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Gauging the Impact of the San Antonio Toyota Plant

Various groups have estimated the economic impact of the new operation.

Since Toyota Motor Co. announced in February 2003 that it would open a truck plant in San Antonio, various groups have estimated the economic impact of the new operation. The most commonly estimated impact is for the total number of jobs created. This is usually based on the number of employees who will work at the plant—2,000—and a multiplier based on supplier and other indirect jobs. For example, the Texas comptroller's office forecast that the state would gain 16,000 jobs, 12,000 of them permanent. The UTSA Institute for Economic Development estimated an impact of 7,300 jobs in Bexar County.

This article defines job multipliers, describes how they are typically calculated, looks at factors that might impact the multiplier for Toyota, and summarizes recent findings on the accuracy of multipliers estimated for a South Carolina BMW plant.

Defining Job Multipliers

A job-creation multiplier is the total number of jobs created as a result of a new production facility, divided by the number of employees who will work there. For example, if a manufacturing plant opens with 100 people and this leads other firms to increase their employment by 100, the multiplier would be 2 (200 divided by 100).

The total job impact can be divided into three main categories: direct, indirect and induced. Direct jobs are those with the new firm—100 in this example. The remaining 100 jobs are indirect and induced jobs. The indirect jobs are supplier and construction jobs that support the establishment and production of the manufacturing plant. The induced jobs are those needed to fulfill the household demands of the direct and indirect employees, such as retail store jobs in the area near the new plant.

While all multipliers look at permanent indirect effects from suppliers, not all count temporary indirect jobs and induced jobs. So one source of differences in multipliers is what type of jobs are being counted.¹

Other differences occur in forecasting which inputs will be produced locally and which will be imported. The more goods and services that are imported, the fewer the indirect and induced jobs created locally. In areas with a large existing supplier base, suppliers will likely expand output to accommodate the new plant. In regions without a supplier base, suppliers are often reluctant to build until they can be sure they will have adequate business to make the move profitable. One measure of the likely use of local suppliers is a survey of the existing local firms

in the industry to determine how many of their supplies come from local producers.

The Bureau of Economic Analysis offers an alternative method to an often costly and time-consuming survey. The Regional Input-Output Modeling System (RIMS II) uses data on output, earnings and employment of regional suppliers to adjust national multipliers that are based on the input-output structure of nearly 500 industries.

For example, if a study of U.S. auto manufacturers revealed that for every unit made, suppliers produced on average 4.1 tires, the national multiplier would take into account the total increase in auto production, how many tires would be needed and the number of new jobs in the tire industry (along with other supplier industries).

For a local economy, this multiplier might be reduced if the auto industry represented a large share of jobs but the tire industry was small—implying that many of the tires are typically produced outside the local economy. If neither the primary nor the secondary industry has a local history and a new plant is being built, the multipliers are particularly difficult to estimate.

Factors Impacting the Toyota Multiplier

Because the auto and auto parts industries are small in San Antonio, the Toyota plant will likely have a smaller local multiplier than if they were large. According to data from the Texas Workforce Commission, the motor vehicle industry accounts for only 0.4 percent of San Antonio's total wages and 0.2 percent of its employment.

Industries new to an area tend to have low multiplier effects initially. Most suppliers will wait to see if other manufacturers relocate, which would make it more cost-efficient to build a

new plant rather than ship products from an existing one. After a visit to Japan, Joe Krier, president of the Greater San Antonio Chamber of Commerce, said some Toyota suppliers were hesitant to move to the San Antonio area unless Toyota added capacity to its San Antonio plant.²

A 2000 study by Thomas Klier, a senior economist at the Federal Reserve Bank of Chicago, found that even plants that adhere to just-in-time inventory management do not necessarily require that suppliers be located within 100 miles of the manufacturer's plant.

Klier suggests that plants look at suppliers located within about 400 miles, or a day's shipping distance. Klier also concludes that since close groupings of related suppliers are not necessary for most auto parts production, suppliers tend to center their factories between auto plants. This allows suppliers to maximize their plant production and use transportation networks to deliver their products.³

There are many automotive manufacturing plants in the Southeastern United States, and three General Motors plants are not far from San Antonio, in Arlington, Texas; Shreveport, La.; and Oklahoma City.

Several possible Toyota suppliers are currently building large plants in eastern Arkansas, which has easy access to the GM plants as well as to other automakers in the Midwest and Southeast. Denso Corp., partly owned by Toyota, is building a 500-employee plant in Arkansas to produce air conditioners, and Eakas Corp. is building a 250-employee plant to produce door handles and outside mirrors. TASUS Corp., a Toyota supplier that makes plastic injection-molded parts, is building a plant in Georgetown, Texas, outside the San Antonio metropolitan area.

The engines for the San Antonio plant are expected to be made at Toyota's Alabama plant and transmissions at either a Japanese or West Virginia plant.⁴

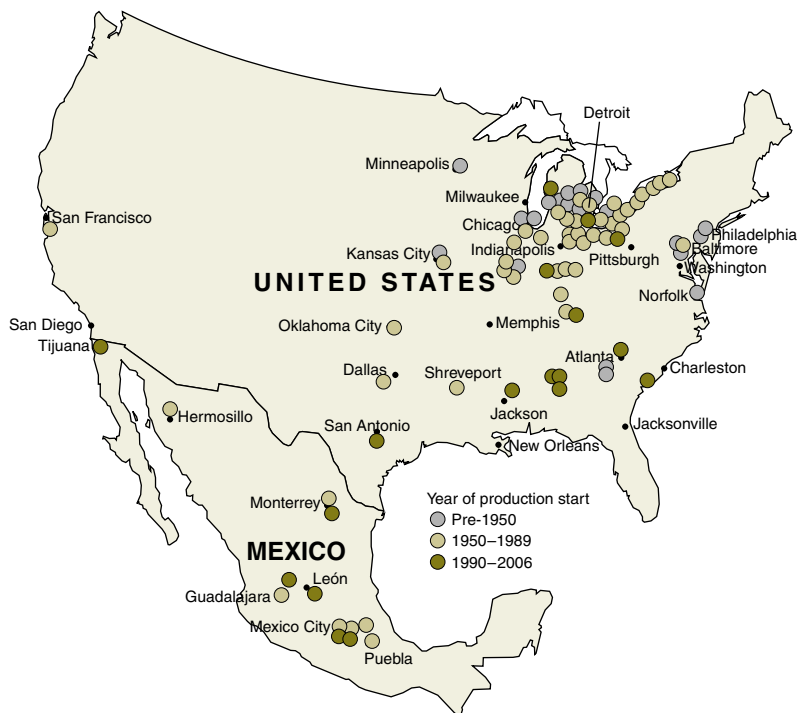
The Mexican Factor. While suppliers seem to be locating themselves for access to several U.S. auto manufacturers, many suppliers and some auto production plants are already operating in Mexico within a day's drive of San Antonio. As shown in the map, San Antonio sits near the center of a recently developed auto corridor that extends from Mexico City to Atlanta. Of the 18 assembly plants planned for or built in the United States and Mexico since 1990, 12 (including Toyota San Antonio) are located in this corridor, five of them in Mexico and six in the Southeastern United States.⁵

A large auto parts industry has evolved in Mexico to take advantage of the country's low labor costs and service plants there and throughout the United States. Employment in auto and auto parts manufacturing in Mexico in 2002 was 652,000, close to the 670,000 in the top six U.S. auto states combined (Michigan, Indiana, Ohio, Kentucky, Illinois and Tennessee).

Much of Mexico's auto parts manufacturing occurs in the maquiladora industry and in the four states that border Texas: Tamaulipas, Nuevo León, Coahuila and Chihuahua. In 2002 there were 232,700 maquiladora jobs in transportation equipment manufacturing. Suppliers in Tamaulipas, Nuevo León and Coahuila are well positioned to serve the Daimler/Chrysler plant in Saltillo that makes Dodge Ram trucks, as well as the Toyota plant in San Antonio.

Toyota is building its first Mexican manufacturing plant in Baja California near Tijuana, where it will make trucks and truck beds for its Tacoma pickup. Toyota purchased \$600 mil-

San Antonio Centered in New Auto Corridor



SOURCES: Automotive News Data Center; auto companies; TIP Strategies Inc.

lion in auto parts from 20 Mexican suppliers in 2002, and according to spokesman Dan Sieger, the company plans to expand its supplier network in Mexico to support San Antonio and Baja.⁶ Ciudad Juárez, which is between Tijuana and San Antonio, has a large auto parts industry and could be an important location for suppliers seeking to produce for both plants. While Juárez is about 550 miles from San Antonio and 725 miles from Tijuana, travel to both locations is expedited due to the light traffic between them and the good condition of Interstate 10. Both markets are also accessible by rail.

The Accuracy of Multipliers

John Connaughton and Ronald Madsen evaluated the use of output multipliers to determine the local economic impact of a BMW assembly plant in South Carolina.⁷ Their study

found that the initial multiplier estimates were overstated.

The South Carolina State Development Board projected a total increase of 10,137 jobs from the BMW plant, even though there were 1,900 direct jobs and the RIMS II multiplier for auto production was 2.55. The board argued that the RIMS II multiplier was too low because it only accounted for the existing supply chains, whereas the board expected an estimated 21 additional suppliers, creating 2,793 jobs. The board combined the projected new-supplier jobs with the on-site direct jobs to get total new jobs of 4,693. A multiplier of 2.16 (aggregated from RIMS II multipliers) was applied to the total estimated new jobs, resulting in total job creation of 10,137.

Connaughton and Madsen point out that a more conservative approach would be to multiply 2.55—the Standard Industrial

Classification code multiplier for motor vehicles and equipment in South Carolina—by the 1,900 on-site jobs to get a total job increase of 4,845—5,292 fewer than the board projected.

The authors of the study also ran a statistical test to determine if the BMW plant sparked the growth in supplier chains the state expected. They found no evidence of an increase in growth of supplier firms in South Carolina for up to three years after the plant opened. This supports their initial contention that the state had overestimated the multiplier impact and a multiplier of 2.55 was more reasonable than the state's 5.33.⁸

Caution May Be Warranted

There is a wide range of estimates for the total job impact of the Toyota plant coming to San Antonio, many of which seem large given the circumstances. There are reasons to suspect many suppliers will locate or expand outside the local area and even the state. The large presence of auto parts suppliers in Mexico, for example, was likely an incentive for Toyota to move to San Antonio but also lessens the need for suppliers to locate in the area. The research on the South Carolina BMW plant also suggests caution in estimating large multipliers.

In March 2004, Texas Gov. Rick Perry announced the Toyota plant would generate 1,000 new local jobs from about 10 automotive suppliers. These jobs will be created by unnamed on-site suppliers, manufacturing such items as seats, interior roof liners, and tire and wheel assemblies.

While more suppliers may come to the area and the state this year and next, it is reasonable to believe the 1,000 jobs the governor announced represent the bulk of the new permanent indirect jobs. However, there is also a good possibility that

because the plant will have the latest technology and proximity to a large, low-cost Mexican supplier base, it will expand production in the future if demand for Toyotas continues to increase.

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Notes

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¹ Although there are also multipliers for income, value-added and output, which are calculated differently, this article focuses solely on the employment multiplier.

² "Toyota Suppliers Likely to Bring In 1,000 Jobs; Some Companies Expected to Move Next to S. Bexar Plant Will Be Local Minority Owned Firms," by Barbara Powell, *San Antonio Express-News*, March 24, 2004, p. 1A.

³ "Does 'Just-in-time' Mean 'Right-next-door'? Evidence from the Auto Industry on the Spatial Concentration of Supplier Networks," by Thomas H. Klier, *The Journal of Regional Analysis and Policy*, vol. 30, no. 1, 2000, pp. 43–59.

⁴ "Suppliers Plan to Move onto Site of Toyota Truck Plant in San Antonio," by Barbara Powell, *San Antonio Express-News*, March 26, 2004.

⁵ "Texas Automotive Industry Profile, TIP Strategies Inc., http://site.tipstrategies.com/Texas_Automotive_Profile.pdf, September 2003.

⁶ "Toyota Says Trucks Produced in S.A. Will Be Sold in the U.S. Market—Despite Mexico's Proximity," by Greg Jefferson, *San Antonio Express-News*, Sept. 18, 2003.

⁷ "Assessment of Economic Impact Studies: The Cases of BMW and Mercedes-Benz," by John E. Connaughton and Ronald A. Madsen, *The Review of Regional Studies*, vol. 31, Winter 2001, pp. 293–303.

⁸ Since this study was completed, the BMW plant has expanded to employ 4,327 workers. Thus the current BMW direct impact is greater than originally expected, and the current supplier impact may also be larger than the study found. This does not abrogate Connaughton and Madison's results, however, since their study looked solely at the impact of the initial 1,900 jobs and not the impact of future plant expansions.

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