Texas manufacturing and innovation jobs could use more education

By SALVADOR CONTRERAS

O{}n December 9th Brookings Institution, a think-tank based in Washington, D.C., put out a report by Robert Atkinson and, Mark Muro, and Jacob Whiton showing that growth of America's best paying high-tech and innovation jobs are concentrated in a handful of "superstar" metros. They claim that 90% of job growth in this sector occurred in Boston, San Francisco, San Jose, Seattle, and San Diego. Among Texas metros on their list of 100 metros, San Antonio and Austin had the highest gains at 27th and 31st place respectively. Between 2005-2017 these metros saw zero and a decline of 0.1% in their share of innovation industry employment.

In this brief we take a closer look at jobs in the innovation sectors in Texas. It is believed that the agglomeration of talent is an important driver of job growth and wages. We also focus on the border region's manufacturing and innovation industry. We show that stagnant wages in part reflect a declining share of employment in good paying occupations. Further, stagnant educational attainment has not helped in attracting the type of jobs needed to see real wage growth.

Wages

We start by showing the evolution of real incomes in Texas and the border region. Figure 1 presents incomes of individuals 25 years and older who are in the labor force (employed plus unemployed). Incomes are in 2010 dollars deflated using the Consumer Price Index. Border metros are El Paso, Laredo, McAllen-Edinburg-Mission, and Brownsville-Harlingen.

The figure presents real incomes at the 90th, 50th, and 20th percentile from 2000 to 2018 for Texas and 2005 to 2018 for the border region. Figure 1 makes it clear that incomes in the state and border region have been flat. In addition, the figure shows that individuals in border region earn substantially less than the overall state. For example, the best paid worker (90th percentile) in the border region earn on average $27,000 less than the comparable state group. Same is true for the middle (50th percentile), $11,000 less, and lowest paid (20th percentile) individuals, $5,000 less.
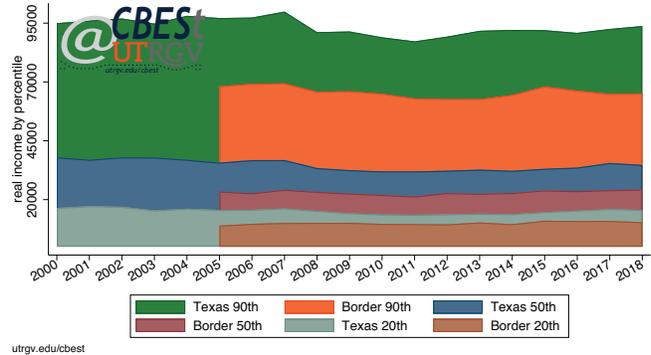

Figure 1: Texas and border region real incomes (2010 dollars), 2000-2018

SOURCE: AMERICAN COMMUNITY SURVEY

Why are wages in Texas flat and why are border region earnings substantially less than the overall state? The surest way to get real wage growth is through higher labor productivity. US manufacturing from 2000 to the second quarter of 2019 saw an annualized 2% growth in real output per hour. However, not all manufacturing jobs are equal. The Brookings piece called the following industries the high-tech innovation sector.

- Basic chemical manufacturing
- Pesticide, fertilizer, and agricultural chemical manufacturing
- Pharmaceutical and medicine manufacturing
- Computer and peripheral equipment manufacturing
- Communications equipment manufacturing
- Semiconductor and other electronic components manufacturing
- Navigational, measuring, electromedical, and control instruments manufacturing
- Aerospace product and parts manufacturing
- Software publishers
- Satellite telecommunications
- Data processing, hosting, and related services
- Other information services

- Scientific research and development services

Notice that eight of the 13 have manufacturing in the name. Manufacturing jobs are highly sought after because they represent a clear path to the middle class. The Trump administration's trade wars are in part a response to America's continued bleeding of manufacturing jobs. In addition, the world has continued to see an ever-increasing move to automate production. Both these factors have led to substantial loses in manufacturing jobs.

Figure 2 shows Texas and the border region's manufacturing jobs as a share of total employment. From 1990 to 2019, the state has seen its share of manufacturing jobs go down from 13 to 7%. The figure also shows border metros experienced a similar fate. For instance, the Rio Grande Valley (RGV) had 1990 levels similar to the state and has seen its manufacturing share fall to 3% by 2019. El Paso saw a decline from 20%, 7% above the state in 1990, to 5%, 2% below the state in 2019. The Laredo metro historically had a relatively small manufacturing base.
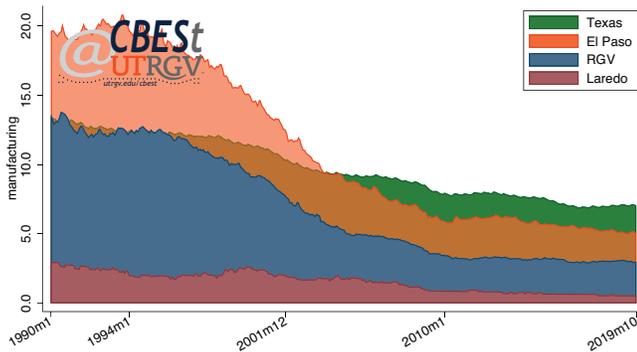

Figure 2: Manufacturing share of total employment

SOURCE: US BUREAU OF LABOR STATISTICS

A recent article by Austen Hufford at the Wall Street Journal points out that American factories are demanding highly educated workers. The sub-header reads: "within three years, U.S. manufacturing workers with college degrees will outnumber those without." Using the classifications from the Brookings piece, figure 3 shows median incomes of Texans in the high-tech innovation and manufacturing sector. Workers in high-tech innovation sector earn on average $22,000 more than workers in the broad manufacturing category. Notice also that the real median income in the two categories are relatively flat. High-tech innovation sector 2018 real median income is $2,000 higher than 2005 levels. On the other hand, manufacturing is down $1,000 over the same time period.
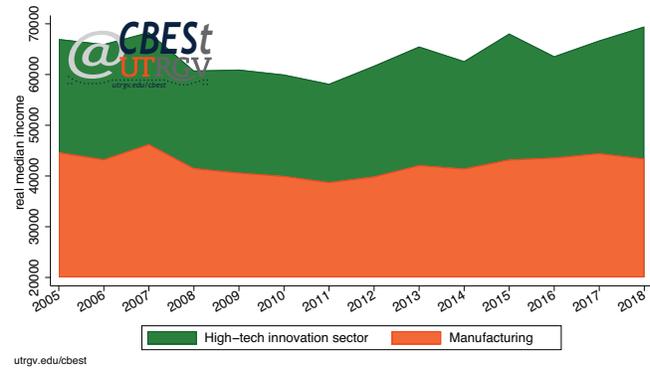

Figure 3: Real median income in high-tech innovation and manufacturing sector in Texas

SOURCE: AMERICAN COMMUNITY SURVEY

This suggests that all manufacturing jobs are not created equal. High-tech innovation sector pays more and demands workers with more education. The median worker in the high-tech innovation sector in Texas has 16 year of education (bachelor's degree) compared to 13 years (some college, no degree) for manufacturing. For reference, the median Texan in the labor force has 13 years of education. This partially explains why high-tech innovation sector jobs are hard to come by in Texas. The median education of the Texas labor force has not changed over this time period.

Education

Education is often seen as a proxy measure of labor productivity. If true, it would imply that job growth in high-tech innovation and manufacturing sectors will be attracted to regions with a highly educated work force. Figure 4 shows the relationship between annualized high-tech innovation sector employment growth (between 2005 and 2018) and average education by Texas metro.
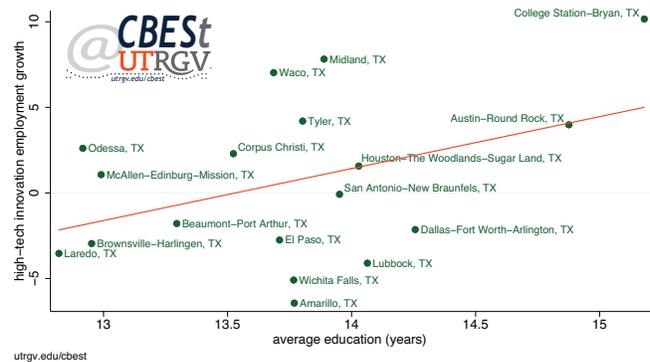

Figure 4: Correlation between annualized high-tech innovation sector employment growth and average education, 2005-2018

SOURCE: AMERICAN COMMUNITY SURVEY

Figure 4 shows that there is a positive correlation between high-tech innovation employment and average metro education. However, this is a bit misleading as College Station-Bryan and Austin-Round Rock pulls the relationship upwards. If we drop these metros the relationship is only slightly positive. Roughly, half the state's metros have seen positive growth in this sector. Among border metros, only McAllen-Edinburg-Mission experienced positive growth. College Station-Bryan, Midland and Waco saw annualized growth in high-tech innovation employment above 5%.

Figure 5 shows the relationship between annualized employment growth in manufacturing and average education by metro. There is a clear positive relationship between these two. More importantly, the positive relationship persists even without the two most educated metros. College Station-Bryan and Midland are the two metros with the highest growth. While, the three border metros of Laredo, El Paso, and Brownsville-Harlingen have the largest declines.
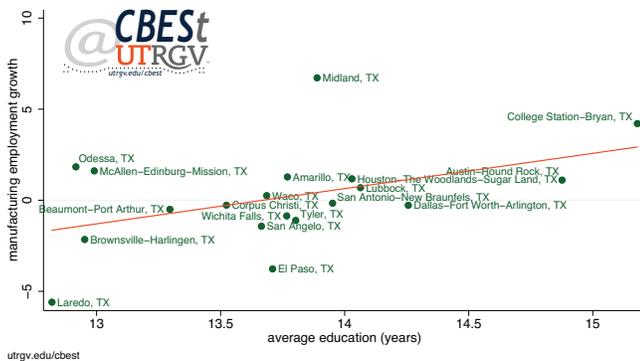

Figure 5: Correlation between annualized manufacturing employment growth and average education, 2005-2018

SOURCE: AMERICAN COMMUNITY SURVEY

Summary

The state has had a difficult time generating real wage growth over the past 18 years. This is in part driven by a decline in good paying manufacturing jobs and an inability to attract high-tech innovation jobs. We saw in figures 4 and 5 that for every metro with positive employment growth there is another with negative growth. This may reflect the skill composition of the labor force needed to attract and retain such jobs. This seems to be particularly true when looking at the border region. The region has the highest loses in manufacturing employment. It also has a labor force with the lowest levels of average education. This explains, to some extent, the income discount observed in figure 1.

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Endnotes

Banner image is from GM's announcement of new Arlington 1-million-square-foot body shop. Retrieved from https://media.gm.com/media/us/en/gm/photos.html

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