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Southwest Economy

Empty Spaces: Are Texas Office Markets on the Road to Recovery?

Office markets are cyclical by nature, but in Texas the booms tend to be larger and the busts seem to last longer. In the past, Texas' office construction was sometimes driven by external factors—such as oil prices and tax law changes—in addition to economic fundamentals. However, beginning in the 1990s, Texas real estate was driven more by supply and demand.

Economic prosperity in the 1990s, partly thanks to the high-tech boom, breathed life into Texas office markets that had been stagnant since the mid-1980s bust. Demand for office space rose strongly, rents increased at double-digit rates and construction cranes dotted the Texas skyline.

The national recession that began in March 2001, along with the high-tech bust and catastrophic events of 9/11, took a toll on the Texas economy, however. The downturn hit harder and lasted longer in Texas than elsewhere in the country. As firms downsized, office vacancies in Texas markets climbed quickly and rents began falling.

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Supply Chain Management: The Science of Better, Faster, Cheaper

Over the past 20 years, real GDP growth in the United States has become strikingly less volatile. Extreme movements in output occur far less often today, and there have been only two relatively mild recessions since 1982. In addition, about 10 years ago productivity growth began to accelerate. The average annual productivity growth rate since 1995 is about double that experienced from 1973 to 1995.

Improved economic stability and accelerating productivity growth have important policy implications. Specifically, accelerating productivity ultimately leads to higher living standards and fewer and milder periods of declining output. This makes the economy more resilient and flexible. Together, rising

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INSIDE:
Domestic Policy No Match for Trade Stance of Central American Countries

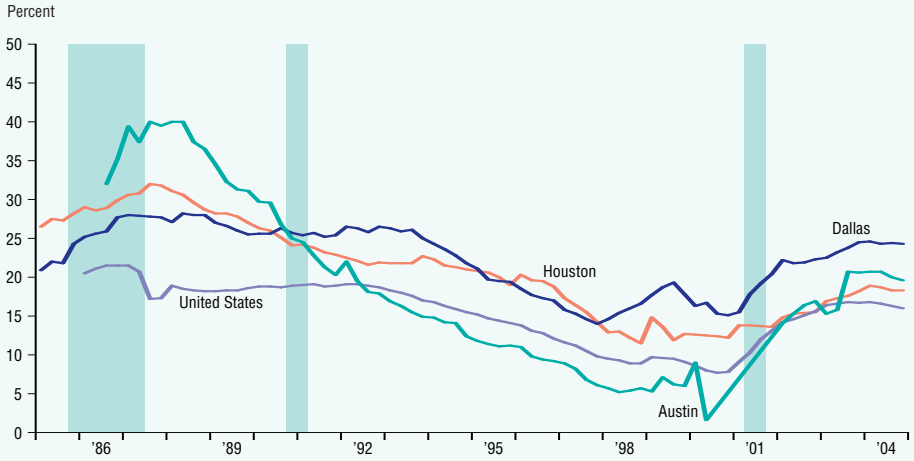
How do Texas office markets stack up currently? At just over 24 percent vacancy, Dallas tops the list of U.S. cities with the highest office vacancy rates. With a vacancy rate near 20 percent, Austin's office market is still in need of tenants. Houston's office sector didn't fare as badly in the most current recession, but its vacancy rate is still above the national average.[1]

Are Texas office markets poised for a rebound? The outlook is murky. Employment growth and corporate relocations are the engines that drive Texas office demand, and these haven't revved up much during this recovery. Texas job growth has lagged the nation during the current recovery and is well below its historical pace. While some corporate relocations have been announced, the pace pales in comparison with that of the early 1990s.

In this article I look at current vacancy rates and employment growth in industries most important for office demand. I then compare these figures with vacancy and employment data from past real estate cycles to gain perspective on prospects for recovery in Texas office markets.

Chart 1

Dallas Tops List with Highest Metropolitan Office Vacancy Rate



NOTE: Shaded areas indicate recessions.
SOURCE: CB Richard Ellis (from Haver Analytics Database).

The 2001 Recession: Bad Timing for Texas Office Markets

The 1990s were good times for Texas real estate. Texas' central location, low cost of living and doing business, abundant land and multiple modes of transportation attracted businesses and people to the state. The state's booming economy fueled the demand for office space, eliminating the overhang from the 1980s and even spurring the need for new construction. (See the box titled "Office Real Estate Cycles in Texas: Some History.") Office vacancy rates fell from 1990 highs of between 25 and 30 percent to single digits in Austin and the mid-teens in Dallas and Houston by 2000 (*Chart 1*).

As the U.S. and Texas economies began to slow in 2000, office vacancy rates began edging up and construction eased. However, the events of 9/11, combined with the high-tech bust and a national recession, blindsided Texas office markets. The Texas economy was hit especially hard by the downturn because much of its growth in the previous 10 years had come from expansion of the high-tech sector. As firms downsized, demand for office space vanished.

Although the U.S. economy emerged from its downturn in late 2001, the Texas economy remained mired in recession until mid-2003.[2] The Dallas and Austin economies, which witnessed the fastest growth of the state's major metros during the '90s, were hit tremendously hard in the prolonged Texas downturn. The Dallas/Fort Worth metroplex lost about 132,000 jobs between the end of 2000 and December 2003. Roughly 30,000 of these losses came from the information sector, while 48,000 were eliminated from trade and transportation. Austin's manufacturing sector (which includes semiconductor production) eliminated almost 28,000 jobs between December 2000 and December 2003, while the information sector fell by 5,000 jobs.[3]

Because the high-tech bust was so pronounced in Dallas and Austin, these cities witnessed the biggest hit to their office markets. Dallas, known in the 1990s for its large concentration of telecom jobs, saw its office vacancy rate jump from a low of 15.1 percent in fourth quarter 2000 to 24.5 percent by fourth quarter 2003 as telecom firms laid off workers. Austin's vacancy rate soared from a low of near 2 percent to above 20 percent by the end of 2003.[4]

Houston's economy weathered the recession better than most of Texas' major metros. As a result, vacancy rates in its office market didn't skyrocket as in Austin and Dallas. Nevertheless, Houston didn't come through the recession unscathed. Although overall employment didn't fall, some industries important to office demand, such as professional and business services and information, witnessed declines. Additionally, the Enron scandal left a prominent downtown skyscraper vacant and further reduced employment in oil-related services.[5] By the end of 2002, Houston vacancy rates began to inch up at a faster pace than the U.S. average.

The Slow Recovery: Are We There Yet?

Although Texas emerged from recession in mid-2003, the recovery since then has been out of character for Texas, with tepid employment growth well below the state's historical pace. Chart 2 shows Texas employment growth by major sector for the 12 months of 2004 compared with the same months during the recovery following the 1990–91 recession. Most sectors recorded positive job growth in 2004, yet less than half that seen in the previous recovery. Additionally, manufacturing and information—which are largely high tech oriented—continued to witness job declines last year.

The sluggish employment recovery has kept demand for office space at a

Office Real Estate Cycles in Texas: Some History

In the oil boom years of the mid- to late 1970s and early 1980s, Texas' office construction increased dramatically. At first, the strong pace of office construction seemed to be driven by healthy economic growth. In fact, a U.S. recession in 1974–75 was barely felt in Texas, thanks to upward spiraling oil prices that helped spur growth in Texas employment. Nonresidential construction more than quadrupled in Texas, while office vacancy rates fell to well below 10 percent.[1]

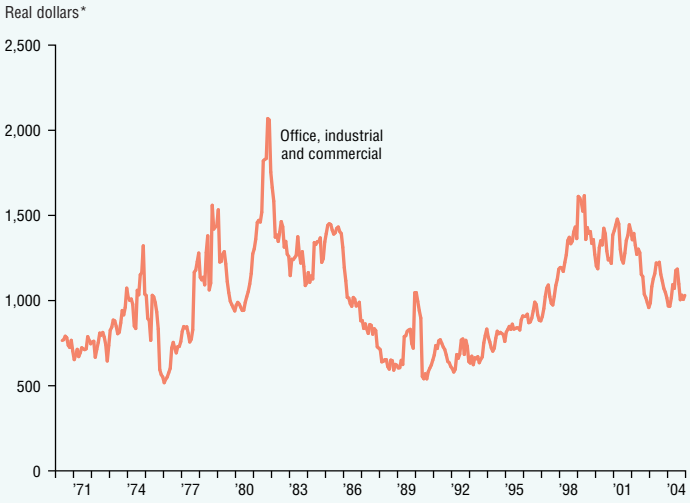
In 1981 the U.S. economy entered a recession, and the Texas economy followed as oil prices began to fall. Despite the downward path of the economy, Texas nonresidential construction continued to rise (*Exhibit 1*). The high level of construction activity in the early 1980s was motivated in part by the Economic Recovery Tax Act of 1981 (ERTA), which encouraged the flow of funds into commercial real estate. At the same time, it became easier to obtain financing due to new legislation that created a larger pool of funds for investing. Together, these factors caused construction to well outpace the demand for office space, leading to massive overbuilding.

In 1986, the bottom fell out of office real estate, and Texas became the center of the storm in a national real estate collapse. Declining oil prices had already sent the Texas economy into a prolonged recession. Moreover, the passage of the 1986 Tax Reform Act removed the advantages given to real estate by ERTA. Real estate investors were hurt as property values fell, and savings and loans and banks were in crisis as bad real estate loans created huge losses. Eventually the Resolution Trust Corp. took charge of failing savings and loans and banks. Its cash-only fire sales of foreclosed properties reduced the value of Texas office properties even further.[2]

Exhibit 1

Office Construction Cycles Boom and Bust in Texas

Texas Construction Contract Values



*Seasonally adjusted, five-month moving average.

SOURCE: McGraw-Hill Construction Dodge.

The 1990s Rebound. A rebound in the Texas economy by 1987 and a prolonged dearth of construction through 1991 brought healthier fundamentals back to the Texas office sector. The U.S. recession of 1990–91 slowed the recovery slightly but had little impact on office vacancy rates in major Texas metros, which continued to edge lower.

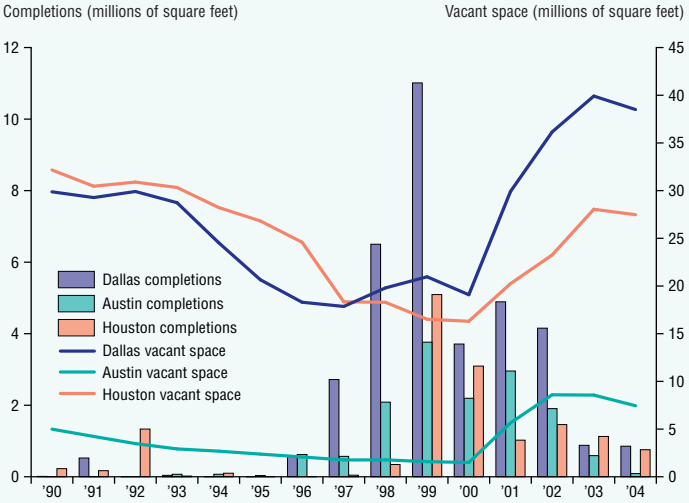
By 1993, as the Texas economy picked up speed, demand for office space intensified, and vacancy rates came down further as construction remained low. Only by the mid- to late 1990s did office demand necessitate new construction, and developers responded eagerly, especially in Dallas.

As Exhibit 2 shows, Dallas' vacant office space fell from 29.8 million square feet in 1990 to 17.8 million square feet by 1997, when office construction really began to pick up. Dallas office completions peaked in 1999 at 11 million square feet.[3]

Austin's office market benefited from the high-tech boom in the 1990s. As the industry took off, vacant office space fell from 4.9 million square feet in 1990 to 1.5 million square feet by 2000. Office space became scarce in the late 1990s as Austin's vacancy rate hovered near 5 percent, and developers began putting up office structures. The pickup in office construction occurred later in Houston, but by 1999, 5 million square feet of office space entered the market as the amount of vacant space fell to 16.5 million square feet.

Exhibit 2

Office Market



SOURCE: Reis Inc.

Another Down Cycle: 2001. The 2001 recession—which lasted much longer in Texas than elsewhere in the United States—once again put Texas at the top of the office vacancy list. Dallas and Austin markets were hit especially hard, as their economies were strongly tied to high-tech industries that endured massive layoffs. The table shows vacancy rates among select U.S. metros. Austin and Dallas, which were among metros with the highest office vacancy rates in the country in the 1980s, are again near the top of the pack.[4]

Notes

[1] For further detail, see "The Texas Construction Sector: The Tail That Wagged the Dog," by D'Ann Petersen, Keith Phillips and Mine Yücel, Federal Reserve Bank of Dallas *Economic Review*, Second Quarter 1994.

[2] For a good explanation of how the boom and bust of Texas real estate impacts investors, see *Timing the Real Estate Market*, by Craig Hall, New York: McGraw-Hill, 2004.

[3] Data provided by Reis Inc.

[4] Dallas' vacancy rate consistently exceeds the nation's, which may be partially because Dallas is normally a high-growth metro area, and knowing this, developers put up more speculative space with the expectation that demand will catch up quickly.

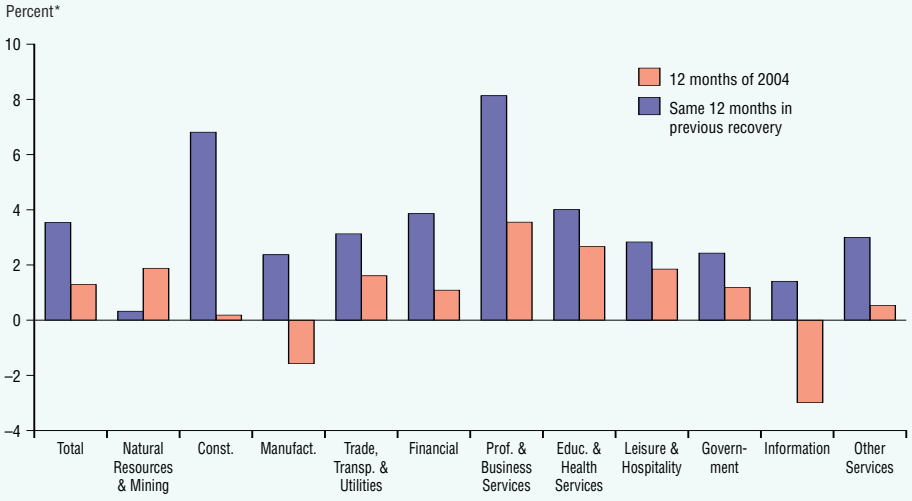
Office Vacancy Rates in Metropolitan Areas

	1986 4th Quarter (percent)	1990 1st Quarter (percent)	2000 3rd Quarter (percent)	2004 4th Quarter (percent)
United States	21.5	18.8	7.7	16.0
Austin	35.2	29.7	3.5*	19.6
Dallas	27.7	25.6	15.3	24.3
Houston	29.9	26.3	12.4	18.3
Atlanta	18.3	18.7	9.6	22.9
Chicago	17.3	15.5	8.8	16.2
Columbus	15.6	15.7	11.4	24.1
Denver	26.5	24.6	10.1	19.4
Los Angeles	17.3	15.9	11.1	13.4
Miami	21.1	22.9	8.6	13.5
New York	—	13.7	2.5	9.9
Philadelphia	14.4	15.0	7.9	15.9
Phoenix	26.4	27.6	9.9	17.0
San Diego	23.6	21.6	5.4	9.8
San Francisco	19.4	15.5	2.0	17.6
San Jose	26.6	14.4	1.1	18.4
Portland	19.2	16.9	7.3	13.7

*Approximate (missing data).

Chart 2

Texas Employment Not Growing as Quickly in This Recovery

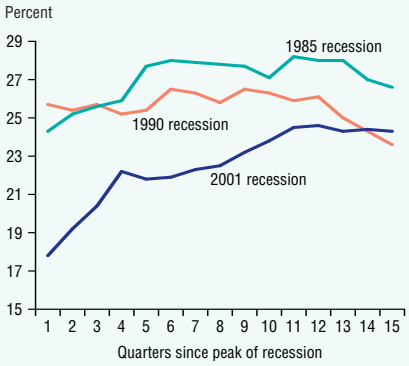


*Seasonally adjusted, annualized rate.

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

Chart 3

Metropolitan Office Vacancy Rates – Dallas



SOURCE: CB Richard Ellis (from Haver Analytics Database).

minimum. Moreover, although construction has eased in most metros, continued work on projects planned before the downturn has helped push vacancies upward. With almost 40 million square feet of empty office space in Dallas and 28 million square feet in Houston, office markets have a long way to go toward recovery.

Some positive signs have recently emerged in Texas office markets, however. Leasing activity has begun to stir, and net demand (absorption) has turned positive in some metros. Additionally, rents appear to be stabilizing after falling for the past four years. Are office markets poised for a quick rebound? Or will slow employment growth put the reins on the office recovery? Below is a look at how the major Texas markets compare and what their prospects for recovery look like.

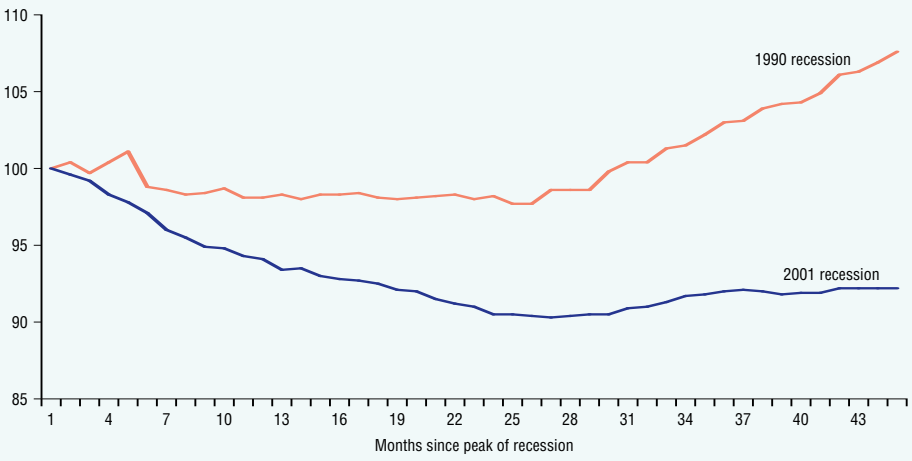
Dallas. Dallas currently tops the list of U.S. office markets for the highest vacancy rate. Although some suggest Dallas' rate is overstated, the available vacancy rate series gives a picture of how the city's office market has performed in past recoveries in comparison with the current one.[6]

Chart 3 shows Dallas' office vacancy rate from the peak of the 2001 U.S. recession through fourth quarter 2004 and the corresponding quarters in the 1990–91 U.S. recession and the Texas recession of 1985–87. As the chart indicates, vacancies started out much lower in the 2001 recession, thanks to the strong economy of the 1990s, which helped reduce the space overhang of the 1980s. And vacancy rates during this recovery remained substantially lower than in the recoveries following the previous two recessions. Nevertheless, while rates started to edge down three years into the prior two recoveries, an improvement has yet to show up in the current cycle.

Why is Dallas' office recovery taking so long to materialize? Industry contacts report that slow job growth coupled with fewer corporate relocations during the current economic recovery are to blame.[7] Indeed, employment growth in Dallas has been uncharacteristically sluggish, and the sectors of the Texas economy that usually boost office demand—including information, financial activities, and professional and business services—are expanding at a much slower pace than usual, with information jobs still falling.[8] In 2004, Dallas' overall employment rose by a modest 0.7 percent, compared with 1.3 percent in

Chart 4

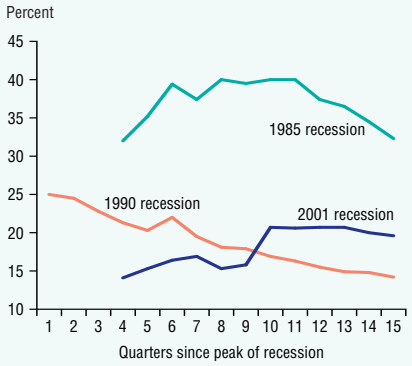
Dallas Office Employment Lags in Current Recovery



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

Chart 5

Metropolitan Office Vacancy Rates – Austin



SOURCE: CB Richard Ellis (from Haver Analytics Database).

Texas overall. Dallas' office employment grew at a mere 0.9 percent pace.

Chart 4 plots office employment in Dallas from the peak of the 2001 recession through the end of 2004 and during the same months of the 1990 recession and subsequent recovery.[9] Although Dallas office employment began accelerating 28 months into the previous recovery, we have yet to see much of a pickup in office jobs in the current recovery.

Given Dallas' vacant office stock of 38.5 million square feet and the slow pace of office employment growth, the recovery of the Dallas office market may be elusive until there is a substantial increase in hiring or relocations among service firms in office-related industries. Still, investors think Dallas is a good bet. 2004's large number of investment transactions indicates buyers expect Dallas' office market to improve rapidly once the recovery begins.[10] Additionally, while corporate relocations remain below the pace set in the 1990s, they may be on the upswing. *Site Selection* magazine recently named the Dallas/Fort Worth metroplex the top market for corporate relocations and expansions in 2004. The ranking stems largely from Vought Aircraft's planned manufacturing expansion and Countrywide Financial's announcement of 5,000 new jobs for Richardson.

Austin. The office market in Austin is much smaller than that of Dallas or Houston, comprising only about one-fourth the space of its larger counterparts. However, Austin's market has experienced larger vacancy rate swings than the other two metros over the past several decades—reaching almost 40 percent in the late 1980s and falling to about 2 percent in the late 1990s. Currently, Austin's office vacancy rate stands at about 19 percent, 3 percentage points above the U.S. average.

Chart 5 shows Austin's office vacancy rate following the peak of the 2001 recession and during the same quarters in the previous two recoveries.[11] Vacancy rates in the current recovery remain well below those seen in the late 1980s and until recently were lower than those recorded in the 1990–91 recovery. Like Dallas, Austin's office market didn't begin improving as quickly in the current recovery as it did in past ones, although the vacancy rate did edge down in the last two quarters of 2004, which may signal the beginning of a turnaround.

The Austin office market's slow recovery stems from sluggish employment growth in industries that fuel office demand (*Chart 6*). Although Austin's office employment didn't fall as steeply as Dallas' during the 2001 recession, it has remained virtually flat for the past 20 months. In 2004, overall employment growth in Austin was 1.3 percent, while office employment grew at a slower 1 percent. This slow growth compares starkly with the previous recovery, when Austin's office employment skyrocketed.

Positive net office demand of just over 1 million square feet in 2004 bodes well for an office recovery in Austin, but the turnaround may be slow unless office employment picks up. A return to the fast rate of economic growth Austin saw in the 1990s remains doubtful, but the presence of high-tech giants in Austin, and the metro's many economic and cultural amenities, will likely attract people and firms once again, especially if the high-tech industry reemerges from its current slump.

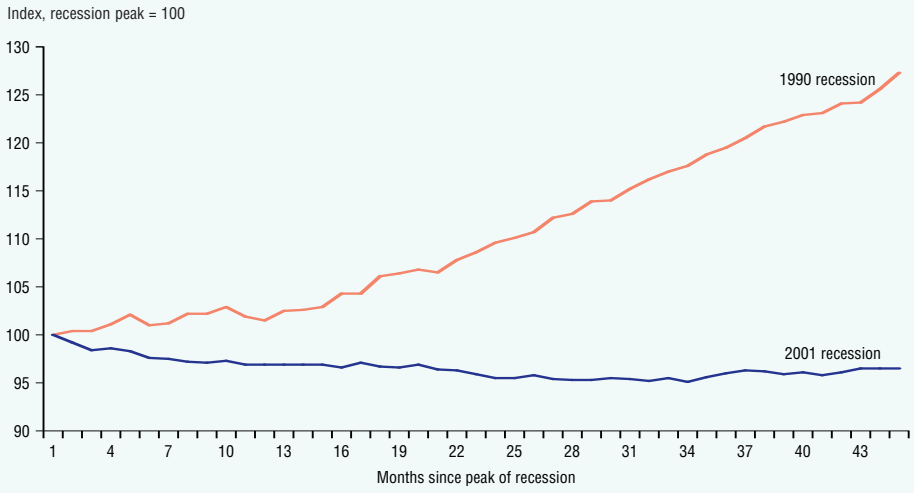
Houston. Houston's office market is in better shape than that of Austin or Dallas, with a current vacancy rate closer to the national average. Houston is less dependent on high-tech industries than Dallas and Austin, so its 2001 downturn was less drastic and its recovery has picked up some steam.

Chart 7 shows office vacancy rates in Houston from the peak of the 2001 recession and in the same quarters during the previous two recoveries. Houston's office vacancy rate remained below levels reached in the previous two recessions. Although the vacancy rate rose during the recent recovery, it remained below 20 percent. In recent quarters, the rate has edged down, a sign that the market may be on the road to improvement.

The good news for Houston's office market is that job growth in office

Chart 6

Austin Office Employment Is Flat in Current Recovery



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

employment has picked up, much like it did in the previous recovery, and is outpacing the growth of the metro's economy overall (*Chart 8*). Houston's 2004 job growth, while below its long-term average, was among the highest in the state (1.3 percent), and office employment increased at a much stronger 3 percent. If construction remains in check, Houston's office market may witness a speedier recovery than its counterparts in Austin and Dallas.

Summary

There are positive signs that office markets in Texas are turning the corner. Rent declines have slowed, leasing activity is picking up and investor interest is high. The recovery may be quicker in some metros than others, however, as office job growth is uneven across the state.

Houston holds the best prospects for recovery. Its office sector suffered less during the recession than its counterparts in Austin and Dallas, and office employment in Houston is growing at a good clip.

The Dallas and Austin economies have been slower to recover, and their office markets have deeper holes to dig out of. Currently, office employment in these two metros is growing at a snail's pace, which is not indicative of a quick turnaround.

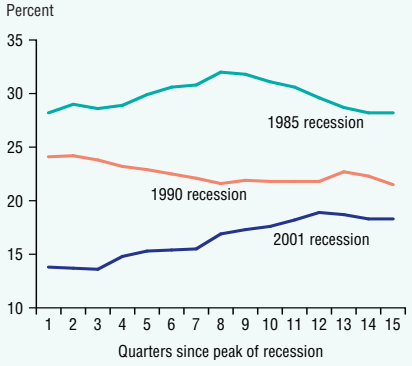
Although the Texas economy is creating jobs again, the rate of job growth has been well below its historical trend. While long-term prospects for Texas job growth remain good—a result of the state's attractive combination of low costs and favorable business climate—leading economic indicators suggest another year of moderate growth for Texas. The Texas Leading Index suggests growth of about 2 percent in 2005, which, although still modest, is a pickup from 2004's slow pace. If office construction remains in check, the slightly higher job growth should help Texas office markets continue to improve, albeit slowly.

—D'Ann Petersen

Petersen is an associate economist in the Research Department of the Federal Reserve Bank of Dallas.

Chart 7

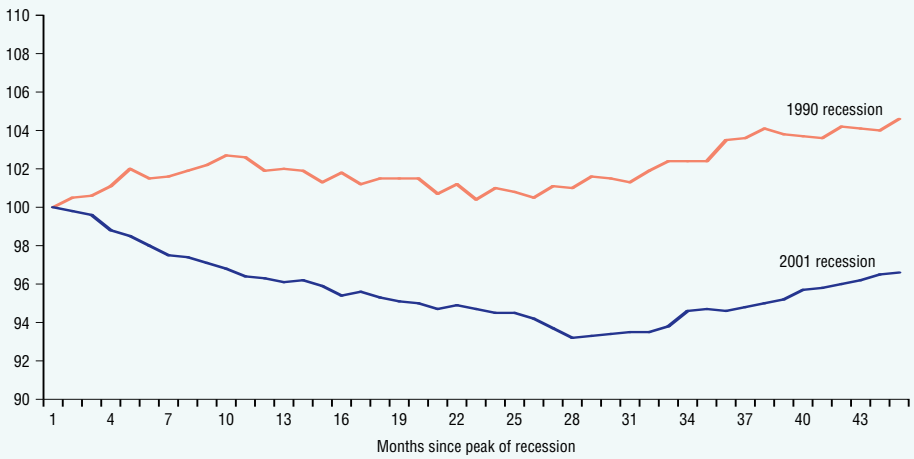
Metropolitan Office Vacancy Rates – Houston



SOURCE: CB Richard Ellis (from Haver Analytics Database).

Chart 8

Houston Office Employment Picks Up in Current Recovery



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

Notes

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[1] CB Richard Ellis vacancy rate data available from Haver Analytics for these three Texas metros only.

[2] "Regional Update, February 2005," by Raghav Virmani, Federal Reserve Bank of Dallas *Expand Your Insight*, February 9, 2005, www.dallasfed.org/eyi/regional/archived/0502update.html.

[3] For more detail on the impact of the recession and slow recovery on Texas' major metros, see "Economic Recovery Under Way in Major Texas Metros," by D'Ann Petersen and Priscilla Caputo, Federal Reserve Bank of Dallas *Southwest Economy*, March/April 2004.

[4] The vacancy rate time series obtained through Haver Analytics from CB Richard Ellis is missing some quarterly data for the Austin metro. Specifically, data are missing for all of 1985 and the first two quarters of 1986, as well as from third quarter 2000 through fourth quarter 2001.

[5] Although Enron's demise introduced a large amount of space into the market in 2002, the loss of occupancy didn't show up in the vacancy rate data until the lease expired in first quarter 2004.

[6] A recent story in the *Dallas Morning News* suggests that Dallas' downtown office vacancy may be exaggerated by up to 1 million square feet. See "A Flaw in the Numbers Game: Downtown Vacancy Rate Is Being Recalculated to Drop Boarded-Up Shells," by Steve Brown, *Dallas Morning News*, Feb. 4, 2005, p. 8D.

[7] The Federal Reserve Bank of Dallas contacts business leaders in many industries, including real estate, in its Beige Book Survey. The Beige Book is released every six weeks and can be accessed through www.dallasfed.org.

[8] Thanks to Mike Sobolik of Invesco Research and Eric Mackey of CB Richard Ellis for help in defining office employment. For the purposes of this article, office employment includes the broad NAICS supersectors of information, financial activities, and professional and business services. These broad sectors include the smaller industries of finance and insurance, real estate, professional services, management of companies, administration and support, and information.

[9] Because employment classifications changed from SIC codes to NAICS beginning in 1990, we are unable to compare current office employment with that of the 1985 Texas recession and the subsequent recovery.

[10] Although the 2001 recession weakened office market fundamentals, investment activity has been extremely heavy during the recovery. 2004 was a banner year for Dallas real estate investment, with metroplex transactions topping $2 billion, according to data provided by CB Richard Ellis. The hot investment market has been fueled by low interest rates, real estate assets that have become more liquid and a weak stock market that helped real estate become a favored asset over some other investments. In addition, Dallas office space is a bargain compared with that on either coast. For further detail, see "Office Market Eyes Record Year," by Christine Perez, *Dallas Business Journal*, Nov. 19, 2004.

[11] Some data are missing. See note 5 for more detail.

Supply Chain Management: The Science of Better, Faster, Cheaper

(Continued from front page)

productivity growth and a more stable economic environment give monetary policymakers more room to maneuver by allowing faster economic growth with less inflationary pressure.

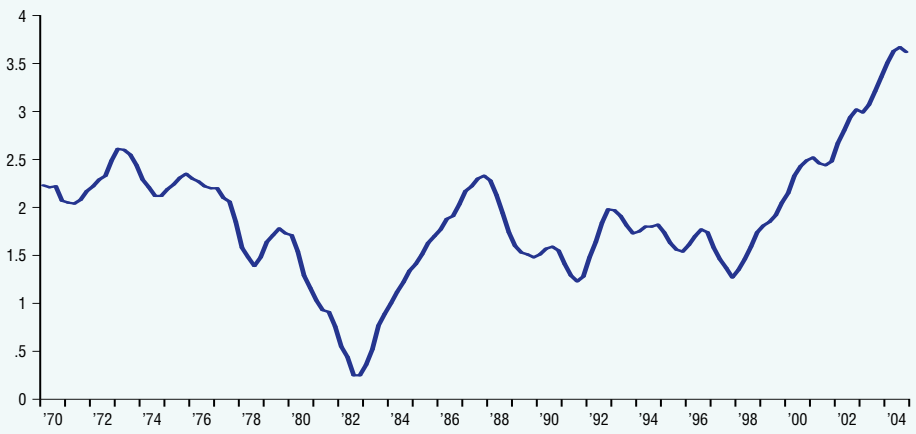
The economy's increased stability and stronger productivity growth in recent years have intrigued economists and policymakers (*Charts 1 and 2*). Several competing explanations—which are not mutually exclusive and are likely complementary—have been put forth. Among the leading hypotheses are that monetary policy has been better in the Volcker and Greenspan eras;[1] that there have been fewer shocks—or better luck—in recent years; that globalization, trade and deregulation have become more commonplace around the world; and that businesses have radically improved their supply chain management through the widespread adoption of new information technologies.[2]

This article focuses on one of these explanations—improved supply chain management. I discuss important changes and emerging trends in management practices and then present some of the evidence that has led analysts to believe that better supply chain management has contributed to the nation's improved macroeconomic performance.

Chart 2

Productivity Growth Has Surged

(Output per hour, nonfarm business sector)



*Four-quarter growth rate.

SOURCE: Bureau of Labor Statistics.

What Is Supply Chain Management?

Supply chain management is getting the right things to the right places at the right times for maximum profit. Many important strategic decisions impact the supply chain: how to coordinate the production of goods and services, including which suppliers to buy materials from; how and where to store inventory; how to distribute products in the most cost-effective, timely manner; and how and when to make payments.

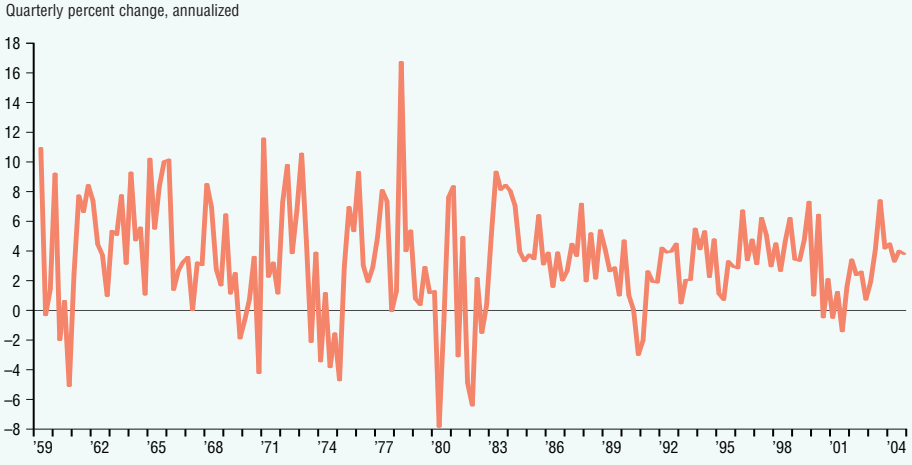
A typical supply chain is made up of many interrelated firms. As shown in Chart 3, component and subassembly suppliers are upstream from the manufacturer. Further up the chain are the supplier's suppliers, who provide raw materials. Downstream from the producing firm are the warehousing and distribution channels, then the retail channels and finally the consumer. Thus, the supply chain encompasses the flow and transformation of goods, services and information from the raw materials stage to the customer.

While supply chain management is as old as trade itself, new information and communications technologies have made today's supply chains better, faster and cheaper. Information engineering that combines new information technologies with improved production, inventory, distribution and payments methods has revolutionized supply chain operations.

For example, one way to buy a computer is to get on Dell's web site and

Chart 1

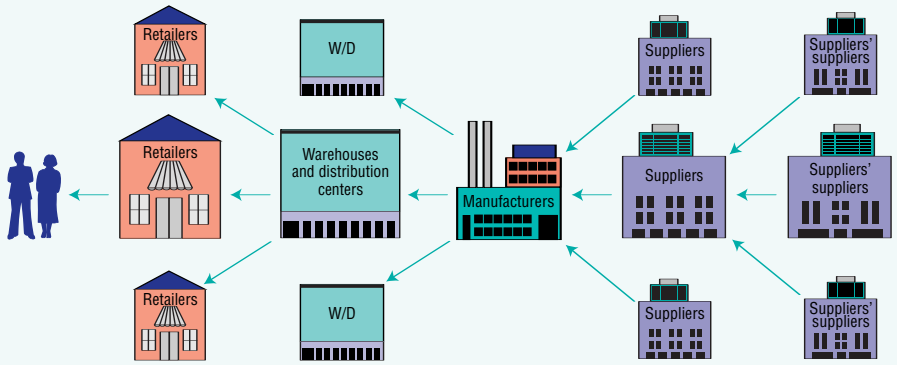
Real U.S. GDP Growth Is More Stable



SOURCE: Bureau of Economic Analysis.

Chart 3

The Supply Chain



configure and price a system exactly as you want it. As soon as you submit the online order, all of Dell's global suppliers—those providing chips, monitors and so on—are immediately notified of the sale and go to work so that you receive your computer typically within a week.

Contrast this direct sales model with yesterday's supply chain. The old model required the customer to go to a store in search of a product that the manufacturer thinks you want to buy.

But now, in some cases, the middlemen between you and the manufacturer can be eliminated. Moreover, in the direct sales model, the upstream suppliers play a key real-time role in keeping production and distribution flowing smoothly.

Better supply chain models help not only manufacturers of goods, but also some service businesses, including those requiring creativity, imagination and specialized knowledge. For example, using a virtual reality system and ultrasound data sent through the Internet, a medical specialist in Dallas can give an opinion to a patient in New York…or London… or Bombay. A virtual reality system worn around the hand and arm allows a physician to feel pressure sensations from computer images and make an informed diagnosis in real time halfway around the globe.

Today's most efficient supply chains use the Internet and associated technologies to move information in real time to those who need it. These bits of data—digital strings of zeroes and ones—can be shipped anywhere in the world in seconds at virtually no cost. And with digital products there are no time-to-manufacture delays, inventory shortages or delivery problems.

Supply Chain Management Eras

Throughout history, new ideas and technologies have revolutionized supply chains and changed the way we work. Two hundred years ago, giant machines replaced manual labor to complete tasks in large factories. Railroads, electricity and new communications media expanded markets and made supply chains better, faster and cheaper.

Mass Production Era. In the early 1900s, Henry Ford created the first moving assembly line. This reduced the time required to build a Model T from 728 hours to 1.5 hours and ushered in the mass production era. Over the next 60 years, American manufacturers became adept at mass production and streamlined supply chains with the help of scientific management methods and operations research techniques.

Lean Manufacturing Era. But in the 1970s, U.S. manufacturing's superiority was challenged. Foreign firms in many industries made higher quality products at lower costs. Global competition forced U.S. manufacturers to concentrate on improving quality by reducing defects in their supply chains.

Starting in the early 1970s, Japanese manufacturers like Toyota changed the rules of production from mass to lean. Lean manufacturing focuses on flexibility and quality more than on efficiency and quantity. Significant lean manufacturing ideas include six-sigma quality control, just-in-time inventory and total quality management. (See the box titled "Lean Manufacturing Lingo.")

Mass Customization Era. Beginning around 1995 and coinciding with the commercial application of the Internet, manufacturers started to mass-produce customized products. Henry Ford's famous statement "You can have any color Model T as long as it's black" no longer applies. While Dell may be the most famous mass customizer, the elimination of middlemen (such as travel agents, warehousers and salespeople) and the sharing of critical information in real time with key partners make this era significantly different. Perhaps a more accurate term would be the "information engineering" or "information management" era.

Firms are effectively using new information technologies to improve service and delivery processes. Through secure intranet systems and business-to-business (B2B) e-commerce platforms, firms focus on improving information

Lean Manufacturing Lingo

Six-sigma: This quality control idea was pioneered by Motorola as a way to improve processes that are already under control. The outputs of such processes typically have a normal distribution, and the process capability is expected to be within plus or minus three standard deviations of the mean. Each standard deviation is one sigma, so the total process capability covers six sigma.

Just-in-time: This inventory management idea was pioneered by Toyota to ensure that inventory in production systems would arrive in good condition exactly when needed: not too early and not too late.

Total quality management: This idea emphasizes multifunctional teams to solve quality-related problems. Such teams are trained to understand basic statistical tools and then collect and analyze data to resolve quality problems.

Kaizen: This is a team approach toward incremental improvement to tear down and rebuild a process layout to function more efficiently.

Kanban: This inventory management technique uses containers, cards and electronic signals to help production systems plan more efficiently.

management by integrating internal systems with external partners. For example, through its web site, Amazon.com gives customers the ability to track the delivery status of their purchases. And Wal-Mart routinely shares all sales data in real time with its upstream suppliers and manufacturers.

Components of the Supply Chain

The supply chain has four basic components:

- Production. Businesses focus on how much to produce, where to produce it and which suppliers to use.
- Inventory. Businesses decide where to store their products and how much to store.
- Distribution. Businesses address questions about how their products should be moved and stored.
- Payments. Businesses look for the best ways to pay suppliers and get paid by customers.

The efficiency and effectiveness of a supply chain is contingent on firms' ability to gather and analyze important information through these components.

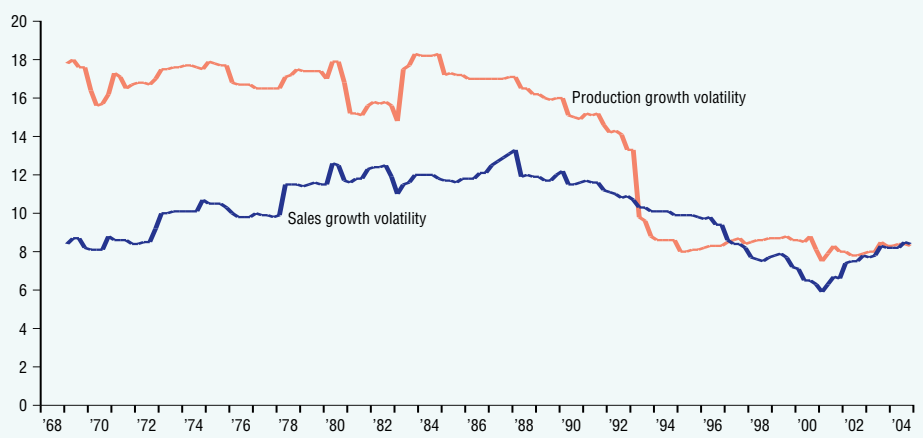
Information Distortions and the Bullwhip Effect

Distorted information, or the lack of information, is the main cause of the "bullwhip effect"—the phenomenon whereby demand uncertainties and variability are magnified as orders are placed at each step up the supply chain from the customer to the raw materials suppliers. The bullwhip effect takes its name from the way the amplitude of a whip increases down its length. This effect has been observed in many industries and is the main cause of supply chain inefficiencies.[3]

Proctor and Gamble (P&G) executives coined the term after studying the demand for disposable diapers. As expected, babies use diapers at a fairly steady and predictable rate, and as a result, retail sales are reasonably uniform. But P&G found that each retailer based its orders on its own slightly exaggerated forecast, thereby distorting information about true demand. Wholesalers' orders to the P&G diaper factory fluctuated more, and P&G's orders to 3M and other materials suppliers oscillated even more.

Chart 4

Reduced Bullwhip Effect for Durables



*10-year moving standard deviation of one-quarter annualized growth.

SOURCE: Bureau of Economic Analysis.

Production. One way to see the bullwhip effect in production is to compare sales growth volatility at the customer end of the supply chain with production growth volatility at the opposite end. Supply chains that use real-time information effectively should have an information distortion bullwhip that is shallower and less volatile.

Chart 4 shows that for durable goods, production growth volatility is now much closer to sales growth volatility. Both have declined since the mid-1980s. Sales growth volatility has declined from a 10-year moving standard deviation of 13 percentage points in 1987 to about 8 percentage points today; production growth volatility has dropped from around 18 percentage points in 1983 to 8 percentage points today.

Several explanations are possible. Deeper and more flexible capital markets, better monetary policies or just plain luck could have all helped to reduce the volatility of final sales, which may have driven production volatility lower. Nevertheless, while these and other explanations may have contributed to supply chain improvements, better supply chain practices that use new information technologies also seem plausible. Certainly, the dramatic reduction in production growth volatility occurred as superior manufacturing and quality control processes combined with new information technologies to bring significant efficiencies to supply chain operations.[4]

To reduce production growth volatility at JCPenney, the company has implemented a revolutionary computer system that directly captures sales data for each of its products at the cash-register level. Rather than making forecasts on what corporate managers think they will sell, forecasts are now based on real-time point-of-sale data.

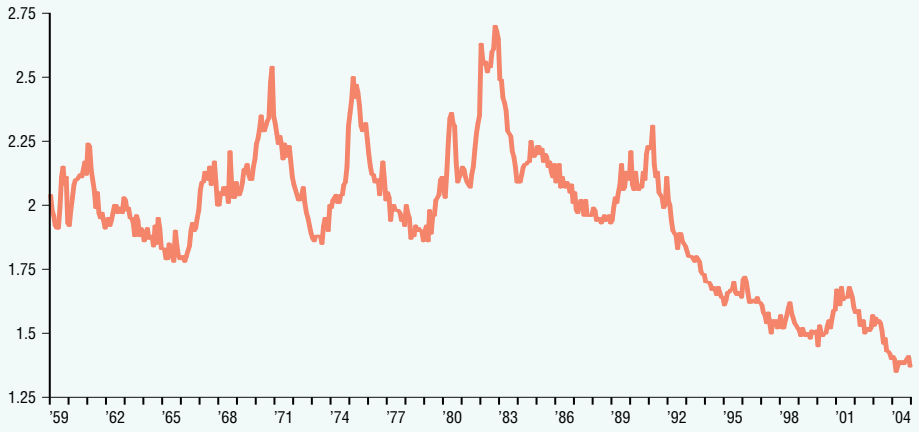
For certain men's dress shirts, JCPenney has gone a step further and outsourced the sales forecasting and inventory management functions to the shirtmaker in Hong Kong. So now a supplier thousands of miles away decides how many shirts to make and in what styles, colors and sizes and then sends the shirts directly to each JCPenney store—bypassing the company's corporate decisionmakers and warehouses.[5]

Inventory. Information distortions and the bullwhip effect also unnecessarily increase inventory at all points along the supply chain. In many respects, inventory is simply insurance against supply chain uncertainties. Unused and unsold inventory carries burdensome costs, including those for holding, warehouse and production-line storage, insurance, obsolescence and spoilage. At the same time, however, sufficient inventory must be maintained to meet demand and keep production flowing smoothly.

Chart 5

Inventory Management Continues to Improve

Durable goods inventory/shipments ratio



SOURCE: Census Bureau.

As shown in Chart 5, producers have streamlined their supply chain operations to hold less inventory relative to sales. The inventory-to-shipments ratio dropped markedly during the 1990s and is now near its all-time low. In essence, new technologies have allowed firms to replace inventory with information and then use that information more productively.[6]

Indeed, Dell has turned traditional manufacturing thinking on its head by saying that it will not make anything until it receives an order. In 1996, Dell held 31 days of inventory. It now holds four days of inventory.

Distribution. Just about everything we consume is taken from the earth, processed and transported, often requiring many stages before reaching consumers. Today's transportation and distribution of goods often involve longer distances and better coordination than in the past.

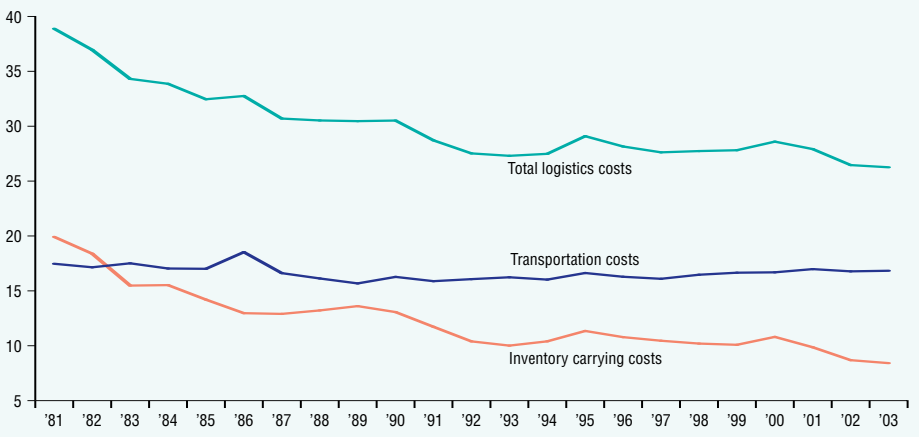
Yet, as Chart 6 shows, logistics costs trended downward from about 39 percent of the goods component of GDP in 1981 to around 26 percent in 2003. Transportation costs declined nearly 4 percent, whereas inventory carrying costs dropped about 58 percent. While inventory carrying costs have been driven down partly by lower interest rates, evidence shows that inventories are managed more efficiently, which also contributes to lower costs. Warehousing expenses have gone down as firms implement automated systems, and risks have been minimized as third-party logistics providers increasingly furnish specialized and customized solutions that increase efficiency. For example, firms such as FedEx and UPS now take on the entire logistics planning and fulfillment tasks for businesses of all sizes.

Chart 6

Logistics Costs

(As a percentage of the goods component of GDP)

Percent



NOTE: For years 2001–03, manufacturing sector income data are grouped by the North American Industry Classification System; previous years use the Standard Industrial Classification.

SOURCES: Bureau of Economic Analysis; "15th Annual State of Logistics Report," by Rosalyn Wilson, Council of Logistics Management, June 2004.

Perhaps the biggest distribution challenge is managing demand in a dynamic and uncertain environment. Demand-based management that optimizes sales prices and shortens lead times from design to delivery will likely become the next major area of strategic competitiveness in managing supply chains. For example, by using real-time sales data, Zara, a Spanish clothing company, streamlined its supply chain to introduce new products in stores within three weeks of design.

Payments. As technology costs have fallen and electronic connections between companies have increased, more firms are adopting digital technologies and eliminating paper transactions and human contact. Automatic order placement, billing and payment can all be triggered and performed by a computer without human intervention and paperwork. And more and more companies have implemented business-to-business e-commerce systems to streamline payments and enhance communications with suppliers. Such systems also guarantee faster collections and result in fewer losses. Progressive Insurance, for example, can use satellites, camera phones and the Internet to issue final settlement checks within minutes of being called.

Better, Faster, Cheaper. All these improvements—reduced production volatility, lower inventory levels, less expensive logistics and streamlined payments systems—have a common denominator: more efficient information management through better methodologies and tech-

Chart 7

U.S. Business Cycle Expansions and Contractions

Black = months in contraction

SOURCE: National Bureau of Economic Research.

nologies. Successful businesses are reorganizing to take advantage of information technology and rethink the way work is done.[7] The result, of course, is that consumers benefit from higher quality products, a greater selection of goods and lower prices.

Macroeconomic Performance Across Supply Chain Management Eras

Chart 7 may look like an ordinary bar code, but a closer scan reveals that it's actually a record of U.S. business cycle expansions and contractions. Each black bar represents a recession: The fatter the bar, the longer the recession. The timeline starts in 1855, the earliest year for such records.[8] The large spaces on the right side of the chart indicate that the U.S. economy is in recession far less often today.

Chart 8 indicates that GDP growth has been less volatile recently. The three pie charts correspond to the three supply chain eras discussed earlier: mass production, lean manufacturing and mass customization. The percentage of time that annual GDP growth is negative, which roughly corresponds to recessionary periods, is far less in the mass customization era than in the prior eras. And the percentage of time the economy experienced real GDP growth above 3.5 percent annually is greater in the mass customization era.

Productivity growth tells a similar story: It has become less volatile and has trended upward for several years. As shown in Chart 9, during the mass customization era, productivity growth exceeds 2.5 percent far more often, and negative productivity growth occurs far less often than in the prior eras. As new technologies help companies streamline supply chain operations, it makes sense that productivity, measured as output per hour, will improve.[9]

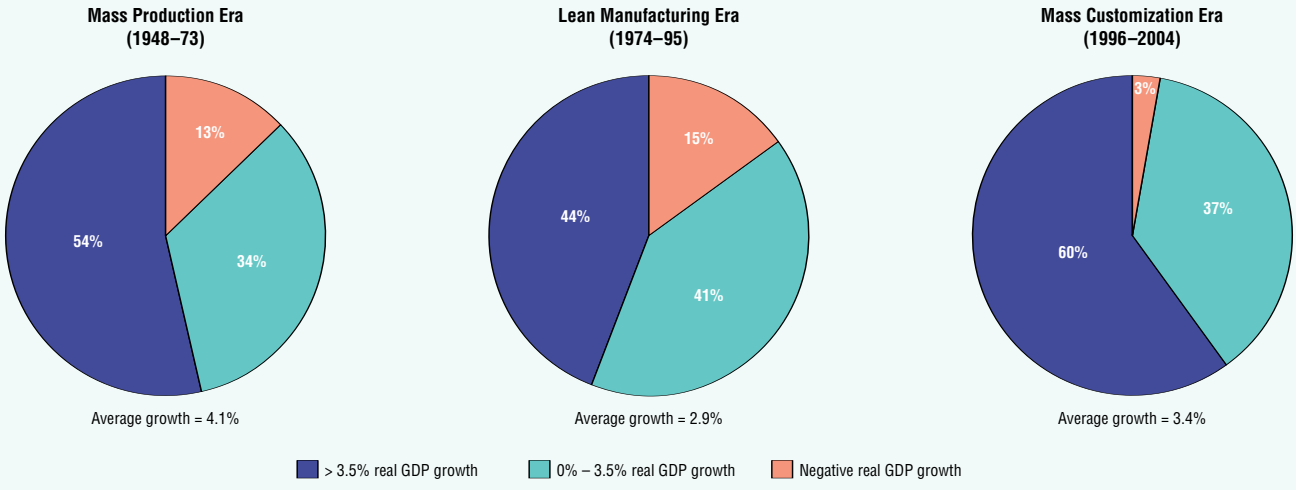
We live far better than did earlier generations because of the power of productivity. Our ability to innovate—to improve production processes, implement new technologies, better manage product and information flows, engage in more specialization and trade, and further upgrade our skills—allows us to get more for less.

The Power of Productivity

Further improvements are on the horizon. Other new information technologies, like the global positioning system (GPS) and radio frequency identifi-

Chart 8

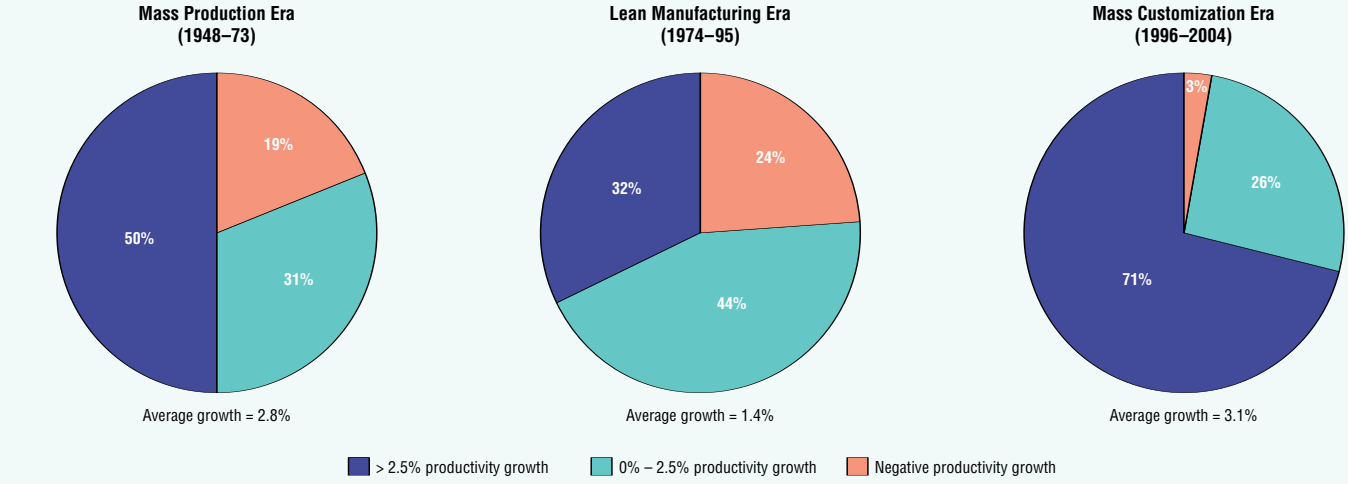
Real GDP Growth Is Less Volatile Today



SOURCE: Bureau of Economic Analysis.

Chart 9

Productivity Growth Getting Stronger



SOURCE: Bureau of Labor Statistics.

cation (RFID), will continue to improve supply chains. This is true not only in manufacturing, but also in retail, insurance, health care and other industries. We are just beginning to see the power of productivity as firms effectively implement these new technologies.

For example, an RFID tag embedded into a product allows it to be tracked and to transmit predetermined information without physical scanning. The productivity gains from RFIDs could be substantial. Imagine wheeling a full grocery cart through checkout and receiving an instant total without scanning individual items.

In our increasingly interconnected and interdependent global economy, the processes involved in delivering supplies and finished goods—including information and other business services—from one place to another are mind-boggling. But through information engineering, supply chain improvements have resulted in a reduced bullwhip effect, lower inventory levels, reduced logistics costs and streamlined payments. These improvements have led to macroeconomic benefits such as more stable economic output and stronger productivity growth.

—Thomas F. Siems

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Notes

I am grateful to Mike Cox, Evan Koenig, Anil Kumar and Mark Wynne for valuable comments that improved this article. Dan Lamendola provided excellent research assistance.

1 Paul A. Volcker was chairman of the Board of Governors of the Federal Reserve System from 1979 to 1987. Alan Greenspan has been chairman since 1987.

2 For more on these explanations, see "Recent U.S. Macroeconomic Stability: Good Policies, Good Practices, or Good Luck?" by Shaghil Ahmed, Andrew Levin and Beth Anne Wilson, *The Review of Economics and Statistics*, vol. 86, August 2004, pp. 824–32; "Monetary Policy Rules and Macroeconomic Stability: Evidence and Some Theory," by Richard Clarida, Jordi Gali and Mark Gertler, *Quarterly Journal of Economics*, vol. 115, February 2000, pp. 147–80; "The Long and Large Decline in U.S. Output Volatility," by Olivier Blanchard and John Simon, *Brookings Papers on Economic Activity*, no.1, 2001, pp. 135–64; and "On the Causes of the Increased Stability of the U.S. Economy," by James A. Kahn, Margaret M. McConnell and Gabriel Perez-Quiros, Federal Reserve Bank of New York *Economic Policy Review*, vol. 8, May 2002, pp. 183–202.

3 "Information Distortion in a Supply Chain: The Bullwhip Effect," by Hau Lee, V. Padmanabhan and Seungjin Whang, *Management Science*, vol. 43, April 1997, pp. 546–58.

4 Kahn, McConnell and Perez-Quiros (2002) find that changes in inventory behavior stemming from improvements in information technology have played a direct role in reducing real output volatility.

5 "Made to Measure: Invisible Supplier Has Penney's Shirts All Buttoned Up," by Gabriel Kahn, *The Wall Street Journal*, Sept. 11, 2003, p. A1.

6 Kahn, McConnell and Perez-Quiros (2002) examine the inventory-to-sales ratio for durable goods against a target ratio extracted from a smooth trend of the data and find evidence that firms are making smaller mistakes now than before the mid-1980s. They argue that this improvement could plausibly be linked to advancements in information technology.

7 "Where IT's @: Technology and the Economy," by Thomas F. Siems and Mine K. Yücel, Federal Reserve Bank of Dallas *Southwest Economy*, January/February 2005, pp. 13–16.

8 The observation that post-World War II expansions are twice as long as prewar expansions has been questioned and investigated in "Business-Cycle Durations and Postwar Stabilization of the U.S. Economy," by Mark W. Watson, *American Economic Review*, vol. 84, March 1994, pp. 24–46. The most likely explanation is that the National Bureau of Economic Research used different ways to choose prewar and postwar business-cycle reference dates. Thus, the recession record shown here uses data that may exaggerate economic volatility prior to World War II.

9 Again, there are several explanations for the higher trend rate of productivity growth and the economy's increased stability. And while it seems plausible that improved supply chain management combined with the effective implementation of new information technologies has contributed to the economy's improved performance, there are difficulties in disentangling the impact of supply chain management. Even so, the anecdotal and factual evidence presented here suggests that the technology-led New Economy paradigm that emerged in the mid-1990s may be alive and well.

Domestic Policy No Match for Trade Stance of Central American Countries

The pending U.S. congressional vote on the Central American Free Trade Agreement has increased attention on the trade policies of the participating countries—Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and the Dominican Republic. (The agreement is known as DR-CAFTA since the Dominican Republic's inclusion in August 2004.)

Entering into regional trade agreements has well-documented positive effects on participating nations, rich or poor, even though the impact on the United States would be lessened by the small market sizes of the DR-CAFTA countries. From the DR-CAFTA countries' perspective, the agreement's impact could be large.[1] Even the most populous of these nations, Guatemala, has less than half as many people as the state of Texas. Moreover, despite what the habitual detractors of trade liberalization claim, there is much evidence that trade openings typically have positive effects on income per capita—generally including that of the poorest fifth of the population, even in developing countries.[2]

Trade Liberalization vs. Domestic Market Orientation

While future trade liberalization is important, the current disposition of the DR-CAFTA countries toward free trade is not new. A good deal of trade liberalization has already taken place in these countries, so future opening is simply more of a good thing.

The past trade openings raise more general questions about market-oriented changes in policies in the DR-CAFTA countries. Have these countries operated consistently with market competition overall? Have they—as with trade—gotten any better at it? I use an index to show that, on average, changes in trade policy in the DR-CAFTA countries have followed a different trajectory than DR-CAFTA market-oriented policies in general, with the trade policy indicators demonstrating more movement toward market orientation. Although the nontrade indicators revealed more market openness to begin with, market openness in the trade sector has long since become greater.

Chart 1 compares three indicators of market orientation constructed from the Heritage Foundation's Index of Economic Freedom. The first, degree of trade openness, is simply the Heritage Foundation's measure without further adornment. The second, domestic market orientation, reflects the Heritage Foundation results about market openness in eight nontrade domestic policy categories: fiscal policy and fiscal balance, government intervention in the economy, monetary policy (with its inflationary implications), banking policy, flexibility of wages and prices, protection of property rights, transparency and simplicity of regulation, and importance of the informal sector versus the formal taxpaying sector.

These different indicators may not always be easy to compare, but they are all scaled to fit the same range of movement. In all cases, a value near 5 means not at all market friendly (such as Honduran monetary policy or Nicaraguan trade policy in the late 1990s), while a value near 1 means very market oriented (such as Salvadoran monetary policy and government intervention now).

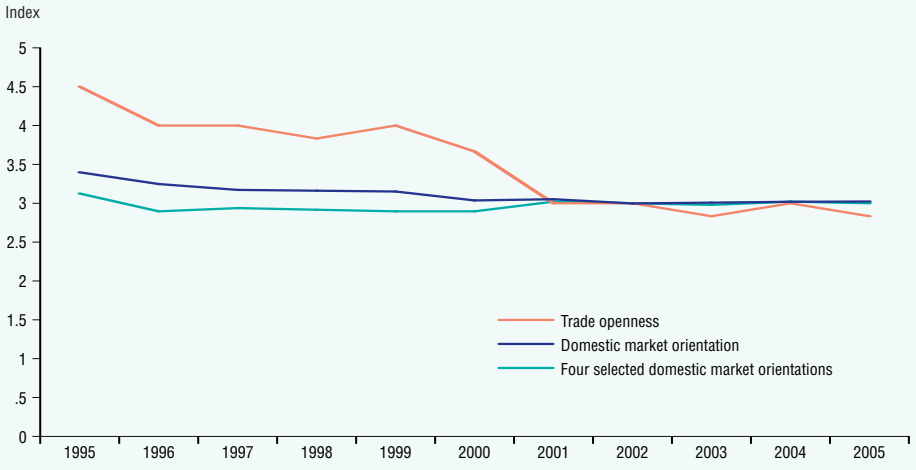
Finally, I narrow the focus of domestic market orientation to a subset of just four variables because I think they deserve more attention than the others. The final four are government intervention in the economy, protection of property rights, degree of regulation in the economy, and wage and price flexibility. Once again, a lower index value represents a greater disposition to let markets work, while a high number means the opposite.

As Chart 1 shows, the DR-CAFTA countries on average have experienced a marked decline in trade protectionism. The value of this index falls from 4.5 (high to very high trade protectionism) in 1995 to 2.8 (low to moderate) in 2005. In contrast, the measure of domestic mar-

Chart 1

Trade Openness vs. Domestic Market Orientation in DR-CAFTA Countries

(Lower values = more market orientation)

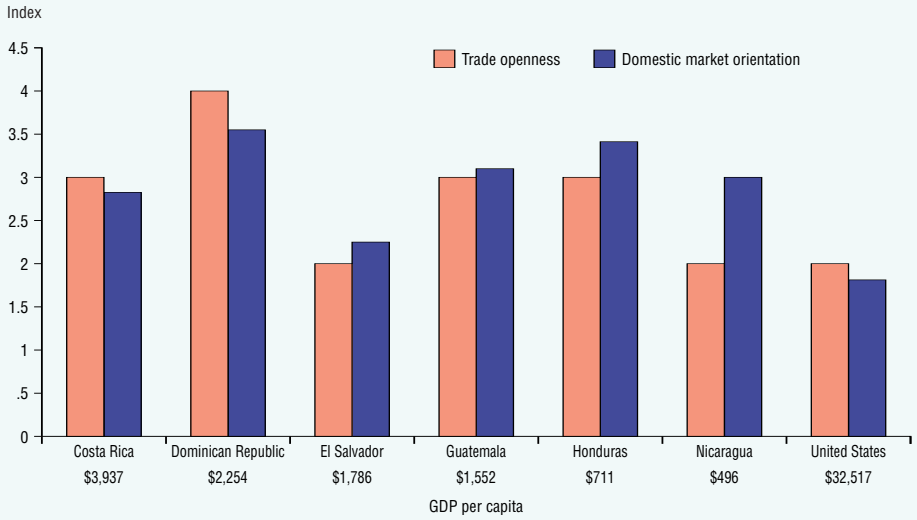


SOURCES: Index of Economic Freedom, The Heritage Foundation, various years; author's calculations.

Chart 2

A Closer Look at Trade Openness and Market Orientation

(Lower values = more market orientation)



SOURCES: Index of Economic Freedom, The Heritage Foundation, 2005; author's calculations.

ket orientation (the eight measures noted above) falls from 3.4 in 1995 to 3 in 2005.

To the extent that it is fair to compare one indicator with another, movements of nontrade indicators in the direction of a market-based economy were much smaller than market-oriented movements in the trade indicators. Nontrade indicators showed more market orientation in the early going than the trade indicator did. In 2001, the falling (improving) trade index caught up with the domestic index and has remained below it for most of the time since.

The relation between the trade index and the four selected domestic market openness measures is similar, except that the line for the four variables starts at a lower (more market-oriented policy) value than that for the eight variables. Note that the final values for both domestic market orientation measures are the same.

Because the trade openness line is above both domestic market orientation lines in 1995 and below them in 2005, we know that—despite the virtues of future trade opening—the domestic market measures have farther to go before they get where market-oriented voters want them. While trade is a legitimate focus for policymaker attention, so are the other indicators—and perhaps a little more so these days.

Certainly it is not true that market orientation automatically means more growth than market closure. Many factors working jointly determine economic expansion. The Heritage Foundation's measures include nothing about educational quality, for example, or managerial skills. But when other things are equal, market orientation seems to make a difference.

Differences Across DR-CAFTA Countries

So far I have discussed how trade openness has moved compared with other measures of market openness for the DR-CAFTA countries overall. With six countries of varied sizes and incomes, we might expect that summary statistics hide a lot of differences across countries. Chart 2 offers a current snapshot of the connection between trade policy and domestic market policy in each of the six DR-CAFTA countries and in the United States. Lower values signify greater market openness.

A striking detail is the tie between GDP per capita and this trade–market policy connection and what it suggests about the relation between economic development and openness. In the two richest DR-CAFTA countries, Costa Rica and the Dominican Republic, the openness of the domestic market category is greater than (shows a lower value than) that of the trade sector.

However, it must be noted that neither trade nor nontrade policy is very market oriented in the Dominican Republic. In fact, the Dominican Republic has both less open trade and less market-oriented domestic policy by the Heritage Foundation's indices than any of the other five Central American countries. The relation between the two types of openness suggests the Dominicans are more interested in nontrade domestic market orientation than in trade policy. This is a trait they share only with the Costa Ricans and, interestingly, the United States—the three countries with the highest GDP per capita among the DR-CAFTA participants. The four poorer Central American countries all exhibit more trade policy orientation than nontrade market orientation.

In and of themselves, these measures do not prove that income is higher because of the market-related orientation of these institutions or that higher income has motivated the development of market-related institutions. But there is much to suggest that the causality runs both ways. The contrast of richer with poorer DR-CAFTA countries is striking in any case.

Moreover, while all four of the poorer countries have less domestic market openness than trade openness, the two richest of those four (El Salvador and Guatemala) have domestic openness levels closer to their trade openness ratings than the two poorest (Honduras and Nicaragua). This again suggests a positive relation between GDP per capita and market openness in policy other than trade, regardless of the direction of causality.

Perhaps as interesting as any detail of this chart is the relation of U.S. trade policy openness to that of the various DR-CAFTA countries in comparison with the relative measure of domestic market openness. Note that the Heritage Foundation measures are not very refined or detailed. A scale of 1 to 5 precludes many opportunities for measurement subtlety. However, it is instructive that El Salvador, Nicaragua and the United States appear in the broad trade openness category of 2; the measure of greatest trade openness is 1. However, the United States has much to recommend against it in agricultural trade protectionism as well as in other historical cate-

(continued on back page)

Regional Update

Texas posted a steady employment gain of 1.3 percent in 2004 and 2 percent annualized in January 2005, underscoring its improving overall health since bouncing back from recession in August 2003. The Texas Coincident Index, an aggregate indicator of statewide economic activity, is in positive territory.

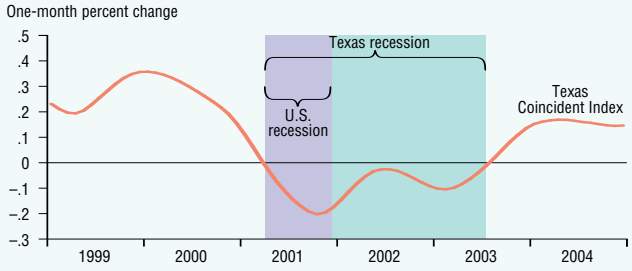
Overall, the state added 125,500 jobs in 2004, with nearly 85 percent of net job creation propelled by services. Seven out of 10 sectors contributed to an arguably broad-based Texas recovery. Increasing oil prices led to heightened energy activity, keeping the natural resources and mining sector afloat; and a late boom drove the construction and information sectors into positive territory in third quarter 2004. Except in manufacturing, which continued its job-loss streak in January 2005, Texas closed 2004—and started 2005—on a high note.

A deeper look into the manufacturing sector reveals the effect of restructuring—rising output and falling employment. With improved production processes, higher productivity of the existing workforce and a shift of focus from labor- to capital-intensive industries, the consequence is greater output per worker.

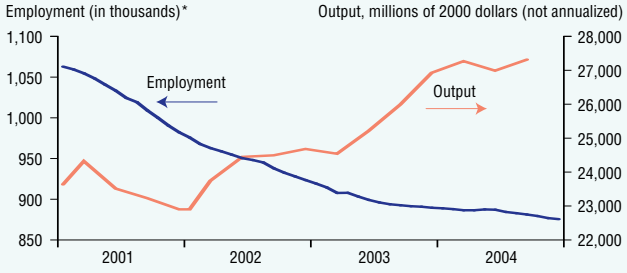
As manufacturing output burgeons in the wake of productivity increases, a weak dollar provides further impetus by stimulating export demand. Increasing domestic production for export bolsters several sectors, and railroads represent one such instance. Recent increases in oil prices have hurt railroads less than they have the trucking sector. In addition, increased shipping demand for such items as coal and heavy machinery for export and for domestic use has boosted railroad shipments. As a result, the 2,000 jobs gained in the railroad sector have, to some extent, been able to offset the 2,400 jobs lost in trucking.

—Raghav Virmani

Texas Economic Growth Flat but Positive

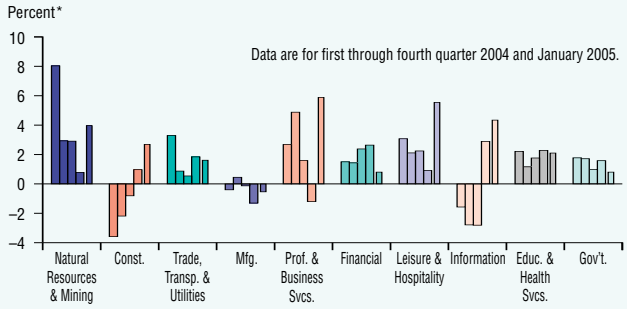


Texas Manufacturing Employment and Output



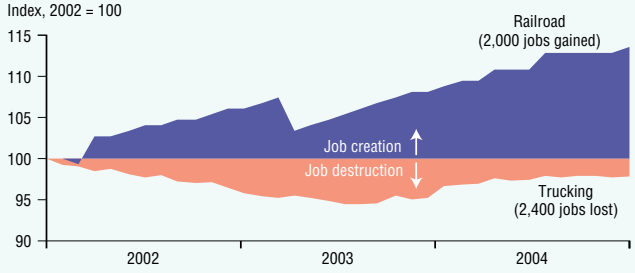
*Seasonally adjusted.

Most Sectors Showing Job Gains



*Quarter-over-quarter, seasonally adjusted, annualized rate.

Texas Railroad and Trucking Employment



Regional Economic Indicators

			TEXAS EMPLOYMENT*					TOTAL NONFARM EMPLOYMENT*		
	Texas Leading Index	TIPI† total	Mining	Construction	Manufacturing	Government	Private service-producing	Texas	Louisiana	New Mexico
1/05	120.3	130.2	153.0	542.2	885.1	1,666.7	6,288.7	9,537.4	1,927.6	799.8
12/04	121.2	129.5	152.5	541.0	885.5	1,665.6	6,275.3	9,521.6	1,916.9	799.1
11/04	119.3	129.1	152.1	540.7	887.2	1,663.7	6,268.1	9,513.5	1,920.3	796.9
10/04	118.8	128.8	151.7	540.3	888.1	1,662.5	6,259.5	9,503.6	1,919.3	795.1
9/04	118.2	129.8	151.9	539.7	888.4	1,659.1	6,249.7	9,490.8	1,913.5	792.6
8/04	118.0	129.4	151.4	539.3	890.2	1,658.6	6,250.0	9,491.4	1,921.3	791.2
7/04	117.3	129.3	151.3	541.4	891.6	1,662.9	6,252.8	9,501.9	1,921.3	791.5
6/04	117.2	128.6	151.0	540.8	888.7	1,655.0	6,235.8	9,473.1	1,919.5	789.4
5/04	117.9	128.7	150.6	541.1	890.0	1,652.1	6,227.4	9,463.1	1,917.9	789.3
4/04	118.1	128.4	150.4	544.5	889.7	1,650.1	6,229.9	9,466.4	1,922.8	789.2
3/04	117.4	128.1	149.7	543.8	887.7	1,648.0	6,206.3	9,437.5	1,921.8	785.8
2/04	117.3	128.3	149.0	545.0	888.9	1,646.2	6,194.4	9,425.4	1,917.8	784.8

* In thousands. † Texas Industrial Production Index.

For more information on employment data, see "Reassessing Texas Employment Growth" (*Southwest Economy*, July/August 1993). For TIPI, see "The Texas Industrial Production Index" (Dallas Fed *Economic Review*, November 1989). For the Texas Leading Index and its components, see "The Texas Index of Leading Indicators: A Revision and Further Evaluation" (Dallas Fed *Economic Review*, July 1990). Online economic data and articles are available on the Dallas Fed's Internet web site, www.dallasfed.org.

Domestic Policy No Match for Trade Stance

(Continued from page 14)

gories of commerce, such as the garment trade. It should be noted that some of the same protectionisms that limit the United States to a 2 have found their way into the agreement that is hoped to be forthcoming with the DR-CAFTA countries.

In contrast, none of the DR-CAFTA countries have policies that facilitate domestic market orientation to the degree the United States has. In the eightfold measure of domestic market orientation, the Heritage Foundation's measure averages 1.8 for the United States, compared with 3.0 for DR-CAFTA countries overall. Clearly, the richest DR-CAFTA nations do not always show the greatest domestic market orientation (Costa Rica at 2.8 vs. Dominican Republic at 3.6), but a large and significant technical literature on such orientation suggests that its growth prospects deserve attention.[3] Also, even though the direction of causality may run both from higher income to more market orientation and vice versa, the domestic market orientation not only of relatively high-growth industrial countries such as the United States (1.8) and the UK (1.8) but also of Asian tigers such as Taiwan (2.3) and Korea (2.6) suggests a basis for growth, despite some glaring exceptions (China, 3.3).

Conclusion

If Congress ratifies the trade agreement with the DR-CAFTA countries, there is much to suggest that both sides will receive growth benefits. But the DR-CAFTA countries have already pursued substantial trade liberalization over the past decade. In some ways, the new agreement is just frosting on the cake. Indeed, for the average DR-CAFTA country, a stickier problem seems to be somewhat less market-directed orientation of policies outside the trade sector. Up to now, market-directed reforms in the non-trade policy area have been smaller on average than those in the trade policy area.

It is clear that the DR-CAFTA countries are working toward more trade liberalization. It will be important to see if the market orientation revealed in anticipated further reductions in trade restrictions—and the improvements in dispute settlement and other factors to facilitate international commerce—will ultimately find expression in purely domestic avenues as well.

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Note

[1] Note, however, that the DR-CAFTA–U.S. agreement includes significant trade protectionism. DR-CAFTA sugar exports will reflect heavy U.S. trade restrictions. The agreement's provisions for the garment trade reflect U.S.-imposed content rules that make costs higher for U.S. consumers.

[2] An excellent overview of the relationships among trade policy, economic growth and poverty is found in "Trade Liberalization and Poverty: The Evidence So Far," by L. Alan Winters, Neil McCulloch and Andrew McKay, *Journal of Economic Literature*, vol. 42, March 2002, pp. 72–115.

[3] See, for example, *Barriers to Riches*, by Stephen L. Parente and Edward C. Prescott, Cambridge: MIT Press, 2000.

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