Texas Economy Remains Resilient, but Low Oil Prices Loom as Future Risk

By Keith R. Phillips and Christopher Slijk

ABSTRACT: After weathering tumult in its energy and manufacturing sectors in 2015, a diversified Texas economy is poised for slow growth this year. The biggest risk to the outlook: If oil prices average below $30 per barrel, overall job losses could result.

Texas employment grew in 2015 despite dramatically lower oil prices and a stronger dollar. While energy and manufacturing jobs declined sharply, employment in many sectors continued to expand at a healthy pace. Economic diversification since the 1980s limited the oil price fallout and played an important role in the state's continuing economic growth.

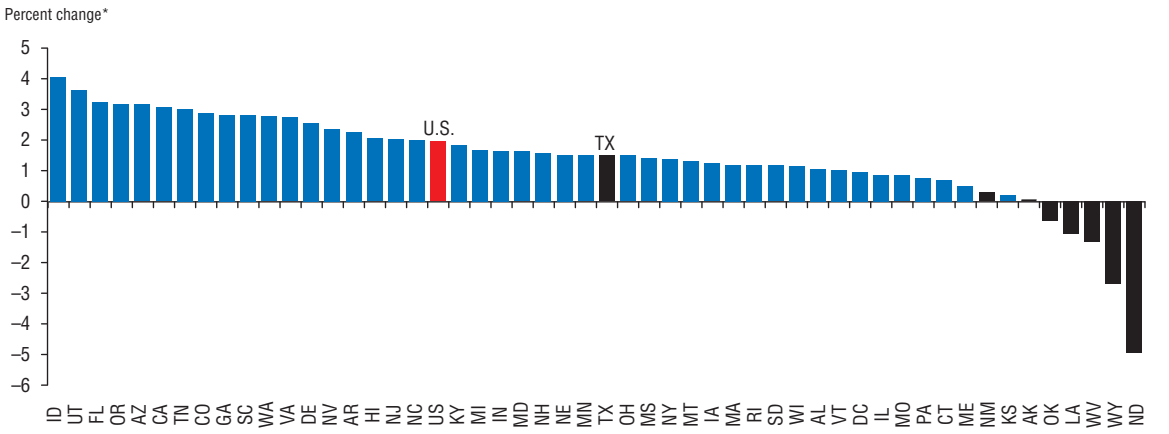
While the Texas unemployment rate rose in the second half of 2015, most indicators suggest a recession was averted. Factoring in declines in the Texas Leading Index and recent modest employment gains, a Federal Reserve Bank of Dallas employment model forecasts continuing, but slightly weaker, job growth in the state in 2016 compared with last year.

The model projects that employment growth will be between zero and 1.5 percent from December 2015 to December 2016. However, oil prices averaging less than $30 per barrel pose the greatest risk to the outlook and could result in overall job losses. Besides further decreasing energy and manufacturing employment, low oil prices could increase problem loans at financial institutions with exposure to the industry.

2015 Slowdown

Texas employment grew 1.5 percent in 2015—the middle of the 1–2 percent range predicted in *Southwest Economy* a year ago.[1] Job growth decelerated from 3.7 percent in 2014 and fell below the national average for the first time since 2003. Yet, compared with other energy states such as North Dakota and Oklahoma, Texas performed well (*Chart 1*). The state's job growth—the fourth fastest in the nation in 2014—ranked 26th last year. All other energy states except New Mexico and Alaska lost jobs. North

Chart 1 Texas Job Growth Falls Below National Average in 2015



*December 2014 over December 2015.

NOTE: Black bars represent major energy-producing states as defined in "The Shale Gas and Tight Oil Boom: U.S. States' Economic Gains and Vulnerabilities," by Stephen P.A. Brown and Mine K. Yücel, CFR Energy Brief, Council on Foreign Relations, October 2013.

SOURCES: Bureau of Labor Statistics; Federal Reserve Bank of Dallas.

Dakota went from the second-fastest growing in 2014 to the sharpest declining in 2015.

Job weakness in Texas was concentrated in the mining and manufacturing sectors, which combined fell 8.1 percent. Hardest hit was oil and gas-related employment, which plummeted 19.4 percent in the face of an almost 66 percent drop in the price of oil and a nearly 75 percent reduction in the drilling rig count since mid-2014 (*Chart 2*). Nearly all of the 63,800 jobs created from 2012 to 2014 were lost.

Manufacturing employment slumped 4.1 percent last year. Sharply reduced energy activity pressured the production of oilfield machinery and other energy-related items, such as fabricated metals. Also, the strengthening dollar—making U.S. goods sold overseas more expensive—weakened the competitiveness of Texas' manufacturing exports.

The Texas trade-weighted value of the dollar—which weights the dollar's real (inflation-adjusted) exchange rate by the countries with which Texas trades—appreciated 11.1 percent last year, and real exports from Texas declined 7.2 percent.[2] These factors led to a very weak manufacturing environment. Based on the Dallas Fed's Texas Manufacturing Outlook Survey, the production, new orders and company outlook indexes last year all suggested contraction and painted a far more pessimistic picture than at any time since the Great Recession.

Growth in the service-providing and construction sectors slowed from 3.6 percent in 2014 to 2.6 percent last year. The health care and education sector stood out as one of the few to accelerate from its 2014 pace. Due in large part to increasing health insurance coverage in Texas, the sector added 58,000 jobs—more than any other—in 2015.

Leisure and hospitality also expanded, growing a substantial 4.7 percent. Declining energy prices benefited consumers, who used some of their energy savings at restaurants, theaters, hotels and amusement parks. This strength in service-related industries is reflected in the Dallas Fed's Texas Service Sector Outlook Survey, which indicated continuing growth last year.

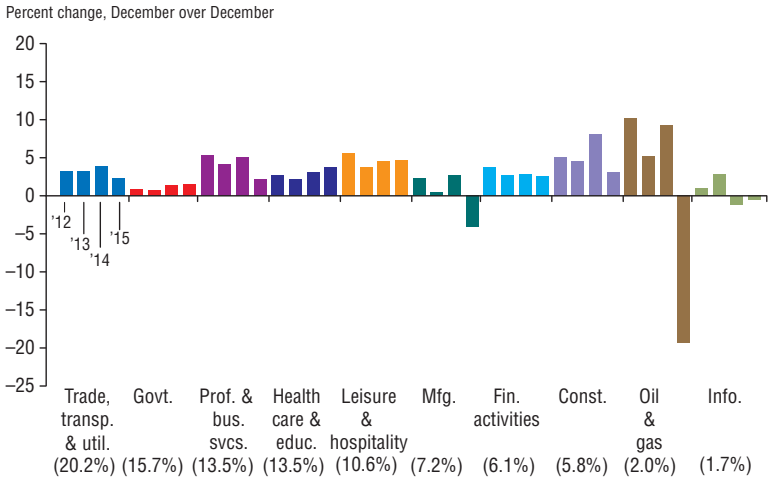
The sharp falloff in the energy and manufacturing sectors caused a regional divergence in economic performance. Job growth was weak in metropolitan areas such as Midland, Odessa, Longview, Corpus Christi and Houston that have a larger share of jobs in mining (*Chart 3*). Conversely, regions more closely linked to the U.S. economy, such as Dallas, or to sectors benefiting from low energy prices, such as leisure and hospitality in San Antonio, continued growing robustly.[3]

The overall correlation between a metro area's share of jobs in mining and its 2015 job growth is strong at -0.87. The negative value means that job growth weakens as the mining share increases, with a correlation of -1 or 1 representing a perfect one-for-one relationship and zero representing no relationship.

Offsetting the loss of energy extraction jobs has been a flurry of petrochemical plant construction along the Gulf Coast. These projects are primarily designed to take advantage of recently discovered large supplies of natural gas in Texas shale formations. In the Houston area alone, $50 billion in planned petro-

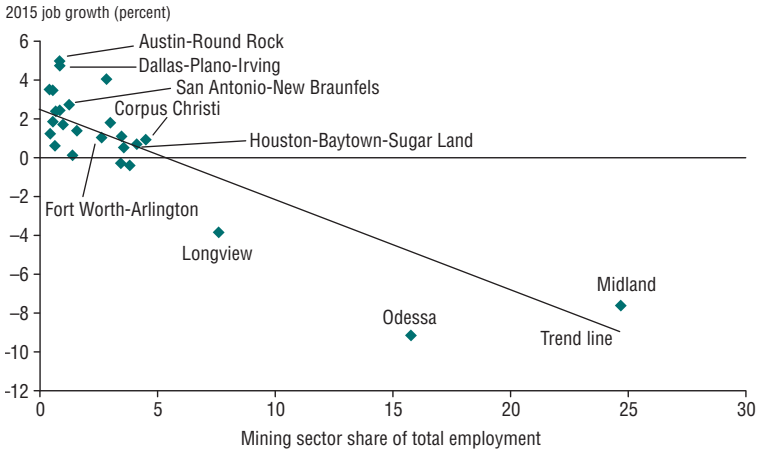
Chart 2 Employment Weakness Centered in Energy and Manufacturing

(Job growth by year, 2012–15)



NOTE: Figures in parentheses represent share of total employment as of December 2015.
SOURCES: Bureau of Labor Statistics; Federal Reserve Bank of Dallas.

Chart 3 Metros with Higher Concentration of Energy Jobs Fare Worst



NOTES: Job growth data are December 2014–December 2015. Mining share data are as of 2014.
SOURCES: Texas Workforce Commission; Bureau of Labor Statistics; Federal Reserve Bank of Dallas.

chemical plants will bolster construction jobs through 2017, when most of these projects are slated for completion.

Other multibillion-dollar projects along the coast, including several large liquefied natural gas export terminals, will continue supporting construction jobs. The expansion of these downstream industries allowed the larger metropolitan areas along the Texas Coastal Bend to avoid job losses in 2015.

Recession Averted

Texas job growth abruptly slowed in first quarter 2015 before growing modestly for the remainder of the year. The unemployment rate ticked down from 4.5 percent in December 2014 to a postrecession low of 4.4 percent in January 2015, where it held steady through August before climbing to 4.6 percent at year-end.

Flattening labor force growth mitigated the impact on the unemployment rate from large layoffs in the oil and gas sector, particularly during the first half of the year. Anecdotal reports suggest that many oilfield workers who had moved to Texas during the drilling boom returned to their home states after losing their jobs. This is supported by a surge of continuing unemployment claims in first quarter 2015 filed by workers who no longer lived in Texas.

Does the uptick in the unemployment rate toward the end of 2015 signal the start of a recession in Texas? Modest, yet positive, job growth suggests continued expansion. Because Texas has a younger, more rapidly expanding population with relatively strong net in-migration from other states and nations, its labor force generally grows faster than the national average. That means the state must have stronger job growth to hold its unemployment rate steady. Thus, if state labor force growth were near its four-year average, monthly payroll job growth would have to be 1.9 percent.

Two measures suggest that the modest job growth and rising unemployment rate reflect weak expansion rather than recession.

An adjusted measure of Texas' real gross domestic product (RGDP) implies slower, but positive, growth last year—2.0 percent, compared with 3.9 percent in 2014.[4]

The Texas Business-Cycle Index, the broadest indicator of the state's business cycle, dipped below its trend pace of previous years during 2015 but continued to grow, indicating weak but positive expansion (*Chart 4*).[5]

Improving job growth and a renewed decline in the unemployment rate in January caused the index to move slightly above its trend growth rate.

Texas More Diversified

Many of the factors that aided job expansion in 2015—petrochemical plant construction and strength in health care and leisure and hospitality—were magnified by economic diversification in Texas.

Illustrative of the transformation, mining as a share of output went from a peak of 15.1 percent in 1981 to a low of 4.2 percent in 1999, before rebounding to 13.5 percent in 2014 in the wake of the shale revolution. As a share of jobs, mining went from a peak of 4.5 percent in 1982 to a low of 1.5 percent in 1999, rebounding to 2.7 percent in 2014.[6]

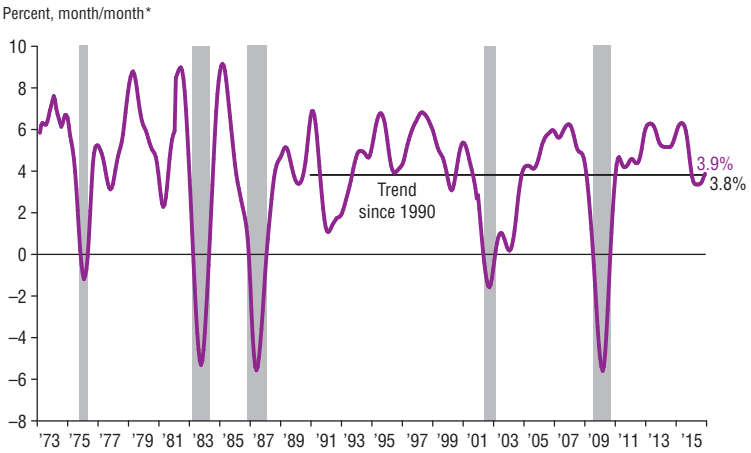
One method to measure broad industrial diversification is to compare the industry structure in a region to that of the nation. The more a region's industrial structure resembles the nation's, the less specialized it is—and the more likely its business cycle follows the nation's.

The industrial structure of Texas became more like that of the U.S. from the early 1980s through the shale boom in the mid-2000s, as noted by the gold line in Chart 5. Technically, the measure is the square root of the mean squared error of the differences of Texas industry employment shares from those of the nation. By this measure, industry shares are exactly the same as the nation's at a value of zero and become increasingly different as the value approaches 1.

Diversification can also be measured by analyzing the volatility of each industry and how it moves—or its covariance—relative to other industries. Industry structure—as well as the accompanying employment growth—has tended to become less volatile overall in Texas, as the blue line in Chart 5 shows.

This measure is the same one used by analysts who look at a stock's beta coefficient to see if it adds to or subtracts volatility from a market portfolio. In this case, each industry is treated as a company stock. If an industry has a beta coefficient of 1, growth in the industry in Texas doesn't affect the volatility of job growth. (In other words, a beta of 1 means an industry moves in unison with the overall market.) However, growth in an industry with a beta less than 1 tends to damp volatility, while growth

Chart 4 Texas Business-Cycle Index Shows No Recession in 2015

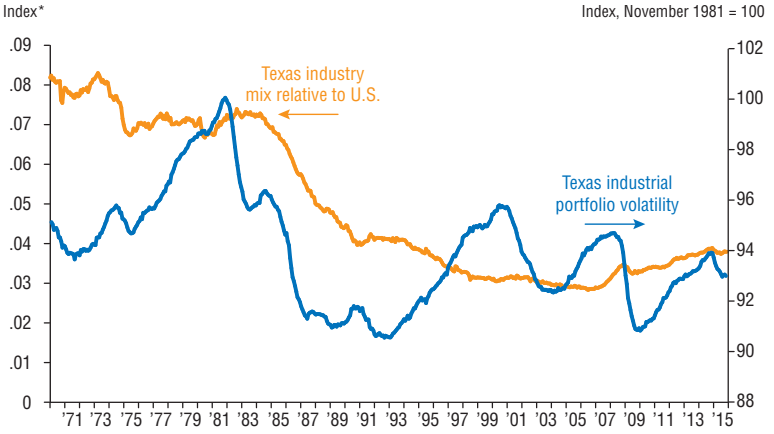


*Seasonally adjusted, annualized rate.

NOTE: Shaded areas represent Texas recessions as determined by contractions in the Texas Business-Cycle Index.

SOURCE: Federal Reserve Bank of Dallas.

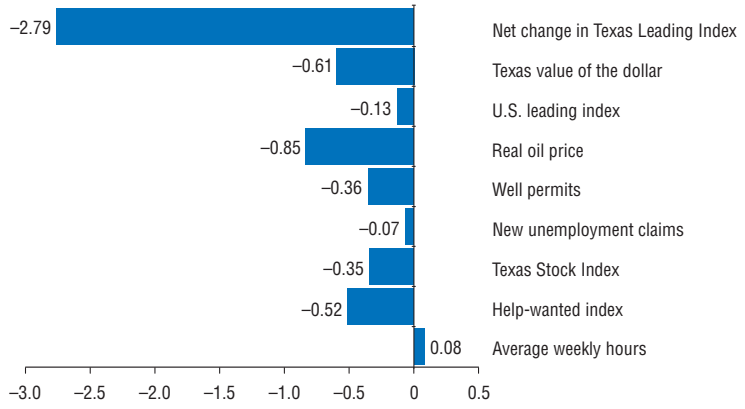
Chart 5 Texas Economy More Diversified than in the 1980s



*The index is the square root of the mean squared error of the differences of Texas industry employment shares from those of the nation, with zero indicating similarity and 1 the most dissimilarity.

SOURCES: Bureau of Labor Statistics; authors' calculations.

Chart 6 Texas Leading Index Components Broadly Negative



NOTES: Chart shows the weighted contribution of components to the index change, December 2015–February 2016. Data are seasonally adjusted.

SOURCE: Federal Reserve Bank of Dallas.

in an industry with a beta greater than 1 increases overall volatility.

Growth in industries that have low variance and/or a low or negative covariance with total job growth reduces the overall portfolio variance—and thus the underlying volatility of the economy (*Table 1*). For example, computer systems design has grown rapidly in Texas since 1990, expanding at an annual pace of 8.8 percent and adding about 148,500 high-paying jobs to the state's economy. This sector is very cyclical, however, and with a beta coefficient of 1.54 (as part of business and other services) has contributed to higher volatility in the Texas economy.

As Table 1 shows, an increasing share of jobs in service industries such as health care, retail, private education, and leisure and hospitality and a shrinking share of jobs in mining and durable manufacturing have reduced the overall volatility of Texas jobs. Thus, the changing industrial structure of Texas has reduced its dependence on the energy sector, made it more similar to the nation and decreased its underlying volatility relative to the early 1980s.

2016 Forecast

Leading economic indicators suggest continued tepid growth in 2016. The components of the Texas Leading Index were weak during the three months ended Feb. 29, and the index declined sharply (*Chart 6*). Oil prices had the largest negative contribution, falling from an average $37.23 in December to $30.33 in February. This decline further stresses drilling companies and economic activity in energy areas of the state. Permits to drill oil and gas wells also dropped.

Table 1 Industry Shares, Betas Affect Texas Employment Volatility

	Mining	Const.	Non-durable mfg.	Durable mfg.	Whole-sale	Retail, leisure & hosp.	Transp.	Util.	Info.	FIRE	Bus. & other svcs.	Educ.	Health care	Govt.
1980 (%)	4.1	7.2	10.1	7.9	7.2	19.5	3.6	1.2	1.4	5.7	9.6	0.8	4.8	16.7
1990 (%)	2.3	4.9	5.4	7.9	5.2	21.1	3.5	0.8	2.5	6.5	12.7	1.2	8.3	17.8
2014 (%)	2.7	5.6	2.6	5.1	5.0	21.1	3.7	0.4	1.7	6.1	16.9	1.6	11.6	15.8
Beta	1.71	2.29	0.81	1.55	1.05	0.80	1.17	–0.03	1.24	0.41	1.54	0.71	0.22	0.61

NOTES: Percent figures represent shares of total state employment for each year. Industry beta coefficients, which measure volatility, are calculated over the period 1990–2015. FIRE stands for finance, insurance and real estate.

SOURCE: Bureau of Labor Statistics.

Broad indicators of labor market conditions were mixed, with new unemployment claims rising slightly (a negative contribution) and help-wanted advertising declining. Average weekly hours worked in manufacturing picked up slightly, but further appreciation in the Texas value of the dollar suggests additional weakness in the sector.

The Texas Stock Index, which measures the share price of a wide range of companies with significant operations and employment in Texas, dropped sharply in December but rose slightly in February.

The Dallas Fed forecasting model, which uses the recent momentum in job growth along with changes in the Texas Leading Index, predicts that Texas employment growth will be between zero and 1.5 percent (179,000 jobs).

Big swings in the index have preceded big movements in job growth, as seen in Chart 7. The chart also depicts an 80 percent confidence band for future job growth. While the most likely outcome is a jobs gain, there is some risk of a jobs loss. The standard error of the model indicates about a 24 percent probability that the true forecast is for zero job growth or contraction. Deterioration in the Texas Business Outlook Surveys also suggests slower growth this year.

While many events in the state, country and world could reduce the accuracy of the Texas forecast, oil prices are a particular risk going forward. The futures market early in the year suggested that oil prices will slowly rise and finish the year at about $39 per barrel. However, to be 95 percent confident of price would imply a possible range of $15 to $96. Clearly, there is much uncertainty. The Dallas Fed employment model reflects the oil price declines through February 2016, when West Texas Intermediate crude hovered around $30 per barrel. If 2016 prices average below $30, employment will likely contract.

Oil prices below $30 would also likely increase loan defaults and bankruptcies in the oil and gas industry, putting increased strain on Texas banks with exposure to the energy sector. As credit among energy producers began drying up in the face of falling oil prices, delinquencies in oil and gas-related loans picked up in the second half of 2015. However, overall loan quality held up, and data through fourth quarter 2015 show that banks in the Federal Reserve Eleventh District—largely Texas—continued to be more profitable than the U.S. average.

However, the region experienced a slight increase in noncurrent loans—those 90 or more days past due, plus those no longer accruing interest—

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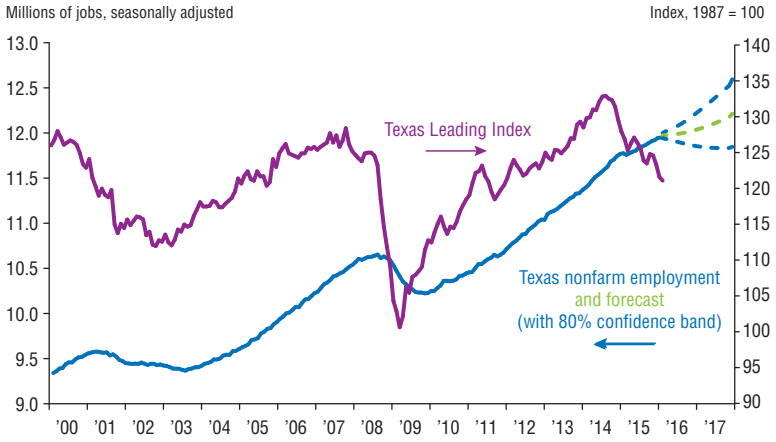
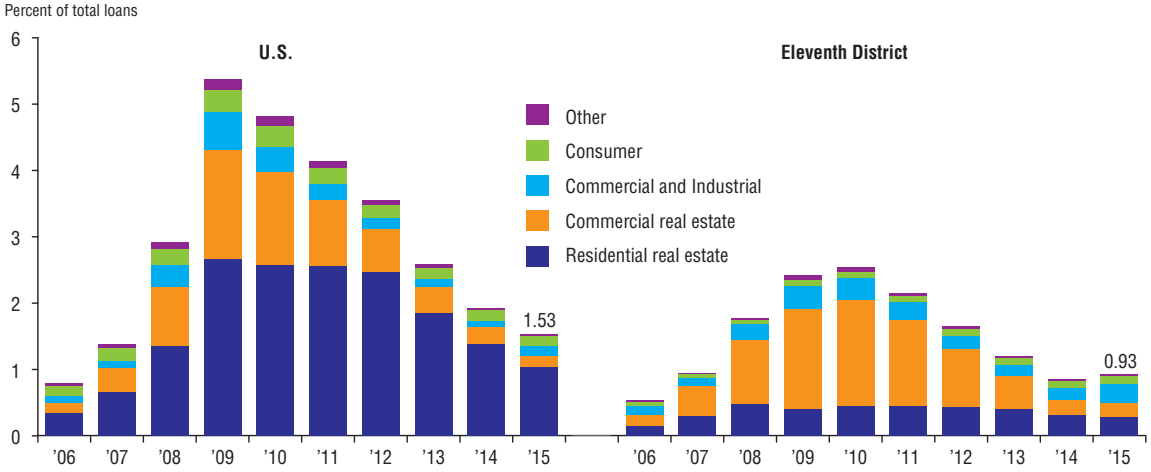
Chart 7 Texas Jobs Forecast Points to Zero to 1.5 Percent Growth in 2016



SOURCES: Bureau of Labor Statistics; Texas Workforce Commission; Federal Reserve Bank of Dallas.

Chart 8 Noncurrent Eleventh District Commercial and Industrial Loans Rising



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

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suggesting some strain on banks going forward (*Chart 8*). More specifically, commercial and industrial loans that were noncurrent rose from around 21 percent of total noncurrent loans to 32 percent. Despite this uptick, the share of loans that are noncurrent in the region is only slightly above half the national average.

This is due to a much healthier residential lending situation in Texas, where housing inventories were tight at the end of 2015 and the state led the nation with the fewest mortgages under water (house values below the amount owed). Strength in the housing market provides a buffer for banks should oil and gas defaults continue climbing in 2016.

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Notes

[1] See "Texas Facing Economic Headwinds in 2015," by Keith R. Phillips and Christopher Slijk, Federal Reserve Bank of Dallas *Southwest Economy*, First Quarter, 2015.

[2] See "New Tool Gauges Impact of Exchange Rates on States," by Keith R. Phillips, Steve Brzezinski and Barbara Davalos, Federal Reserve Bank of Dallas *Southwest Economy*, Fourth Quarter, 2010.

[3] For more detail on metro industrial profiles, see "At the Heart of Texas: Cities' Industry Clusters Drive Growth," by Laila Assanie, Kristin E. Davis, Pia M. Orrenius and Michael Weiss, Federal Reserve Bank of Dallas Special Report, February 2016.

[4] Our version of state real GDP uses an alternative measure of output for oil and gas extraction and support services. For more information, see "A Closer Look at Potential Distortions in State Real Gross Domestic Product: The Case of the Texas Energy Sector," by Keith R. Phillips, Raul Hernandez and Benjamin Scheiner, *Journal of Economic and Social Measurement*, vol. 39, no. 1–2, 2014, pp. 105–19.

[5] See "A New Monthly Index of the Texas Business Cycle," by Keith R. Phillips, *Journal of Economic and Social Measurement*, vol. 30, no. 4, 2005, pp. 317–33. Specifically, the index measures underlying cyclical changes in the Texas economy based on smoothed movements in state real GDP, job growth and unemployment.

[6] As of third quarter 2015, the mining share of GDP had fallen to 8.8 percent and the share of employment had declined to 2.2 percent.

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