Globalizing Texas: Exports and High-Tech Jobs

By Anil Kumar

Texas has won plaudits for globalization. The Kauffman Foundation's 2007 State New Economy Index ranked Texas the third most-globalized state. The Regional Globalization Index, constructed by Moody's Economy.com, puts Dallas among the country's top 10 most globalized cities; Austin and Beaumont make the top 25.

A key factor in these high marks for globalization has been expanding trade, which has made Texas the top exporting state. Compared with the nation, Texas exports a larger share of its output, depends on exports for more of its jobs, sends more sophisticated products overseas and employs higher-skilled workers in export-related jobs. The state has been instrumental in the surge of overall U.S. trade; its port activity has grown more than twice as fast as the nation's in the past decade.[1]

Texas, however, hasn't diversified its export markets, continuing to depend heavily on Mexico. It also hasn't done as much as the nation in penetrating some of the large, emerging markets that will grow rapidly in coming decades.

Globalization has been spreading and deepening in the past decade or two. Economists are still trying to understand how the cross-border movement of goods, services, people and money is affecting national economies.

Globalization's state-level impacts are even more uncertain because important data are either incomplete or unavailable. We track regional exports of goods but not services. We don't have any reliable data on imports. State-level export data have limitations as well, but they provide valuable information on how Texas and other states are faring in a more open world economy.[2]

Economic Boost

Texas was a standout in goods exports even before it surpassed California in 2002 as the top exporting state. Over the past decade, the state has maintained a significant lead over the nation in foreign sales as

FIRST OF TWO PARTS

a share of total output (*Chart 1*). In 2006, exports accounted for 14 percent of Texas' economic activity, compared with 8 percent for the United States.

As economies globalize, workers' livelihoods are more likely to be tied to foreign markets. According to Census Bureau and International Trade Administration data, export-related jobs account for 5.5 percent of all private-sector employment in Texas, compared with the nation's 4.5 percent. Twenty percent of the state's manufacturing jobs depend on exports, versus 17 percent for the U.S.

Total exports and the jobs they create are key aspects of Texas' globalization, but we can also look at the mix of export products and markets. Export diversification is measured using the Herfindahl index, which equals the sum across industries or countries of the square of export shares. A larger value indicates that fewer industries or countries dominate total exports. A lower value signifies less concentration and more diversification.

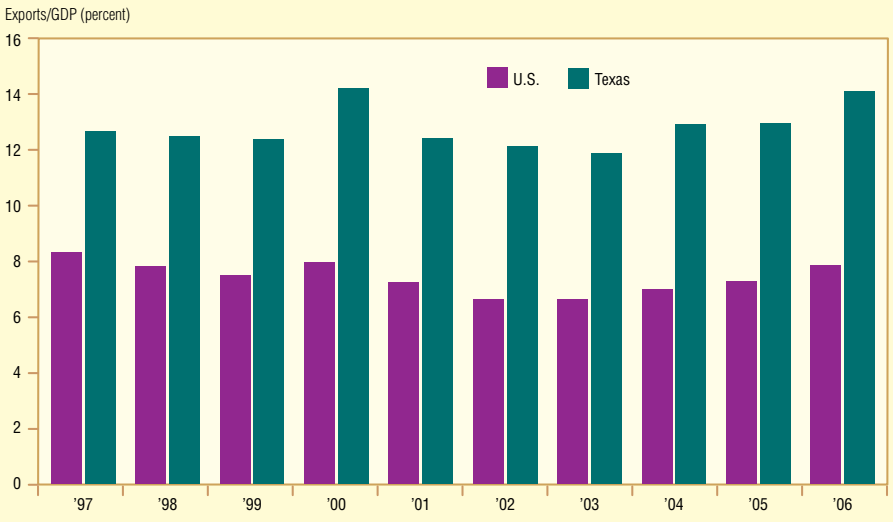
Across both export products and markets, these diversification indexes show that Texas' overseas sales are more concentrated than the nation's. This isn't surprising because the U.S. index is simply a weighted average of the states, which have different comparative advantages in terms of what they export and the markets they find favorable.

Comparing Texas with California, the No. 2 exporter, we see that the two states have come together in recent years in the industrial diversification of their exports (*Chart 2A*). Nearly all the movement, however, has come from California, suggesting that Texas hasn't made much progress in changing its export mix.

Texas continues to lag California and the nation in diversification across countries (*Chart 2B*). Texas' top three foreign markets account for more than half its exports, com-

Chart 1

Texas Exports a Larger Percentage of Its Manufactured Output Than the U.S.



NOTE: GDP in U.S. ratio is based on North American Industrial Classification System. The exports consist of manufactured products.

SOURCES: WISER Exports; Bureau of Economic Analysis; Haver Analytics.

Texas' high-tech workers help put the state ahead of the nation in exporting technologically sophisticated goods.

pared with 40 percent for the U.S. and 37 percent for California.

Mexico is a big part of the story. In recent years, Texas has become somewhat more diverse, with fast export growth to Latin America, Asia and the European Union.[3] Even so, Texas still depends heavily on its southern neighbor as an export market. Although Mexico is the top export destination for both Texas and California, Texas relies on the Mexican market for 36 percent of overseas sales, substantially higher than California's 15 percent.

The principle of comparative advantage encourages greater specialization, but a diversified export portfolio can help sustain economic growth by lending stability to states' overseas sales. The greater a state's range of products and markets, the more likely it will be able to withstand shocks to particular industries or countries.

Several times in the 1980s and early 1990s, Mexico's economic turmoil spilled over into Texas, hitting the border region particularly hard. Over the past decade, Mexico has achieved a long stretch of economic stability, which lessens concerns about Texas' reliance on a single market for its exports.

Rising exports are a positive for Texas and other states. Expanding trade's gains, however, may entail side effects—for example, globalization's impacts on certain segments of the economy, such as low-skilled workers. These are largely import-related, and state-level data aren't reliable enough to measure the overall economic effects on Texas' industries, jobs and income.

Sophisticated Products

As a high-wage country, the United States can't compete with the likes of China and India in markets that rely on cheap labor. America's edge in global markets is more likely to be found in goods and services that embody a high degree of advanced technology and skilled labor.

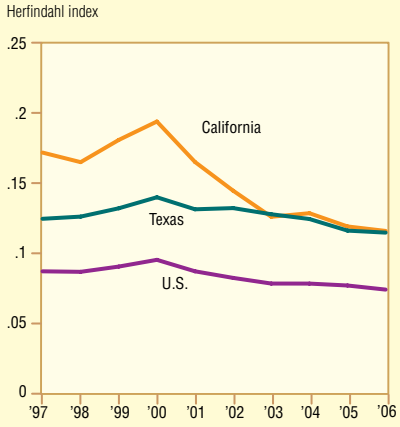
In general, Texas gets high marks for the superior quality of its workforce. The state ranks eighth on the Milken Institute's Technology and Science Workforce Composite Index and 12th in concentration of high-tech workers per 1,000 private-sector employees.

Texas' high-tech workers help put the state ahead of the nation in exporting technologically sophisticated goods. We measure the state's edge in these skill-intensive products as the export-share weighted average of research and development (R&D) spending to net sales ratio across manufacturing industries (*Chart 3*).

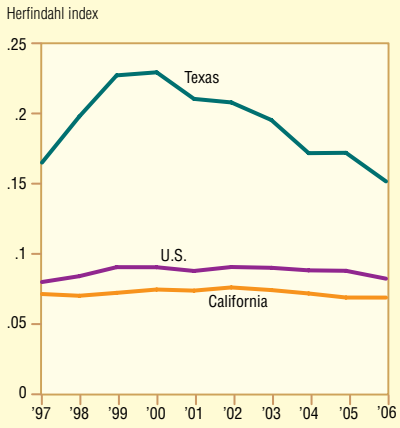
In both Texas and the U.S., relatively skill-intensive industries are more globalized and employ a larger concentration of export-related workers. Of these, the computer and electronics sector is the most skill-intensive, with industrial R&D expenditures of 11 percent of net sales. The sector also ranks No. 1 in share of jobs tied to exports.

Chart 2
Diversification of Texas Exports
(Higher score = less diversified)

A. Texas Exports Across Products Are Less Diversified Than U.S.



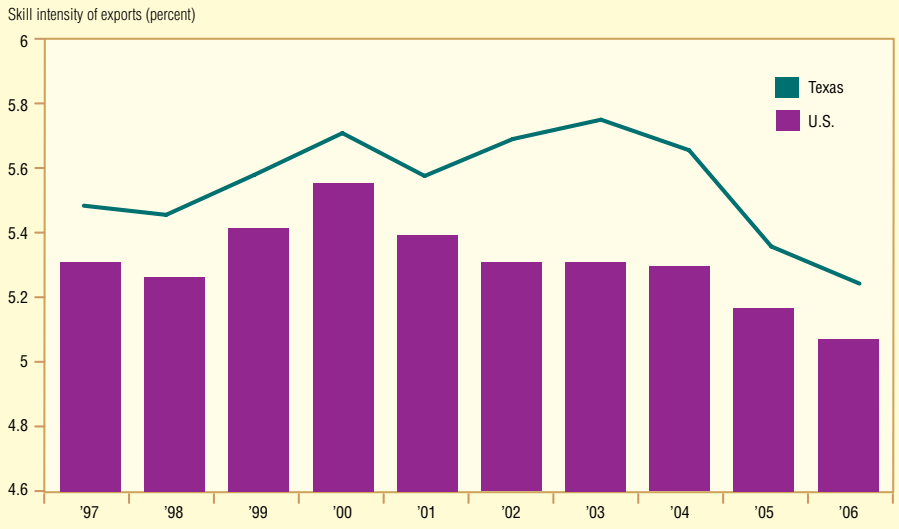
B. Texas Exports Are Getting More Diversified Across Countries



NOTE: Industrial diversification was calculated using exports data on two-digit HS commodities from WISER.

SOURCES: WISER Exports; author's calculations.

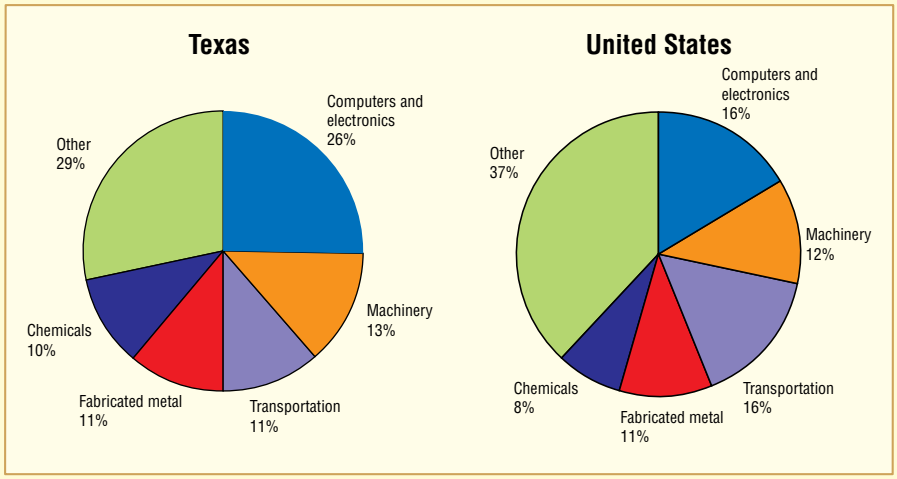
Chart 3
Skill Intensity of Texas Exports Is Higher Than U.S.



NOTE: Skill intensity of exports was calculated using average R&D/net sales ratio from 1999 to 2003.

SOURCES: WISER Exports; National Science Foundation; author's calculations.

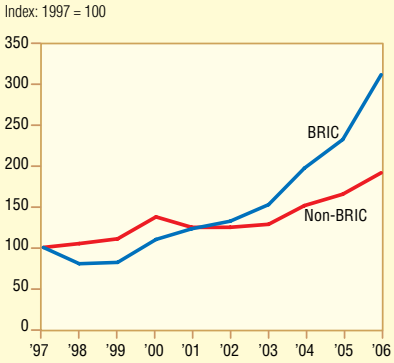
Chart 4
Industrial Distribution of Export-Related Jobs



NOTE: Export-related jobs data used are for 2003.

SOURCES: International Trade Administration; Census Bureau; author's calculations.

Chart 5
Texas Exports to BRICs Grow Faster Than to Non-BRICs



SOURCES: WISER Exports; author's calculations.

As much as 48 percent of Texas' computer and electronic equipment jobs depend directly or indirectly on exports, compared with 35 percent for the nation.[4] The high level of skill intensity in exports and export-related jobs reflects Texas' prowess in computer and electronic equipment manufacturing, which accounts for 26 percent of all export-related jobs, compared with 16 percent for the nation (*Chart 4*).

Texas and the U.S. have differences in export-related jobs in chemicals and transportation, but they aren't decisive for skill intensity.

The data show important links between globalization and the high-tech sector, which has emerged as one of the Texas economy's mainstays. Recent research stresses the importance of exports' skill content, including its positive effects on technological progress, productivity and economic growth.[5] Selling more sophisticated products on world markets also accelerates the learning process that makes exporters more efficient than nonexporters. All this suggests that qualitative aspects of trade may be just as important as the quantitative ones.

Trade with BRICs

In the 21st century, several large developing economies have emerged as major drivers of global economic growth. Brazil, Russia, India and China, collectively known as the BRICs, are likely to continue their rapid economic growth in coming decades, creating markets for goods and services from more advanced nations.

Today, the BRICs produce just 15 percent of the combined output of the U.S., Japan, Germany, France, U.K. and Italy, collectively the G6. According to Goldman Sachs, however, the BRICs will reach half the G6's GDP in 2025 and surpass the G6 in 40 years.[6] Increases in demand from the four countries are likely to exceed that of the G6 as early as 2009 and are projected to be four times the G6 in 2050.

Texas' exports to the four emerging giants have shown impressive growth, more than doubling over the past decade (*Chart 5*). Since 2001, when the BRIC growth rate eclipsed the non-BRIC rate, the dollar value of sales has risen by 320 percent to China, 217 percent to India, 76 percent to Russia and 42 percent to Brazil.

Even with high growth rates, however, the share of Texas exports going to the BRICs hasn't increased relative to the nation's over the past decade. The state has traditionally done much better than the U.S. in selling to a group of 21 emerging economies (including the BRICs), a fact that largely reflects Mexico's prominence as a market for the state (*Chart 6*).

Over the past decade, Texas has trailed the U.S. in the share of its total exports to the BRICs but is closing the gap. In 2006, the BRICs accounted for a relatively small 8 percent of the state's total exports. These nations purchase 9 percent of U.S. exports. Texas' exports relative to the U.S. are larger

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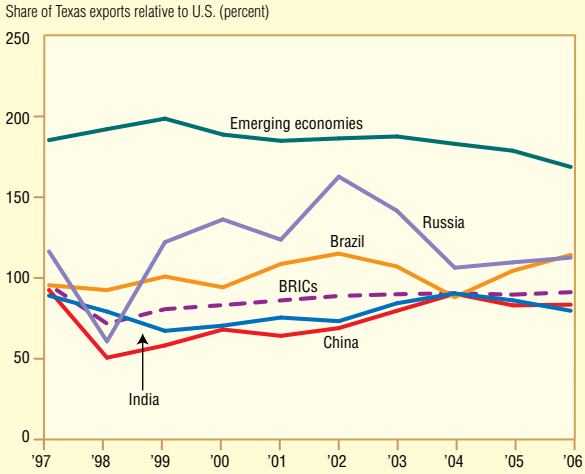
Chart 6
Relative to U.S., Texas Exports More to Emerging Economies, Less to BRICs



NOTE: The 21 emerging economies included in the analysis are Argentina, Brazil, Chile, China, Colombia, Egypt, India, Indonesia, Israel, Korea, Malaysia, Mexico, Pakistan, Peru, Philippines, South Africa, Russia, Singapore, Thailand, Turkey and Venezuela.

SOURCES: WISER Exports; author's calculations.

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to Russia and Brazil and smaller to India and China. The performance difference probably reflects other nations' needs as well as what Texas firms supply at competitive prices.

Gaining an Edge

We know a lot less about globalization at the state level, but what evidence we do have suggests Texas compares favorably with the nation on globalization yardsticks centered on exports.

The state depends more than the nation on overseas sales, as a percentage of both state GDP and employment. Texas scores higher on export sophistication, suggesting the state maintains a competitive edge in the high-tech sector. Texas trade with emerging economies remains solid, although the state depends heavily on the Mexican market and lags the U.S. in tapping into the fast-growing BRICs.

In upcoming years and decades, the forces of globalization aren't likely to subside. States, just like nations, will face sometimes difficult challenges as economic integration increases competition. At the same time, globalization will create new opportunities for states to boost exports, not only creating jobs but also raising incomes.

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Notes

The author thanks Keith R. Phillips and Raghav Virmani for useful comments.

[1] For details about Texas port activity, see "Full Steam Ahead for Texas Ports," by José Joaquín López and Keith R. Phillips, Federal Reserve Bank of Dallas *Southwest Economy*, November/December 2006, pp. 3–6.

[2] The Census Bureau advises caution in interpreting its state-level export statistics. The numbers track origin of movement, which may differ from exporters' actual locations. Goods not manufactured but merely shipped from a particular state count as exports from that state.

[3] "Texas Exports: Markets Grow Faster Beyond North America," by Anil Kumar and Raghav Virmani, Federal Reserve Bank of Dallas *Southwest Economy*, March/April 2007, p 10.

[4] The Census Bureau estimates export-related jobs as the total of (1) employment related to direct exports and (2) employment from activities supporting direct exports. The bureau uses the following methodology: Export data are from the Annual Survey of Manufactures (ASM) and U.S. International Trade in Goods and Services. These direct exports are multiplied by the employment/shipment ratio from the ASM to yield employment related to direct exports. The estimate of supporting employment is based on multipliers from input/output accounts provided by the Bureau of Economic Analysis. The multipliers are used to calculate supporting shipments to direct exports. Employment multipliers are then used to estimate employment related to supporting shipments.

[5] For example, see "The Export Skill Content, Learning by Exporting and Economic Growth," by Galina An and Murat F. Iyigun, *Economics Letters*, vol. 84, July 2004, pp. 29–34.

[6] For details, see "Dreaming with BRICs: The Path to 2050," Global Economics Paper No. 99, Goldman Sachs, October 2003.

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