

# Bridging the Texas GDP Gap

By Stephen P. A. Brown and Raghav Virmani

**W**eeks after the end of each quarter, the Commerce Department releases its first estimate of the nation's gross domestic product. Because GDP numbers are timely and offer broad coverage of U.S. economic activity, policymakers, analysts and business executives rely heavily on them in assessing the nation's economy.

At the state level, however, GDP data are available only annually, and they're released more than five months after the end of the year. In May 2007, for example, the most current numbers on Texas output covered 2005—a gap of 17 months.

The lag diminishes the value of state GDP data, prompting analysts to turn to other measures to gauge the Texas economy's performance—most notably payroll employment, household employment and earnings. All three series are timely and relatively broad. They also track well with inflation-adjusted Texas GDP (*Chart 1*).

The related movements suggest employment and earnings could be used to project Texas GDP for the quarters for which state output data haven't yet been released. We conducted a series of econometric tests to evaluate how much information about Texas GDP is contained in the other three measures.

In our most effective models, household employment and real earnings explain 55 to 60 percent of the change in Texas GDP. Payroll employment doesn't explain as much as the other two measures. The results suggest the first two data series do a reasonable job anticipating state output and can help bridge the gap until the Texas GDP numbers are released.

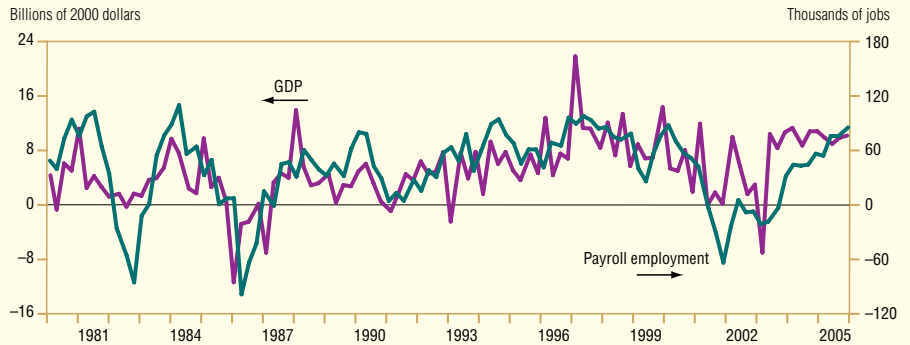
## State-Level Data

State and federal agencies supply most of the data that track the Texas economy. Real state GDP, produced annually by the federal Bureau of Economic Analysis (BEA), is generally released in June following the year it covers. Using procedures developed in-house, the Dallas Fed makes quarterly estimates of state output, enabling us to track the economy's ups and downs more closely during any given year.<sup>1</sup>

The two state employment measures

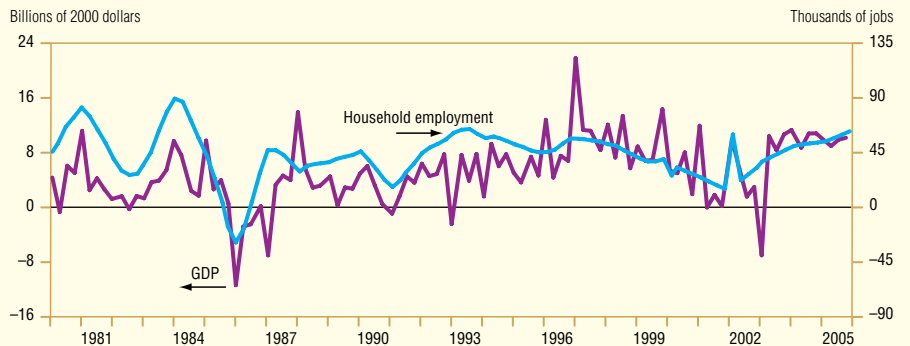
**Chart 1**  
**Employment, Earnings Move with State GDP**  
(Quarter-to-quarter change)

### Payroll Employment



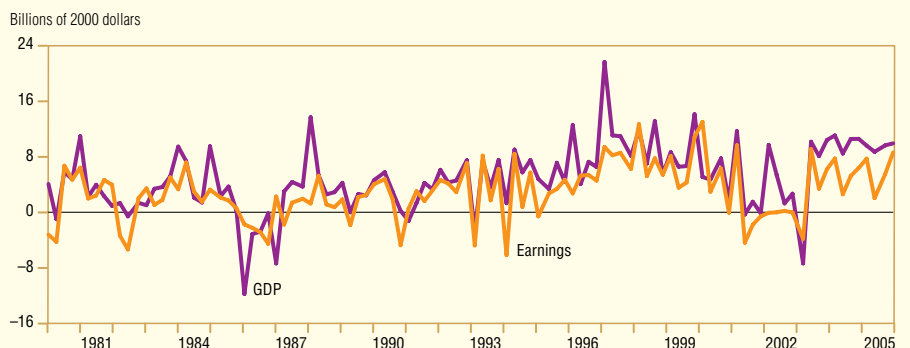
SOURCES: Bureau of Economic Analysis; Bureau of Labor Statistics; Texas Workforce Commission.

### Household Employment



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

### Real Earnings



SOURCES: Bureau of Economic Analysis; Federal Reserve Bank of Dallas.

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are released about three weeks after month's end. The Texas Workforce Commission (TWC) produces what's commonly called payroll employment, which summarizes a monthly survey of nonfarm business establishments. These data are timely and provide information broken down by industry and metro area.

The alternative measure is household employment, from the federal Bureau of Labor Statistics. The agency gathers national data by surveying households about whether members are employed or looking for work. The TWC produces state-level numbers with models that use Texas-specific elements of the national survey, payroll employment and unemployment insurance claims. The household series is used to calculate the unemployment rate, but it also offers information on total employment, overall workforce size and demographic groups' labor force participation.

The BEA compiles state earnings, a quarterly measure that covers wages, salaries and their supplements, and business owners' income.<sup>2</sup> The data are available a little more than three months after the quarter ends. In our work, we've adjusted the data for inflation using the U.S. Consumer Price Index.

The availability of these data depends on the time of the year. In July 2006, for instance, state GDP ran through the end of 2005. Employment data were available for the second quarter of 2006 and earnings for the first quarter of that year (*Table 1*). In April 2007, we had no new state GDP reports, but employment data were available for first quarter 2007 and earnings for fourth quarter 2006.

### Estimating State GDP

Projecting Texas GDP required eight models. For each, we considered seven different specifications—three with payroll employment, household employment and real earnings separately; three with them in pairs; and one with all of them.<sup>3</sup> We used quarterly data from 1980 through 2005 and staggered lags to reflect the timing of each series' release.

We needed so many models because our task varied with the calendar. In July 2006, it involved projecting the first two quarters of 2006. In October 2006, it became projecting the year's first three quar-

ters. In January 2007, we had to estimate all four quarters of 2006. In April 2007, the task was projecting all four quarters of 2006 and the first quarter of 2007. In July 2007, it will once again be projecting the first two quarters of the year.

One group of four models projects Texas GDP from the first through fourth quarters, when up-to-date employment data are available but earnings are from the previous quarter. We found household employment was the most useful series for projecting state GDP. In three cases, real earnings may provide some help with the projections. Payroll employment provides no additional information. These models account for nearly 60 percent of the change in Texas GDP.<sup>4</sup> (Details of these statistical tests are available at [www.dallasfed.org/research/swe/2007/swe0703x.cfm](http://www.dallasfed.org/research/swe/2007/swe0703x.cfm).)

The other group of four models projects first through fourth quarter Texas GDP when employment and earnings data are all current. We found that both household

**Table 1**  
**What We Know, When We Know It**

	State GDP	Employment	Earnings
July 2006	4th quarter 2005	2nd quarter 2006	1st quarter 2006
October 2006	4th quarter 2005	3rd quarter 2006	2nd quarter 2006
January 2007	4th quarter 2005	4th quarter 2006	3rd quarter 2006
April 2007	4th quarter 2005	1st quarter 2007	4th quarter 2006

employment and earnings are useful for projecting state GDP. The payroll series adds no useful information. These models account for nearly 55 percent of the change in Texas GDP.<sup>5</sup>

We conclude that household employment and earnings data do possess the ability to anticipate state GDP numbers—with these two series performing better at various times of the year (*Table 2*). Up-to-date data are important. So earnings take a backseat to household employment data for any quarter for which earnings are not yet available.

It's somewhat surprising that the survey-based payroll employment is statistically inferior to household employment in projecting state GDP. It's possible the household data's value in assessing Texas real GDP growth owes partly to its construction from employment surveys, population data and unemployment insurance reports.

**Table 2**  
**Keys to Projecting State GDP**

	Quarters to project	Relevant data	
		Most recent quarter	Earlier quarters
July	1st, 2nd quarters same year	Household employment	Real earnings & household employment
October	1st–3rd quarters same year	Household employment & possibly real earnings	Real earnings & household employment
January	1st–4th quarters previous year	Household employment & possibly real earnings	Real earnings & household employment
April	1st quarter same year & 1st–4th quarters previous year	Household employment & possibly real earnings	Real earnings & household employment

### Recent Growth Rates

What do the household and earnings data tell us about the recent behavior of Texas GDP? At this writing in May 2007, state output data weren't yet available for the five quarters from the beginning of 2006 through March 2007. Employment data were available through first quarter 2007 and real earnings through fourth quarter 2006.

Using our models, we conclude that Texas GDP growth had a bumpy ride in 2006, with a downswing in the second quarter before a revival in the second half of the year. The state's economy then slowed somewhat in first quarter 2007 (*Chart 2*). Confidence bands around the results indicate some uncertainty about the precise path of Texas GDP.

This assessment is generally consistent with the Dallas Fed's Beige Book reports for 2006 and first quarter 2007. These anecdotal surveys suggested the slowing of the

economy in the middle of the year as well as the uptick in activity that followed. They also indicated a slowing in the first quarter of this year.

The results suggest that paying closer attention to household employment might help analysts get a better fix on what's happening in the Texas economy. However, accurate assessments are more likely to come from considering a range of timely measures—from employment and earnings data to the Beige Book reports.

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### Notes

The authors thank Jiroko Rosales for research assistance and Nathan S. Balke, Franklin D. Berger, Dong Fu, Anil Kumar, Pia M. Orrenius, Keith R. Phillips and Mine K. Yücel for helpful comments.

<sup>1</sup> See "A New Quarterly Output Measure for Texas," by Franklin D. Berger and Keith R. Phillips, Federal Reserve Bank of Dallas *Economic Review*, Third Quarter 1995, pp. 16–23.

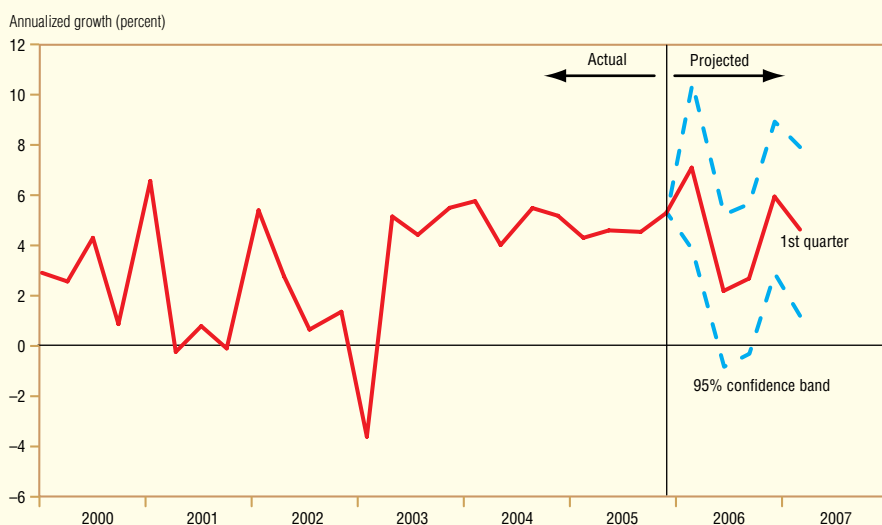
<sup>2</sup>Earnings better track Texas GDP than personal income. The latter measure is broader than earnings, incorporating other sources of income, much of which comes from outside Texas.

<sup>3</sup> We conduct all econometric analysis in first differences because augmented Dickey–Fuller tests show all the series are difference stationary. We use a cointegrating term between real state GDP and real earnings because the Johansen procedures show the two series are cointegrated. The use of an interpolated series for Texas GDP raises the possibility that the standard errors of the estimated relationships will be understated. We hope the careful construction of the quarterly GDP series keeps these problems to a minimum. Because household employment is a model-generated series, estimates of its standard errors are understated, but hypothesis testing of the coefficients on the variable being equal to zero remains valid. See "Econometric Issues in the Analysis of Regressions with Generated Regressors," by Adrian Pagan, *International Economic Review*, vol. 25, February 1984, pp. 221–47.

<sup>4</sup> The adjusted  $R^2$ s are somewhat lower at 0.40–0.44.

<sup>5</sup> As shown in the estimation details, available on the Dallas Fed's web site, all four models prove to have the same specification. The adjusted  $R^2$  is 0.53.

**Chart 2**  
**Projections Point to Bumpy Texas GDP**



NOTE: Data have been adjusted for inflation.

SOURCES: Bureau of Economic Analysis; Federal Reserve Bank of Dallas; Bureau of Labor Statistics; Texas Workforce Commission; authors' calculations.