Southwest Economy

Opting Out of Work: What's Behind the Decline in Labor Force Participation?

The labor force participation rate—the share of the adult population that is working or looking for work—has been declining in the United States in recent years.[1] The downward trend has generated concern among some economists and policymakers. The economy grows by adding workers or increasing productivity (or both). Barring other changes, a decline in the share of the population that is economically active translates into a lower rate of economic growth.[2]

Another worry is whether more-vulnerable groups are participating disproportionately in the decline. For middle- and high-income families, less attachment to the labor force may simply reflect a change in priorities or increasing wealth and may not have adverse consequences. For low-income families, on the other hand, dropping out of the labor force can bring about financial distress, lower future earnings and a greater dependence on welfare programs.

The National Economic Outlook: Continued Growth Likely

Most analysts believe that Hurricanes Katrina and Rita—for all their terrible effects on coastal communities in Louisiana, Mississippi, Texas and Alabama—will have no major lasting impact on overall U.S. economic activity. In its September policy statement, the Federal Reserve System's Federal Open Market Committee, while acknowledging Katrina's possible near-term adverse effect on spending, production and employment, argued that hurricane-related disruptions and uncertainties "do not pose a more persistent threat."
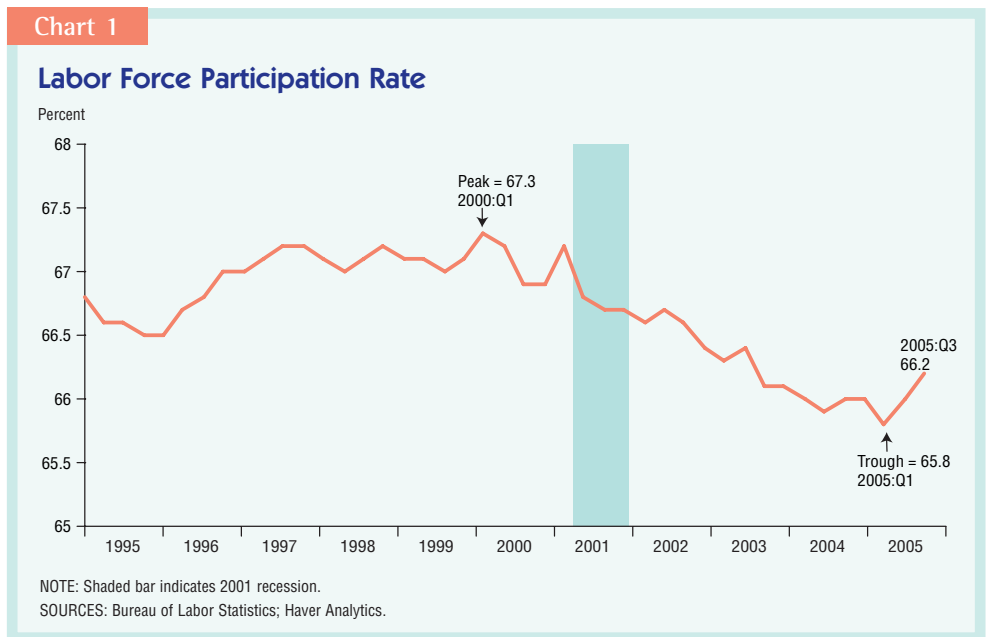
This article discusses the factors driving recent trends in labor force participation. Given that participation rates started to turn around in 2005, there is less concern about long-run trends than there was in the beginning of the year. Nonetheless, the experience in recent years has been unusual. We focus on how gender, age and education groups have fared in the recent past and discuss the role of cyclical variation versus long-term trends in participation among these groups.

The Recent Decline in Labor Force Participation

Chart 1 illustrates the recent decline in the labor force participation rate. The rate fell from its peak of 67.3 percent in first quarter 2000 to a low of 65.8 percent in first quarter 2005. Since then, participation has risen slightly, reaching 66.2 percent in the third quarter. The 1.5 percentage point drop between the peak in 2000 and the trough in 2005 stemmed from the fact that the adult civilian population rose faster than the labor force. The labor force rose by 5.9 million workers over this period, or 3.8 percent (the U.S. labor force currently stands at about 150 million workers). In contrast, the adult civilian population grew by 13.5 million, or 5.9 percent.

Table 1 breaks down this change in the overall labor force participation rate for gender, age and education categories. Within each category, the groups are weighted by their share of the adult

Chart 1

Labor Force Participation Rate

NOTE: Shaded bar indicates 2001 recession.
SOURCES: Bureau of Labor Statistics; Haver Analytics.

population so that the sum of the groups' differences over time equals the total change in participation for that category. Note that negative numbers in the "total change" row do not necessarily mean that the participation rate fell for that group. To illustrate this point, the total change is decomposed into two parts: (1) the difference in labor force participation that is due to an increase or decrease in the group's share of the adult population, and (2) the difference due to a change in the group's propensity to participate in the labor force.

For example, as Table 1 shows, males

and females contributed equally to the decline in participation between the peak and trough periods (both subgroups contributed about −0.7 percentage point). Over this period, however, men increased as a share of the adult population, while women decreased. Hence, the population component is positive for men (0.2) and negative for women (−0.2). The decomposition further shows that holding population shares constant, participation rates fell more for men (−1.0) than for women (−0.6).

By age category, young workers (ages 16 to 24) and prime-age workers

Table 1

Contributions to the Labor Force Participation Rate in Peak and Trough Periods

| | Gender | | Age | | | Education | | | |
	Male	Female	16–24	25–54	55+	Less than high school diploma	High school diploma, no college	Some college, no bachelor's degree	Bachelor's degree
Peak (2000:Q1)	36.0	31.3	10.3	47.9	8.8	7.0	21.4	18.6	20.6
Trough (2005:Q1)	35.3	30.5	9.6	45.5	10.5	6.7	20.2	18.4	21.5
Total change	**−.7**	**−.7**	**−.7**	**−2.5**	**1.7**	**−.3**	**−1.3**	**−.1**	**1.0**
Change due to population composition	.2	−.2	.1	−1.5	.5	−.5	−.6	.1	1.5
Change due to labor force participation rate	−1.0	−.6	−.8	−.9	1.1	.2	−.7	−.2	−.5

NOTES: Data are seasonally adjusted. Contributions are weighted according to each group's population share. Within each category, such as gender for example, the groups' contributions sum to the total participation rate. Some numbers do not add up to total due to rounding. The data by education are for individuals ages 25 and over.
SOURCES: Bureau of Labor Statistics; Haver Analytics; authors' calculations.

(ages 25 to 54) both contributed to the total decline, with −0.7 and −2.5 percentage points, respectively. Prime-age workers' contribution to total labor force participation change was driven largely by their declining share of the adult population (contributing −1.5 percentage points to the total change). Older workers (ages 55 and over), on the other hand, increased their participation rate as well as their share of the population and contributed 1.7 percentage points to the overall change in this period.

Among education groups, contributions to the participation rate were negative for all groups except college graduates. Weighted participation fell the most for high school graduates (−1.3 percentage points), followed by individuals who lack a high school diploma (−0.3) and those with some college but no bachelor's degree (−0.1). Despite the positive contribution of college graduates to the total change in labor force participation rate (1.0), the participation rates among college graduates actually fell in this period by 0.5 percentage point. College graduates' contribution was positive because they grew as a share of the adult population.

Cyclical Factors by Group

Both cyclical (temporary) and long-term (permanent) factors influence the changes in labor force participation rates illustrated in Table 1. First, let us consider the cyclical component. The 2001 recession and the jobless recovery that followed led to a lower demand for labor, which in turn resulted in layoffs, higher unemployment and lower real wage growth relative to the late 1990s. These cyclical developments are partly to blame for some individuals' exit from the labor force during the post-2000 period and affected some groups more than others. Aside from different demand-side factors influencing group behavior, such as a disproportionate effect of the recession on skilled workers in information technology, the groups identified in Table 1 are also characterized by different supply-side sensitivities to cyclical changes.

To better illustrate each group's sensitivity to the business cycle, Table 2 shows simple correlations of quarterly real gross domestic product (GDP) with leads and lags of the labor force participation rate. To isolate the cyclical component of output and participation, the trends are removed from the logs of GDP and labor force participation rate before taking the correlation.[3] In addition, the standard deviation (volatility) of each group's labor force participation rate is noted. The data cover first quarter 1948 through first quarter 2005, except for the education groups, which are annual observations from 1970 through 2004.[4]

While employment is typically a coincident indicator, meaning it changes simultaneously with economic output, the unemployment rate is a lagging indicator, meaning it changes after output has changed. Given that labor force participation is a combination of employment and unemployment, we would expect it to be a slightly lagging indicator. This means that changes in GDP today should be more highly correlated with participation rates in the near future than on current or past participation rates. We also expect participation rates to be pro-cyclical, or positively correlated with economic output, as economic expansions are characterized by greater labor demand.

As seen in Table 2, workers who traditionally have had less attachment to the labor force—women, young workers, older workers and high school dropouts—have more volatile labor force participation in general. Standard deviations, shown in the first column, are much higher for these groups as compared with males and prime-age workers, for example, and correlations with GDP are lower. Males' labor force participation rates are less volatile and more closely correlated with economic output; the largest correlation coefficients are between 0.42 and 0.47 in the three quarters following a change in GDP. Female participation rates, on the other hand, have a maximum correlation with GDP of about 0.31 after three quarters. Table 2 therefore suggests that participation rates are pro-cyclical—positively correlated with

Table 2

Cross-Correlation of Real GDP With Leads and Lags of Labor Force Participation Rate by Group

	Volatility (percent standard deviation)	4-period lead	3-period lead	2-period lead	1-period lead	Contemporaneous	1-period lag	2-period lag	3-period lag	4-period lag
Labor force participation rate for:										
Total	.39	0	.04	.10	.18	.26	.35	.36	.38	.36
Male	.30	−.02	.05	.11	.19	.29	.42	.45	**.47**	.43
Female	.76	0	.02	.08	.16	.23	.29	.29	**.31**	.27
16–24	1.13	.04	.09	.17	.25	.34	**.40**	.38	.35	.28
25–54	.27	−.06	−.07	−.05	.07	.19	.30	.32	.39	**.40**
55+	.85	.04	**.09**	**.09**	.05	−.02	−.01	−.02	.01	.01
Less than high school	1.27	−.30	−.07	.13	.14	.23	**.35**	.26	.09	−.19
High school, no college	.76	−.29	−.28	−.30	−.11	.24	**.39**	.31	.11	−.02
Some college	.86	−.23	−.13	−.07	.15	**.35**	.22	.17	−.10	−.21
Bachelor's degree	.36	.03	.12	.14	−.13	−.14	.01	.01	**.15**	−.08

NOTES: All data (except the education groups) are seasonally adjusted, quarterly, span 1948:Q1–2005:Q1 and are correlated with quarterly GDP data. Data by education groups are annual, span 1970–2004 and are correlated with annual GDP data. The maximum correlation between labor force participation and GDP is in bold type for each group.

SOURCES: Bureau of Labor Statistics; Bureau of Economic Analysis; Haver Analytics; authors' calculations.

economic output—and that the strongest correlation for males and females is between GDP today and participation two and three quarters from today. This supports the contention above that labor force participation decisions respond to changes in economic output with a slight lag.

Among the age groups, the highest correlations with economic output are among the young and prime-age workers. Interestingly, the participation behavior of older workers is essentially uncorrelated with GDP (the correlation coefficients are close to zero). This suggests that structural or long-term factors, rather than cyclical or temporary changes, drive the work decisions of older people.

Young workers have participation decisions that are the most correlated with GDP after a one-quarter lag (0.4), while prime-age workers have a maximum correlation with output after a three- and four-quarter lag (0.39 and 0.4, respectively). The responsiveness of youth to changing labor market conditions reflects both the types of jobs they take and their financial dependence on their parents. Generally, younger, less-experienced and less-skilled workers take entry-level jobs characterized by high turnover (quick hiring and firing). In addition, given that about half of youths ages 16 to 24 are enrolled in school and many are financially dependent on their parents, one would expect their participation behavior to be more elastic. They have the luxury of working more in good times and less in bad times to a greater extent than older workers, including their parents.

The evidence on the cyclicality of the education groups is also interesting. With the exception of the college-educated, each education group demonstrates significant pro-cyclical participation behavior with maximum correlation coefficients at or above 0.35 occurring in the same year or with a one-year lag of GDP. The education data are annual (not quarterly as above) and cover workers ages 25 to 64. The results seem to suggest that college-educated individuals are both less responsive to business cycles and have less volatile participation behavior generally. This finding is sensitive to the time period selected, however.[5]

Long-Term Trends by Group

As mentioned above, both short- and long-term factors feed into the changes in labor force participation. For groups with highly cyclical participation behavior, short-term factors have been important in driving rates down in the recent past and driving rates up so far this year. Other groups have been largely unaffected by cyclical changes. In this section, we discuss long-run trends in labor force participation by age, gender and education categories. These trends also shed light on how participation rates are likely to evolve in the future.
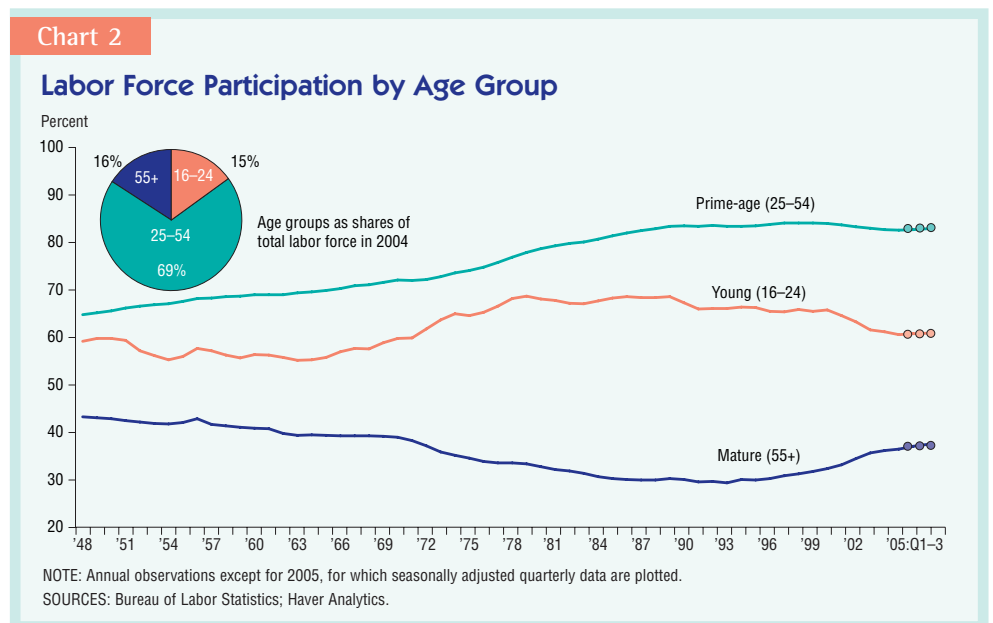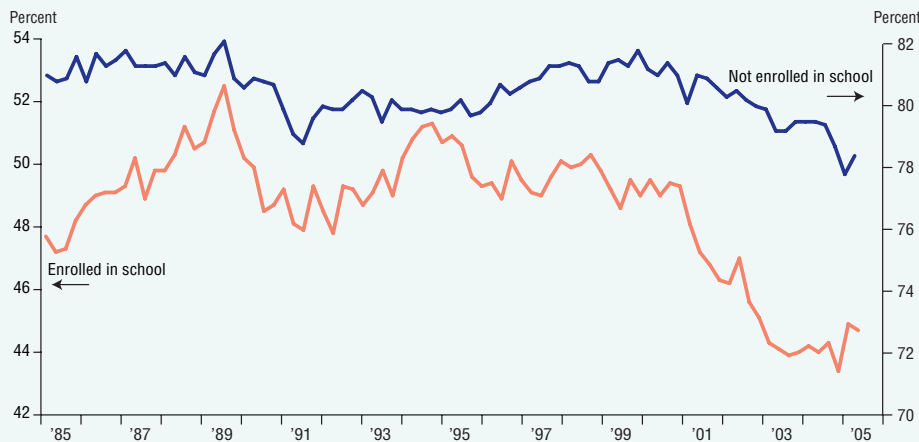
Participation by Age. Chart 2 shows

The results seem to suggest that college-educated individuals are both less responsive to business cycles and have less volatile participation behavior generally.

Chart 2

Labor Force Participation by Age Group

Percent

Age groups as shares of total labor force in 2004: 16–24: 15%, 25–54: 69%, 55+: 16%

NOTE: Annual observations except for 2005, for which seasonally adjusted quarterly data are plotted.
SOURCES: Bureau of Labor Statistics; Haver Analytics.

Labor Force Participation Rate by School Enrollment Status
(16- to 24-year-olds)

Percent / Percent

Not enrolled in school

Enrolled in school

'85 '87 '89 '91 '93 '95 '97 '99 '01 '03 '05

NOTE: Data are seasonally adjusted.
SOURCES: Bureau of Labor Statistics; Haver Analytics.

labor force participation rates by age group since 1948. Declining participation rates among youth is a long-term trend, ongoing since the late 1980s. The decline has seemingly intensified in and around recession years, in 1990 and again post-2000, for example. The opposite trend holds for mature workers. After bottoming out in 1993, participation rates for older individuals have steadily increased. Prime-age workers (ages 25 to 54), meanwhile, make up the bulk of the workforce and have experienced a leveling off in rates. After rapid increases in rates in the 1970s and mid-1980s, labor force participation among prime-age workers stabilized in the 1990s, rising very slowly to a peak in 2000. Post-2000, there has been a slight decline in participation among this group.

Some of the drop in youth participation stems from a decline in the share of students who work. Chart 3 shows how the drop-off in participation among youth who are enrolled in school began earlier and is much steeper than among youth who are not enrolled in school. Compounding the effect of this sharp decline in participation rates among students is an increase in the share of 16- to 24-year-olds who are students. Between 1985 and 2004, the share of 16- to 24-year-olds enrolled in school jumped from 36 percent to 51 percent.

Another striking change in Chart 2 is the upturn in market participation among the 55 and over group. The increase followed almost a decade of flat participation rates among this group. What caused it? Research suggests that the rise in the labor force participation rate of older workers is due to a combination of factors. These include longer-term changes such as healthier and longer life spans, the decline in defined-benefit pension plans, changes to Social Security benefit rules, and the increased cost of health care.
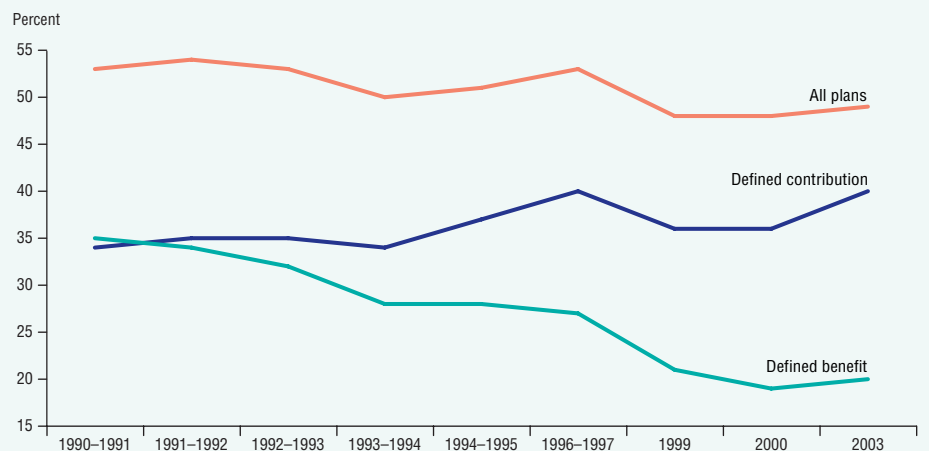
For a given age, older individuals today are healthier than they have been historically.[6] People also live longer, making them more able to work and increasing their need for income in retirement. Life expectancy at birth was 77.3 years in 2002, compared with 49.2 years in 1900. Conditional life expectancy has also increased dramatically. Whereas a 55-year-old in 1900 could expect to live an additional 17.9 years, a 55-year-old in 2002 could expect to live an additional 26.1 years.

The decline in defined-benefit plans and rise in defined-contribution plans are also contributing to keeping older workers in the labor force. One study found that defined-contribution plans have postponed retirement by two years on average.[7] As Chart 4 shows, the share of workers covered by defined-benefit plans has been falling, while the incidence of defined-contribution plans, such as 401(k) plans, has been rising. Defined-benefit plans often discourage additional work because such plans provide a fixed monthly payment once a worker reaches a certain combination of age and on-the-job tenure. Defined-contribution plans, on the other hand, are more flexible. They are not characterized by age and experience-based cutoffs (except an initial period required for vesting), and workers who continue on the job accumulate more retirement savings.

In addition, several changes to Social

Percent of Private Industry Workers Participating in Retirement Plans

Percent

All plans

Defined contribution

Defined benefit

1990–1991 1991–1992 1992–1993 1993–1994 1994–1995 1996–1997 1999 2000 2003

NOTE: Some workers have both defined-benefit and defined-contribution plans. Thus, the figures for all plans are less than the sum of defined-benefit and defined-contribution plans.
SOURCE: *Compensation and Working Conditions*, by Jordan Pfuntner, Bureau of Labor Statistics, July 2004.

Chart 5

Labor Force Participation Rate by Gender
(25- to 54-year-olds)
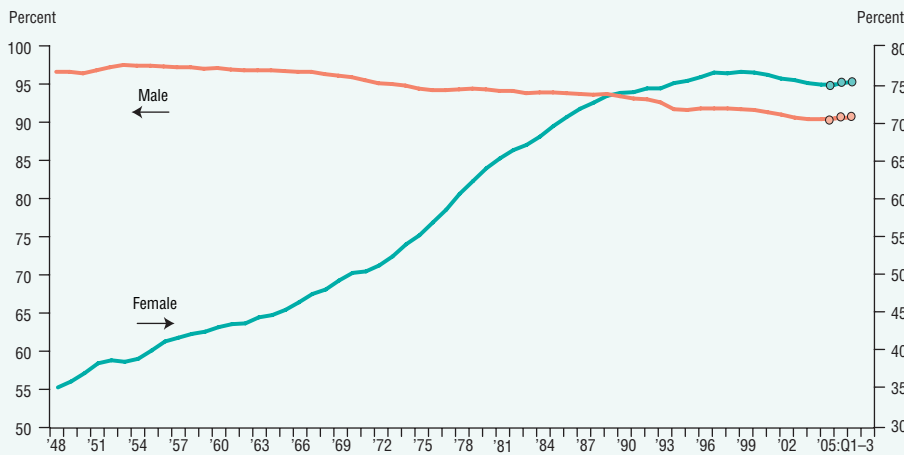
Percent   Percent

NOTE: Annual observations except for 2005, for which seasonally adjusted quarterly data are plotted.
SOURCES: Bureau of Labor Statistics; Haver Analytics.

Security encourage the elderly to work longer. For example, Social Security recipients who work past the normal retirement age can now receive full benefits. Another factor cited in the rise in labor force participation among older workers is increasing health care costs. The need to cover higher out-of-pocket medical expenses and the desire for employer-based health insurance are two important factors tying older workers to the labor force to a greater extent than in the past.[8]

Participation by Gender. Long-run changes in the prime-age population's participation behavior have been primarily driven by dramatic changes in female labor force participation since the 1950s. As Chart 5 illustrates, the labor force participation rate of men has been declining steadily since 1948. But changes for prime-age men have been small, with labor force participation falling by about 7 percentage points over 50 years. Prime-age female labor force participation, in contrast, has risen by about 40 percentage points in the past 50 years.

The long-term trends in female participation rates are familiar topics in the literature. Demographic changes affecting labor supply, such as fewer children, delayed marriage, higher divorce rates, more education and aging of the baby boomers, drove women into the labor

market in the 1970s and 1980s. One study suggests demographic changes such as these accounted for 46 percent of the change in labor force participation rates of prime-age women between 1970 and 1985.[9] The rest of the change was due to the rising propensity to participate, a change that could have been driven more directly by demand-side factors such as rising wage rates and increasing acceptance of women in the workplace.

Additional explanations have been offered for the expansion of the female labor force. One of them is technological innovation, such as the microwave oven and the dishwasher. Household inventions dramatically reduced the number of hours needed to complete household chores and freed up time to be spent on other activities, such as work outside the home. The advent of the birth control pill and other forms of modern contraception allowed women to exercise more control over the timing and size of their family.

The recent downturn in women's labor force participation rate has surprised many. Prime-age female labor force participation rates slid from their peak of 76.8 percent in 1999 to 75.1 percent in first quarter 2005. This is an unprecedented fall in the prime-age female participation rate in the post-World War II era (since the first quarter of 2005, prime-age female participation has risen slightly from 75.1 percent to 75.4 percent). It bears noting, however, that the pace of increase in female participation rates has been slowing since the mid-1980s. According to a recent Federal Reserve Bank of Boston paper, the decline in rates has been concentrated among college-educated women, both married and unmarried.[10] Declines have been largest for college-educated, married women who have children under age

Chart 6

Labor Force Participation Rate by Educational Attainment
(25- to 64-year-olds)

Percent

College graduate

Some college, less than bachelor's degree

High school graduate, no college

Less than high school diploma
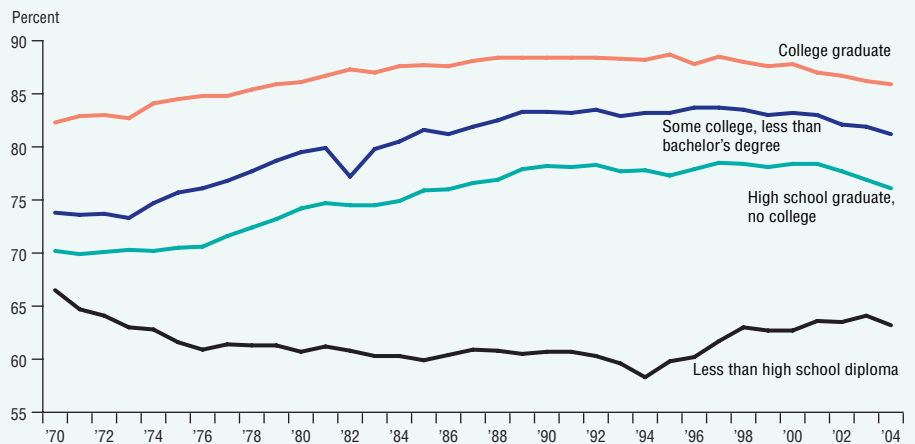
SOURCE: Bureau of Labor Statistics.

Texas Trends in Labor Force Participation

Historically, the Texas labor force participation rate has been higher than the U.S. rate (*Chart 1*). Over the past 20 years, the average participation rate in Texas is 68.6 percent, compared with the U.S. average of 66.4 percent. Several factors contribute to this difference.

Texas has a higher employment-to-population ratio, meaning a larger share of the adult population is employed. This is due to differences both in Texas' demographic composition and a higher propensity of the Texas population to work. With regard to demographics, Texas has larger population shares of the age groups that are characterized by higher participation rates, such as prime-age individuals 25 to 54. At the same time, Texas has fewer older people—a portion of the population that is typically not employed. For example, in 2004, 25 percent of the adult civilian population in Texas was over the age of 54, while in the United States 28.5 percent was. Some of the differences in the labor force participation rates are also explained by the foreign-born share of the population. Texas has a greater percentage of foreign-born residents, and foreign-born men are characterized by higher labor force participation rates than U.S.-born men. Undocumented foreign-born men in particular have very high labor force participation rates.[1]

In addition to demographic differences, institutional differences help to explain higher labor force participation rates in Texas. Texas does not have a state income tax. It also has less generous safety net programs relative to the other large states. As a result, there are greater incentives in Texas to participate in the labor force than there are in many other states.

Chart 1 also shows that the difference between Texas and U.S. participation rates has been shrinking over time. The main reason for the convergence is a long-run decline in the state's female labor force participation rate. Chart 2 shows relative labor force participation rates by gender—the Texas labor force participation rate divided by the U.S. rate and multiplied by 100. An observation above the 100-line indicates a higher participation rate in Texas, while an observation below the 100-line indicates a lower rate. The relative male labor force participation rate has been roughly constant over time, remaining well above the 100-line. The relative female labor force participation rate has declined significantly over the past two decades and fell below the 100-line in 2000. In 2004, the female labor force participation rate in Texas was about 2 percent lower than the U.S. rate.
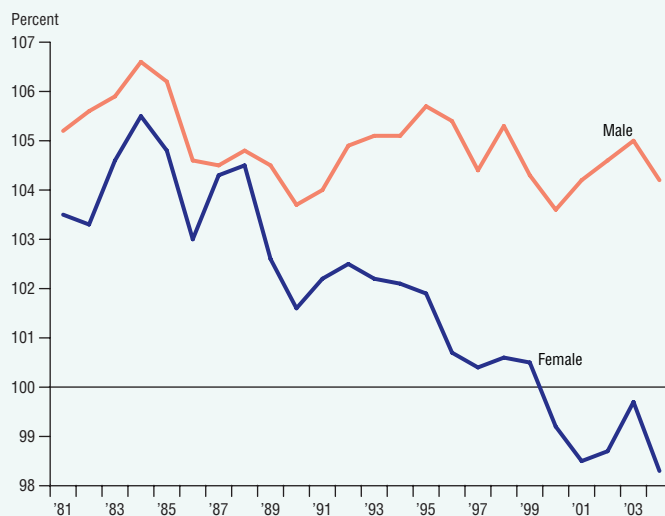
—Anna L. Berman

Note

[1] "Undocumented Immigrants: Myths and Reality," by Randy Capps and Michael Fix, The Urban Institute, October 2005 (www.urban.org/UploadedPDF/900898_undocumented_immigrants.pdf).

Chart 1
Labor Force Participation Rate
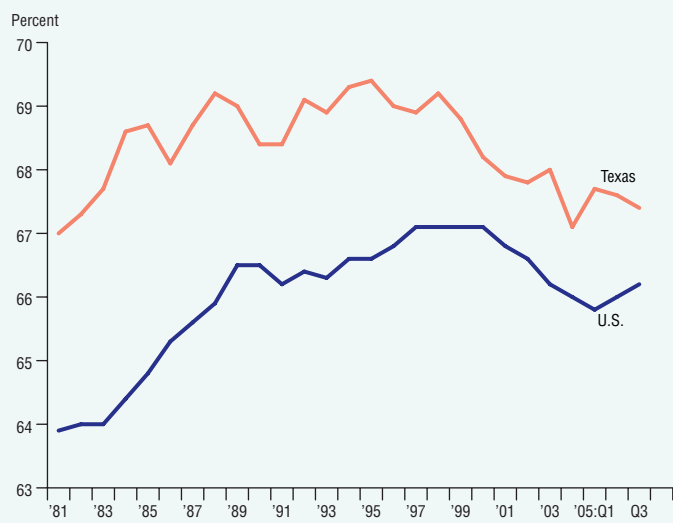
SOURCE: Bureau of Labor Statistics.

Chart 2
Relative Labor Force Participation Rates by Gender
(Texas as a share of U.S.)

SOURCE: Bureau of Labor Statistics.

6 and/or high-earning husbands.

Compounding these behavioral changes are compositional changes in the female population, such as growing shares of prime-age women who have college degrees or are Hispanic. Hispanic women have likely had an important effect because they have increased quickly as a share of the adult population and have lower labor participation rates than other women. (Hispanic men, in contrast, have higher labor force participation rates than non-Hispanic men.)

A Bureau of Labor Statistics report notes an additional change—in the 1990s, there was a large increase in the number of prime-age women who were disabled. In fact, between 1991 and 2003, the proportion of out-of-labor-force women ages 25 to 54 who reported that they did not work because they were ill or disabled rose from 12.6 percent to 21.9 percent.[11] Over the same period, the share reporting that they did not work because they could not find a job fell from 1.9 percent to 1.0 percent (for prime-age men, this share fell from 10.5 percent to 4.4 percent). These data suggest women could still readily find work.

Other potential explanations for the decline in female participation rates include declining real wage growth, increases in other family income and

changing preferences for work. More than anything else, however, research seems to point to "unexplained factors" driving down female labor force participation in recent years.[12] In other words, this phenomenon is not well understood.

Participation by Education Level. One concern with falling participation rates is that the trend may reflect reduced job market opportunity for vulnerable workers, such as those with lower education levels and hence, lower incomes and less wealth. The evidence does not seem consistent with an exodus of the least-skilled workers from the labor force (*Chart 6*). In fact, labor force participation rates have risen among individuals ages 25 to 64 who lack a high school diploma—from 58.3 percent in 1994 to 63.2 percent in 2004. All other education groups have experienced declines, and the higher the education level, the greater the decline. The largest decline—2.8 percentage points since 1995—is among individuals with a college degree or higher. Individuals with some college education but without a college degree had a decline of 2.5 percentage points from their 1996 peak. High school graduates with no college have posted a reduction of 2.4 percentage points since 1997.

Latin American immigrants are an important reason that participation rates are rising among people who lack a high school diploma. Less-educated immigrants have higher participation rates than similarly educated U.S. natives and currently make up all the growth in the low-skilled labor force, pushing up this group's participation rates over time.

Conclusion

Over the past half century or so, labor force participation rates have tended to be pro-cyclical, with a slight lag. That is, labor force participation tends to increase following increases in economic activity. However, when we look at the cyclical behavior of participation rates by gender, age group and educational attainment, we see noticeable differences. For example, the participation rates of men tend to be less volatile and more pro-cyclical than the participation rates of women. Likewise, the participation rates of the young tend

to be more volatile and pro-cyclical than those of the elderly.

Cyclical movements in participation rates occur against a backdrop of longer term trends. The trend toward greater female labor force participation has been going on for several decades and has been well documented and widely studied. As more women have entered the labor force, men have tended to leave, with the net effect being that participation rates for prime-age workers have been rising for the past several decades, albeit at a slower rate over time. More recently, these increases have ceased altogether.

Outside of the prime-age groups, participation rates have displayed different trends in recent decades, with younger workers dropping out of the labor force and older workers joining it. The trend toward greater labor force participation by older workers dates from the early 1990s. Because there appears to be remarkably little variation in this group's participation rate over the business cycle, we are probably seeing a trend driven by longer term forces. Likely candidates are increased life expectancy and changes in pension arrangements.

— Helen McEwen
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Notes

[1] The adult population in this context refers specifically to the civilian, noninstitutionalized population ages 16 and over.

[2] This is partly because conventional output measures, such as GDP, do not include the value of unpaid work, such as household production. It should also be noted that a decline in the participation rate will not necessarily affect aggregate production if the number of hours worked rises among those who remain employed. Similarly, labor force participation can rise or fall with changes in unemployment even if the number of employed workers does not change. Again, output would be unaffected.

[3] We follow the methodology in "Business Cycles: Real Facts and a Monetary Myth," by Finn E. Kydland and Edward C. Prescott, Federal Reserve Bank of Minneapolis *Quarterly Review*, Spring 1990, pp. 3–18.

[4] In contrast to Table 1, we use annual observations for the education groups. The quarterly time series for participation by education groups

starts in 1992. Annual labor force participation rates by education are for the adult civilian noninstitutionalized population ages 25 to 64. Quarterly labor force participation rates by education are for the same population ages 25 and up, while all other participation rates are for the same population but include everyone 16 and above.

[5] We also ran the correlations of GDP with education groups on quarterly data from 1992 to 2005. The results showed a pro-cyclical correlation of GDP with two-period leads and lags of the participation rates of people with college degrees. The other education groups, however, were either weakly pro-cyclical (those with some college but no degree) or countercyclical, as in the case of high school graduates.

[6] See, for example, "Declining Disability Among the Elderly," by D. M. Cutler, *Health Affairs*, Vol. 20, November/December 2001, pp. 11–27.

[7] "Retirement and the Evolution of Pension Structure," by Leora Friedberg and Anthony Webb, *Journal of Human Resources*, vol. 40, Spring 2005, pp. 281–308.

[8] See "Program Report: The Economics of Aging," by David A. Wise, *NBER Reporter*, Summer 2003, for papers referring to these issues (available at www.nber.org/aging.html).

[9] "How Do Demographic Changes Affect Labor Force Participation of Women?" by Daniel Lichter and Janice Costanzo, *Monthly Labor Review*, November 1987.

[10] "Women's Rise–A Work in Progress: Are Professional Women Opting Out?," by Katharine Bradbury and Jane Katz, Federal Reserve Bank of Boston *Regional Review*, First Quarter 2005.

[11] "Labor Force Participation during Recent Labor Market Downturns," by Steven Hipple, Bureau of Labor Statistics, *Issues in Labor Statistics*, September 2003.

[12] See, for example, "What's Up with the Decline in Female Labor Force Participation?" by Julie L. Hotchkiss, Federal Reserve Bank of Atlanta Working Paper 2005-18, August 2005.

The National Economic Outlook

(Continued from front page)

This article presents recession probabilities calculated from two different economic forecasting models and uses them to get a sense of the economy's pre- and poststorm strength. The models are very different. The first relies exclusively on the slope of the Treasury yield curve (the difference between the yields on long- and short-term Treasury securities). The second relies on a new measure of oil-supply shocks and on financial indicators other than the yield curve. Both models suggest that the likelihood of continued positive real output growth was high pre-Katrina and that it remains high today.

The Yield Curve and the Probability of Recession

The Yield Curve. The Treasury yield curve shows how the yield on Treasury securities varies with time to maturity. Chart 1, for example, shows yield curves for May 2004, just before the Federal Reserve began raising short-term interest rates, and for August and October 2005. With long-term interest rates drifting generally lower and short-term rates up 300 basis points, the yield curve has flat-

tened sharply over the current policy-tightening cycle. This flattening is a source of concern because there is evidence the yield curve has forecasting power for real economic growth and because an inverted yield curve—which occurs when short-term interest rates exceed long-term rates—has proven to be a reliable recession indicator.[1] (See the box titled "The Yield Curve as an Economic Indicator.")

The 10-year minus one-year spread, for example, has turned negative prior to each of the past eight recessions, while giving only one false signal (*Chart 2*). As of August 2005, the spread was 39 basis points—less than one-third its average value for the past 25 years (127 basis points) and less than half its average value for the past 50 years (82 basis points). In October 2005, the spread narrowed further, to 28 basis points.

The Neftçi Method. We have seen that an inverted yield curve has often—but not always—signaled that an economic recession is imminent. Salih Neftçi developed a procedure that can be used to attach a numerical value to the probability of an upcoming recession, based

on the yield curve's behavior.[2] To begin, we construct a leading-indicator series that is the cumulative sum of 10-year minus one-year yield-curve spreads. This series obviously increases when the yield spread is positive and decreases when it is negative.[3] To say the yield

The Yield Curve as an Economic Indicator

It is generally accepted that at horizons of more than a few years, monetary policy primarily influences the rate of inflation and not the course of the real economy. A corollary is that monetary policy affects the 10-year Treasury bond yield mainly through expected inflation. The *real* yield on 10-year bonds—the market yield less expected inflation—varies mostly for nonmonetary reasons (such as changes in long-term productivity trends).

However, financial frictions imply that monetary policy actions can have a temporary impact on short-term real interest rates and, through that channel, influence real economic activity at short horizons. A policy that drives short-term real rates down relative to the 10-year real rate encourages current investment and consumer-durables spending, stimulating real activity. Conversely, a policy that drives short-term interest rates up relative to 10-year real rates discourages current spending and restrains real activity.

Surveys of professional forecasters suggest that long-term and short-term inflation expectations have tended to move together over the past 20 years…. Consequently,…the slope of the market yield curve…has been a reliable indicator of the difference between real long-term and short-term interest rates and, by the arguments given above, has also been a good guide to the stance of monetary policy and a useful indicator of the economy's future strength.[1]

[1] Excerpted from "Monetary Policy Prospects," by Evan F. Koenig, Federal Reserve Bank of Dallas *Economic and Financial Policy Review*, vol. 3, no. 2, 2004, www.dallasfedreview.org. See also "Predicting Real Growth and Inflation with the Yield Spread," by Sharon Kozicki, Federal Reserve Bank of Kansas City *Economic Review*, Fourth Quarter 1997, pp. 39–57; "Understanding the Term Structure of Interest Rates," by William Poole, Federal Reserve Bank of St. Louis *Review*, September/October 2005, pp. 589–95; and "Why Does the Yield Curve Predict Output and Inflation?" by Arturo Estrella, *Economic Journal*, vol. 115, July 2005, pp. 722–44.
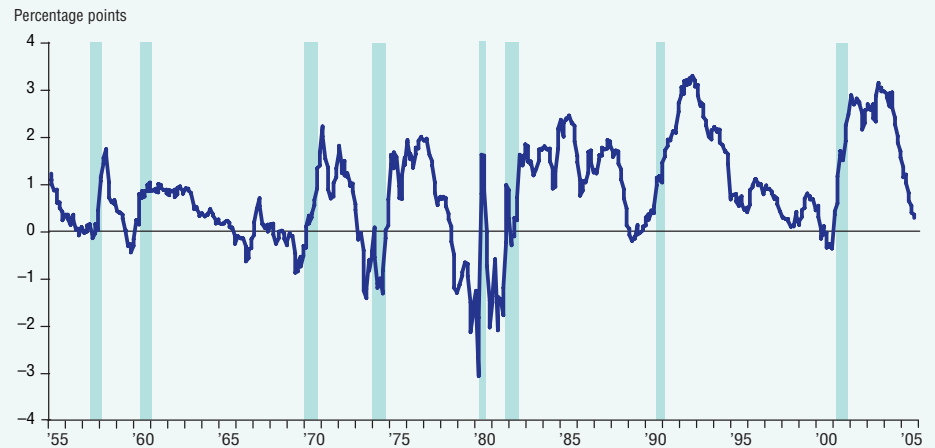
Chart 1

The Yield Curve Flattens
(Yields on Treasury securities of various maturities)
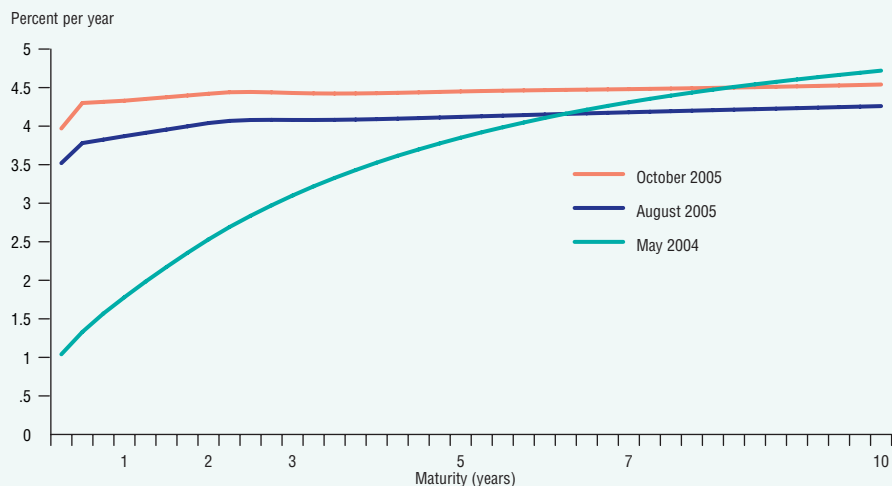
SOURCES: Federal Reserve Board; Haver Analytics.

Chart 2

Yield Spread Turns Negative Before Recessions
(10-year Treasury yield minus 1-year Treasury yield)

Percentage points

NOTE: Shaded bars denote recessions.
SOURCES: Federal Reserve Board; Haver Analytics.

An inverted yield curve has often— but not always— signaled that an economic recession is imminent.

curve has inverted prior to every recession is equivalent to saying that our indicator series has turned down before every recession.

Next, we identify cyclical phases in the indicator series. These are the upswings and downswings that correspond to, but generally precede, expansions and contractions in the overall economy, as identified by the National Bureau of Economic Research (NBER). Finally, for each month we calculate the probability that the leading indicator series is in cyclical decline, signaling a future recession.

To start the process, the probability of recession is set equal to zero when the economy is at a cyclical trough. In each subsequent month, the recession probability is revised upward or downward (using a statistical formula called Bayes' rule), depending on how likely it is that the latest yield spread comes from a cyclical down phase. The key point is that knowing the current yield spread is not enough to determine the probability of recession. A low yield spread that is just the most recent of a series of low spreads sends a stronger recession signal than the same low yield spread preceded by a series of high spreads.

Based on our estimates, the probability of recession obtained by applying the Neftçi method to the yield curve rises

sharply roughly one year before the onset of NBER contractions. As of August 2005, prior to Katrina, the probability of a recession was only 1.2 percent, so a recession anytime before third quarter 2006 appeared unlikely. October saw a modest further narrowing of the yield spread, raising the probability of recession to 2.4 percent (*Chart 3*).

An Alternative Approach

The Model. As an alternative to assessing the economic outlook by applying the Neftçi method to the yield spread, we regressed average GDP growth over the next two quarters on a variety of financial indicators and a measure of oil-supply shocks, and calculated the implied probability that growth would turn negative. The chief advantage of the alternative approach is that it allows us to bring to bear a wider range of potentially relevant information. An important disadvantage is that we run the risk of overfitting to recent experience.[4]

We forecast two-quarter GDP growth rather than one- or four-quarter growth because over the past 50 years there is a one-to-one correspondence between NBER recessions and episodes in which two-quarter GDP growth dips below zero. This correspondence allows us to interpret our negative-growth probabilities

as recession probabilities similar to those derived using the Neftçi formula.

On the right side of our equation we include the following: (1) the 12-month change in the Standard & Poor's 500 index, divided by nominal GDP; (2) the three-month change in the junk-bond spread (Merrill Lynch high-yield bond index less Moody's AAA corporate bond yield); (3) the three-month change in the real Treasury bill rate (the three-month Treasury bill yield less one-year inflation expectations from a survey of professional forecasters); and (4) an oil-supply-shock variable. We tried including lagged values of GDP growth, the slope of the yield curve and the unemployment rate in the equation, but none of these variables proved to add forecasting power, so all were dropped from the analysis. The estimation period starts in first quarter 1986 and includes two episodes of negative two-quarter annualized GDP growth (corresponding to recessions) and two additional episodes during which growth fell below 1 percent.[5]

Stock-price appreciation reflects investors' profits-growth expectations and contributes to households' purchasing power. Movements in the junk-bond spread reflect changes in the financial stress felt by marginal corporate borrowers.[6] Changes in real short-term interest rates help capture changes in monetary policy. One would expect future GDP growth to be positively related to stock-price appreciation and negatively related to increases in the junk-bond spread and real three-month Treasury-bill yield. Such is indeed the case in our estimations. (See the box titled "Forecasting GDP Growth.")

There is no consensus on how best to measure oil-price shocks. There is, however, substantial agreement that oil-price increases have a bigger impact on the economy than oil-price decreases and a suspicion that price increases caused by supply disruptions have a bigger impact than those caused by increases in oil demand.[7] In an effort to isolate price changes caused by adverse shifts in supply, the oil-shock variable used here discounts oil-price increases to the extent they are accompanied by increases in U.S. oil consumption. The idea is that shifts in oil demand tend to

Chart 3

Despite Narrowing Yield Spread, Recession Probability Remains Low
(Neftçi formula applied to 10-year minus 1-year spread)

Probability (percent)

NOTE: Shaded bar denotes a recession.
SOURCE: Authors' calculations.
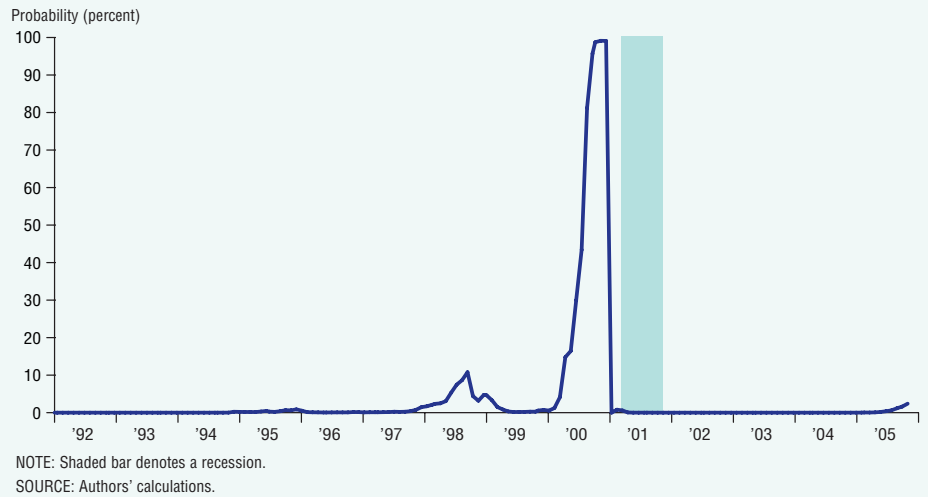
Forecasting GDP Growth

We have three forecasting equations for real GDP growth: one based on financial data for the first month of the quarter, one based on second-month data and one based on third-month data. Financial-indicator coefficients are restricted to be equal across all three equations—a restriction not rejected by the data. Similarly, the total oil-shock effect—but not its timing—is restricted to be the same across equations. Coefficient estimates reported in the table below are obtained using the full sample period, which runs from first quarter 1986 through second quarter 2005. (However, the probabilities displayed in Chart 5 are based on recursive estimates.)

Coefficient Estimates*

Indicator (lag)	Coefficient	Standard error	t statistic
Constant	3.535	.141	25.076
ΔStock prices (−2)	25.487	7.136	3.571
ΔReal short rate (−2)	−.551	.209	−2.635
ΔJunk-bond spread (−2)	−.715	.131	−5.436
First month :			
Oil Shock (−3)	−.008	.004	−2.026
Oil Shock (−4)	−.019	.004	−4.584
Second month:			
Oil Shock (−3)	−.011	.004	−2.979
Oil Shock (−4)	−.015	—	—
Third month:			
Oil Shock (−3)	−.015	.004	−3.771
Oil Shock (−4)	−.012	—	—

Summary Statistics

First month: Adj. R^2 = 0.630   SE = 0.988   SSR = 64.474
Second month: Adj. R^2 = 0.638   SE = 0.978   SSR = 62.193
Third month: Adj. R^2 = 0.618   SE = 1.004   SSR = 65.516

* Dummy variables are used to effectively exclude fourth quarter 1990 through second quarter 1991 and third quarter 2001 through first quarter 2002 from the sample. Iraq's invasion of Kuwait and the 9/11 terrorist attacks had an unforeseeable adverse effect on growth during these periods. Precise definitions of the indicator variables are in the main text.

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cause price and quantity to move in the same direction, while shifts in supply cause price and quantity to move in opposite directions. To capture the asymmetry in the economy's response to oil-supply shocks, only positive values of the resultant series are considered.[8]
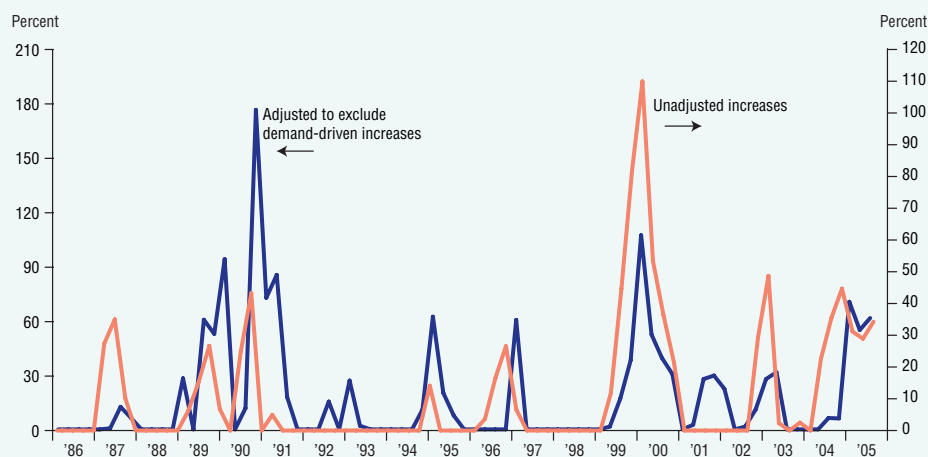
Chart 4 compares our oil-shock variable to a plot of oil-price increases unadjusted for changes in oil consumption. The two series are scaled so their respective means line up with one another. Note how our adjustment enhances the relative size of the 1990 oil-price spike while shrinking the 1987, 1999–2000, 2002–03 and 2004 increases, attributing them partly to increases in U.S. oil demand. In a head-to-head horse race, our oil-shock variable has predictive power for GDP growth, while the unadjusted price-increase series does not.[9]

The Results. In Chart 5, green bars show periods during which actual two-quarter GDP growth fell below 1 percent (light green) or below 0 percent (dark green). Colored lines, meanwhile, show our forecasting model's assessment of the probability that GDP growth over the next two quarters would fall below 1 percent (the blue line) or below 0 percent (the red line). Since there is a one-to-one correspondence between NBER recessions and episodes of negative two-quarter GDP growth, the red line can also be thought of as our model's estimate of the probability of a recession. As of August 2005, the recession probability was only 2.8 percent—well below the levels reached in December 2000 (15.5 percent), July 2002 (16.4 percent) and June 2005 (6.9 percent). A significant "growth recession" was somewhat more likely, with a 15.6 percent probability of GDP growth below 1 percent as of August 2005—down from 23.3 percent in June. Using October data, the probabilities of an outright recession and a growth recession are only 3.8 percent and 21.3 percent, respectively.

Discussion. Although Charts 3 and 5 are currently telling similar stories about the probability of recession, this clearly has not always been the case. In 2000, for example, Chart 3 shows recession chances soaring to near certainty. Chart 5 suggests that the economy was in a weakened condition, vulnerable to an adverse shock, but that outright recession

was far from inevitable. (The economy was equally vulnerable in 2002, according to the chart, but experienced only a period of sluggish growth.)

The differences between the charts reflect differences between the underlying models. The yield-curve model behind Chart 3 treats recessions as distinct from expansions, with distinct dynamics. Recessions are triggered by the cumulative effects of financial-market imbalances, signaled by a short-term interest rate that is too high for too long

relative to the level of long-term rates. Once these cumulative effects reach a critical level, an economic downturn is all but inevitable. One can question the reliability of the signal and, more deeply, the whole notion of an economic tipping point.

In the forecasting model underlying Chart 5, in contrast, a recession is just a period of unusually slow growth; nothing otherwise distinguishes it from a period of economic expansion. Given this assumption, other variables dominate

Chart 4

Recent Oil-Price Increases Largely Demand-Driven Until 2005
(Four-quarter price increases)

SOURCES: *Wall Street Journal*; Haver Analytics; Department of Energy; Bureau of Economic Analysis; authors' calculations.

Chart 5

Forecasting Model Says Recession and Slow-Growth Risks Both Low
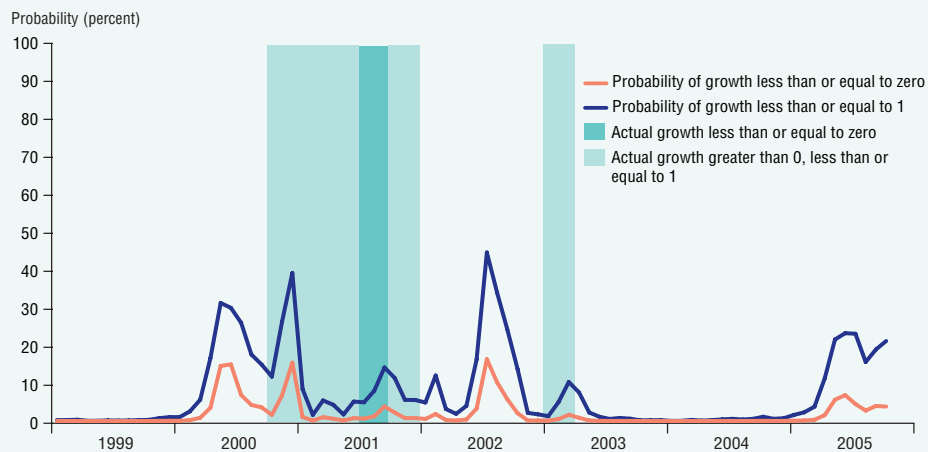
NOTE: The model is estimated recursively from fourth quarter 1998 forward.
SOURCE: Authors' calculations.

the current slope of the yield curve as indicators of the economy's future strength. It is largely coincidence that those other variables now tell much the same story as the yield curve.

Cautious Optimism

Historical links between oil prices, various financial indicators and the real economy suggest that the probability of a recession over the next several quarters is low. Conclusions are basically the same regardless of whether we look at pre- or post-Hurricane Katrina data. This is not to say that Hurricanes Katrina and Rita are unimportant to the economic outlook. Much of the storms' direct adverse impact will be felt at a shorter horizon than that at which our models are designed to forecast.[10] In this sense, the storms slip in under the radar screen of our models. And there is no way we can disentangle the storms' effects from the implications of other economic data released in September.

In any event, the U.S. economy's dynamic nature makes it difficult to predict its future movements. Changes in technology and in environmental and other regulations constantly alter the way energy prices impact the economy and the way it adapts to shocks of all kinds. The standard disclaimer, that past performance is no guarantee of future results, certainly applies.

—Evan F. Koenig
Keith R. Phillips

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Notes

Thanks go to Harvey Rosenblum, Alan Viard and Steve Brown for helpful comments and Nicole Ball for research assistance.

[1] For empirical evidence, see "Predicting U.S. Recessions: Financial Variables as Leading Indicators," by Arturo Estrella and Frederic S. Mishkin, *Review of Economics and Statistics*, vol. 80, February 1998, pp. 45–61.

[2] "Optimal Prediction of Cyclical Downturns," by Salih N. Neftçi, *Journal of Economic Dynamics and Control*, vol. 4, November 1982, pp. 225–41.

[3] Formally, $LI(t) = LI(t-1) + R10(t) - R1(t)$, where $LI(t)$ is the value of the leading index in period t and $R10(t)$ and $R1(t)$ are the 10- year and one-year interest rates, respectively.

[4] Estrella and Mishkin (note 1) question the reliability of multivariate recession-forecasting models partly on these grounds.

[5] The start date is driven partly by the limited availability of comparable

junk-bond data. However, it offers several other advantages. First, it excludes the pre-1984 period of highly volatile GDP growth, and so avoids statistical problems associated with shifts in the variance of the forecasting equation's error term. Second, the sample period is dominated by a single Federal Reserve chairman. This is important because changes in how monetary policy is conducted can alter the empirical links between financial variables and the real economy. Third, oil prices and oil consumption exhibit increased high-frequency volatility following the 1986 oil-price collapse. By excluding pre-1986 data, we needn't worry about modeling this break in behavior when we construct our oil-shock variable. (See the appendix to this article on the Dallas Fed's web site, www.dallasfed.org.) Finally, the reductions in the energy intensity of the U.S. economy that followed the big oil-price hikes of the 1970s slowed after 1985. (See Alan Greenspan's remarks before the Japan Business Federation, Japan Chamber of Commerce and Industry, and Japan Association of Corporate Executives, Tokyo, Oct. 17, 2005, www.federalreserve.gov.) By starting our sample in 1986, we lessen concerns about a possible gradual weakening of the links between oil prices and economic activity.

Over the sample, there is a total of three quarters during which growth was negative and another eight quarters in which growth was positive but below 1 percent. Over the full sample, then, growth was negative $100 \times 3/79 = 3.8$ percent of the time and was below 1 percent $100 \times 11/79 = 13.9$ percent of the time. The average GDP growth rate

is 3.08 percent per year, with a standard deviation of 1.63 percentage points.

[6] "The Information in the High-Yield Bond Spread for the Business Cycle: Evidence and Some Implications," by M. Gertler and C. S. Lown, *Oxford Review of Economic Policy*, vol. 15, Autumn 1999, pp. 132–50.

[7] "Business Cycles and Energy Prices," by Stephen P. A. Brown, Mine K. Yücel and John Thompson, in *Encyclopedia of Energy*, vol. 1, Cutler J. Cleveland, ed., Elsevier-Academic Press, 2004, and "What Is an Oil Shock?" by J. D. Hamilton, *Journal of Econometrics*, vol. 113, issue 2, 2003, pp. 363–98.

[8] Formally, the oil-shock variable is $SHOCK(t) = \max\{0, \Delta P(t) - 17.5 \times \Delta Q(t)\}$, where $\Delta P(t)$ is the four-quarter percentage change in the real price of oil less its sample average and where $\Delta Q(t)$ is the four-quarter percentage change in total U.S. demand for petroleum products less its sample average. The appendix accompanying this article on www.dallasfed.org gives details of the derivation.

[9] We obtain similar results in a head-to-head comparison with an oil-shock variable suggested by Hamilton (note 7), which counts only oil-price increases that are not merely a reversal of recent price declines.

[10] The Congressional Budget Office estimates that the hurricanes will knock between 0.17 and 0.26 percentage points off GDP in the second half of 2005. Then, recovery efforts will boost first-half 2006 GDP by between 0.19 and 0.28 percentage points, relative to baseline.

A New Barometer for the Texas Economy

The Federal Reserve Bank of Dallas has introduced the Texas Manufacturing Outlook Survey, a new tool designed to provide insights into current activity and expectations for growth in the state's manufacturing sector.

The new monthly survey, which launched its premier release November 28, is based on manufacturers' responses to questions about their Texas operations. It asks about changes in production, capacity utilization, orders, inventories, prices, employees and capital expenditures. Other questions solicit opinions about general business activity.

For all questions, participants are asked whether the indicator has increased, decreased or remained unchanged. Answers cover changes over the previous month and expectations for activity six months into the future. Roughly 80 manufacturers regularly participate in the Dallas Fed survey, which began collecting data in May 2004.

Anecdotal assessments like the manufacturing survey do not measure output or employment directly, but they are nevertheless valuable tools.[1] Those operating on the front lines of business are often the first to see changes in economic conditions. By tapping into their real-time collective judgments, including observations about prospects for growth, the surveys can provide timely readings on the economy.

The anecdotal surveys provide information right away and are not subject to large revisions. Generally, regional data are available only with a substantial lag and are often revised as much as a year later.

Texas Manufacturing

The outlook survey focuses on manufacturing because movements in this sector can be particularly useful for understanding changes in the general economy. Swings in business activity are often felt more quickly and more intensely in the manufacturing sector, which tends to be more cyclically sensitive than the total economy.

Texas is important to the nation's manufacturing. The state produced roughly $98 billion worth of manufactured goods in 2003, about 7 percent of the country's output. Texas ranks second, behind California, in factory production and first as an exporter of manufactured products.

Texas' share of the nation's factory output has been on the rise. A low cost of living, fast-growing workforce and favorable business climate have attracted factories to Texas from other parts of the country. Although both Texas and the United States lost a sizable number of manufacturing jobs during the 2001 recession, Texas manufacturers added workers in 2005 while U.S. factories continued to shed jobs.

Chart 1 shows Texas manufacturing output as a percent of the nation as a whole. Not surprisingly, Texas turns out a large share of the country's petroleum and coal products, reflecting the muscular refining industry. Texas also claims nearly 10 percent of the nation's output in computer and electronics products and nonmetallic mineral products, such as brick, glass and cement.

Survey Execution and Results

Near the end of each month, the questions for the new manufacturing survey are electronically transmitted to respondents. Answers are collected over a few days.[2] Survey respondents are instructed to exclude the effects of normal seasonal changes. After sufficient

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Chart 1

Texas Manufacturing Output as a Share of U.S. Output
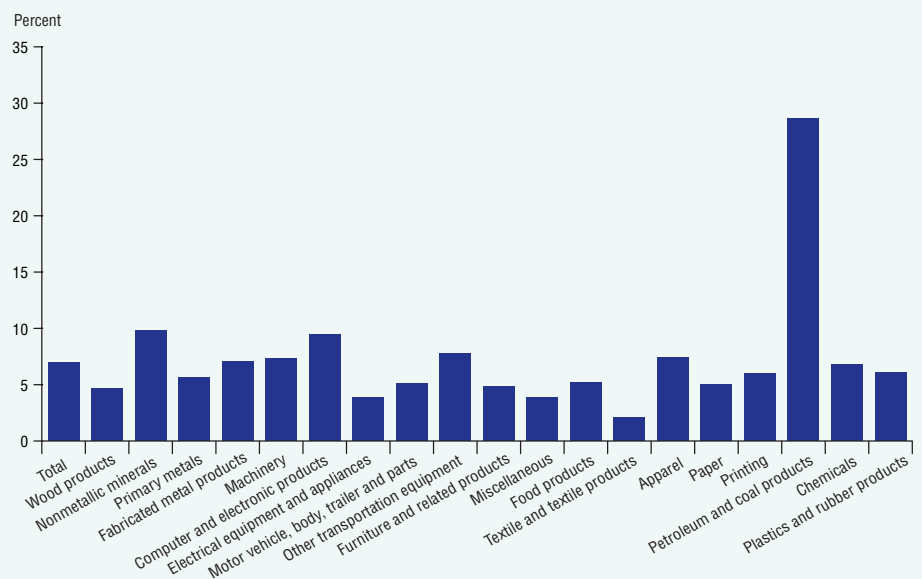
NOTE: Data are for 2003.
SOURCE: Bureau of Economic Analysis.

data are gathered, the survey will be statistically tested for the presence of seasonality and corrections will be made as necessary.

Survey responses are used to calculate an index for each question. Each index is calculated by subtracting the percentage reporting a decrease from the percentage reporting an increase. When all firms report that activity has increased, an index will register 100. An index will register −100 when all firms report a decrease. An index will be zero when the number of firms reporting an increase or a decrease is equal.

To date, the manufacturing survey's index for general business activity has been consistently positive (Chart 2). The index for future activity has remained mostly above the index for current activity, suggesting optimism among firms that their business will improve over the next six months.

The index for production has also remained in positive territory (Chart 3). Once again, the production index for future activity continues to be stronger than for current production, suggesting that firms believe output will increase over the next six months. The future production index rose in August and September 2005.

The manufacturing employment index has remained generally positive, although it dipped slightly below zero in October 2004 (Chart 4). This index has been weaker than the other indexes. This is consistent with the general increase in productivity that has been occurring in manufacturing for years, with output increasing at a stronger rate than employment. Echoing the production index, the employment index for future activity rose in August and September 2005, suggesting growing optimism about future manufacturing activity in the state.

Other FRB Indexes

The Texas Manufacturing Outlook Survey is the fifth such survey published by a Federal Reserve Bank. The Philadelphia Fed was the first to introduce a survey, starting in 1968. The Richmond, Kansas City and New York Federal Reserve Districts also publish manufacturing outlook surveys. These indexes have become useful tools that provide

Chart 2

General Business Activity

Chart 3

Production

Chart 4

Employment

insights into the regional and national economies—a factor in the Dallas Fed's decision to create its own.

Three recent Federal Reserve Bank studies have found positive results for the ability of their respective Business Outlook Surveys to predict regional economic indicators.[3] In their article "What Can Regional Manufacturing Surveys Tell Us? Lessons from the Tenth District," William R. Keeton and Michael Verba report that the Kansas City Federal Reserve District's employment indexes provide substantial information about current and future growth in district manufacturing employment.[4] They also suggest that their survey provides valuable information about production, orders and capital spending for which no independent regional data exist in their district.

Matthew Harris, Raymond E. Owens and Pierre-Daniel G. Sarte report that the Richmond Federal Reserve Bank employment index leads changes in manufacturing employment by one quarter and is a timely gauge of movements in personal income in the Richmond Federal Reserve District.[5]

In a parallel result, Timothy Schiller and Michael Trebing report that the Business Outlook Survey Index for the Philadelphia Federal Reserve District is a significant variable in explaining movements in the district's manufacturing employment.[6]

The Dallas Fed cannot yet make similar claims for its Texas Manufacturing Outlook Survey because there are not sufficient data to seasonally adjust the index or to test its relationship to employment, output or other data. Other Federal Reserve Bank indexes benefit from seasonal adjustment, and the Dallas Fed index will be seasonally adjusted as soon as three years of data are available. At the same time, the Dallas Fed will continue to test the index against key economic measures, with the intent of honing its predictive power.

Survey Availability

The Texas Manufacturing Outlook Survey adds another tool to an already large set of indicators the Dallas Fed has developed to track the Texas economy. (See the box titled "Dallas Fed's Regional Economic Tool Kit.") The Bank expects this monthly survey to provide timely indicators for future Texas employment, manufacturing output and personal income, as well as other regional economic variables of interest.

Survey results will be posted each month on the Dallas Fed web site. An electronic mailing list is available to notify recipients each month when new data are released. To subscribe, go to the Dallas Fed web site at www.dallasfed.org and click on "E-mail Alerts" under "Tools."

—Fiona Sigalla
Franklin D. Berger
Thomas B. Fomby
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Notes

This index could not have been developed without the help of Mine Yücel, Mario Hernandez, Donya Sonnier, Stephen Douglass and Matthew Garibaldi. Also helping with production of the survey or this article were Tonya Abna, Jennifer Afflerbach, Richard Alm, Laila Assanie, Suzanne Babb, Anna Berman, Anne Coursey, Elizabeth Delaire, Dianna Elzner, Connie Nevarez, Raghav Virmani and Andrea Willis.

[1] The Federal Reserve System regularly conducts an anecdotal Survey of Current Economic Conditions prior to every Federal Open Market Committee meeting. For more information about this survey and its success in predicting economic conditions, see "How Well Does the Beige Book Reflect Economic Activity? Evaluating Qualitative Information Quantitatively," by Nathan S. Balke and D'Ann Petersen, *Journal of Money, Credit and Banking*, vol. 34, February 2002, pp. 114–36.

[2] A copy of the survey form is available on the Dallas Fed web site, www.dallasfed.org.

[3] Other studies have reported positive results for the predictive power of business outlook surveys and national economic indicators. For example, see "The Predictive Abilities of the New York Fed's Empire State Manufacturing Survey," by Richard Deitz and Charles Steindel, Federal Reserve Bank of New York *Current Issues in Economics and Finance*, Second District Highlights, vol. 11, January 2005.

[4] Federal Reserve Bank of Kansas City *Economic Review*, Third Quarter 2004, pp. 39–69.

[5] "Using Manufacturing Surveys to Assess Economic Conditions," Federal Reserve Bank of Richmond *Economic Quarterly*, vol. 90/4, Fall 2004, pp. 65–92.

[6] "Taking the Measure of Manufacturing," Federal Reserve Bank of Philadelphia *Business Review*, Fourth Quarter 2003, pp. 24–37.

Getting a Jump on Texas Employment Revisions

The Dallas Fed has revised its estimate of Texas job growth over the past year from 1.8 percent to 2.4 percent—an additional 57,000 jobs were added between September 2004 and September 2005.

The Bureau of Labor Statistics (BLS) and Texas Workforce Commission (TWC) are currently reporting 1.5 percent job growth for the September 2004 to September 2005 period, 85,000 fewer jobs than the Dallas Fed's current estimate. The BLS and TWC are expected to upwardly revise Texas employment growth in March 2006. In the past, the Dallas Fed employment estimates have done a good job of predicting BLS and TWC revisions.

Preliminary payroll employment estimates are based on a sampling of firms known as the Establishment Survey. The BLS, TWC and Dallas Fed use these data to calculate initial job growth estimates for the most recent months.

Another estimate of employment is computed using quarterly filings made by firms reporting the number of employees eligible for unemployment insurance. This estimate, referred to as the Covered Employment and Wages Survey, is much more comprehensive but is available only with a lag of several months.
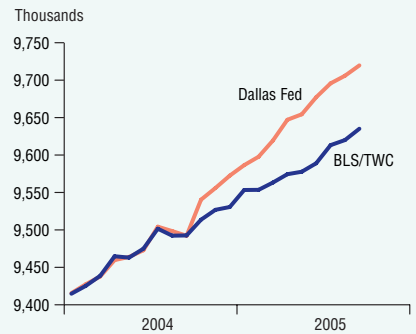
The BLS and TWC revise initial job growth estimates using the more comprehensive data in March of each year. The Federal Reserve Bank of Dallas re-estimates job growth four times per year, as soon as the more comprehensive data become available.[1] The difference between these employment series can, at times, be substantial.

Chart 1 shows how the early use of these new data has led to a difference between employment data reported by the Federal Reserve Bank of Dallas and data reported by the TWC and BLS.

Dallas Fed employment estimates indicate stronger job growth for most sectors of the economy compared with BLS data over the past year. The largest difference is for the professional and business services sector, where the Dallas Fed is reporting 34,200 more jobs than current BLS estimates (*Chart 2*).
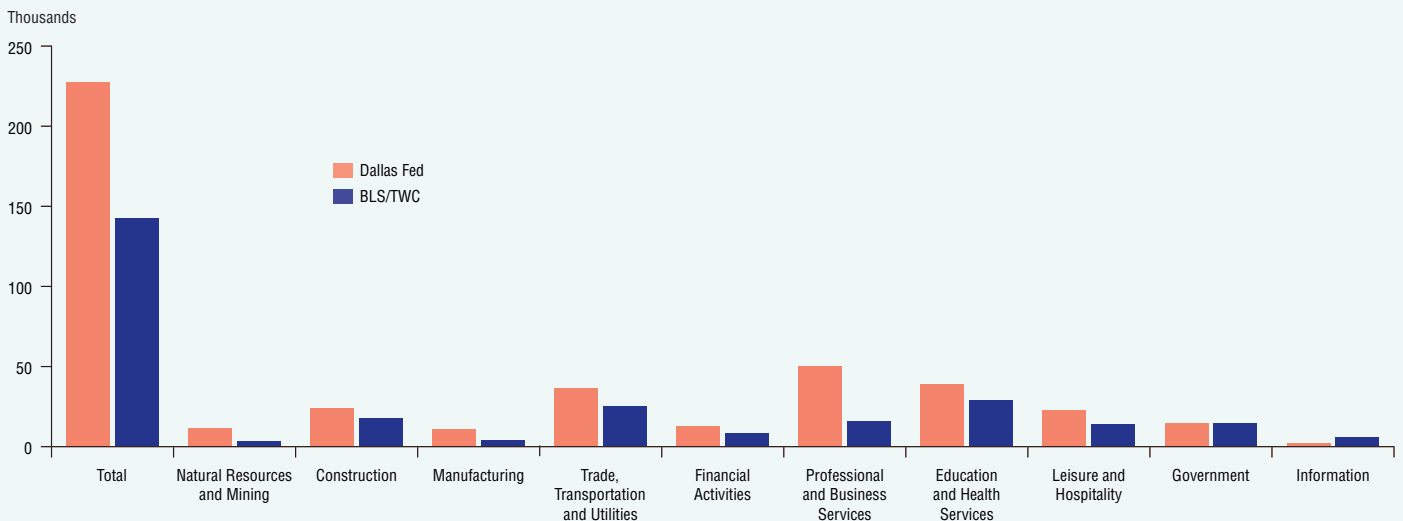
The revised data also show sizable increases in employment estimates for most major metropolitan areas. For example, Dallas Fed estimates suggest that San Antonio job growth has increased nearly a full percentage point more than indicated in data that do not include the

Chart 1

Dallas Fed Reporting Stronger Growth than BLS/TWC
(Texas total nonfarm employment)

Thousands

[Line chart showing Dallas Fed and BLS/TWC employment series from 2004 to 2005, with values ranging from about 9,400 to 9,750 thousand. The Dallas Fed line rises higher than the BLS/TWC line.]

Chart 2

Most Sectors Report Stronger Growth in Revised Data
(Texas payroll employment, September 2004–September 2005)

Thousands

[Bar chart comparing Dallas Fed (orange) and BLS/TWC (blue) payroll employment changes across sectors: Total, Natural Resources and Mining, Construction, Manufacturing, Trade, Transportation and Utilities, Financial Activities, Professional and Business Services, Education and Health Services, Leisure and Hospitality, Government, Information. Total is about 228 (Dallas Fed) and 143 (BLS/TWC).]

NOTE: Dallas Fed data were seasonally adjusted by the Dallas Fed. BLS/TWC data were seasonally adjusted by the BLS/TWC, except for the information sector, which the Dallas Fed adjusted because the BLS and TWC do not adjust this series.

Yuan Diplomacy: China, Taiwan Vie in Latin American Trade Arena

In recent years, much of the talk in Central America's business communities has revolved around competition with China in the garment trade. In the early 1990s, Chinese apparel exports to the United States were more than twice those of the countries that would become part of the Central American Free Trade Agreement (DR-CAFTA)—Costa Rica, the Dominican Republic, Guatemala, Honduras, Nicaragua and El Salvador. By 1994, these countries had begun to capture U.S. apparel market share from China and, by 1998, had overtaken China.

The DR-CAFTA countries' competitive advantages included trade openings with the U.S. that China did not share. The U.S. has encouraged the apparel industry in Central America and the Caribbean islands through trade arrangements in the Caribbean Basin Initiative (1985) and related acts and agreements in 2000 and 2002. However, China's 2001 entry into the World Trade Organization increased its competitive opportunities in textiles and apparel. The following year, China's U.S. apparel sales pushed past DR-CAFTA's.

The competition remains intense. China's apparel production costs are only 75 percent of Nicaragua's and 62 percent of Guatemala's. But the average time required for transporting textiles and apparel to the U.S. from DR-CAFTA countries is less than one-third China's. Overall, the average turnaround between receipt of an order and delivery to the U.S. is about four weeks for DR-CAFTA nations and 10 weeks for China.[1]

Although the DR-CAFTA countries are going head to head with China in economic competition, there is reason to think that China may seek ways to buy their diplomatic cooperation. China has been devoting considerable effort to economic diplomacy in Latin America. In 2004, President Hu Jintao visited Argentina, Brazil, Chile and Cuba. China's vice president, Zeng Qinghong, visited Mexico, Venezuela and Peru. Chinese investment projects in those countries were announced in conjunction with the visits. These investments seem designed largely to create stable supply sources to China and to allow Chinese firms to profit on the supply end. Many of the announced investment plans involve raw materials production, metal smelting and transportation infrastructure. Another Chinese initiative appears to be textile investments in Mexico—another significant, though waning, apparel exporter to the U.S.

China's investments in Latin America have been small by U.S. standards. But in Brazil alone, some 50 Chinese firms have already directly invested. In 2004, 46 percent of total Chinese foreign direct investment went to Latin American and Caribbean countries. The new projects are said to be dominated by the Chinese equivalents of Japanese *keiretsu*—large business conglomerates with strong government ties.

China's Latin American diplomatic forays and investments may well have political implications for its future involvement in Central America. It is no secret that China wants Latin American nations to break their diplomatic ties with Taiwan. Twelve of the 25 nations that still recognize Taiwan are in Latin America and the Caribbean. Six of the 12 are in DR-CAFTA.

In some countries, China has already announced investment and aid plans substantially larger than Taiwan's. Last year, Taiwanese newspapers complained that the new prime minister of the Caribbean island country of Dominica asked Taiwan for $58 million in aid and then accepted a package from China for double that amount. In response, Dominica dropped its diplomatic recognition of Taiwan. The Taiwanese argue that China's financial program for Dominica is part of an ongoing attempt to discredit Taiwan's unusually independence-focused president, Chen Shui-bian. Since Chen took office in 2000, not only Dominica but also Macedonia, Nauru, Liberia and Grenada have all dropped diplomatic recognition of Taiwan.

Taiwan's ties to the DR-CAFTA countries include announcements of investment plans in Guatemala and other DR-CAFTA countries. Not to be outdone by Chinese diplomacy, Taiwan's Chen made a 12-day tour of Central American and Caribbean countries in September. Taiwanese Vice President Annette Lu also made a diplomatic tour of Central America.

But President Chen's term of office ends in 2008, leaving plenty of time for more Chinese diplomatic efforts at reducing world support for Taiwan during his administration. It would not be surprising to see China attempt to make the DR-CAFTA countries adopt its political perspective. There are already reports that China plans textile investments in Central America.

The DR-CAFTA accord includes duty-free benefits on fibers, fabrics, yarns and apparel made in member countries, giving DR-CAFTA countries an advantage over China in selling to the U.S. The tariff savings might offset some of China's lower production costs. Coupled with these factors, political incentives might be more reason for Chinese textile operations in Central America.

It is conceivable that the Chinese might realize a price advantage from the region's "spaghetti bowl" of free trade agreements, perhaps by producing textiles in Mexico for manufacture into apparel in Central America. This, however, ignores the Taiwan issue. Investments, whether in textiles or other industries, could turn up as carrots for DR-CAFTA countries that consider playing the mainland China side of the street.

—William C. Gruben

Gruben is director of the Center for Latin American Economics and a vice president of the Federal Reserve Bank of Dallas.

Note
[1] *The Emergence of China: Opportunities and Challenges for Latin America and the Caribbean,* edited by Robert Devlin, Antoni Estevadeordal and Andres Rodriguez, Inter-American Development Bank, 2005.

Hurricanes Katrina and Rita roiled economic activity and statistics, but aside from these unprecedented events, the Texas expansion has strengthened in recent months.

Storm evacuees stimulated the real estate market, particularly for apartments, and boosted demand for many goods and services. Oil production and refining activity was severely disrupted, but demand for energy products remains strong and repairs to industry infrastructure are under way. The extent and duration of the hurricanes' effect are still uncertain.

September's new claims for unemployment insurance jumped as a result of the hurricane disruptions. The Texas unemployment rate also increased sharply in September but was subsequently revised to a mild rise. While these effects are expected to be largely temporary, they are dampening growth in the Texas Coincident Index and have contributed to a decline in the Texas Leading Index.

The hurricanes also contributed to a sharp hike in the price of many goods and services, particularly energy, petro-chemicals and some construction products. Business contacts interviewed for the October Beige Book expressed increased uncertainty about the outlook for economic activity, mostly because of higher energy prices. Contacts interviewed for the November Beige Book continue to be cautious but have become more optimistic.

The Texas expansion has strengthened in recent months, in part because of growth of construction activity. In recent years, Texas' construction sector has been slower than the rest of the country's. But construction employment has picked up in 2005, boosted by strong apartment building and a recent surge in home building.
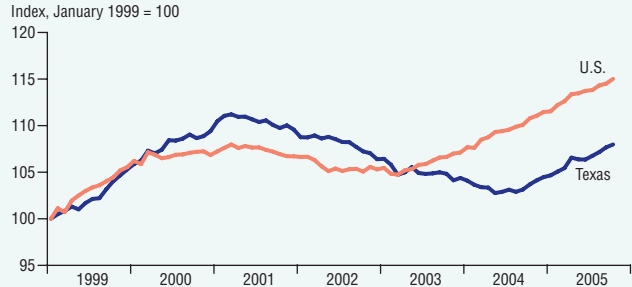
Employment growth has remained solidly in positive territory this year. Job growth is typically stronger in Texas than in the rest of the country, but after 2000 it had grown at about the same pace. The Texas economy is now more likely to be an asset to U.S. economic growth, albeit not at the magnitude it was over the past couple of decades.
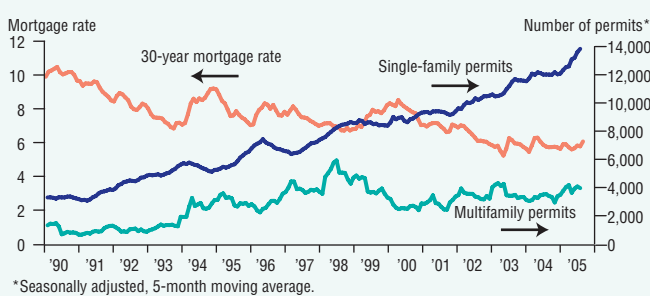
—Fiona Sigalla
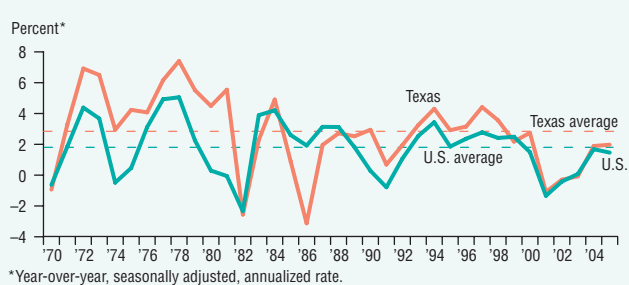
Texas Total Nonfarm Employment Strengthens
Percent growth*

*Month-over-month, seasonally adjusted, annualized rate.

Construction Employment
Index, January 1999 = 100
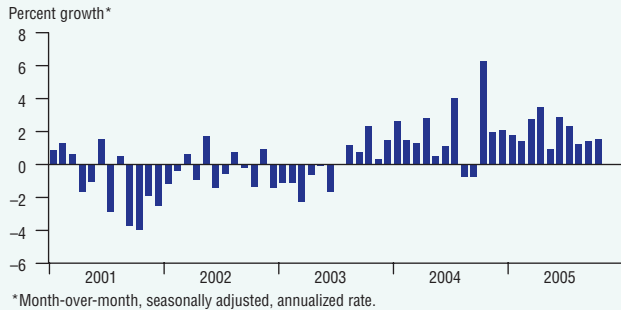
Texas Residential Permits and Mortgage Rate
Mortgage rate / Number of permits*

30-year mortgage rate · Single-family permits · Multifamily permits

*Seasonally adjusted, 5-month moving average.

Texas Usually Outpaces U.S. Employment Growth
Percent*

Texas · Texas average · U.S. average · U.S.

*Year-over-year, seasonally adjusted, annualized rate.

Regional Economic Indicators

| | Texas Leading Index | TIPI† total | TEXAS EMPLOYMENT* | | | | | TOTAL NONFARM EMPLOYMENT* | | |
			Mining	Construction	Manufacturing	Government	Private service-producing	Texas	Louisiana	New Mexico
10/05	122.6	132.7	164.0	567.4	899.4	1,673.1	6,424.6	9,729.8	1,699.4	811.7
9/05	121.4	132.9	163.8	565.8	899.3	1,673.2	6,413.8	9,717.4	1,695.6	809.4
8/05	122.8	132.1	163.5	563.1	899.0	1,672.3	6,406.4	9,705.9	1,935.6	806.3
7/05	122.1	132.7	163.1	561.0	899.5	1,671.4	6,399.2	9,695.7	1,930.1	806.1
6/05	122.6	131.5	162.7	558.9	896.3	1,668.3	6,390.1	9,677.2	1,933.6	806.1
5/05	121.0	131.8	161.5	559.0	894.9	1,665.6	6,371.7	9,654.4	1,932.4	807.6
4/05	121.2	131.3	160.8	560.0	894.5	1,664.9	6,364.6	9,647.1	1,933.4	804.7
3/05	122.2	130.2	159.3	554.1	894.6	1,664.8	6,345.8	9,619.5	1,931.5	802.1
2/05	121.6	129.9	158.8	552.1	894.0	1,663.6	6,328.5	9,597.7	1,924.8	799.4
1/05	120.5	129.0	157.9	550.0	893.8	1,665.2	6,318.0	9,586.5	1,926.5	799.7
12/04	121.2	129.2	155.2	549.0	893.5	1,664.4	6,306.8	9,572.5	1,916.9	799.1
11/04	119.4	129.1	154.9	547.2	893.3	1,662.8	6,294.9	9,555.9	1,920.3	796.9

* In thousands. † Texas Industrial Production Index.

Getting a Jump on Texas Employment Revisions

(Continued from page 17)

Chart 3

Metro Employment Growth

Percent*

Legend: Dallas Fed, BLS/TWC

Categories: Austin, Dallas, El Paso, Fort Worth/Arlington, Houston, San Antonio

*September 2004/September 2005, annualized rate. Both series were seasonally adjusted by the Dallas Fed.

more comprehensive survey (*Chart 3*).

The Dallas Fed's Texas payroll employment estimates are updated monthly and posted on the Dallas Fed web site, www.dallasfed.org, in the Regional Data section. Selected data are also published in *Southwest Economy*.

—Franklin D. Berger
Fiona Sigalla

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Note

[1] In mid-October, new data from the Covered Employment and Wages Survey were released for second quarter 2005. Data were revised for first quarter 2005. The Dallas Fed also improves the quality of its employment data estimates by using a sophisticated seasonal adjustment technique. For more information about both of these statistical adjustments, see "Reassessing Texas Employment Growth," by Franklin D. Berger and Keith R. Phillips, Federal Reserve Bank of Dallas *Southwest Economy*, July/August 1993 (www.dallasfed.org/research/swe/1993/swe9304a.pdf).