to continue to firm.

Due to the increasingly diversified Texas economy, and as the headwinds from weak energy begin to dissipate, I am very optimistic about the growth prospects for our state and the Eleventh District in the months and years ahead.

A handwritten signature in black ink that reads "Robert S. Kaplan". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

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





# Lingering Energy Bust Depresses, Doesn't Sink Texas State Budget

By Jason Saving

**ABSTRACT:** The recent oil price collapse has adversely affected Texas' budget situation and slowed the growth of its rainy-day fund. While energy continues to play an important role in Texas, the state has been better economically and fiscally positioned than most other energy states.

**E**ver since Texas began taxing oil and gas in 1906, the state has relied on revenue from the energy sector. Those initial taxes on “sundry oil companies” brought in a mere \$101,403 to the Texas budget—about 3 percent of state tax revenue.

No doubt, energy has grown a lot since then, prompting some to conclude that without a robust energy sector, the Texas economy is in trouble. After all, the Great Recession and a contemporaneous oil-price decline created an unprecedented \$15 billion shortfall for Texas that prompted deep cuts to education and health care in fiscal 2012–13.

Prices for benchmark West Texas Intermediate crude oil fell by more than half from August 2014 to February 2015 and have remained relatively low in 2016. The state's rig count declined dramatically as did energy and manufacturing employment.

Something else just as noteworthy also occurred: Despite the oil bust, the state budget has held up without the need for significant fiscal adjustments. Subsequent events provide insight into the state's rainy-day fund and its ability to withstand future recessions.

Texas' experience has provided a useful counterpoint to other energy-dependent states, though the bust's lingering impact has been particularly notable in formerly booming areas.

## Energy and the Budget

Petroleum producers in Texas are taxed based on the market value of the products they extract. Oil producers pay 4.6 percent of market value in “oil production and regulation tax,” which is also levied on related petroleum products called condensates. Natural gas producers pay 7.5 percent of mar-

ket value in “natural gas production tax” for natural gas they extract and capture. These taxes are collectively known as severance taxes.

Over the last three years, state revenue from oil and natural gas taxes has varied dramatically. Oil prices remained high for almost all of fiscal 2014 (September to August), and severance tax revenues—oil plus natural gas—totaled \$5.8 billion. This revenue fell 28 percent to \$4.2 billion in fiscal 2015 and another 45 percent to \$2.3 billion in fiscal 2016—a total \$3.5 billion decline.

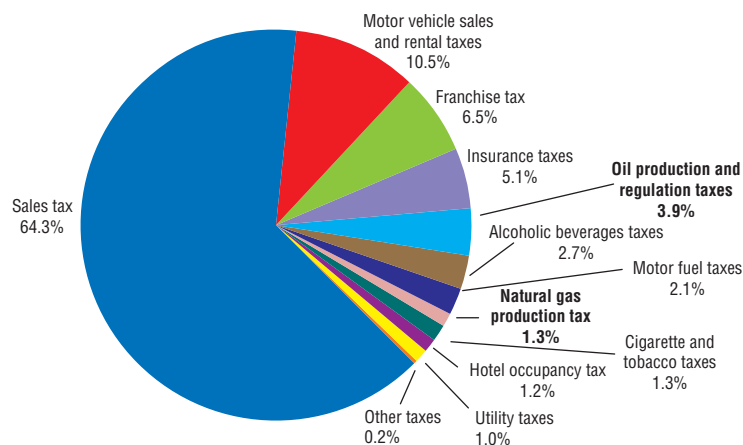
The oil production tax contributed 3.9 percent of state tax revenue, making it the fifth-largest source of state tax revenue in 2016; the natural gas production tax accounted for 1.3 percent, the eighth-largest-source of state tax funds.

By comparison, about 64.3 percent of state tax revenue came from the sales tax, and 10.5 percent came from the state's motor vehicle taxes (*Chart 1*). Other significant taxes include the franchise tax (assessed on corporations), insurance taxes (primarily on premiums paid), “sin” taxes on alcohol and cigarettes, and motor fuel taxes.

Severance taxes, even at their 2014 peak, made up a far smaller proportion of total state taxes than in the 1980s (*Chart 2*). Oil production tax routinely contributed more than 10 percent of state tax revenue during that time, briefly spiking to 17 percent in 1981, just before the 1980s oil bust. Natural gas tax revenue also exceeded 10 percent of state tax revenue in the first half of the 1980s before prices plunged in 1986 and slid again as the shale and hydraulic fracturing (fracking) revolution took hold in 2009. Absent a large

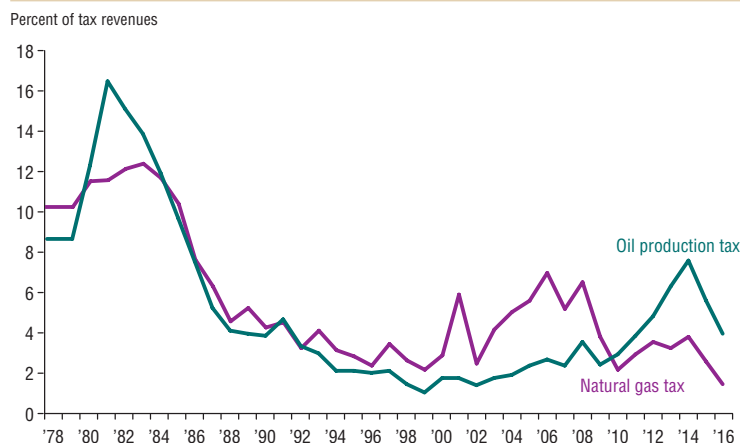


**Chart 1** Oil and Gas Taxes Provide Relatively Small Piece of Texas Collections



NOTE: Data are for fiscal 2016.  
SOURCE: Texas Comptroller of Public Accounts.

**Chart 2** Texas Oil and Gas Tax Revenue Falls Sharply in Latest Period, Remains Far Below 1981 Peak



SOURCE: Texas Comptroller of Public Accounts.

and unexpected change in energy markets, these trends will not soon reverse, suggesting severance taxes will remain a relatively modest budget contributor in the near future.

### Rainy-Day Fund

The oil and gas sector also affects the state's overall fiscal position—though not its year-to-year budget—in another way. When state economic growth slows, tax revenue typically follows as firms produce less (and individuals work less)

than would have been the case in more robust economic times.

Sales tax revenue grew 1.5 percent annually between 2014 and 2016, for example, compared with a 6.4 percent annual rate the preceding two years. At the same time, slower growth (or a recession) typically causes state expenditures to rise as more people find themselves in need of safety-net programs such as unemployment insurance and Medicaid health coverage. These developments tend to strain

state budgets during periods of slow growth. As the economy moves into a period of stronger expansion, pressures abate.

Standard models of government finance suggest jurisdictions should deficit-spend when growth falls below trend and make up for it by running surpluses when growth is unusually strong. However, Texas and most other states (all but two, in fact) require yearly revenues and expenditures to be balanced.

While states differ in how stringently these rules are applied and what exceptions can be made, balanced budget requirements make it difficult for states to spend more than they receive in any given year. This presents states with a dilemma: At the precise moments when policymakers know state services will be most needed, they can reasonably expect funding for those services to be least prevalent.

To work around this public finance problem, most states have created “rainy-day” funds. Known as the Economic Stabilization Fund in Texas, the rainy-day fund is intended to stockpile revenue during periods of robust economic growth. The money can then be used to help fund state services when economic growth is weak or a recession brings contraction. State policymakers can use the fund to ensure stable provision of public services over time.

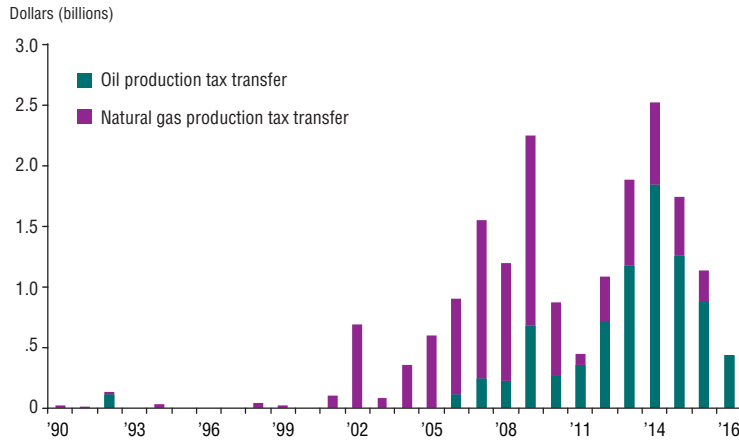
In Texas, oil and natural gas production taxes provide rainy-day funds. By law, 75 percent of severance tax revenue in excess of 1987 levels—\$599.8 million for natural gas, \$531.9 million for oil—is deposited in the rainy-day fund rather than used for ordinary expenditures.<sup>1</sup> The transfers were small in the 1990s but soared in the 2000s, driven primarily by the natural gas production tax (Chart 3).

As fracking came into prominence in 2009 and natural gas production surged, natural gas prices collapsed and boosted the relative importance of oil in rainy-day contribution data. Rainy-day contributions from the oil production tax soared to nearly \$2 billion as the oil boom ended in 2014,



### Chart 3

#### Energy Tax Contributions to Rainy-Day Fund Fall to 13-Year Low in 2016



NOTES: Each year's transfer is based on the previous year's tax revenues; thus, 2017 transfers are based on fiscal 2016 tax revenues. 2017 oil production transfer data point based on 2016 actual data.

SOURCE: Texas Comptroller of Public Accounts.

while the natural gas production tax netted only one-third of that amount. By 2016, reductions in the prices of both oil and natural gas had reduced contributions from the oil production tax to a five-year low and cut contributions from the natural gas tax to zero—a phenomenon that had not occurred since 2000.

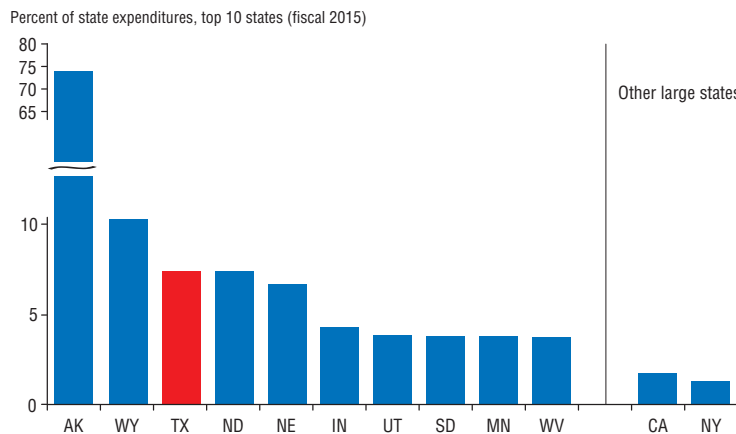
Yet a slower pace of inflows over the last two fiscal years does not mean the rainy-day fund's balance was “low”—or lower than other states.

While complete 2016 data is not yet available, Texas' rainy-day fund balance at the end of 2015 was the second highest nationally in dollar terms and third highest as a share of annual state expenditure (*Chart 4*). As a percentage of state expenditures, the Texas fund at 7.4 percent was more than four times larger than California's 1.7 percent and nearly six times New York's 1.3 percent, suggesting those states would experience greater difficulty using the rainy-day fund to stabilize state expenditures

Known as the Economic Stabilization Fund in Texas, the rainy-day fund is intended to stockpile revenue during periods of robust economic growth. State policymakers can use the fund to ensure stable provision of public services over time.

### Chart 4

#### Texas Rainy-Day Fund Balance Third Largest in Nation



NOTE: California ranked 25th; New York ranked 35th.

SOURCE: National Association of State Budget Officers.



during a significant economic downturn.

Although the rainy-day fund is supposed to supply a fiscal cushion, the fund's balance in Texas suggests it does not vary much when the state enters recession (*Chart 5*).<sup>2</sup> Even the appearance of a \$15 billion budget shortfall for fiscal 2012–13 did little to alter the trajectory of the rainy-day fund, with lawmakers instead adopting sizable cuts to education and other parts of the state

budget. These reductions may or may not have been appropriate, but they do beg the question of why the rainy-day fund exists if not to stabilize outlays during times of economic distress.

### How Texas Compares

Texas is often portrayed as the nation's energy capital, with good reason. It produces more oil than any other state (36.4 percent of domestic production) and more natural gas (24.9 per-

cent). Yet, because the state economy is so large and so diversified, the impact of an energy bust on the state budget is less than it might otherwise be.<sup>3</sup>

Severance taxes as a share of state expenditures are much lower in Texas (4.6 percent) than in other key energy-producing states (*Chart 6*). North Dakota, where severance taxes equal nearly 44 percent of state expenditures, tops the list. North Dakota is nearly 10 times as dependent on severance-tax revenue as Texas, suggesting its budget is much more vulnerable to energy-price swings.

North Dakota's economy has shifted from rapid growth to a substantial recession during the oil bust, as the lack of industrial diversification implicitly places a substantial number of the state's economic eggs in the petroleum-based basket. This is also reflected in North Dakota's real state gross domestic product, which plunged 8.4 percent in the second quarter 2016 versus the comparable year-ago level, the latest period for which data is available.

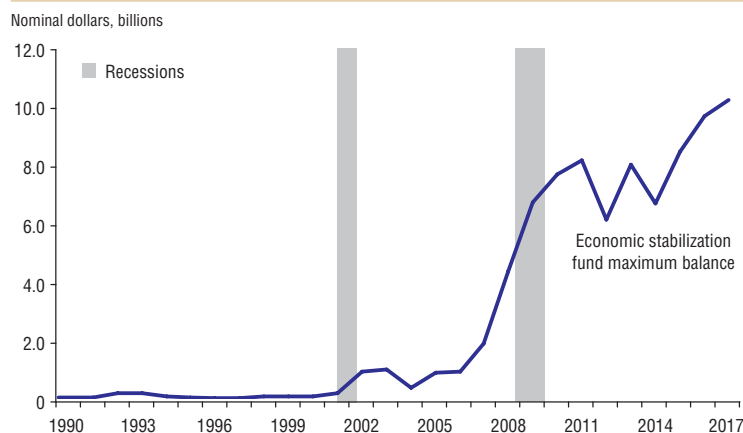
Alaska and Wyoming also receive an outsized proportion of state revenue from severance taxes. In Alaska, oil and gas tax revenue equaled 19 percent of state expenditures in 2014. Wyoming, at 15 percent, is just over three times the Texas level. For these states as well, plummeting severance-tax revenue affected their ability to meet state priorities.

### Local Community Effects

Boom-and-bust oil cycles also have implications for localities that are heavily dependent on energy extraction, such as the Midland-Odessa area, and the many small towns along the Eagle Ford formation in South Texas made temporarily boom towns by the 2009–14 shale oil boom.

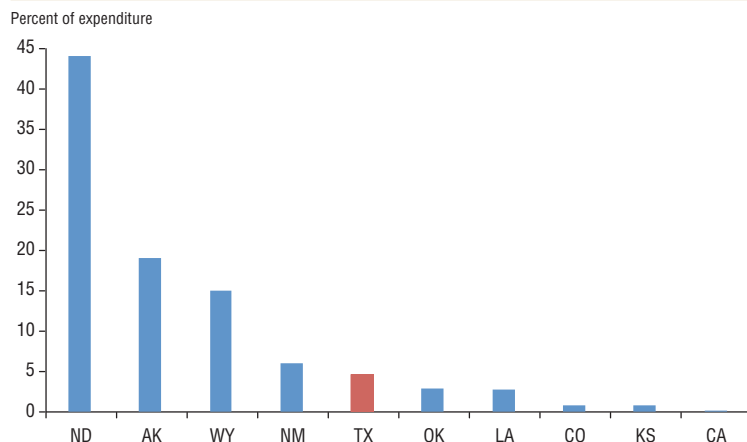
When the sector is strong, local economies thrive as energy firms and workers purchase goods and services from local vendors, rent homes and dine out. Lease payments and royalties also boost incomes locally.<sup>4</sup> With increased activity comes a need for improved infrastructure and other government works

**Chart 5** State Recessions Hardly Dent Rainy-Day Fund Balance



NOTES: Fiscal 2016 balance data point is unaudited; final number not yet available. Fiscal 2016 is first year to include investment revenue in the balance. Fiscal 2017 balance based on 2015 certification revenue estimate.  
SOURCE: Texas Comptroller of Public Accounts.

**Chart 6** Texas Energy Tax Revenue Smaller Share of Spending than in Many Other Energy States



NOTE: Bars represent severance tax revenue as share of state expenditures for each state's fiscal 2014.  
SOURCE: Census Bureau.



in affected areas, both to accommodate the economic boom and to ensure local transportation networks can handle increased roadway transit (often with vehicles far heavier than rural roads were designed to routinely handle).<sup>5</sup> There are also indirect effects from a strong energy sector, as soaring demand for real estate in affected areas can temporarily propel property values (and property tax bases) to very high levels.

The problem is that energy booms are inevitably followed by energy busts. And as the sector weakens, consumer demand abates. Local governmental entities largely dependent on property taxes for financing confront greatly reduced revenue.

Although predicting oil booms and busts would be helpful for energy-dependent states and localities, oil prices have proven notoriously difficult to forecast. Surveys that better document what industry insiders believe is most likely to happen can prove helpful. For example, 62 percent of respondents in the Dallas Fed's quarterly energy survey believe oil prices will be higher in late 2017 than they were in late 2016, and about half anticipate that natural gas prices will be higher in late 2017 than they were in late 2016.<sup>6</sup>

## Fiscal Outlook

As the post-Great Recession oil boom drew to a close, energy moved from being a Texas tailwind to a Texas headwind during 2014–15. The impact on tax revenue was noticeable, though smaller than it would have been had the state remained as energy-focused as it was during the early 1980s.

Other states much more dependent on energy than Texas suffered more profoundly from the oil slump, illustrating the importance of having a diversified economy in much the same way individuals benefit from having a diversified investment portfolio. This is easier said than done, especially for energy-producing states and communities in the midst of an energy slump.

Following the 2015 Texas legislative session, lawmakers passed a \$209.4 billion, two-year budget that left roughly \$4 billion in general

revenue unspent. There were hopes in some quarters that the state might begin its 2017 session with a significant surplus. However, a combination of lower-than-expected oil and gas prices, falling energy production, slower-than-expected economic growth, greater Medicaid outlays and a growing shortfall in the state's teacher retirement system suggest the state will enter its budget deliberations with little if any surplus.

From that vantage point, the state will need to carefully balance demands for more spending in the areas of K–12 education, infrastructure, health care and the environment against the desire to preserve its low-tax, low-regulation climate that has historically helped the state grow more rapidly than the nation.

To some degree, it would be possible to mitigate these pressures by tapping the rainy-day fund. So far, however, state voters have chosen to address structural problems within the budget, approving a reallocation of certain rainy-day contributions in 2014 to bolster highway spending. Whether this evolution of the fund's purpose will continue is unclear, though it will certainly be a topic of discussion in 2017 and beyond.

Severance taxes are a common thread linking these budget issues. Because severance taxes are a relatively small part of state revenue and expenditures, developments in the energy sector cannot single-handedly solve (or derail) Texas' fiscal situation.

But at the margin, energy matters. For example, state agencies were recently asked how they would cope with a 4 percent reduction if the 2017 Legislature approved a cut of that magnitude. Such a decrease could save perhaps \$1.5 billion annually, depending on exactly where the cuts occur. If the energy sector were to rise from its 2016 levels to its 2014 heights, the resulting \$3.5 billion increase in severance-tax revenue would provide enough new general revenue to offset this reduction and additionally make a sizable contribution to the rainy-day fund.

Put another way, severance taxes may not be able to solve Texas' fiscal issues, but they can certainly help.

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

## Notes

<sup>1</sup> See Article III, Section 49-g-d of the Texas constitution.

<sup>2</sup> Recession dates given by the Dallas Fed's Business-Cycle Index for Texas.

<sup>3</sup> See, "The Effect of High Oil Prices on Today's Texas Economy," by Mine Yücel and Stephen P.A. Brown, Federal Reserve Bank of Dallas, *Southwest Economy*, no. 5, 2004, [www.dallasfed.org/research/swe](http://www.dallasfed.org/research/swe).

<sup>4</sup> See, "Oil Boom in Eagle Ford Shale Brings New Wealth to South Texas," by Robert W. Gilmer, Raúl Hernández and Keith R. Phillips, Federal Reserve Bank of Dallas, *Southwest Economy*, second quarter, 2012, pp. 3–7, [www.dallasfed.org/research/swe](http://www.dallasfed.org/research/swe).

<sup>5</sup> See "On the Record: South Texas County Hopes to See Lasting Gains from Eagle Ford Shale Oil Boom," Federal Reserve Bank of Dallas, *Southwest Economy*, third quarter 2014, pp. 8–9, [www.dallasfed.org/research/swe](http://www.dallasfed.org/research/swe).

<sup>6</sup> The full report for third quarter 2016 is available at [www.dallasfed.org/research/surveys/des/2016/1603/des1603.aspx](http://www.dallasfed.org/research/surveys/des/2016/1603/des1603.aspx).



*A Conversation with Adrián Mijares Elizondo*

## Cinépolis Theater Chain Seeks North Texas Stardom

*Adrián Mijares Elizondo is CEO of Cinépolis USA. The subsidiary of Morelia, Mexico-based Cinépolis relocated to Addison, Texas, from Los Angeles earlier this year. The parent company is Mexico's predominant movie theater chain. It has operations in 12 other countries, with a concentration in India and now the U.S., where it has 16 theaters with 161 screens. Mijares discusses the movie business and his company's prospects in the competitive U.S. market.*

**Q. Cinépolis, the world's fourth-largest movie theater company, just moved the headquarters of its U.S. division to the Dallas area from the film capital of Los Angeles. Why?**

Cinépolis USA's goal is to become the best national high-end movie theater company in the U.S., and we have grown since our inception in 2011. We like to be very hands-on and frequently visit our theaters, our construction sites, our competitors and our partners.

Traveling is a must, and traveling from Southern California to the East Coast was not easy. As a result, moving to Dallas made a lot of sense. It offered a more central location in the states that leads to shorter flight times when visiting our different theaters across the country and when visiting our parent company's offices in Mexico. That has allowed a better work-life balance for many of our corporate team members who fly frequently.

**Q. How does doing business in Dallas differ from your experience in Los Angeles?**

I have nothing bad to say about Los Angeles. It's been 10 months since we moved, and it's been amazing. We couldn't be happier. So many companies and entities have reached out to us; people are so proactive.

In Los Angeles, there are so many things going on that I feel it's not really

focused. Here, I see businessmen with a go-get-it attitude and companies looking for better ways to do better things together—very aggressive, but very collaborative. We feel we have grown more as a company in the last 10 months than maybe we did in the last two years with regard to seeing more business opportunities with different and new partners.

Other time efficiencies also improved—we're now in a more neutral time zone that allows us to better manage our U.S. theaters that are spread out across multiple time zones, and we're now aligned with our parent company's time zone in Mexico, which helps when trying to coordinate calls with counterparts in India or Spain.

**Q. What makes Cinépolis USA different from competitors such as Plano-based Cinemark and Austin-based Alamo Drafthouse?**

We have a lot of respect for all of our competitors including Cinemark and Alamo Drafthouse. Regarding Cinemark, we compete against them in several countries, and we have great respect for what they have done in the U.S. and Latin America.

One important difference is that we concentrate much of our development and growth in very specific markets that tend to reach a more affluent crowd and/or are underserved with the type of theater concept we offer. It ap-

pears as though Cinemark targets most markets in the U.S.

Comparing our operations in the U.S. versus Alamo, I would say that we are more family friendly and maybe less focused on art or specialty titles.

**Q. How are your guest services different from those of other companies?**

For starters, we say guests, not customers. For us, we say they are guests as if they were in our house. We have a lot of programs to evaluate how we're doing. We're always seeking feedback, so we have mystery shoppers; we have customer-tracking programs. We're constantly comparing one site to another and looking for ways to make it better. We visit the competition and we also look at other ways to improve.

When we go to a stadium or restaurant, we're thinking about what we see that can give us an opportunity. We are always evolving. We're very focused on continuous improvement. There are always opportunities.

**Q. Such as?**

I was at LaGuardia Airport [in New York] recently, and they have a lot of automated concessions.

We're looking at everything; for example, what Taco Bell is doing with its apps and Starbucks is doing with pre-purchase. With all of these new technologies, we are always looking at how we can do it—how can our guests order their popcorn and sodas before they arrive, how can we make the process easier.

When we go to a restaurant, we look at the menus and take pictures of the food everywhere. People sometimes think it's weird. We're always thinking of new plates and ideas. Right now, cocktails are very trendy. We do a lot of movie cocktails, with each cocktail tied to a certain movie.

We always have new offerings. We want our regular guests, who go once a month or more, to have new options each and every time they visit our theaters, whether it's a new movie cocktail or a new food offering.





► *We feel that our guests in the U.S. are much more selective with regard to content. If a movie comes out that's not rated very well, it really affects people going to the theater.*

**Q. With growing on-demand, home-based services such as Netflix, where is the future of the theater business? What are the biggest challenges you see going forward?**

2015 was a record year at the box office, and 2016 is ahead of last year. Having said that, there are always challenges. Consumers are now able to access content in alternative ways that were once not available to them. In order to combat that and remain top of mind for these consumers, it is important to constantly innovate and continue to elevate the moviegoing experience, offering new and value-added concepts to our guests. This could be through luxury dine-in, IMAX, 4DX or some other concept. We will have to keep evolving and offering better value to make sure our guests want to leave their homes and come to our movie theaters.

**Q. Where else in the world does Cinépolis have operations? How does the global theater business compare to that in the U.S.?**

Our parent company, Cinépolis, operates movie theaters in 13 countries. These countries are Mexico, the U.S., Costa Rica, Guatemala, El Salvador, Honduras, Panama, Colombia, Peru, Chile, Brazil, India and Spain. The theater business in the U.S. is more mature than in other countries in the world and, therefore, it is growing at a lower rate.

**Q. Which markets are you looking at for growth?**

In the United States, we are focusing on California—both Northern and Southern California. We are additionally focusing on Texas, Florida, Ohio, the

Northeast corridor from Washington, D.C., to Boston and the greater Chicago area.

**Q. Why those areas?**

Initially mostly because of demographics—because we are targeting higher-end demographics as we are targeting higher-end products. That's where we can have the most theaters in a reduced geography.

**Q. How are you financing this kind of expansion at a time when some have spoken of difficulties accessing capital?**

For all of our funding necessities, we always look at the biggest banks in the world, and most of them are based in the U.S. And we've had great relationships with them for many years. We work with Bank of America and JPMorgan—all of the usual suspects. Coming into the U.S. and then moving from Los Angeles haven't impacted funding that much because the banks are so well-connected in different geographies.

**Q. Have you considered the public debt market?**

We've thought about it, but nothing's concrete at this point.

**Q. How do U.S. customers differ from their counterparts in Mexico?**

We feel that our guests in the U.S. are much more selective with regard to content. If a movie comes out that's not rated very well, it really affects people going to the theater. Our guests in the U.S. have a broader offering of entertainment options, so we're competing against more things. In Mexico, in mostly the mid- to small-sized towns, there aren't a lot of other entertainment options. We have a stronger position in that regard.

In Mexico and in some other places in Latin America, going to the movies is a very social experience, taking the whole family out. The movie becomes secondary, versus in the U.S., where how good the movie is remains very, very important.

**Q. A community of Mexico-based corporations operates in North Texas. Is there a critical mass that makes doing business here easier?**

That has been a bit different from Los Angeles. Dallas is very spread out. It's very big, physically and geographically. Los Angeles is similarly big, but with the addition of traffic, it's very difficult to move around. Here in Dallas, the group seems much more connected simply because it's easier to see people, to go have breakfast. In Los Angeles, there may be a company in Orange County, and you spend the whole morning or day doing these things.

Here, we have an association of Mexican businesses. It is very well-connected. It has a lot of events. Since Day One when I landed here, they were looking out for me, and they were inviting me everywhere. It is just amazing how well-connected the community is. The Mexican business community really appreciates Dallas and Texas. I have been really nicely surprised at how well Mexican business is integrated with the general business community.

**Q. What advice would you give to other Mexican companies considering operations in Texas?**

Definitely consider the Dallas area as an option. It is much more international than we thought, and it is booming.





## INEQUALITY: Intergenerational Mobility Higher in Houston

A child with parents in the bottom fifth of the national income distribution has a 7.5 percent chance of growing up and joining the top fifth of earners, according to a 2014 study of intergenerational mobility by Harvard economics professor Raj Chetty, based on tax records from 1996 to 2012. By comparison, a child with parents in the top fifth has a 34 percent chance of staying at the top.

Houston surpasses the national average. Children growing up in the bottom fifth have a 9.3 percent probability of ending up in the top fifth. Dallas kids, meanwhile, have slightly lower levels of intergenerational mobility than the U.S. average; those in the bottom fifth have a 7.1 percent likelihood of ending up in the top fifth.

At the lower extreme, Memphis children in the bottom quintile have a 2.8 percent chance of making it to the top 20 percent; for kids in Charlotte, North Carolina, there is a 4.4 percent likelihood. By comparison, San Jose, California, children have a 12.9 percent chance of rising from the bottom to the top quintile.

Among factors associated with greater mobility are fewer single-parent families, stronger social networks and community involvement, better elementary schools, less income inequality and less housing segregation.

—Stephanie Gullo



## WELL-BEING: Texas Income, Health Coverage Improve in 2015

Texas real (inflation-adjusted) median household income rose 4.8 percent in 2015 to \$55,638—meaning half of household incomes in the state were above that figure and half were below—according to the Census Bureau’s American Community Survey. The U.S. median, at \$55,775, though exceeding the state’s number, rose only 3.8 percent during the year.

Dallas-Fort Worth’s median income of \$61,644 substantially outpaced the state figure and was just ahead of the Houston median of \$61,465.

Poverty rates nationally and in Texas decreased in 2015—down 1.3 percentage points to 15.9 percent in Texas compared with a 0.8 percentage-point decline to 14.7 percent nationally. The number of Texans covered by health insurance rose by 1 million people, although Texas still leads states in the share of residents without coverage. Put another way, Texas’ insured rate stands at 82.9 percent, well below the national figure of 90.6 percent.

For the U.S. as a whole, earnings rose for all racial groups, paced by Hispanic gains of more than 6 percent, the Current Population Survey found. Measured on the basis of educational attainment, earnings for people with a bachelor’s degree or higher grew most, while those who did not complete high school experienced a wage decrease in 2015. The decline followed two years of increases.

—Sarah Greer



## ENERGY: Ethanol Blend Rules Inflate Refiner ‘RIN’ Credit Costs

The Environmental Protection Agency (EPA), as part of national environmental sustainability goals, requires that refiners blend ethanol into gasoline. The EPA increased the amount of ethanol (derived from corn and other plant products) in the fuel mix based on predicted 2016 fuel use.

However, actual gasoline consumption missed expectations, prompting refiners to either boost ethanol in the fuel blend or turn to a marketplace option.

Increasing the proportion of ethanol is a problem because most cars cannot use gasoline containing more than 10 percent ethanol. Alternatively, refiners can purchase a “credit” in the open market that exempts a quantity of gasoline from the EPA mandate.

A renewable identification number (RIN) is created for every gallon of ethanol blended into gasoline. These credits let the EPA track compliance with biofuel targets and allow fuel suppliers that exceed EPA requirements to sell their extra credits. The price of one RIN was around 30 cents at the beginning of November 2015; heightened RIN demand more than tripled the price.

RIN costs have affected refiners’ bottom lines. San Antonio-based Valero Energy Corp. reported the cost of meeting its biofuel obligations at \$173 million in second quarter 2016—\$117 million higher than the same period in 2015.

—Rachel Brasier



# Texas Has ‘All-of-the-Above’ Energy Approach

By Navi Dhaliwal

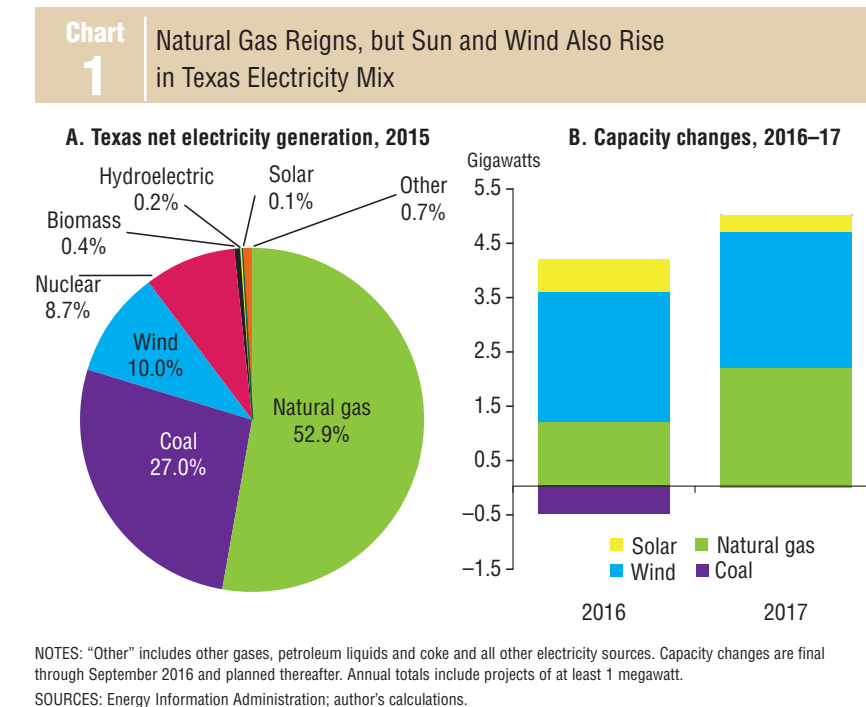
**A** bundant, cheap natural gas has been viewed as an obstacle to broader adoption of renewable energy. Yet during 2016, a year of rock-bottom natural gas prices, several multimillion-dollar wind and solar power plants broke ground in Texas. Overall, the Texas outlook suggests an “all-of-the-above” approach rather than an “either-or” choice between renewables and hydrocarbons.

Tax incentives, cost reductions and consumer preferences have kept renewables competitive in Texas even though natural gas-fired generation still accounts for most of the state’s electrical output. In 2015, around one-fifth of electricity generated in Texas came from renewable resources (wind, solar, nuclear, hydroelectric and biomass), half from natural gas and the rest from coal (*Chart 1A*).

Planned capacity additions will not drastically change this profile; wind ranks first among additions due in 2016 and 2017, followed by natural gas (*Chart 1B*). Many wind projects are in West Texas, far from urban centers. Large projects, such as Amazon.com Inc.’s estimated \$300 million wind farm about 75 miles from Abilene in Scurry County (scheduled for completion next year), should help bring jobs and investment to mostly-rural communities. In Amazon’s case, the project is motivated by a long-term push to power its cloud web services using 100 percent renewable energy.

Texas is known for being the country’s No. 1 oil and gas producer, but it also leads in wind turbine electricity. Wind has flourished in Texas, bolstered by electricity market deregulation in the 1990s, investment in transmission lines in the 2000s and long-standing property tax exemptions for solar and wind generators.

U.S. Energy Information Administration (EIA) data show that 42 percent of the nation’s gains in wind generation capacity in 2015 were in Texas, the most of



any state. Texas wind-generated electricity has broken multiple records in 2016, a trend expected to continue, according to the Electric Reliability Council of Texas.

While Texas is a wind leader, its solar output has lagged that of other states—notably California. National Renewable Energy Laboratory research suggests that sunny, windy Texas boasts near twice as much technical solar and wind energy potential as the next-closest states. Yet solar has made up a tiny fraction of Texas’ electricity mix historically—for example, just 0.1 percent in 2015.

Texas solar growth has been largely concentrated in Austin. This year, the city was among the first 14 nationwide to receive a gold designation by the Department of Energy, recognizing efforts to make solar easier and cheaper to adopt and install. Solar panel costs per watt have fallen roughly 70 percent since 2010 due to efficiency improvements and abundant polysilicon used in photovoltaic cells.

Government subsidies have helped reduce costs even further for wind and solar. Texas’ primary electricity market

is highly competitive, so even small tax incentives can greatly affect which electricity sources are competitively priced.

In December 2015, Congress extended two federal corporate tax credits, offering stability to developers whose renewable plants can have 20- to 40-year life spans. A production tax credit rebates 2.3 cents per kilowatt-hour for the first 10 years of operation (primarily wind). An investment tax credit refunds 30 percent of outlays involving renewable energy (primarily solar). Both incentives are set to decrease as they approach expiration, in 2019 and 2022, respectively.

Renewables are subsidized by the federal government in part because they lessen pollution. Solar and wind are free of emissions. Electricity generation from natural gas emits roughly half the carbon dioxide as coal for the same amount of power. Texas ranked first in carbon dioxide emissions in 2013 (the latest EIA data available), with around twice the emissions of second-place California. As coal-fired plants retire, a rise in renewables and natural gas usage should improve Texas’ standing.



# New Mexico Recovery Lags amid Energy, Government Sector Weakness

By Roberto Coronado and Marycruz De León

**ABSTRACT:** New Mexico's unique history is reflected in the state's demographics and economy. Tourism, energy and government have traditionally driven activity. Although government once bolstered growth, it is now a drag. While new industries have emerged and trade with Mexico has grown, economic recovery has been slow.

**N**ew Mexico's economy has traditionally reaped the benefits of tourism and commodities, principally oil and natural gas, and government programs. More recently, cross-border manufacturing and trade with Mexico have become important economic drivers, increasingly setting southern New Mexico apart from the northern portion of the state.

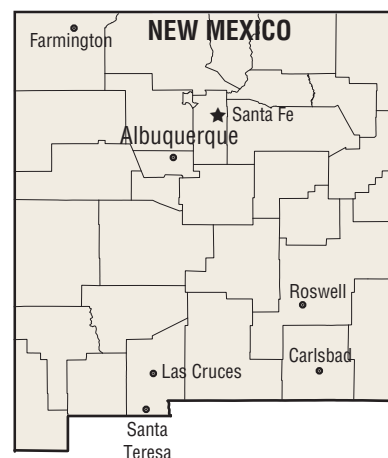
However, New Mexico has failed to rebound during the recovery from the Great Recession as it confronts the ongoing impact of the global energy slowdown, weak government spending and sluggish residential construction activity.

New Mexico's job growth exceeded that of the nation from at least 1990 to the beginning of the Great Recession in December 2007. But as U.S. employment has rebounded from the downturn, the state remains 20,000 jobs short of its level prior to the recession.

## Spanish Colonial Roots

New Mexico's economy and demographics remain closely intertwined with its history. The nation's 47th state—admitted to the Union in 1912 after overcoming opposition by those who viewed it as a foreign land—retains the imprint of its indigenous tribes and early explorers. The Spanish first arrived in New Mexico in the 1500s, hoping to find pueblos filled with gold just as they had in the Aztec empire. The Spanish not only failed to find gold, but they were also forced to retreat. A permanent Spanish presence wasn't established until the mid-18th century.

In 1848, when the Treaty of Hidalgo ended the Mexican-American War, New Mexico became a territory of the U.S. With time, Santa Fe, the nation's oldest city to serve as a state capital, established itself as a center of commerce. Ranching,



farming and mining became growing industries, and by 1850, the population of New Mexico stood at 61,547.<sup>1</sup> U.S. government troops forcibly relocated Navajo and Apache tribes to the Bosque Redondo Reservation in eastern New Mexico, near present-day Fort Sumner, in the 1860s.<sup>2</sup>

The federal government's presence greatly expanded during World War II. Los Alamos played an integral role in the creation of the atomic bomb under the Manhattan Project and eventually became part of a network of national laboratories.<sup>3</sup> The government subsequently took control of millions of acres of land to establish military bases and research and design facilities.

The war era was a period of strong economic growth in New Mexico and a catalyst for the decades that followed, heralding a dependence on the federal government.

## Population Reflects History

New Mexico is the 36th-largest state, though its 2015 population of 2.1 million is small next to No. 2 Texas' 27.5 million (*Table 1*). Two-thirds of New Mexico residents live in four metropolitan areas: Albuquerque, Farmington, Las Cruces



and Santa Fe. The state population has increased 8.1 percent since 2005, close to the nation's 8.4 percent growth rate but behind Texas' 20.2 percent rate.

Despite its decade of expansion, New Mexico's population shrank slightly in 2014 as international in-migration failed to offset domestic out-migration.

New Mexico boasts the largest share of Hispanics in the U.S.—47 percent of residents self-identify as Hispanic and some can trace their roots to family members who accompanied Spanish explorers and settled the region 400 years ago.

New Mexico also has a large Native American population; only Alaska has a greater share. Native Americans represent 8.5 percent of the state's population, compared with less than 1 percent nationally. New Mexico is home to 23 Indian tribes—19 pueblos (a Spanish term for village or community), three Apache tribes and the Navajo nation.<sup>4</sup> There is also a considerable urban Native American population.

### Educational Attainment Limited

New Mexico lags behind the U.S. in educational attainment. The share of adults with less than a high school diploma is 15.4 percent versus 12.9 percent for the nation. Only 26.5 percent of adults have a bachelor's degree or higher, compared with nearly 30.6 percent in the U.S.

Results are even more dismal in primary education. New Mexico ranked last among the 50 states in reading proficiency among fourth-graders, with just 23 percent rated as proficient in the 2015 National Assessment of Educational Progress. Only 17 percent of Hispanic students and 10 percent of Native Americans were at standard.

Lower educational attainment leads to depressed wages and household income. Per capita income totaled \$37,938 in the state in 2015, nearly \$10,000 below national and Texas levels. New Mexico also has one of the highest poverty rates in the country at 20.4 percent, trailing only Mississippi.

### Tourism and Energy

New Mexico's economy ranks 37th among the states, with a gross domestic

**Table 1** New Mexico Demographics: How State Compares with Texas, U.S.

	New Mexico	Texas	U.S.
<b>Population, 2015 (#)</b>	<b>2,085,109</b>	<b>27,469,114</b>	<b>321,418,820</b>
Hispanic alone (%)	47.0	38.2	17.6
White alone (%)	39.6	44.3	61.65
Black/African-American alone (%)	1.8	11.6	13.3
American Indian/Alaska Native alone (%)	8.5	0.3	0.9
Asian alone (%)	1.3	4.0	5.6
2 or more races (%)	1.5	1.5	2.6
<b>Educational attainment, population 25 and over</b>			
Less than high school (%)	15.4	17.6	12.9
High school or equivalent (%)	26.8	25.3	27.6
Some college or associates degree (%)	31.3	28.7	29.0
Bachelor's degree or higher (%)	26.5	28.4	30.6
<b>No health insurance coverage, 2015 (%)</b>	<b>10.9</b>	<b>17.1</b>	<b>9.4</b>
<b>Poverty rate, 2015 (%)</b>	<b>20.4</b>	<b>15.9</b>	<b>14.7</b>
<b>Per capita personal income, 2015 (\$)</b>	<b>37,938</b>	<b>46,947</b>	<b>48,112</b>

SOURCES: Census Bureau; Bureau of Economic Analysis.

product (GDP) of \$93.3 billion in 2015. By comparison, Texas ranks second, with a GDP of \$1.6 trillion.

Identifying clusters of economic activity helps explain the dynamics of New Mexico's economy. Chart 1 depicts New Mexico industry clusters organized by location quotient (LQ)—the share of local employment in each industry cluster relative to the nation—and the change in employment share between 2006 and 2014.<sup>5</sup>

Clusters in the top half of the chart have an LQ above 1 and are, therefore, more concentrated in New Mexico than in the nation. These are considered drivers of the state economy. Clusters in the "star" quadrant, such as health services and biomedical, are relatively heavily concentrated in New Mexico and fast growing. "Mature" sectors, such as construction, are more concentrated relative to the U.S. but slower growing.

Government is the largest cluster in New Mexico, followed by recreation and food services and retail. The latter two clusters are closely linked to tourism. About 33.3 million tourists visited New Mexico in 2014, spending an estimated \$6.1 billion.<sup>6</sup>

About 98 percent of tourists are from elsewhere in the U.S., with the vast majority (86 percent) visiting for leisure

and 10 percent for business.<sup>7</sup> The tourism industry is estimated to support nearly 89,000 New Mexico jobs, equal to about 10 percent of total employment.

Energy and mining is the state's third-largest cluster, reflecting New Mexico's standing as the nation's sixth-largest crude oil producer.<sup>8</sup> Southeastern New Mexico lies within the Permian Basin, the nation's largest oil-producing region. This corner of the state accounts for more than 90 percent of New Mexico's crude oil.<sup>9</sup> New Mexico is also a top natural-gas producer, responsible for about 4 percent of U.S. production, with northwestern New Mexico (near Farmington) the most prolific region.

Additionally, New Mexico is a leading source of potash and copper, ranking first in U.S. potash production and third in copper (behind Arizona and Utah).

### Health, Government and Trade

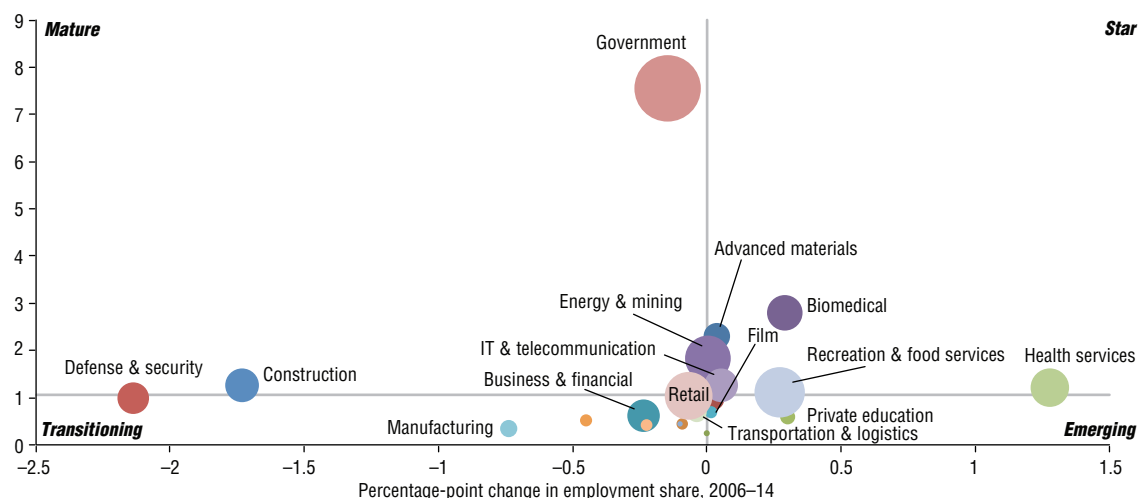
Government—federal, state and local—is the state's largest sector, representing approximately 25 percent of all jobs and placing New Mexico fourth nationally in concentration. (The District of Columbia, Wyoming and Alaska rank higher.) Much of the government work involves military installations (Cannon Air Force Base, Holloman Air Force Base, Kirtland Air Force Base and White



# Chart 1

## Government, Recreation, Retail, and Energy and Mining Dominate New Mexico Economy

Location quotient in 2014



NOTE: Bubble size represents cluster share of state employment.

SOURCES: Bureau of Labor Statistics; authors' calculations.

Sands Missile Range), research labs (Los Alamos National Laboratory and Sandia National Laboratory), and Native American tribes and pueblos. Nearly 7,000 local government jobs are tied to Native American tribes—sovereign nations with their own governments.<sup>10</sup>

Health services is the fastest-growing cluster. Since 2006, health employment has increased more than 15 percent and the industry's growth in share of state employment has outpaced the national rate. The rapid rise may be tied to expansion of health care coverage under the Affordable Care Act as well as to a growing retiree population. Although jobs in nursing facilities and social assistance pay below average, hospitals and ambulatory health care services offer above-average compensation.

Transportation and logistics is a transitioning sector, although cluster employment has increased nearly 15 percent since 2010, an outgrowth of expanding international trade. Between 2009 and 2015, the value of total trade through border ports of entry—at Santa Teresa and Columbus—increased nearly 330 percent.

The vast majority of trade—99.4 percent in 2015—moved through Santa Teresa. Expansion and concentration

of manufacturing in Santa Teresa has boosted cross-border activity there (Chart 2).

### Slow Postrecession Recovery

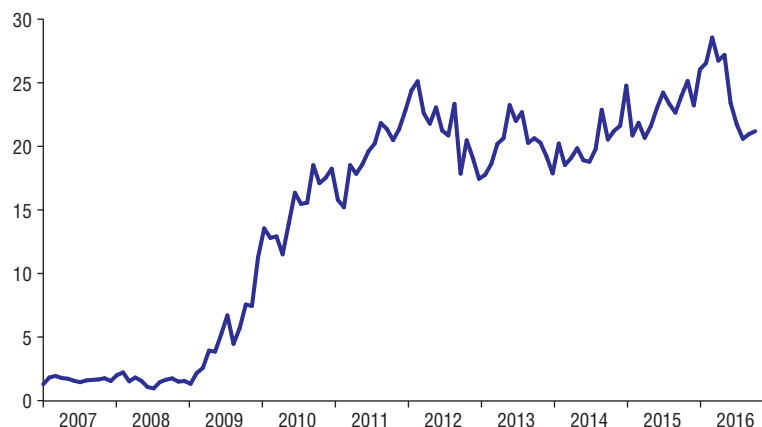
While New Mexico declined at a similar pace as the nation during the recession, its recovery has been much weaker. Employment remains below the prerecession peak, when state growth outpaced the nation (Chart 3).

The housing boom helped drive the state's prerecession expansion. After 2000, New Mexico became a popular relocation destination, especially for California residents. But when the U.S. housing market crashed, relocation fell from favor, and the New Mexico housing market collapsed.<sup>11</sup> Since then, housing has languished and construction employment has remained well below the prerecession peak.

# Chart 2

## Trade Through Santa Teresa Port of Entry Up Since 2009

Real total trade (billions of 2016 dollars)\*



\*Seasonally adjusted; annualized.

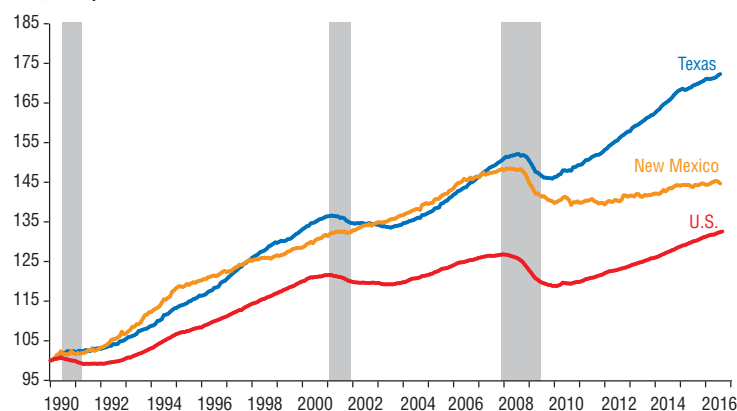
SOURCE: Census Bureau.



## Chart 3

### New Mexico Employment Remains Relatively Weak

Index, January 1990 = 100\*



NOTE: Gray bars indicate national recessions.  
SOURCE: Bureau of Labor Statistics.

Government was another growth engine before the recession, accounting for more than 200,000 jobs. During the recovery, local and state government job growth has been offset by declining federal employment. Overall, New Mexico has 10,000 fewer public sector jobs than at the prerecession high.

The energy bust of the past couple of years has contributed additional headwinds. Slow drilling activity has prompted job cuts and strained state finances. Mining and logging employment fell 21 percent in 2015 and at a 25 percent annualized rate during the first 11 months of 2016.

Severance tax revenues—generated on the value of extracted natural resources (principally oil and gas)—accounted for as much as 20 percent of New Mexico’s total tax receipts during the boom. They fell to 8.6 percent in the first half of 2016, leading to a state budget shortfall of about \$130 million for fiscal year 2016.<sup>12</sup>

New Mexico employment increased only 0.3 percent in 2015 before contracting at a 0.7 percent annualized rate during the first 10 months of 2016. The state unemployment rate has remained more than a percentage point above the U.S. rate—an average of 6.4 percent for the first 10 months of 2016 and 6.5 percent for all of 2015.

Weak oil prices and the housing

bust only partially account for the slow recovery. Educational attainment levels are low and government dependence is high. Investment in the primary education system could improve educational outcomes, a key to long-term economic growth.

### Boosting Economic Prospects

New Mexico also lags behind other states in business climate measures, according to the 2015 “Economic Freedom of North America” report published by the Fraser Institute, a Canadian think tank. New Mexico ranks as one of the least “free” states—behind California, Alaska, Hawaii and New York—relative to the amount of state government spending, taxation and labor regulation (based on 2013 data). Improving its business environment could make New Mexico a more attractive option for relocations and expansions.

Finally, New Mexico is one of the states most dependent on the federal government. A more diversified economy would make it less vulnerable to budget swings.

*Coronado is a senior economist and vice president in charge of the Federal Reserve Bank of Dallas’ El Paso Branch, and De León is a senior economic analyst at the El Paso Branch.*

## Notes

<sup>1</sup> See the New Mexico Art Tells New Mexico History exhibit webpage, <http://online.nmartmuseum.org/nmhistory>. Population data are from the Census Bureau.

<sup>2</sup> See the Office of the State Historian website, [NewMexicoHistory.org](http://NewMexicoHistory.org).

<sup>3</sup> See the Atomic Heritage Foundation website, [www.atomicheritage.org/location/los-alamos-nm](http://www.atomicheritage.org/location/los-alamos-nm).

<sup>4</sup> See the New Mexico Economic Development Department website, <https://gonm.biz/site-selection/tribal-profiles>.

<sup>5</sup> For more information on methodology, see “At the Heart of Texas: Cities’ Industry Clusters Drive Growth,” Federal Reserve Bank of Dallas Special Report, February 2016, [www.dallasfed.org/research/heart](http://www.dallasfed.org/research/heart).

<sup>6</sup> “The Economic Impact of Tourism in New Mexico,” *Tourism Economics*, August 2015, <http://nmtourism.org/wp-content/uploads/2015/10/NM-Visitor-Economic-Impact-2014-w-counties.pdf>.

<sup>7</sup> See note no. 6. The remaining 4 percent cited both business and pleasure as the purpose of their visit.

<sup>8</sup> New Mexico State Energy Profile, U.S. Energy Information Administration, [www.eia.gov/state/print.cfm?sid=NM](http://www.eia.gov/state/print.cfm?sid=NM).

<sup>9</sup> See the monthly Energy in the 11th District update, Federal Reserve Bank of Dallas, [www.dallasfed.org/research/energy11](http://www.dallasfed.org/research/energy11).

<sup>10</sup> “The Public Administration Sector in New Mexico,” *Industry Spotlight*, New Mexico Department of Workforce Solutions, May 2014, [www.jobs.state.nm.us/admin/gsipub/htmlarea/uploads/IndSpotlight\\_May2014.pdf](http://www.jobs.state.nm.us/admin/gsipub/htmlarea/uploads/IndSpotlight_May2014.pdf).

<sup>11</sup> “New Mexico Recovery Still Struggles in 2012,” by Monica Bonilla-Romero and Robert W. Gilmer, Federal Reserve Bank of Dallas *Crossroads*, no. 1, April 2012, [www.dallasfed.org/~media/documents/research/crossroads/2012/cross1201.pdf](http://www.dallasfed.org/~media/documents/research/crossroads/2012/cross1201.pdf).

<sup>12</sup> Tax revenue data are from the Census Bureau. State budget figures are from the New Mexico Finance Committee minutes, Aug. 24–26, 2016.



# Texas Border Cities Illustrate Benefits and Challenges of Trade

By Jesus Cañas

**ABSTRACT:** Texas border cities, at the front line of North American Free Trade Agreement-driven economic changes, have found new paths to growth by taking advantage of trade-inspired commercial opportunities during the past two decades. Partly as a result, unemployment in the largest communities has declined.

**I**nternational trade is important to Texas, the nation's No. 1 exporting state. A large part is an outgrowth of Mexico opening itself to trade in the 1980s and later signing the North American Free Trade Agreement (NAFTA).

Border cities have been the front-line for the resulting changing commercial patterns. After a period of adjustment that became more pronounced in the immediate aftermath of NAFTA's implementation in 1994, Texas border communities have capitalized on growth opportunities. Many opportunities have arisen from increased trade and investment as well as rising living standards on the Mexican side of the border.

Texas exports reached \$247 billion in 2015—tops in the nation and followed by California at \$163 billion and Washington state, \$86 billion.<sup>1</sup> Texas has benefited from proximity to the international border and important seaports and inland ports, trading in oil-related products such as refined fuels,

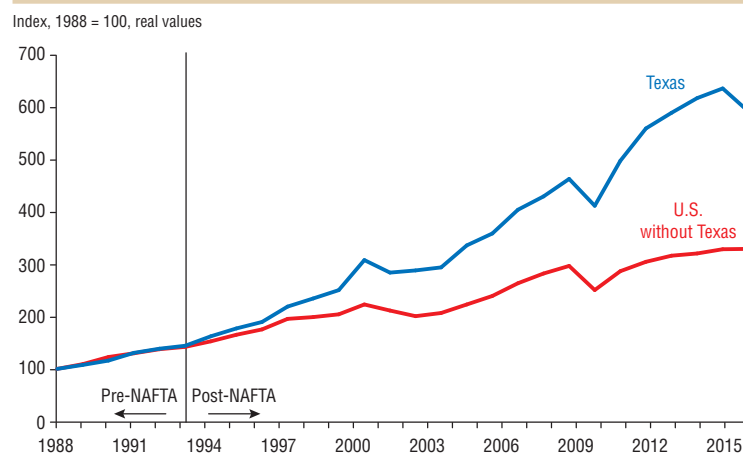
petrochemicals, high-technology goods and transportation equipment. About 75 percent of U.S.–Mexico land trade—approximately \$343 billion in 2015—crosses via a Texas port of entry. Texas also borders four highly industrialized Mexican states that are richer and tend to grow faster than the rest of Mexico.<sup>2</sup>

Manufactured goods exports supported an estimated 990,000 jobs in Texas in 2015, equal to 8.2 percent of total employment, according to the International Trade Administration, U.S. Department of Commerce.<sup>3</sup> The state is the third-most globalized in the U.S., reflecting export-based manufacturing and foreign-owned companies' employment. It is thus more dependent on foreign markets for economic growth than most states.<sup>4</sup> Overall, Texas exports grew 13 percent per year while U.S. exports excluding Texas only grew 6 percent per year from 1994 to 2015 (*Chart 1*).

Trade expansion, while fueling overall growth and fostering the economy's global competitiveness, has not been achieved without dislocation

**Chart 1**

Texas Exports Grow Faster in Post-NAFTA Period



SOURCES: WISERtrade; Census Bureau.



of workers, declines in certain industries and other difficult adjustments, notably among Texas border communities. More than 45 percent of an estimated 49,652 Texas job losses due to NAFTA were concentrated along the Texas–Mexico border, according to the U.S. Department of Labor.<sup>5</sup>

### Border Cities' Transition

In the more than two decades of NAFTA, the identity of Mexico–U.S. border-city pairs (such as El Paso and Ciudad Juárez) as manufacturing and distribution centers has largely evolved to take better advantage of developing trade opportunities.

The border has become a part of a global phenomenon known as production sharing, in which companies—predominantly based in the U.S.—locate some operations in Mexico, thus achieving lower costs in the overall production process.<sup>6</sup>

Cross-border manufacturing operations have become an important part of U.S. corporate strategy to achieve competitively priced goods in the U.S. market as well as worldwide.

Formerly, manufacturing in the border region was heavily concentrated in low-value-added industries such as apparel. NAFTA, along with other

market forces and technological change, created different jobs in Texas as low-value-added manufacturing jobs were lost and as trade and investment increased. Border cities went on to gain far more employment than what they lost amid increased imports from Canada and Mexico and shifting production between the countries. Moreover, the unemployment rate went down in major Texas border cities following NAFTA implementation (*Chart 2*).<sup>7</sup>

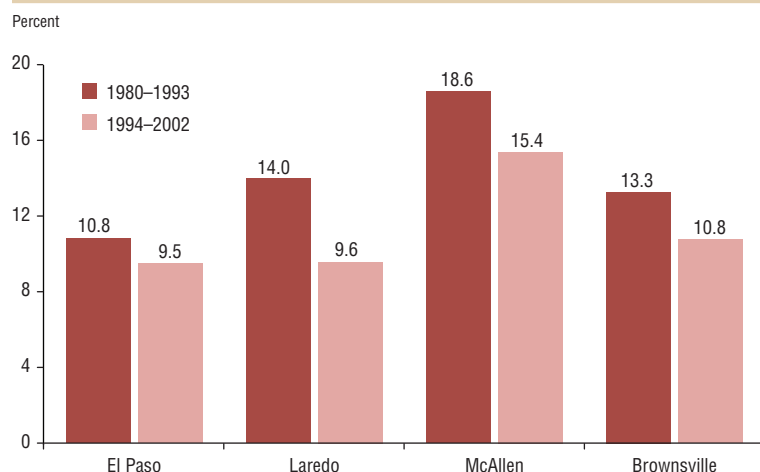
At the same time, Texas exports to Mexico grew 236 percent from 1994 to 2015, while U.S. exports to Mexico (excluding Texas) expanded 116 percent over the period. A significant share of this trade is in intermediate products—goods destined for assembly or other processing after which they are imported back into the U.S. Mexico is Texas' most important market, accounting for more than 40 percent of Texas exports in 2016. Computers, electronic products and electrical equipment make up one-third of Texas exports to Mexico, followed by transportation equipment, 12 percent, and petroleum and coal products, 11 percent (*Chart 3*).

### Underlying Challenges

NAFTA accounts for only a part of the underlying trends driving economic

► *Texas, along with the rest of the nation, has undergone an economic evolution in which labor has shifted from manufacturing activities toward other sectors such as business services.*

**Chart 2** Average Unemployment Rate Declines Along the Texas–Mexico Border After NAFTA



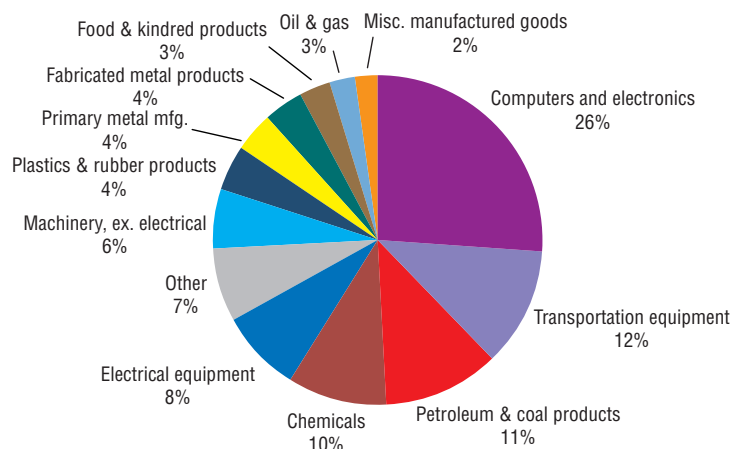
NOTE: Depiction of average for unemployment after 1994 ends in 2002, when China entered the World Trade Organization.

SOURCE: Bureau of Labor Statistics.



### Chart 3

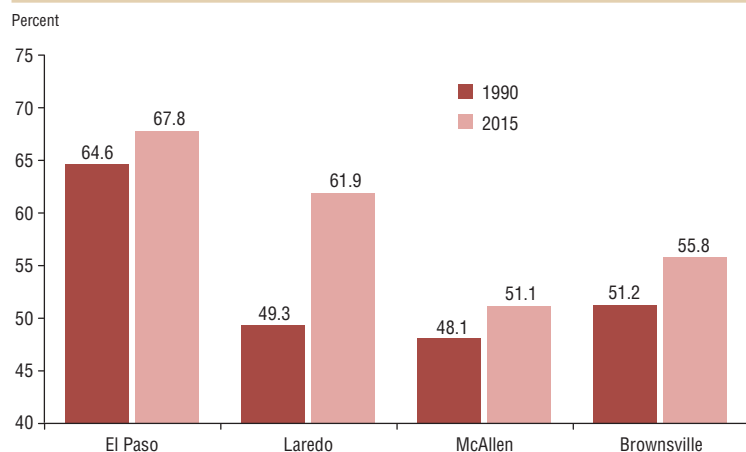
#### Texas Exports to Mexico Indicate Trade Diversity



NOTES: Data from 2015. "Other" includes all categories under 2 percent.  
SOURCE: U.S. Trade Database, Census Bureau.

### Chart 4

#### Texas Border Cities Narrowing the Income Gap with Nation (Income as a share of U.S. total)



SOURCE: Bureau of Economic Analysis.

change over the period. Texas, along with the rest of the nation, has undergone an economic evolution in which labor has shifted from manufacturing activities toward other sectors such as business services.

Much of the decline in manufacturing employment can be explained by automation; it is believed to be far more significant in this regard than offshoring and outsourcing. The El Paso, Brownsville and McAllen metropolitan statistical areas (MSAs) have transformed their economies in the last 20 years. Employ-

ment in the private service-producing sector represents 70 percent of those economies, up from between 55 and 59 percent (depending on the city) in 1994.

The federal government provides adjustment assistance to workers who are believed to have lost their jobs as a direct result of trade. The border faced a particular challenge in providing trade-adjustment training benefits to displaced workers because of the large numbers involved. In El Paso alone, 18,500 individuals were displaced between 1994 and 2014, representing 37

percent of the state total for that period. In addition, most workers requiring re-training had relatively low educational levels and limited English proficiency.<sup>8</sup>

Local leaders decided on a transition strategy aimed at attracting new jobs to replace those lost. The effort included upgrading the workforce by increasing accessibility to two-year associate degree programs in arts, science and general education in addition to short-term specific occupational skills certification.

Affected workers initially found jobs paying less than their former positions.<sup>9</sup> Texas border cities have since progressed toward bringing local per capita income closer to the U.S. average (Chart 4).

Enhanced industry mix—moving people into higher-compensated sectors—has been the largest contribution to per capita income growth.<sup>10</sup> Expansion of highly paid federal government jobs, such as in Customs and Border Patrol, has also contributed to that growth. Additionally, border communities have benefited from Texas' lower cost of living relative to other states.

Moreover, the nonprofit Pew Research Center has documented a growing middle class in McAllen, Laredo and Brownsville, while it held steady in El Paso from 2000 to 2014—a time when the middle class contracted in most metropolitan areas.<sup>11</sup>

### Economic Integration Benefits

Despite the initial weakness, border cities now benefit from servicing trade flows between Texas, Mexico and Canada. A 10 percent increase in manufacturing on the Mexican side of the border increases employment 2.2 percent in Brownsville, 2.8 percent in El Paso, 4.6 percent in Laredo and 6.6 percent in McAllen, Federal Reserve Bank of Dallas research shows.<sup>12</sup>

Texas' comparative advantage in manufacturing has grown with productivity increases over the past decade. While Texas manufacturing employment has fallen 9 percent since NAFTA implementation, manufacturing output has grown 4.1 percent per year between 1997 and 2015.



Comparative advantage refers to the ability of a country to produce a particular good or service at a lower opportunity cost than another provider. Texas' comparative advantage in energy-related industries such as petrochemical products has improved, consistent with the shale oil and gas boom that dominated state economic growth from the mid-2000s until 2014.

Texas also gained competitiveness in the automotive industry against states with a history of dominance in that sector, such as Ohio and Illinois. This is consistent with Texas' manufacturing linkages across the Rio Grande where automotive manufacturing is highly concentrated.<sup>13</sup>

## NAFTA, the U.S. and Texas

Close to 710,000 jobs were lost between 1994 and 2014 as a result of increased imports from Mexico and Canada or due to shifts in production, a total of 0.6 percent of jobs, according to U.S. Department of Labor statistics generated under the NAFTA Transitional Adjustment Assistance program and the Trade Act of 2002. Texas was the second-most affected state (49,652 displaced workers), with North Carolina (51,243 displaced workers) leading the list and California (48,588 displaced workers) ranking No. 3.

Absent a similar count of jobs created by NAFTA, the job-loss number

should not be interpreted as the net employment effect of the trade agreement. Some studies suggest small aggregate U.S. welfare gains from NAFTA.<sup>14</sup>

On the other hand, recent research suggests that under NAFTA, blue-collar workers, whose industries have been most affected by Mexican imports—including along the border—experienced substantially lower wage growth than their counterparts in other industries.<sup>15</sup>

Meanwhile, the elimination of tariff and nontariff barriers under NAFTA increased total U.S. trade with Mexico 297 percent in inflation-adjusted terms from 1994 to 2015, while trade with Canada grew about 87 percent. In addition, trilateral foreign direct investment (FDI) rose more than fourfold in the post-NAFTA period.<sup>16</sup>

## Role of Foreign Investment

Trade agreements such as NAFTA generate an incentive for FDI, as companies within the regional trade bloc as well as firms from outside seek to access the new and bigger markets they create. In Texas, the MSAs that suffered the greatest job losses due to NAFTA also have benefited the most from FDI.

Foreign-owned establishments accounted for 9 percent of private employment in El Paso (the high for Texas), 5 percent in McAllen and 4 percent in Brownsville during 2011, according to the Brookings Institution. They made up 8

percent of private employment in Houston and 5 percent in Dallas-Fort Worth (Chart 5).<sup>17</sup>

Overall, more than 462,000 jobs in Texas as of 2011 were in foreign-owned establishments. The Brookings study also shows that private employment in them is widespread among all sectors, with manufacturing accounting for nearly two out of every five foreign-owned establishment jobs. After manufacturing, foreign entities employ the largest number of workers in wholesale trade, retail trade, finance and insurance, and professional, scientific and technical services.

## Openness for All

The Texas economy, mirroring the nation as a whole, has been transitioning toward a more service-based economy, with a lean and increasingly productive manufacturing sector. Such a transition has resulted in more than 4 million jobs gained in Texas between 1994 and 2015 and per capita real (inflation-adjusted) income growing from \$30,000 to \$47,000 over the period.

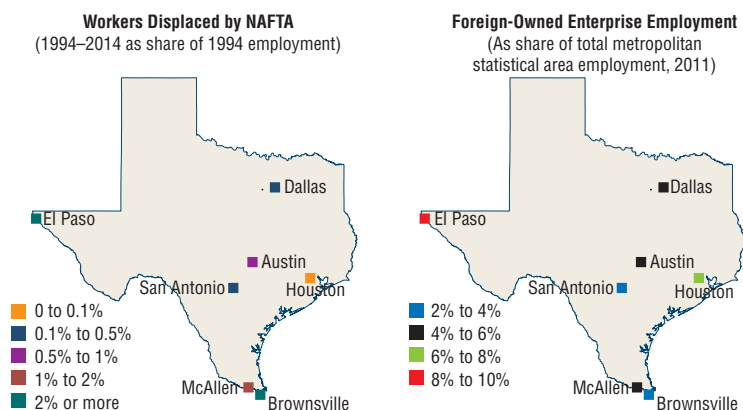
Texas border cities have been largely able to adjust to trade, taking advantage of geographic location to exploit NAFTA-derived opportunities and growth in northern Mexico.

Nationally, the benefits of trade and openness have not been equally distributed among regions. Thus, Texas and its border communities provide a useful case study of what attributes and strategies may help trade-impacted communities transition to the next level of economic development.

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

### Chart 5

#### Foreign Firms' Hiring Offsets Jobs Lost



SOURCES: Public Citizen; Bureau of Labor Statistics.

SOURCE: Brookings Institution.

## Notes

<sup>1</sup> State export data come from the Origin of Movement (OM) series compiled by the Census Bureau's Foreign Trade Division. A weakness of the OM series is that exports are designated to a state based on where they began their journey, not where production occurred. For a discussion, see "State Export Data: Origin of Movement vs. Origin of Production," by Andrew J. Cassey, *Journal of Economic and Social Measurement*, vol. 34, no. 4, 2009, pp. 241–68. State imports by source country are relatively new and less is known about the quality of the data. For



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## Notes (con't)

more information about state imports, see <http://tse.export.gov/stateimports/TSIReports.aspx?DATA=>.

<sup>2</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.

<sup>3</sup> "Jobs Supported by State Exports 2015," by Jeffrey Hall and Chris Rasmussen, Office of Trade and Economic Analysis, International Trade Administration, U.S. Department of Commerce, May 31, 2016, [www.trade.gov/mas/ian/build/groups/public/@tg\\_ian/documents/webcontent/tg\\_ian\\_005503.pdf](http://www.trade.gov/mas/ian/build/groups/public/@tg_ian/documents/webcontent/tg_ian_005503.pdf).

<sup>4</sup> "Texas Maintains Top Exporter Standing While Its Trade Remains Concentrated," by Janet Koech and Mark A. Wynne, Federal Reserve Bank of Dallas *Southwest Economy*, Third Quarter, 2015, pp. 16–20.

<sup>5</sup> U.S. Department of Labor, NAFTA Transitional Adjustment Assistance (TAA) program data, [www.doleta.gov/tradeact/dataoverview.cfm](http://www.doleta.gov/tradeact/dataoverview.cfm).

<sup>6</sup> For more information about cross-border manufacturing, see "Texas Border Employment and Maquiladora Growth," by Jesus Cañas, Roberto Coronado and Robert W. Gilmer, *The Face of Texas: Jobs, People, Business, Change*, Federal Reserve Bank of Dallas, October 2005.

<sup>7</sup> The reasons for the decline in unemployment are complex; some of the improvement has to do with the decline of agriculture in the Rio Grande Valley, which led to seasonal farm and agriculture workers finding year-round employment.

<sup>8</sup> "Trade Adjustment Assistance: Experiences of Six Trade-Impacted Communities," U.S. Government Accounting Office, report no. 01-383, August 2001.

<sup>9</sup> See note 8.

<sup>10</sup> "El Paso and Texas Border Cities Close the Gap in Per Capita Income," by Robert W. Gilmer and Roberto Coronado, Federal Reserve Bank of Dallas *Crossroads*, no. 2, 2012.

<sup>11</sup> "America's Shrinking Middle Class: A Close Look at Changes Within Metropolitan Areas," Pew Research Center, May 2016.

<sup>12</sup> For more information about cross-border employment elasticity, see "The Impact of the Maquiladora Industry on U.S. Border Cities," by Jesus Cañas, Roberto Coronado, Robert W. Gilmer and Eduardo Saucedo, *Growth and Change*, vol. 44, no. 3, September 2013, pp. 415–42.

<sup>13</sup> "Texas Comparative Advantage and Manufacturing Exports," by Jesus Cañas, Luis Bernardo Torres Ruiz and Christina English, in *Ten-Gallon Economy: Sizing*

*up Texas' Economic Growth*, by Pia M. Orrenius, Jesus Cañas and Michael Weiss, eds., Palgrave MacMillan, 2015.

<sup>14</sup> "Estimates of the Trade and Welfare Effects of NAFTA," by Lorenzo Caliendo and Fernando Parro, *The Review of Economic Studies*, vol. 82, no. 1, 2015, pp. 1–44, and "NAFTA's and CUSFTA's Impact on International Trade," by John Romalis, *Review of Economics and Statistics*, vol. 89, no. 3, August 2007, pp. 416–35.

<sup>15</sup> "Looking for Local Labor Market Effects of NAFTA," by John McLaren and Hakobyan Shushanik, *Review of Economics and Statistics*, vol. 98, no. 4, October 2016, pp. 728–41.

<sup>16</sup> "NAFTA at 20: Shortcomings Suggest Trade Agreement Alone Isn't Enough," by Pia Orrenius and Jesus Cañas, Federal Reserve Bank of Dallas *Southwest Economy*, Fourth Quarter, 2014.

<sup>17</sup> "FDI in U.S. Metro Areas: The Geography of Jobs in Foreign-Owned Establishments," by Devashree Saha, Kenan Fikri and Nick Marchio, Brookings Institution, June 2014.

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