



Looking for Opportunity in **TENNESSEE'S** Manufacturing Sector



Center for Business and Economic Research
College of Business Administration
The University of Tennessee

for
Institute for Public Service
The University of Tennessee

October 2007

Looking for Opportunity in Tennessee's Manufacturing Sector

Prepared by
Matthew N. Murray, Associate Director
Vickie C. Cunningham, Research Associate
Zachary W. Richards, Graduate Research Assistant

Center for Business and Economic Research
College of Business Administration
The University of Tennessee
for
Institute for Public Service
The University of Tennessee

November 2007



Center for Business & Economic Research

College of Business Administration
The University of Tennessee
804 Volunteer Blvd., Temple Court, Suite 100
Knoxville, Tennessee 37996-4334
(865) 974-5441
<http://cber.bus.utk.edu/>

Research Faculty

William F. Fox, Director
Matthew N. Murray, Associate Director and Project Director
Donald J. Bruce, Associate Professor
LeAnn Luna, Research Assistant Professor

Research Staff

Vickie C. Cunningham, Research Associate
Betty A. Drinnen, Program Resource Specialist
Matthew J. Harper, Research Associate
R. Brad Kiser, Research Associate
Julie L. Marshall, Research Associate
Carrie B. McCamey, Communication Coordinator
Joan M. Snoderly, Research Associate
Angela R. Thacker, Research Associate

Graduate Research Staff

Kate Harper
Zachary W. Richards
Bryan M. Shone
Martin W. Tackie
Ann Boyd Watts
Kelly M. Woodruff
Zhou Yang

Table of Contents

Executive Summary	1
Introduction	5
Global Considerations	5
The Environment Confronting Manufacturing	7
Technological Change	7
The Rise of Foreign Producers.....	7
Reduced Trade Barriers.....	8
Domestic Manufacturing	9
State and Local Factors That Affect Manufacturing.....	10
Manufacturing Sector Trends, Strengths and Weaknesses.....	13
Historical and Projected Employment Trends in Manufacturing.....	13
Manufacturing Output.....	18
Exports of Manufactured Products	19
Manufacturing Establishments	20
Value Added, Input Spending, Shipments and Investment.....	22
State Gross Domestic Product Per Worker	24
Earnings in Manufacturing.....	25
RIMS II Multipliers	28
Linking the Pieces Together	29
Appendices.....	33
Appendix A: Trend Projections of Plants, Durable and Nondurable Goods	34
Appendix B: County Profiles	38

List of Tables and Figures

TABLE 1: Site Selection Factors	12
TABLE 2: Quality-of-Life Factors Affecting Location	12
TABLE 3: Historical and Projected Job Trends in Manufacturing	16
TABLE 4: Projected Growth in State Gross Domestic Product	18
TABLE 5: Manufacturing Establishments and Average Plant Size	21
TABLE 6: Manufacturing Statistics per Production Worker: Tennessee, 2002	25
TABLE 7: Manufacturing Statistics per Production Worker: Tennessee Counties, 2002	26-27
TABLE 8: Projected Growth in Output per Worker, Tennessee	28
TABLE 9: Average Annual Wage and Salary, 2005 (dollars)	29
TABLE 10: RIMS II Multipliers for Output, Earnings and Employment by Industry Aggregation, Tennessee	30
TABLE 11: Index of Manufacturing Sectors' Performance	32
FIGURE 1: Distribution of Tennessee Nonfarm Jobs	13
FIGURE 2: Manufacturing as a Share of Total Nonfarm Employment	14
FIGURE 3: Change in Manufacturing Employment, 1997 to 2006	15
FIGURE 4: Distribution of Tennessee Durable Manufacturing Jobs	17
FIGURE 5: Distribution of Tennessee Nondurable Manufacturing Jobs	17
FIGURE 6: Tennessee Manufacturing Total Exports by Subsector, 2006 (millions of dollars)	19
FIGURE 7: Tennessee Manufacturing Exports, 2006 (millions of U.S. dollars)	20
FIGURE 8: Percent Change in Number of Manufacturing Establishments, 1998 to 2005	23
FIGURE 9: Trend Projections of Plants, Total Durables' Manufacturing	24
FIGURE 10: Trend Projection of Plants, Total Nondurables' Manufacturing	24

Executive Summary

This is the second report sponsored by the University of Tennessee's Institute for Public Service focused on the manufacturing sector in Tennessee. The first report, released in 2005, provided an overview of the manufacturing sector's contribution to the economic base of the state. The current report is complementary, extending the initial analysis in two ways. First is a consideration of the global and local environments within which manufacturers operate today. These external influences are important as they impact the competitiveness of manufacturers and their ability to thrive in today's modern economy. Second is an examination of trends across industries and into the future, with an eye on identifying key strengths and weaknesses of different industrial sectors. Together these extensions are intended to help policymakers craft policies that can be used to promote the competitiveness of Tennessee manufacturers, in turn supporting the job, wealth and tax base creation process.

Manufacturing has long played an important role in the Tennessee economy and it will continue to do so in the years ahead. While manufacturing employment and the number of manufacturing establishments has fallen, industrial output continues to expand, and workers continue to earn good wages and fringe benefits. In the face of intense competition, manufacturing enterprises are investing in new productive capacity and technologies that will allow them to perform more effectively in the global marketplace. These same investments mean that new firm locations and expansions will continue to take place, though not at the same pace as in the past. The new investments also mean enhanced productivity and the need for a better trained workforce to support the production process. Policies that encourage investments in productive capacity and worker training will be essential to the survival and prosperity of Tennessee's manufacturing establishments in the years ahead.

The global environment within which manufacturing firms operate today has changed markedly. Important forces of change include the rapid emergence of new technologies, the ascendancy of foreign producers from developing countries and the decline in trade barriers. Together these forces have heightened the competition confronting Tennessee manufacturers. While some manufacturers in Tennessee have been hurt by this competition, other firms have been able to find new market opportunities and have seen their production and exports expand. Manufacturers generally have found that the new technologies have allowed them to produce more

output with fewer workers. The shifting global landscape certainly has proven to be a two-edged sword.

In the face of these changes, domestic manufacturers confront unique challenges, especially in comparison to their counterparts in the developing world. Escalating health care costs, high tort litigation costs, and environmental and workplace safety regulations can place domestic enterprises in a noncompetitive situation. These disadvantages will erode with the passage of time as developing countries progress to a more advanced stage of economic development. But this process of change will take years if not decades to unfold. The looming shortage of skilled workers will place an increasing burden on manufacturers as the baby boom generation withdraws from the workforce and labor force participation rates slow. Manufacturers in Tennessee have no choice but to fight to overcome these disadvantages.

The competitiveness of Tennessee's manufacturers also is affected by features of the local communities where manufacturing facilities are located and production takes place. These local characteristics have a significant impact on the cost of doing business and the productivity of the business enterprise. Important factors affecting costs and competitiveness include public and private infrastructure, private capital, technology, intermediate inputs, labor market conditions, taxes and government services, and economic development incentives. Quality of life factors, while not affecting the firm's bottom line, have become especially important to where economic development now

takes place. Unlike the global forces of changes that are impacting manufacturers, all of the community-based factors can be affected directly or indirectly through state and local policy actions.

Different businesses will place different weight on the importance of these local factors. For example, heavy industry may need access to rail facilities while high technology firms may require broad-band access and airport facilities; virtually all firms today that expect to compete directly or indirectly in the global marketplace will require a skilled labor force. There is no “one size fits all” strategy to meet the needs of manufacturers (and their workers). A given region may not offer everything a firm needs to compete effectively in the global market, giving rise to the need for partnerships in economic development across cities and counties. A good example would be industrial and technology parks supported by multiple jurisdictions. Rural communities in Tennessee

face especially difficult challenges, including more limited infrastructure capacity, small labor pools and a relatively weak tax base. Partnerships make particularly good sense for rural communities.

To identify the strengths and weaknesses of different sectors within manufacturing, a variety of data were carefully examined, including employment, output, establishments, exports, value added and the value of shipments, output per worker, earnings and economic impact multipliers. Projections of employment and output extending to 2016 were also considered. While some of the broad findings are reported below, the reader is encouraged to review the discussion in the body of the report for additional detail and further insights on the strengths and weaknesses of specific industry sectors.

- Manufacturing represented 14.4 percent of nonfarm jobs in Tennessee in 2006, but by 2016, manufacturing’s employment share will decline to 12.3 percent. The durable goods sector will see job growth while jobs in nondurable goods will continue to contract. The national economy will also witness a narrowing of its manufacturing job base by 2016.

- Using 1990 as a point of departure, the number of manufacturing jobs peaked in 1995 at 523,644. By 2006 manufacturing jobs in Tennessee stood at only 400,149. Projections call for further job losses yielding 390,425 manufacturing jobs by 2016.

- Despite statewide job losses, twenty-one counties were able to show job gains between 1997 and 2006, including 11 counties with double-digit gains.

- While job losses are expected to continue, manufacturing output will nonetheless expand. Inflation-adjusted state manufacturing gross domestic product is forecast to rise by 53.1 percent between 2006 and 2016, translating into a compound annual growth rate of 4.4 percent. Only the apparel subsector will see output fall by 2016. The use of new technologies and better skilled workers will be instrumental to achieving this output growth.

- In 2006, exports valued at \$19.9 billion from Tennessee made their way to 189 countries around the world, from Canada (the state’s top export market) to Mauritania in Western Africa (the state’s smallest export market).

- Transportation equipment and computers and electronics products were the two largest export sectors in 2006. Between 1997 and 2006, exports from the transportation equipment sector were up 111.8 percent while growth in computers and electronics products jumped 201.3 percent.

4.6

Manufacturing as a whole is projected to see a 4.6 percent compound annual rate of growth in average worker output between 2006 and 2016.

- The number of manufacturing plants declined from 7,514 facilities in 1997 to 6,671 in 2005. Fighting this trend are nonmetallic minerals, fabricated metals, transportation equipment, miscellaneous durable goods and the beverage and tobacco subsectors, all of which engineered an increase in the number of plants over the same time period. There is some evidence that plant growth at the county level is stronger when in close proximity to interstate highways and to metropolitan areas.
- On average there were 66.9 workers per manufacturing plant in 1997 versus 61.3 workers per plant in 2005. Only the wood products, nonmetallic minerals, electrical equipment and appliances, and food subsectors have seen average plant size grow. The smaller workforce is consistent with strong capital investments and the use of a more skilled labor pool.
- Output per worker in durable goods manufacturing was \$118,600 in 2006 versus \$102,100 in nondurable goods manufacturing. Manufacturing as a whole is projected to see a 4.6 percent compound annual rate of growth in average worker output between 2006 and 2016.
- The average wage in manufacturing in 2005 was \$43,088, with a spread ranging from a low of \$27,761 in apparel to a high of \$60,797 in chemicals. The nondurable goods sector pays an average wage that is \$2,770 higher than the average in durable goods.
- Job, income and output multipliers that capture the ripple effects of changes in economic activity differ significantly across industrial subsectors. All else the same, assistance to industry should focus on those subsectors with the largest multiplier effects on economic activity.

Thirteen of the data series considered in the report are used to construct an index that summarizes the net strengths and weaknesses of different industry subsectors. For each data series, a subsector sector is assigned a value of 1 or -1 depending on whether it is above or below average

compared to the average in manufacturing. For example, if a subsector's wage is above average, this subsector is assigned value of 1 for this measure of economic activity. Transportation equipment proves to have the highest index value, while electrical equipment has the lowest index.

Introduction

Manufacturing jobs in the U.S. and in Tennessee continue their long-term decline, with 1998 being the last year that jobs were added to either economy's manufacturing base. The number of manufacturing establishments is also in decline, a trend that accelerated on the heels of the 2001 recession. But there is some good news as well. First, the output of the state and nation's manufacturing sector continues to expand due to advances in productivity. These productivity gains are one of the most important trends taking place in the manufacturing sector today. As an example, in 2004 Tennessee's manufacturing sector saw inflation-adjusted output grow by over 12 percent at the same time that jobs fell. Second, some new manufacturing jobs are still being created in Tennessee by existing firms and newly-locating firms, though the interstate competition for these emerging jobs is nothing less than fierce. Between 1997 and 2006, 21 counties experienced job growth in manufacturing.¹

Manufacturing will continue to play an important role in the Tennessee economy in the years to come. But fostering growth—or forestalling decline—in the state's manufacturing sector will be increasingly difficult. Fewer and fewer manufacturing facilities will be needed due to improved productivity, outsourcing and production flows from abroad. These forces will continue to have an adverse affect on overall manufacturing employment. Compounding the problem is the expectation of a growing shortage of skilled workers. Demographic forces are a major factor as baby boomers retire and withdraw from the labor force. Some estimates suggest that baby boomers account for as much as one-third of the nation's current labor force. At the same time, there are not enough new workers entering into the skilled trades, nor science and engineering occupations. The failure to meet the workforce needs of tomorrow's manufacturers means that production activities will simply be located elsewhere.

Maintaining a strong manufacturing sector is important to the state for many reasons. The jobs generally pay well, workers often have access to employer-provided health insurance, and manufacturing firms provide an important contribution to state and local tax bases. Manufacturing firms also tend to have strong supply chain linkages with other business in the state which increases the scope of their economic and fiscal impact. And while manufacturing's share of statewide nonfarm jobs slipped to only 14.4 percent in 2006, many counties still rely heavily on industrial

employment as their economic foundation. For example, data from the U.S. Bureau of Labor Statistics show that Meigs, Perry and Rhea Counties each have over 50 percent of their nonfarm jobs in manufacturing. Across the state there are 36 counties where manufacturing accounts for one-third or more of all employment.

This report, which is focused on the state's manufacturing sector, has two fundamental objectives. The first is to frame the environment within which Tennessee manufacturers operate today. This environment is important as it determines the market conditions confronting the state's manufacturers and it affects business competitiveness. Two perspectives are brought to bear on this issue, one global and one local. The global environment captures broad influences like outsourcing and international competition, while the local environment reflects characteristics of places where firms engage in their production activities. These place characteristics are especially important as they have a direct impact on the cost structure of businesses and thus the ability to compete.

The second objective is to identify important trends taking place within manufacturing and key strengths and weaknesses of various manufacturing subsectors. Historical and projected job, output and establishment trends are presented for the manufacturing sector, complemented by an array of data on earnings, value added, manufactured exports, and so on. Together the data offer the opportunity to acquire a refined understanding of the state's manufacturing sector and its prospects for economic opportunity in the years ahead.

Global Considerations

The emergence of the new global economy has created a wide array of challenges outside the direct control of U.S. manufacturing firms. These challenges spring from both domestic sources and abroad. Within the U.S., manufacturers face rising energy and healthcare costs, more stringent environmental regulations, and a shortage of skilled workers. These factors are hindering the ability of American firms to compete globally using low-cost strategies. Emerging economies, such as China and India, are placing additional pressure on U.S. manufacturing competitiveness in the form of increased competition in both labor- and knowledge-intensive industries. U.S. firms, particularly those in the manufacturing sector, must identify the issues framing the current economic environment and develop appropriate strategies to deal with these global trends.

¹ Background information on the state's manufacturing sector can be found in Matthew N. Murray et al., "The State of Manufacturing in Tennessee," Center for Business and Economic Research, The University of Tennessee, Knoxville, November 2005.

The Environment Confronting Manufacturing

Over the past generation, the nature of U.S. manufacturing has changed dramatically. In the 1990's, the U.S. manufacturing sector was thriving as a result of heavy capital investment, accelerated productivity gains, and unprecedented innovation. However, due to many factors outside the control of the individual firm, the landscape has changed. The change began as many low-skill, labor-intensive industries such as textiles moved overseas to developing countries where labor is relatively cheap. As the Internet and other communication technology improved, other service-based industries moved as well. As a result, job growth in manufacturing industries has become stagnant. In fact, manufacturing employment as a share of total civilian employment in the U.S. has fallen over the past thirty years. But despite the job losses, productivity gains have continued to rise, increasing manufacturing output.

The structural shifts in the global economic environment where American manufacturing firms compete can be summarized by three distinct trends. First is the emergence of the Internet and other technological innovation. Second is the emergence of new economic markets in the developing world. Third is the widespread reduction of trade barriers across the globe. These developments impact U.S. manufacturing firms from several angles, particularly in the form of increased productivity, expanded access to both input and output markets, and greater competition from foreign firms.

Technological Change

The past few decades have seen extraordinary strides in technological progress. The development of computers ushered in a new era. Computers have transformed all stages of the manufacturing process, from the development of product design to shipping and inventory management. Advanced modeling software allows engineers to design and test products in a low-cost virtual environment. Once designed, advanced computer-based assembly machines are able to produce larger quantities of higher-quality products than ever before, thanks to superior precision in measurement, speed, and efficiency of execution. These trends have helped domestic manufacturers, as well as their competitors abroad.

Once a product is produced, computer systems assist in managing the firm's inventory, receiving and completing orders, and shipping the orders to customers. Sophisticated tracking software can monitor the location of all shipments and solve complex logistical issues, reducing transportation and shipping costs. In the day-to-day business activity

of the firm, computers have streamlined tasks such as payroll management, accounting, and sales. Each of these developments has increased productivity, lowered production costs, and improved overall manufacturing efficiency.

Communication technology has further enhanced efficiency. It has made communication between branches of firms and communication between buyers and sellers faster and cheaper. Real-time communication allows manufacturers to supply their customers on an as-needed or "just-in-time" basis, minimizing costs from both delays and excessive inventories. It has also changed customer expectations regarding time delays in responding to their needs.

Communication technology, especially the Internet and wireless technology, has made physical distance less of an obstacle. Again, this has touched every aspect of business. Developers are able to collaborate with each other in real time regardless of their physical location. This has opened manufacturers' access to expertise across the globe. Designs can be sent from an engineer's home or office to a manufacturing plant anywhere in the world. The same goes for managers. Integrated, real-time data systems are able to constantly update managers on operations, regardless of their location. Cell phones allow greater contact between buyers and sellers. Manufacturing firms are better able to communicate with both suppliers and customers resulting in a more efficient alignment of demand and supply. Of course all of this depends on whether or not there is sufficient infrastructure to support these forms of communications. Such infrastructure is often lacking in rural places, including rural places in Tennessee.

The Rise of Foreign Producers

Another significant trend affecting the manufacturing environment is the growth in foreign markets such as China, India, Brazil, and the former Soviet Union. Each of these areas has become integrated into the global economy in one way or another. While they consume more, they also produce more and increasingly compete against firms in the U.S. and Tennessee. Much of the time this integration is a result of political forces. In the case of China, the government has made a concerted effort to open borders to trade and the flow of information. Historically, China sealed itself from the rest of the world but has more recently reversed course. In addition, China has begun the process of privatization of many state-run industries. In Russia and other former Soviet countries,

Due to many factors outside the control of the individual firm, the landscape has changed. The change began as many low-skill, labor-intensive industries such as textiles moved overseas to developing countries where labor is relatively cheap. As the Internet and other communication technology improved, other service-based industries moved as well. As a result, job growth in manufacturing industries has become stagnant.

the fall of communism has replaced the command economy with market mechanisms, fostering innovation, production, and trade.

The end of the Cold War largely signaled the end of political and economic rifts that divided the world for the better part of the century. The political and economic changes that have taken place in China and Russia, combined with the rapid growth of India and Brazil, and the strides in education made by many Southeast Asian countries have brought in a new wave of manufacturing competition. For a variety of reasons, labor costs in these countries tend to be much lower than in the U.S., eroding the ability of American firms to compete on a low-cost basis. This is changing as workers abroad demand better working conditions and higher pay, but this change is slow.

The rapid economic growth that is occurring in places like China and India is also raising costs for manufacturers around the world. Scrap steel, gasoline, natural gas, concrete, and so on have all experienced sharp price increases in recent years. This situation—especially in the context of fossil fuels—is not expected to see improvement.

Competition has been tempered by recent concerns over food and product safety issues, especially for products coming from China. Foreign producers will have to invest more and spend more in the future to produce goods and services that consumers feel are safe to purchase. This can do nothing but benefit both consumers and domestic producers.

Reduced Trade Barriers

The third major trend affecting the global manufacturing environment is the vast reduction of trade barriers, both tariff and non-tariff. The average tariff rate for Organization for Economic Cooperation and Development (OECD) countries has fallen from 40 percent in the 1940's to around 4 percent today. This has been fostered by the creation of strong trade agreements such as the North American Free Trade Agreement (NAFTA), the expansions to the General Agreement on Tariffs and Trade (GATT), and the formation of organizations such as the World Trade Organization (WTO). These events have successfully removed or reduced import quotas and other non-tariff barriers in addition to lowering or eliminating tariffs on manufactured goods.

As one might expect, the volume of trade has increased dramatically as trade barriers have fallen. Over the past generation, the volume of global trade has increased at an annual rate of 5.8 percent, more than double the rate of the world economy as a whole. Much of the trade growth has been in manufactured goods which represents about 60 percent of all trade in goods and services. Many Tennessee manufacturers have been able to benefit from this growing export trade (see below).

Lower tariff rates and the reduction of non-tariff barriers with trade partners have opened new markets and expanded existing ones for both a firm's inputs and output. Firms are better able to sell their output to foreign consumers and to access a broader market for their inputs. This has allowed firms to import higher-quality intermediate goods more cheaply, keeping costs lower and restraining inflation in the over economy.² But like the other major trends of the past few decades, lower trade barriers have also increased exposure to foreign competitors who wish to sell their products to American consumers. Lower tariffs benefit domestic consumers in that they drive down the cost of foreign goods, but they also reduce the market share held by U.S. firms. Consumers are generally better off, but workers may be displaced from their jobs as imports rise.

² This is one likely reason for the limited pressure on China to adjust its currency, since many domestic manufacturers purchase inputs from Chinese producers.

Domestic Manufacturing

The three “megatrends” outlined above have had many of the same effects on U.S. manufacturers. They have all opened access to cheap labor markets around the world. Better communication technology, the emergence of developing economies, and the reduction of trade barriers have allowed manufacturing firms in all countries to access abundant supplies of labor, which has contributed to the recent outsourcing phenomenon. Since capital is extremely mobile in a global economy while labor is relatively immobile, manufacturers have begun to access low labor-cost areas by importing low-cost parts and components.

Another way in which these trends have impacted American manufacturing firms is through a more competitive world marketplace. Since firms in all countries have greater access to more extensive and cheaper input markets, they are able to minimize production costs and thus keep their prices low. American firms must also access these markets in order to remain competitive with an expanding number of foreign firms that are taking advantage of these cheaper markets.

In addition to widespread political and economic forces abroad that frame the current economic environment, there are several domestic issues that impact American manufacturing competitiveness. The major domestic trends facing U.S. firms include rising energy and healthcare costs, the increased burden of tort litigation, more stringent environmental compliance requirements, and the shortage of skilled labor. Each of these issues imposes costs on manufacturing firms that are largely unrelated to production and threaten the ability of American firms to compete with cheaper foreign products.

One of the biggest challenges facing U.S. manufacturing firms is the rising cost of healthcare. It is well known that the American workforce is aging. As workers grow older and require more medical attention, the demand for medical services increases. This drives up the price of healthcare for all Americans. In addition, advances in medicine have enabled the treatment of previously untreatable illnesses in the form of expensive medical procedures. The cost of prescription drugs continues to increase as well. These and other factors contribute to higher healthcare costs for employers who must include healthcare as part of their compensation packages to compete for a limited number of skilled workers. Not providing healthcare to employees is simply no longer optional for many firms. Large domestic corporations like General Motors incur much higher costs than their foreign competitors in part because of high

health insurance costs for current workers and retirees.

The shortage of qualified workers is another obstacle facing U.S. manufacturers. While American workers are the most productive in the world, recent surveys reveal the lack of skilled labor to be one of the biggest concerns facing domestic firms. As many low-skill jobs have moved overseas, U.S. manufacturing has become more technology-oriented. High-tech manufacturing continues to rise as a share of total manufacturing output. These jobs require educated workers equipped with skills suited to a high-tech economy. The educational attainment gap between the U.S. and other countries has shrunk or even disappeared in recent years. As a result, 60 percent of manufacturers reject half of all job applications because the applicant lacks basic skills. As high as 80 percent of manufacturers indicate that they have difficulty finding qualified employees. In order to remain competitive in industries where the U.S. has a comparative advantage, America must invest in the education of its workers in order to equip them with the skills required to succeed in the fast-paced and ever-changing global economy.

Rising energy costs also threaten the ability of U.S. manufacturing firms to compete in global markets. In particular, natural gas costs in the U.S. have more than doubled since 2005. This is especially bad news for manufacturers, as they use a disproportional amount of natural gas compared to other sectors of the economy. While manufacturers consumed 34 percent of all U.S. energy in 2002, they accounted for 48 percent of natural gas consumption. Natural gas is also unique in that, unlike oil, the price varies considerably from country to country. Over the past ten to fifteen years, the price of natural gas has increased in the U.S. more rapidly than in competing countries. Considering that manufacturers rely on natural gas for 28 percent of their total energy needs, rising prices threaten their ability to compete globally. From 2002 to 2004, spending by manufacturers on natural gas increased by 59 percent, despite a slight decrease in consumption. According to the National Association of Manufacturers (NAM), the U.S. had a 30 percent cost advantage in natural gas in the mid 1990's. By 2005 this cost advantage had turned into a 0.7 percent disadvantage. As noted above, the energy situation is not expected to improve in the years ahead.

Environmental compliance costs place additional burdens on U.S. manufacturers since many foreign producers do not face similar costs. Firms must bear the costs created by the imposition of pollution emission caps. Often U.S. firms are required to cut emissions by a larger amount than their foreign competitors, thereby altering

the competitive landscape since pollution abatement is costly. From 1992 to 2004, environmental compliance costs borne by domestic manufacturers increased by over 24 percent, greater than most of U.S. trading partners. Future trade accords, as well as policy changes implemented by developing countries, may narrow disparities such as this, but it is likely that domestic manufacturers will confront a cost disadvantage for the foreseeable future.

High tort costs are a source of additional pressures on American manufacturing competitiveness. Even though increases in tort costs have slowed in recent years, they are still significant. In 2003, the cost of tort litigation in the U.S. represented 2.2 percent of GDP, up from 2.0 percent in 2000. This is a larger share than in any other country for which data are available. The ratio of tort litigation costs to total output for the U.S. is about three times that of Canada, Japan, the United Kingdom, and France. It is twice as large as that of Germany.

A final consideration is the evolution of the manufacturing enterprise itself. Traditionally manufacturers of a particular product brand produced their wares using facilities that they owned and workers that they employed. But this has changed markedly with the passage of time. Not only has outsourcing of input production expanded, as with automobile parts suppliers, but some companies produce nothing at all, contracting out the entire production process. These contract production processes, like the automobile parts suppliers, are under perennial pressure to cut costs.

The economic environment has transformed remarkably over the last several decades. The technology age has revolutionized production through automated assembly lines and precision manufacturing. Advances in communication have made the world smaller, rendering virtually any place accessible. The destruction of political and economic barriers has integrated the economies of the world. China, India, and other developing nations are joining the traditional economic powers as major players in manufacturing. These shifts have opened all markets, creating an ultra-competitive environment where U.S. firms now compete not only with other domestic firms, but with firms across the globe. The integrated world economy magnifies domestic pressures such as environmental regulation, healthcare costs, and the growing skilled labor shortage. In order to succeed, U.S. manufacturers must identify strategies that recognize these shifts in the way they do business and adapt to this new environment.

State and Local Factors That Affect Manufacturing

The viability and competitiveness of a manufacturer hinge on its ability to produce a quality product at low cost and sell the product in the face of intense interstate and international competition. The cost side of this ledger is affected in significant ways by conditions within the state and within the local communities where production actually takes place. The less attractive these conditions are, the less attractive a community will be to businesses. Unlike the global forces discussed above, we have some control over the state and local conditions that affect the firm's cost structure and competitiveness. Education and training offer good examples, as an educated workforce means more productive workers. Focused technical assistance to individual firms may also prove helpful. Investments in these areas will not provide complete insurance against the loss of firms or the loss of jobs. But good economic development policy and effective assistance to firms can enhance competitiveness for many businesses and their workers.

The broad influences on the local cost structure of manufacturers include the following:

- Public and private infrastructure
- Private capital
- Technology
- Intermediate inputs
- Labor market conditions
- Taxes and government services
- Incentives

These factors can be inventoried and assessed to identify how they might affect the general business climate and competitiveness of manufacturers in specific communities. This should be done in tandem with an assessment of global forces affecting manufacturers. Together such an assessment can help frame the nature of any technical assistance that might be provided to industry and guide more general policies that support business competitiveness.

Public infrastructure includes factors like roads and highways that allow the business to bring inputs to the plant (including workers) and get the final product out to wholesalers and consumers. The absence of good roads, or the presence of serious congestion on roads, can hamper business activity. At the same time, more infrastructure and more roads may only matter if the full range of conditions are ripe to support economic development;

infrastructure typically connects economic activity rather than creating it. Railroads and telecommunication facilities are examples of important forms of private infrastructure that can facilitate economic development.

Private capital includes the machinery, equipment and structural facilities that the manufacturer uses to produce its product. Technology is generally embedded in this same capital. Together the physical facilities and the embedded technology will determine the ability of the firm to cost-effectively transform inputs into outputs. Older firms tend to have older capital that will render them less competitive. New investments on the part of existing and newly-locating firms can directly affect business competitiveness. These investments are influenced in part by the industrial recruitment activities of local industrial development boards, often in concert with the state. New technologies and production processes typically translate into the need for workers with new and improved skills.

Intermediate inputs are the things purchased from other businesses that go into the production process. This might include tangible inputs that become embedded in the product, energy which is used in production, and services that support the business's operation (e.g. accounting and maintenance services). In small communities with little economic diversification, most of these inputs will have to be imported from other places. This can be costly to the firm and will dampen any economy-wide effects associated with the manufacturer's operations at the local level. For most businesses, it is more cost effective to operate within close proximity to a metropolitan area where competition in input markets is more extensive and where more inputs are available locally.

Labor costs, labor quality and the size of the local labor force are of great importance because for many firms labor costs are the single-largest cost category. Labor quality tends to go hand in hand with labor costs; labor costs in Tennessee and other Southeastern states tend to be lower than the national average in part because workforce educational attainment levels are relatively low. The workforce preparedness problem in Tennessee has been affirmed by a host of rankings, including the Development Report Card of the States produced by the Corporation for Enterprise Development. The Report Card perennially gives the state's workforce poor marks.

The occupational and skill mix of the workforce will be affected by the size of the local labor pool. A small community will have a relatively small labor force that may not meet the range of occupational demands of larger firms. Many rural communities also have low labor force participation rates which can discourage firms

from locating because of the signal that is sent regarding attachment to the workforce. Rural places tend to have more poorly funded public school systems and a less educated adult population which aggravates their economic development woes. Together these considerations point to the importance of partnerships across rural communities in order to pool resources and maximize the potential for an improved economic development climate.

State and local taxes in Tennessee are low compared to other states, in turn increasing the attractiveness of doing business in the state. For example, the U.S. Census Bureau reports that Tennessee ranked 49th in the nation in state and local own-source revenue per capita and state and local own-source revenue as a share of personal income in 2005. While low taxes can encourage firms to do business in Tennessee, the same low taxes translate into relatively low levels of government spending. For example, Tennessee's spending on elementary and secondary education is consistently among the bottom ten states in the country. This spending, along with perceptions of workforce quality and low levels of adult educational attainment, adversely affects the state's ability to attract and retain quality businesses and jobs.

Incentives have become a prominent feature of the business recruitment and retention strategies of states and localities across the country. But most observers think that the use of economic development incentives has gotten out of hand. Mississippi bid nearly \$1 billion for the Kia automobile assembly plant that was ultimately sited in Georgia; Alabama recently recruited a steel plant that will employ 2,700 workers for a price tag of \$811 million, a cost of over \$300,000 per job. Most companies today that intend to make significant capital investments or create large numbers of jobs will ask states and localities for some form of an incentive; existing industry often asks for incentives to simply keep economic activity located where it is. In many instances incentives serve as a mechanism to overcome an otherwise adverse economic environment within a community.

At a broad level there are two types of incentives. First are those that simply improve the firm's bottom line, like tax abatements. Tax abatements lower costs, but they do absolutely nothing to improve the underlying competitiveness of the firm in the marketplace. Second are incentives that fundamentally improve the ability of a business to compete and the ability of a community to sustain economic growth over time. Worker training is a good example. Training improves worker performance on the job and improves the ability of the business to compete. Should an employer leave a community after its

workers have been trained, at least the community is left with a better trained workforce for the future.

Different businesses will place different weights on the importance of these and other factors that affect costs and competitiveness. To get a sense of what matters most, consider the opinions expressed by a group of site consultants in a recent survey. (As an opinion survey, the findings obviously need to be taken with a grain of salt.) Table 1 shows the top site selection factors as identified by these site location consultants.³ Generally the factors fit into the broad categories that affect costs discussed above. Highway accessibility is the top factor, pointing to the importance of transportation infrastructure. Incentives

³ The survey was conducted by Area Development magazine and is available online at http://www.1800arkansas.com/reports_publications/files/3rd%20Annual%20Consultants%20Survey.pdf. (Accessed June 12, 2007.)

TABLE 1: Site Selection Factors

RANKING	FACTORS
1	Highway accessibility
2	State and local incentives
3	Labor costs
4	Availability of land
5	Availability of skilled labor
6	Cost of land
6T	Proximity of major markets
7	Occupancy or construction costs
8	Tax exemptions
9	Availability of high-speed Internet access
10	Availability of telecommunications services
11	Energy availability and costs
12	Low union profile
13	Corporate tax rate
14	Proximity to suppliers
15	Accessibility to major airport
15T	Training programs
16	Right-to-work state
17	Environmental regulations
18	Raw materials availability
19	Availability of long-term financing
19T	Availability of unskilled labor
20	Proximity to technical university
21	Railroad service
22	Waterway or oceanport accessibility

appear as number 2 on the list. Labor costs and labor availability both make it to the top five.

Input costs and similar factors aren't the only things that influence where companies choose to do business. Quality of life factors have in recent years become increasingly important to where economic growth takes place. The site location consultants were also asked to identify the quality of life factors that were most important to their clients. This list is shown in Table 2. Ratings of public school quality and the presence of nearby institutions of higher education rank 1 and 2 on this list. Workers and plant managers alike want to live where there are good schools for their children. School quality also affects workforce quality. More generally people simply want to live where there is a good quality of life.

In practice, each community will offer its own business climate and quality of life characteristics, and each business will have its own needs. But the general framework set out above can still be used to help identify the features of communities that contribute to business success and those that inhibit competitiveness. This assessment could be done at a general level to evaluate a community's overall business climate or it could be done more specifically to assess the climate for specific firms and industries.

TABLE 2: Quality-of-Life Factors Affecting Location

RANKING	FACTOR
1	Ratings of public schools
2	Colleges and universities in area
3	Low crime rate
4	Housing costs
5	Health facilities
6	Housing availability
7	Cultural opportunities
8	Recreational opportunities
9	Climate

Manufacturing Sector Trends, Strengths and Weaknesses

The sections that follow each focus on a different dimension of the state's manufacturing sector. Included are discussions of employment trends, output trends, manufacturing establishments, manufactured exports, value added and manufactured shipments, output per worker, earnings and economic impact multipliers. All of these data are intended to shed complementary insight on the trends taking place in the manufacturing sector and highlight the relative strengths and weaknesses of different manufacturing subsectors.

Historical and Projected Employment Trends in Manufacturing

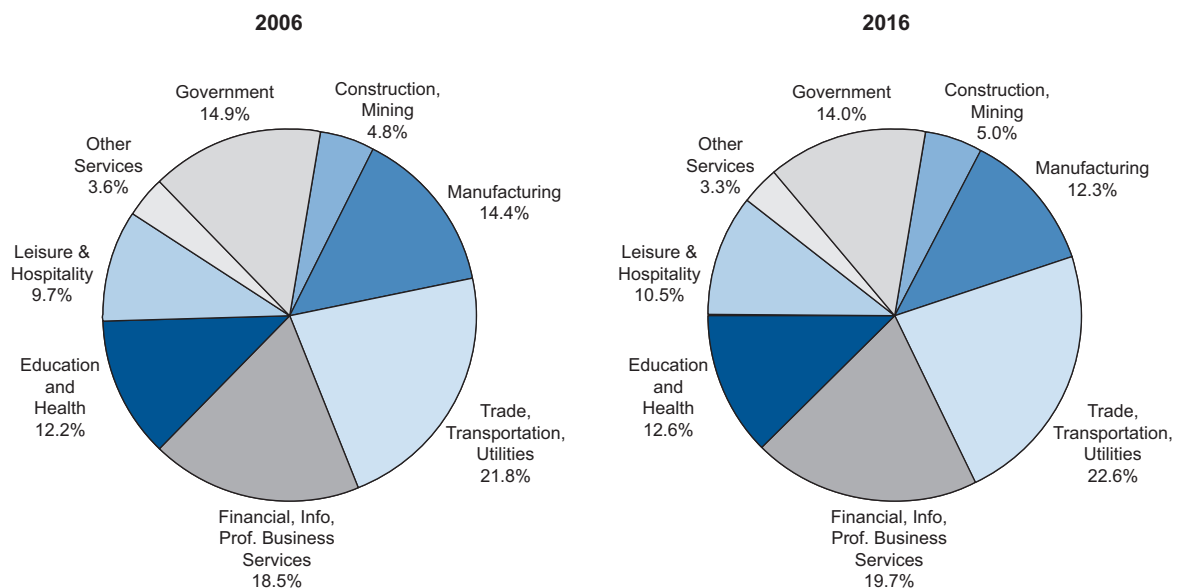
Manufacturing represented 14.4 percent of nonfarm jobs in Tennessee in 2006 as shown in Figure 1. Manufacturing in Tennessee now accounts for fewer jobs than the government sector that includes federal, state and local government employees. By 2016, projections indicate that manufacturing's employment share will decline further to 12.3 percent.⁴ This diminished role is due to the expectation of very weak job growth in manufacturing coupled with strong growth in other sectors of the economy, especially services. Together, other services,

leisure and hospitality services, education and health services and financial, information and business services will represent 46.1 percent of all nonfarm jobs in 2016. Education and health services alone will account for more jobs than manufacturing by 2016.

Manufacturing jobs have steadily declined as a *share* of nonfarm employment for both Tennessee and the U.S. since 1990 as shown in Figure 2. The rate of decline accelerated slightly in Tennessee in the aftermath of the recession of 2001. The decline is expected to flatten out in 2012 and the years that follow. The *number* of jobs in manufacturing has also been in decline though the pattern is not nearly as pronounced as that portrayed in Figure 2. The state actually saw some job growth in the early 1990s with jobs peaking in 1995 at 523,644. However, in 2006 manufacturing jobs in Tennessee stood at only 400,149.

⁴ The long-term employment and output projections for Tennessee are taken from the 2007 *Economic Report to the Governor of the State of Tennessee*, prepared by the Center for Business and Economic Research.

FIGURE 1: Distribution of Tennessee Nonfarm Jobs



Source: Bureau of Labor Statistics and CBER UT, *An Economic Report to the Governor of the State of Tennessee*, January 2007.

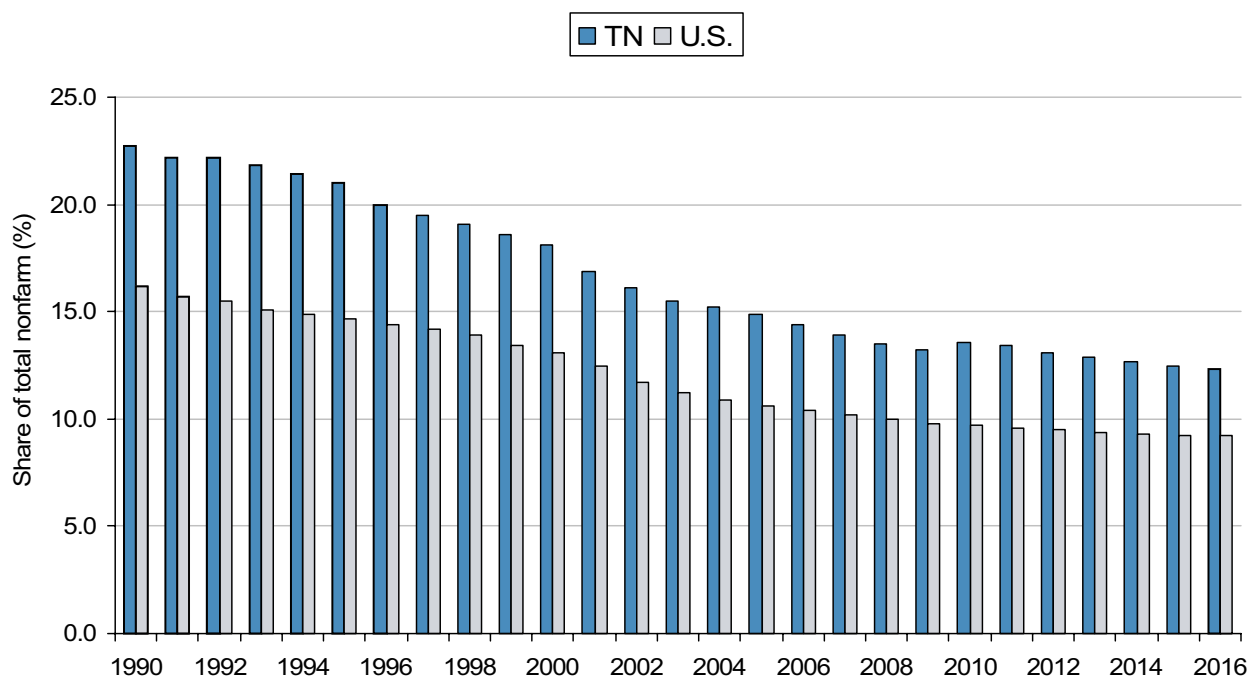
County-level data on changes in manufacturing employment between 1997 and 2006 are presented in Figure 3. Twenty-one counties were able to show job gains over this window of time, including 11 with double-digit gains. All other counties for which data are available show job losses. Fourteen counties lost more than one-half of their manufacturing jobs between 1997 and 2006. The steepest decline was in Morgan County where jobs fell by 83.1 percent. (See the discussion below on changes in manufacturing plants by county.)

The state's manufacturing sector will see periods of both job growth and job contraction in the years ahead. But on net, manufacturing employment in 2016 is expected to fall short of the level that prevailed in 2006. By 2016 the job count in manufacturing is expected to total only 390,425, compared to 400,149 jobs in 2006 and 501,545 jobs in 1996. Like Tennessee, the nation will see the number of manufacturing jobs continue to erode in the years ahead, falling from 14.2 million in 2006 to 13.5 million in 2016. As a result, the state will account for about the same share of U.S. manufacturing jobs in 2016 as it did in 2006.

Table 3 shows historical and projected jobs for Tennessee manufacturing subsectors for various years, beginning with 1996 and ending in 2016. In total, firms in the durable goods sector are expected to add jobs to their payrolls while firms producing nondurable goods will see job erosion between 2006 and 2016. On net, nine manufacturing subsectors will see job growth while 11 will experience job losses. The U.S. economy will not fare as well, with only 4 subsectors expected to show job gains by 2016.

The state's durable goods sector is projected to add 5,800 jobs while the nondurable goods sector is projected to lose 15,600 jobs by 2016. On net, manufacturing jobs are forecast to fall by 9,700. The strongest numerical job gains are anticipated in transportation equipment (up 7,100) while the largest losses will be in chemicals (down 4,900). Apparel and textile mills employers will shed more than one-half of their 2006 workforce by 2016. The strongest percentage job gains will be in transportation equipment (up 11.2 percent); textile mills will see the steepest decline (down 56.4 percent).

FIGURE 2: Manufacturing as a Share of Total Nonfarm Employment



Source: Bureau of Labor Statistics and CBER UT, *An Economic Report to the Governor of the State of Tennessee*, January 2007.

Loss of more than 50.0%

Loss of 0.1% to 50.0%

Gain of 0.1% to 50.0%

Gain of more than 50.0%

data not available

Source: Bureau of Labor Statistics.

data not available

The distribution of jobs by subsector for durable goods and nondurable goods producers for 2006 and 2016 is shown in Figures 4 and 5. Transportation equipment and primary and fabricated metals are expected to be sustained as the largest two subsectors of durable goods, together accounting for 49.0 percent of jobs in 2016. Employment in the computers and electronics subsector will be a declining share of the durable goods sector due to advances in technology that displace workers while allowing output to continue to expand at a healthy pace.

Textiles and apparel employment held only 11.0 percent of the jobs in the nondurable goods sector in 2006, a share that will decline further to 6.9 percent by 2016 (see Figure

5). In 1990 there were 81,099 jobs in textiles and apparel, representing over one-third of all jobs in the nondurable goods sector; the projections for 2016 indicate that there will be only 9,200 jobs in textiles and apparel. These dramatic job losses have taken place across the state but have had a disproportionate impact on rural Tennessee. Food and plastics and rubber will account for 47.5 percent of jobs in the nondurable goods sector by 2016. Adding in chemicals means that just three sectors will represent almost two-thirds of all jobs engaged in nondurable goods production in 2016. The experience of textiles and apparel should provide an important lesson on the importance of maintaining a diversified economic base.

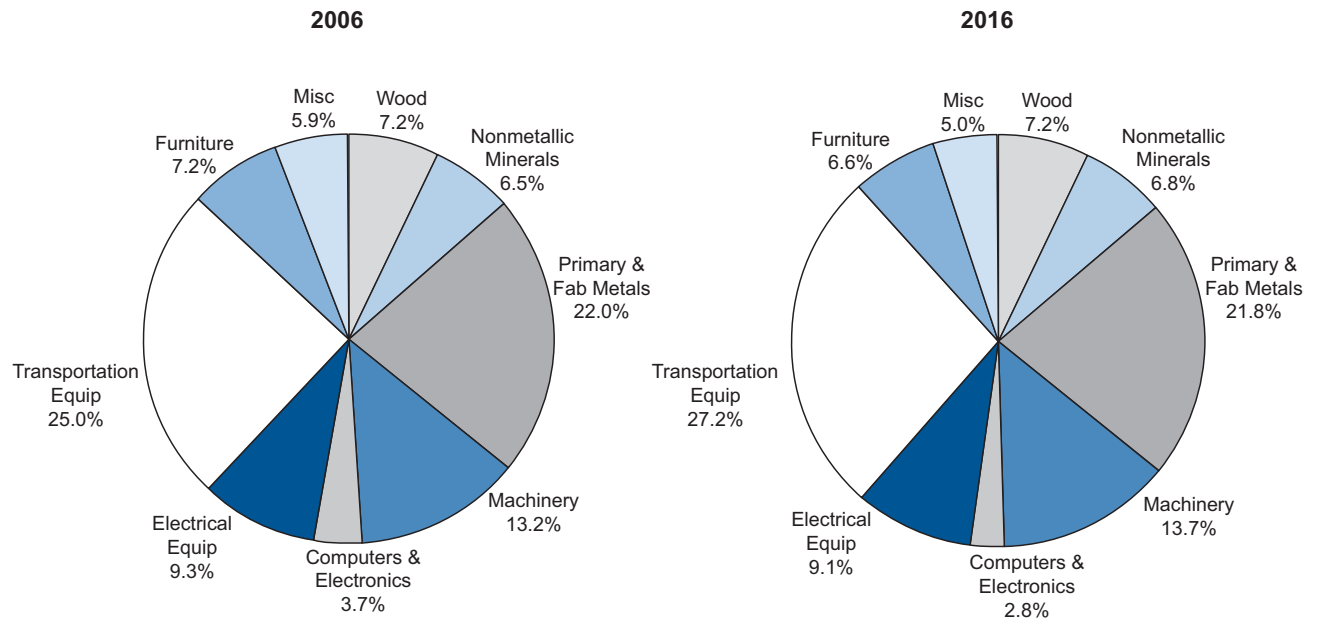
TABLE 3: Historical and Projected Job Trends in Manufacturing

Sector	TN EMPLOYMENT (thous)					2006 to 2016 Employment growth			
						TN		TN	U.S.
						Number (thous)	Percent		
	1996	2001	2006	2011	2016				
Total Manufacturing	501.5	454.2	400.1	396.1	390.4	-9.7	-2.4	-	-
Total Durable Goods	290.5	277.2	251.5	253.9	257.3	5.8	2.3	+	-
Wood Products	18.8	17.9	18.1	18.2	18.6	0.5	3.0	+	-
Nonmetallic Minerals	15.6	15.7	16.3	16.7	17.4	1.1	6.8	+	-
Primary Metals	16.1	15.3	11.6	11.7	11.7	0.1	0.7	+	-
Fabricated Metals	45.9	43.2	43.8	44.0	44.3	0.4	1.0	+	+
Machinery	37.8	39.9	33.2	34.1	35.3	2.1	6.2	+	+
Computers & Electronics	15.9	15.3	9.4	8.2	7.2	-2.2	-23.4	-	-
Electrical Equipment									
Appliances, Components	29.1	26.3	23.4	23.2	23.3	-0.1	-0.5	-	-
Transportation Equipment	62.6	62.3	62.8	66.0	69.9	7.1	11.2	+	-
Furniture	29.1	23.6	18.0	18.0	16.9	-1.1	-6.1	-	-
Miscellaneous Durables	19.8	17.7	14.9	14.0	12.8	-2.1	-13.8	-	+
Total Nondurable Goods	211.1	177.0	148.7	142.2	133.1	-15.6	-10.5	-	-
Food & Beverage & Tobacco	37.4	42.3	39.3	39.2	38.6	-0.7	-1.7	-	+
Food	31.3	35.8	34.1	34.7	34.8	0.7	2.1	+	+
Beverage & Tobacco	6.0	6.5	5.2	4.5	3.8	-1.4	-26.5	-	-
Textile Mills & Textile									
Product Mills	18.2	13.6	9.0	7.0	5.6	-3.4	-38.1	-	-
Textile Mills	13.6	9.5	5.0	3.3	2.2	-2.8	-56.4	-	-
Textile Product Mills	4.5	4.1	3.9	3.7	3.4	-0.6	-14.4	-	-
Apparel	39.7	15.1	7.3	5.2	3.6	-3.7	-50.5	-	-
Paper	20.7	21.1	18.5	19.2	19.2	0.7	3.8	+	-
Printing & Related Support	24.3	22.2	17.8	16.8	15.0	-2.8	-15.8	-	-
Chemicals	34.6	29.0	26.1	23.7	21.2	-4.9	-18.8	-	-
Plastics & Rubber	30.8	30.3	28.4	29.0	28.5	0.0	0.1	+	-
Miscellaneous Nondurables	5.4	3.4	2.4	2.0	1.6	-0.8	-33.8	-	-

"-" indicates negative growth; "+" indicates positive growth.

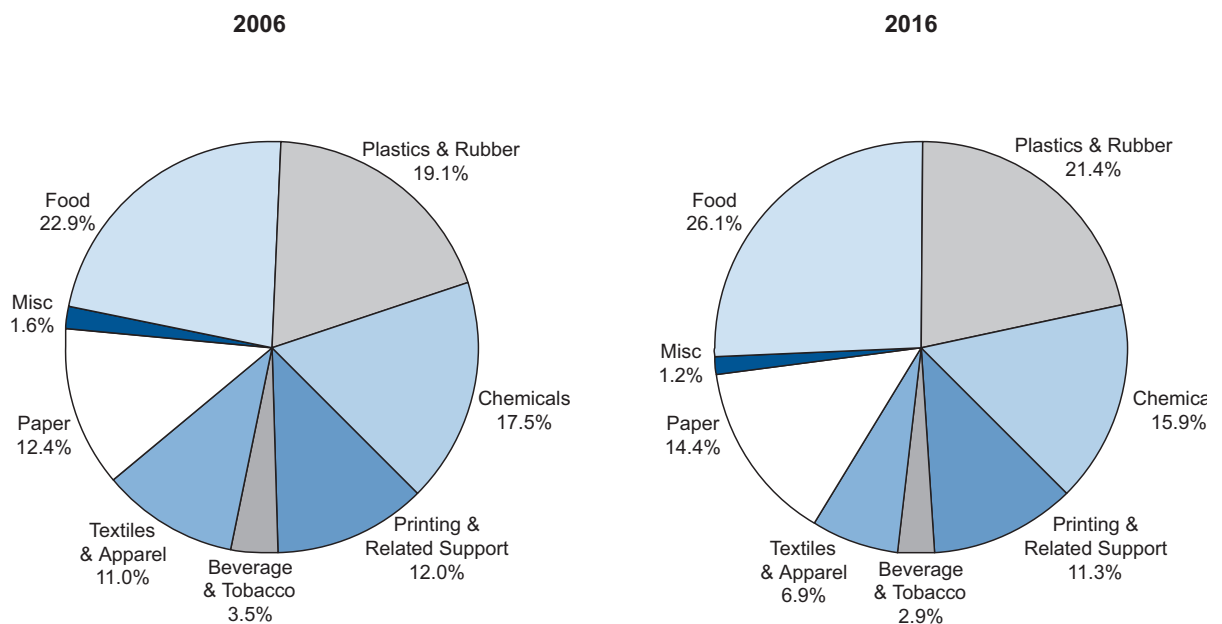
Source: Bureau of Labor Statistics; and CBER-UT, *An Economic Report to the Governor of the State of Tennessee*, January 2007.

FIGURE 4: Distribution of Tennessee Durable Manufacturing Jobs



Source: Bureau of Labor Statistics and CBER UT, An Economic Report to the Governor of the State of Tennessee, January 2007.

FIGURE 5: Distribution of Tennessee Nondurable Manufacturing Jobs



Source: Bureau of Labor Statistics and CBER UT, An Economic Report to the Governor of the State of Tennessee, January 2007.

Manufacturing Output

While the employment outlook in manufacturing is grim, output is expected to continue to grow at a healthy pace in the coming years. Inflation-adjusted manufacturing gross domestic product is forecast to rise by 53.1 percent between 2006 and 2016, translating into a compound annual growth rate of 4.4 percent (see Table

4). The output of the nation's manufacturing sector, as reflected by the industrial production index shown in Table 4, is also expected to expand into 2016. The state's durable goods sector will see compound annual output growth of 5.8 percent, benefiting from both job growth and productivity gains. Nondurable goods will eke out a 0.8 percent compound annual output gain, with gains in productivity overwhelming the loss of jobs.

TABLE 4: Projected Growth in State Gross Domestic Product

Sector	STATE GDP ¹ (mil 2000 \$)		Change in GDP 2006-2016		U.S. Industrial Production Index ²
	2006	2016	CAGR (%)	Chg (%)	
Total Manufacturing	45,016	68,900	4.35	53.1	+
Total Durable Goods	29,829	52,532	5.82	76.1	+
Wood Products	838	930	1.05	11.0	+
Nonmetallic Minerals	1,598	1,834	1.39	14.8	+
Primary Metals	1,246	1,733	3.35	39.0	+
Fabricated Metals	3,587	4,701	2.74	31.0	+
Machinery	2,973	3,826	2.55	28.7	+
Computers & Electronics	7,318	20,951	11.09	186.3	+
Electrical Equipment					
Appliances, Components	2,809	4,258	4.25	51.6	+
Transportation Equipment	6,933	11,332	5.04	63.5	+
Furniture	841	876	0.41	4.2	+
Miscellaneous Durables	1,686	2,090	2.17	24.0	+
Total Nondurable Goods	15,186	16,368	0.75	7.8	+
Food & Beverage & Tobacco	4,683	4,740	0.12	1.2	+/- ^a
Food	b	b	b	b	+
Beverage & Tobacco	b	b	b	b	-
Textile Mills & TextileProduct Mills	694	729	0.49	5.0	-
Textile Mills	b	b	b	b	-
Textile Product Mills	b	b	b	b	-
Apparel	519	488	-0.62	-6.0	-
Paper	2,030	2,611	2.55	28.6	+
Printing & Related Support	1,228	1,247	0.15	1.5	+
Chemicals	3,539	3,598	0.16	1.7	+
Plastics & Rubber	2,390	2,842	1.75	18.9	+
Miscellaneous Nondurables	102	114	1.05	11.0	-/+ ^c

Notes:

1. CBER-UT, *An Economic Report to the Governor of the State of Tennessee*, January 2007.

2. Federal Reserve Board.

a. U.S. Industrial Production Index for the Food sector: + ; for the Beverage & Tobacco sector: -.

b. State GDP data not available.

c. U.S. Industrial Production Index for the Leather & Allied sector: - ; for the Petroleum & Coal sector: + .

These 2 sectors are the components of the miscellaneous nondurables sector.

CAGR: compound annual growth rate

Chg: percentage change

All subsectors within durable goods will see output expand, along with their national counterparts. The production of computers and electronic products will see exceptionally strong growth of 186.3 percent, yielding a compound annual growth rate of 11.1 percent. (This growth is anticipated despite the loss of 2,200 jobs between 2006 and 2016.) Transportation equipment will see compound annual growth of 5.0 percent while electrical equipment and appliances output will advance at a 4.3 percent compound annual rate.

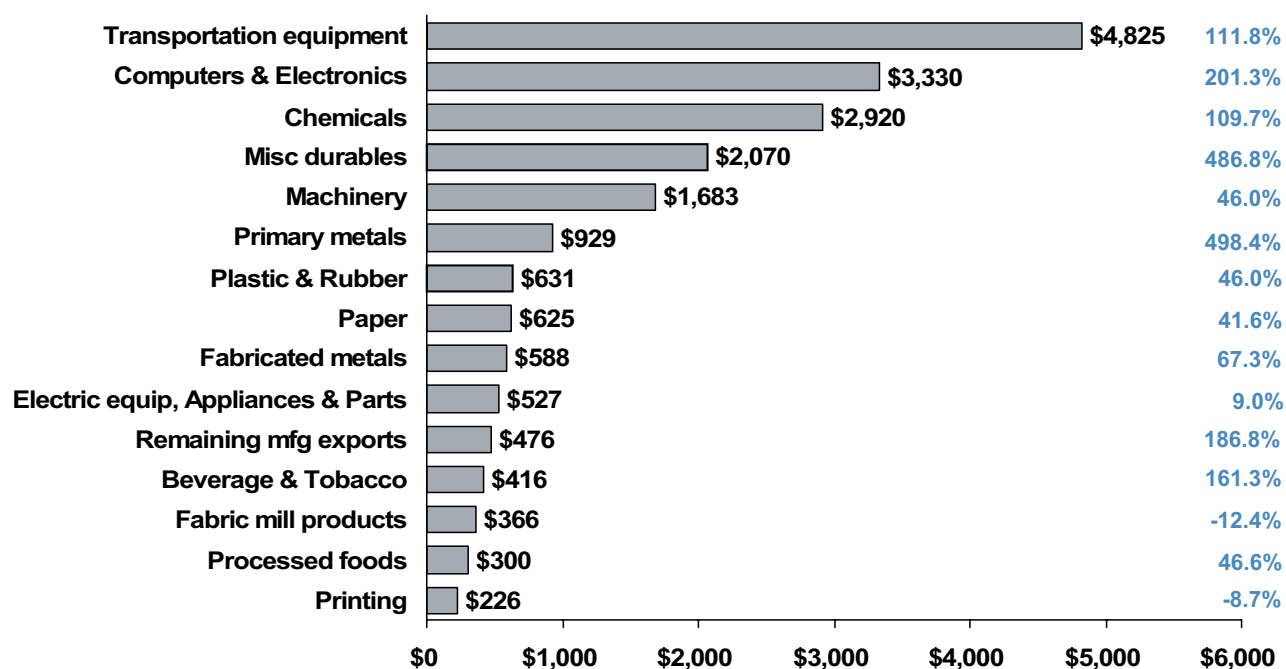
In the nondurable goods sector, only apparel output will contract. For the nation, about one-half of the subsectors will see output decline and about one-half will see output grow. Tennessee's inflation-adjusted output of paper products will grow at a 2.6 percent compound annual rate between 2006 and 2016, the strongest showing in nondurable goods. Paper is one of only two subsectors in nondurable goods with job gains forecast by 2016. Jobs are also expected to be up in food products, though output will tally an anemic 0.1 percent compound annual rate of growth.

Exports of Manufactured Products

Many of the state's manufacturers compete successfully in the global marketplace by exporting their wares abroad. In 2006, exports from Tennessee made their way to 189 countries around the world, ranging from Canada (the state's top export market) to Mauritania in Western Africa (the state's smallest export market). In 2006, manufactured exports from Tennessee to the rest of the world totaled \$19.9 billion. The dollar is expected to continue to depreciate in international currency markets through 2009 which should help stimulate exports further, at least in the near term.

As shown in Figure 5, transportation equipment and computers and electronics topped the list of exports in 2006 with sales of \$4.8 billion and \$3.3 billion. These two subsectors alone accounted for 41.0 percent of the state's exports to other countries. The top five exported product sectors together accounted for nearly three-quarters of all

FIGURE 6: Tennessee Manufacturing Total Exports by Subsector, 2006
(millions of dollars)
(percent change, 1999 to 2006)



Source: Office of Trade and Industry Information, Manufacturing and Services, International Trade Administration, U.S. Department of Commerce.

the products shipped abroad in 2006.

The growth in exports from 1999 to 2006 is also displayed in Figure 6. Only two subsectors—fabric mill products and printing—show declines in exports over the period shown. Several subsectors show gains in excess of 100 percent, with miscellaneous durable goods topping this list with 486.8 percent growth. It is important to note that these gains have taken place at the same time that there have been broad-based job losses in manufacturing. This indicates the success that many firms have had in competing in the global market.

Canada is the leading recipient of Tennessee's exports with purchases of \$6.7 billion in 2006 representing just over one-third of all exports (see Figure 7). Mexico comes in second at \$2.1 billion, followed by China, Japan, the United Kingdom, Germany and the Netherlands. The remaining 182 countries in total purchased \$7.1 billion of Tennessee's manufactured products in 2006. The global economy is currently growing at a healthy pace which, along with a favorable exchange rate, should support strong export growth at least into 2009.

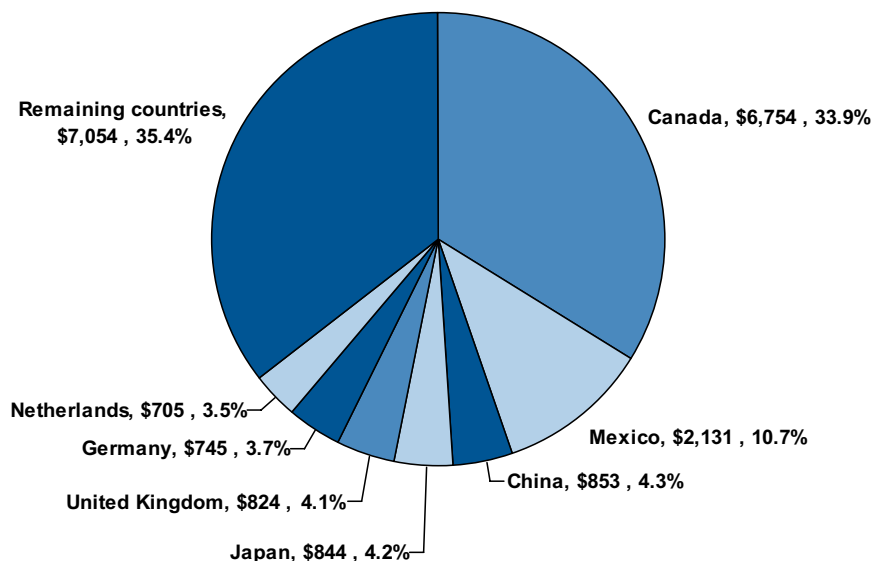
Manufacturing Establishments

The number of manufacturing plants has declined precipitously since 1997.⁵ In 1997 there were 7,514 manufacturing facilities in Tennessee, but by 2005 the number of plants had fallen 11.2 percent to 6,671, as shown in Table 5. By 2005 there were 4,343 plants producing durable goods products and 2,328 plants producing nondurable goods products. Fabricated metals accounted for 1,174 plants in 2005, more than any other subsector in manufacturing.

The setbacks that have taken place since 1997 have been broad based, affecting both the durable goods and nondurable goods sectors. The durable goods sector has fared somewhat better with the loss of only 6.5 percent of its plants versus an 18.8 percent loss of plants engaged in the production of nondurable goods. Growth has taken place in nonmetallic minerals, fabricated metals, transportation equipment and miscellaneous durable goods. Within the nondurable goods sector, only the beverage and tobacco subsector was able to engineer an increase in the number of producers, but this was a single establishment. The largest percentage decline in the number of plants was in

5 This is the earliest year that number of establishments by NAICS is available in *County Business Patterns*.

FIGURE 7: Tennessee Manufacturing Exports, 2006
(millions of U.S. dollars)



Source: Office of Trade and Industry Information, Manufacturing and Services, International Trade Administration, U.S. Department of Commerce.

apparel at 62.9 percent; apparel also had the largest numerical decline in plants, a loss of 237 establishments.

Average employment per plant has slipped along with the decline in the number of plants. This pattern is consistent with manufacturers' drive to produce more with a leaner workforce. Manufacturers are becoming leaner while at the same time pressing for a more highly skilled workforce that can work with and adapt to emerging technologies and production process. >

For manufacturing as a whole there were 66.9 workers per plant in 1997 versus 61.3 workers per plant in 2005. Average plant size is down in all but four subsectors: wood products, nonmetallic minerals, electrical equipment and appliances and food. The exceptionally strong capital investment that has taken place since 2004 for the national economy would suggest that average employment per plant will continue to contract.⁶

Figure 8 illustrates the pattern of establishment growth and decline for Tennessee counties between 1998 and 2005.⁷ Twenty-three counties saw growth in the number of

6 Nonresidential fixed investment was up 5.9 percent, 6.8 percent and 7.2 percent in 2005, 2006 and 2007. Investment growth has slowed but is still expected to exceed the rate of overall growth in gross domestic product for the next several years. Investment in manufacturing structures jumped 21.1 percent in 2005, followed by a 12.2 percent gain in 2006. Double-digit growth in manufacturing structures investment is projected through 2010. While the *net* number of manufacturing establishments in Tennessee is expected to decline, these national investment patterns indicate that there will also be significant new plant sitings in the years ahead.

7 County-level data on the number of plants under NAICs are not available before 1998.

Average employment per plant has slipped along with the decline in the number of plants. This pattern is consistent with manufacturers' drive to produce more with a leaner workforce. Manufacturers are becoming leaner while at the same time pressing for a more highly skilled workforce that can work with and adapt to emerging technologies and production process.

TABLE 5: Manufacturing Establishments and Average Plant Size

Sector	Number of establishments			Average number of jobs per establishment	
	1997	2005	% change	1997	2005
Total Manufacturing	7,514	6,671	-11.2	66.9	61.3
Total Durable Goods	4,647	4,343	-6.5	63.5	58.6
Wood Products	671	593	-11.6	29.5	29.9
Nonmetallic Minerals	377	385	2.1	41.4	41.4
Primary Metals	139	128	-7.9	120.1	93.8
Fabricated Metals	1,158	1,174	1.4	39.9	36.3
Machinery	550	495	-10.0	72.1	68.5
Computers & Electronics	191	146	-23.6	82.2	71.4
Electrical Equipment					
Appliances, Components	150	117	-22.0	197.3	200.8
Transportation Equipment	314	329	4.8	204.1	194.2
Furniture	568	439	-22.7	49.0	43.8
Miscellaneous Durables	529	537	1.5	37.7	28.5
Total Nondurable Goods	2,867	2,328	-18.8	72.5	66.2
Food & Beverage & Tobacco	429	391	-8.9	89.1	101.6
Food	373	334	-10.5	85.7	102.7
Beverage & Tobacco	56	57	1.8	111.4	95.2
Textile Mills & Textile					
Product Mills	260	210	-19.2	69.4	46.1
Textile Mills	108	71	-34.3	122.4	79.2
Textile Product Mills	152	139	-8.6	31.7	29.2
Apparel	377	140	-62.9	93.1	59.3
Paper	157	154	-1.9	135.6	123.0
Printing & Related Support	877	717	-18.2	27.7	26.2
Chemicals	288	259	-10.1	119.3	104.8
Plastics & Rubber	386	374	-3.1	81.1	78.4
Miscellaneous Nondurables	93	83	-10.8	57.8	27.3

Source: Census Bureau, *County Business Patterns*, annual; Bureau of Labor Statistics.

plants, despite the overall net decline in plants statewide. Five counties saw no change while the remaining 67 counties saw the number of plants decline. Some of the largest percentage changes reflect small numerical changes. Lake County shows a 100 percent decline due to the loss of its 3 manufacturing facilities while Hancock County's loss of 66.7 percent reflects the exit of just 2 plants. But in other cases the percentage changes are indicative of a large number of plant closings. Roane County, for example, saw a 36.6 percent decline in plants between 1998 and 2005, as 26 facilities closed their doors.

Comparing Figures 3 and 8 shows that there is not always a clear and direct correspondence between changes in establishments and changes in employment. For example, Robertson, Montgomery and Cheatham Counties all saw employment gains between 1997 and 2006, while the number of manufacturing plants declined for these counties between 1998 and 2005. Part of this might be explained by the slightly different time periods. But the more likely explanation is that existing industry and new company locations made up for the job losses arising from plant closings.⁸ Sequatchie County, on the other hand, saw 40 percent growth in the number of plants (4 net new facilities), but employment in manufacturing slipped 20.0 percent.

One pattern that emerges from Figure 8 is the propensity for plant growth to be stronger near metropolitan areas, though there are a number of exceptions. Another pattern is that plant growth typically occurs within reasonably close proximity to an interstate highway. These findings are consistent with the discussion above on the factors that affect business competitiveness and their location decisions.

Simple trend projections on the number of establishments in durable goods and nondurable goods manufacturing are shown in Figures 9 and 10, while similar figures are presented in Appendix A for each broad subsector of durable and nondurable goods. The trends are generated using historical data for 1997 through 2005. Despite their simplicity, the figures do reveal the potential consequences of continued restructuring of the state's manufacturing sector that mirrors recent history. The overall number of plants is expected to continue to erode, a result that should have been anticipated given the historical data. But there are some exceptions. In durable goods,

⁸ The plant data for different years show *net* change in the number of facilities. The net loss of 5 plants could, for example, mask the loss of 10 firms and the location of 5 new firms. A similar story applies to employment changes from year to year.

nonmetallic minerals, fabricated metals, transportation equipment and miscellaneous durable goods could see the number of plants rise. These are the same sectors that saw growth from 1997 to 2005. In the nondurable goods sector, beverage and tobacco and petroleum and coal could see the number of plants expand. If the projections implied by these simple trends are realized, the state could lose 1,032 more manufacturing facilities by 2016.

Value Added, Input Spending, Shipments and Investment

Value added is the contribution a business enterprise makes to production above and beyond the cost of materials and supplies. In practice this means the total income that is generated by the production process, including that which accrues to workers in the form of wages and salaries and to employers in the form of profits. The greater is value added, the greater is the income earned in Tennessee from the business's operations.

Purchases of materials and inputs reflect all of the non-labor inputs that go into the production process. Some of these will be made locally, some will be produced elsewhere in the state and some will be brought in from outside the state. The more that is produced locally and within the state, the greater is the economic and tax revenue impact for the state. Shipments are the sales of the business's products to other manufacturers and to final consumers. In many instances, as with the state's transportation equipment sector, the business-to-business share of these shipments can be critical to the production process and serve to support other businesses and workers across the state. Capital expenditures are expenses incurred through investments in equipment and facilities. Some industries tend to more capital intensive than others. But all else the same one would expect subsectors and companies to be more competitive when they make greater capital investments.

Statewide data on these measures are shown in Table 6 for the manufacturing sector. The figures are expressed on a per worker basis to control for differences in scale (i.e. size) across subsectors. Value added per worker is perhaps the most important component of the table since it most directly affects the wellbeing of workers in the state. Average value added per *production* worker across the entire manufacturing sector was \$160,299 in 2002. But there is considerable variation across industries in value added, ranging from a low of \$66,566 in apparel to a high of \$958,933 in the beverage and tobacco

Loss of more than 33.3%

Loss of 0.1% to 33.3%

No change

Gain of 0.1% to 33.3%

Gain of more than 33.3%

Source: County Business Patterns.

Gain of 0.1% to 33.3%

Gain of more than 33.3%

products subsector. Value added in the petroleum and coal products subsector comes in second (\$551,066) while the computer and electronic products subsector comes in third (\$441.985). Capital investment per worker also shows wide variation. The furniture and related products

subsector made the smallest investments, only \$2,158 per worker. The petroleum and coal products subsector made much more substantial capital investments of \$171,017 per worker.

Material costs per worker vary from \$56,205 in the leather subsector to nearly \$2.7 million in the petroleum and coal products subsector. Shipments vary from a low of \$121,333 in leather to \$3.2 million in petroleum and coal products.

Table 7 provides the same information on a county-by-county basis. Anderson, Blount, Humphreys, Jefferson, Lewis, Lincoln, Loudon, Madison, Maury, Shelby, Sullivan and Wilson Counties all have value added per worker figures in excess of \$200,000. In each of these counties there is a unique firm or cluster that is the source of high value added. Wilson County is particularly noteworthy for the presence of Dell Inc. and overall value added per worker of \$616,194.

FIGURE 9: Trend Projections of Plants, Total Durables' Manufacturing

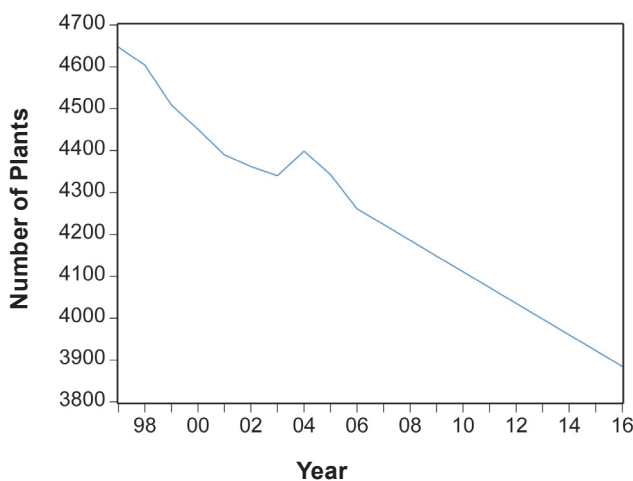
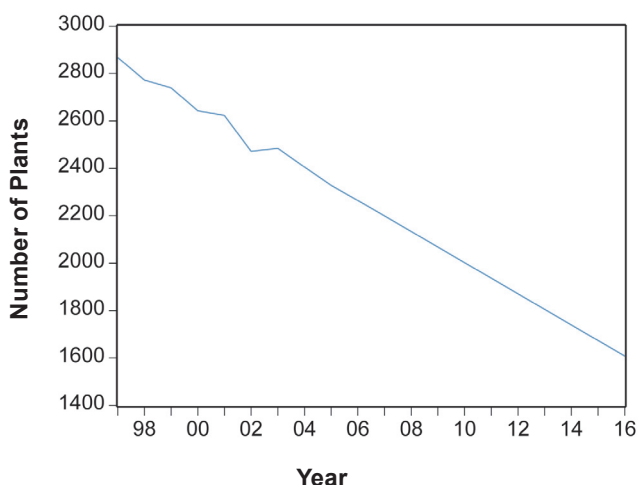


FIGURE 10: Trend Projection of Plants, Total Nondurables' Manufacturing



State Gross Domestic Product Per Worker

Output per worker is a commonly used measure of labor productivity largely because of its simplicity. It is not as useful as the measure of value added that was presented above because it does not net out the cost of inputs used in the production process. For example, a worker might add little value to the production process, but if input expenses are high, this will translate into a high level of output per worker. Despite this potential weakness, output per worker can still help identify high aggregate-value sectors of the state economy. These sectors can be especially important if there are strong business-to-business supply-chain linkages within the state.

As shown in Table 8, output per worker in durable goods manufacturing (\$118,600) was quite similar to output per worker in nondurable goods manufacturing (\$102,100) in 2006. Manufacturing as a whole is projected to see a 4.6 percent compound annual rate of growth in average worker output between 2006 and 2016, with durable goods production performing much better than nondurable goods production. The manufacturing subsector with the highest level of output per worker in 2006 was computers and electronics at \$781,600, almost seven times higher than the manufacturing average. Computers and electronics will see dramatic growth in output per worker by 2016 as a result of exceptionally strong productivity growth. The compound annual rate of growth in output per worker is projected to be 14.1 percent. Wood products, furniture and miscellaneous nondurable

goods have relatively low levels of output per worker, a situation that is not expected to change materially by 2016.

Earnings in Manufacturing

Average wage and salary income varies considerably across sectors of the state economy. The lowest earnings by broad sector accrue to workers in the leisure and hospitality sector. Manufacturing, on the other hand, pays well by statewide standards. Table 9 reports earnings for manufacturing and its key subsectors for 2005. The overall average was \$43,088, with the spread ranging from a low of \$27,761 in apparel to a high of \$60,797 in chemicals.

It is particularly interesting to note the earnings

differentials across the nondurable goods and durable goods sectors. It will surprise some that average earnings are higher in nondurable goods manufacturing: jobs in the durable goods sector provide annual earnings of \$42,043 while earnings are \$44,813 in nondurable goods, a difference of \$2,770. The massive job losses that have taken place in nondurable goods manufacturing have likely contributed to the increased use of technology and skills upgrading of the residual workforce, consistent with national trends.⁹ The remaining workforce is thus better skilled and receives relatively higher wages and salaries. The three highest paying subsectors are all in nondurable

⁹ National data show that while overall manufacturing employment is in decline, manufacturers continue to add skilled workers to their payrolls. See Richard Dietz and James Orr, "A Leaner, More Skilled U.S. Manufacturing Workforce," *Current Issues in Economics and Finance* 12 (2006), 1-7.

TABLE 6: Manufacturing Statistics per Production Worker: Tennessee, 2002

Manufacturing sector	Number of estab- lishments	Per Production Worker (dollars)			
		Value added	Total cost of materials	Total value of shipments	Total capital expenditures
Total manufacturing	6,948	160,299	191,933	351,722	14,567
Food	370	231,448	191,114	424,139	14,592
Beverage & tobacco products	64	958,933	481,720	1,436,653	36,778
Textile mills	75	119,379	190,882	304,211	4,677
Textile product mills	140	103,665	113,113	216,249	5,429
Apparel	181	66,566	72,429	140,662	a
Leather & allied products	37	66,747	56,205	121,333	a
Wood products	593	71,723	101,752	172,624	4,920
Paper	157	165,217	180,923	346,798	23,692
Printing & related support activities	786	107,087	63,083	169,853	9,315
Petroleum & coal products	59	551,066	2,699,061	3,196,345	171,017
Chemicals	278	367,242	350,587	717,413	46,365
Plastics & rubber products	362	112,544	112,892	225,516	9,823
Nonmetallic mineral products	387	139,592	107,102	246,355	10,608
Primary metals	120	166,335	256,863	419,164	12,167
Fabricated metal products	1,186	106,055	98,773	204,303	6,981
Machinery	528	156,362	192,343	351,886	7,444
Computer & electronic products	150	441,985	788,110	1,227,083	9,124
Electrical equipment, appliance, & components	131	116,911	134,265	251,254	8,170
Transportation equipment	318	144,703	294,654	438,415	29,844
Furniture & related products	478	73,169	60,313	132,012	2,158
Miscellaneous manufacturing	548	165,823	93,073	255,469	9,361

NOTE: Includes data for industry groups and industries with 100 employees or more only.

a. Withheld to avoid disclosing data for individual companies; data are included in higher level totals.

Source: 2002 Economic Census, Manufacturing: Geographic Area Series (Tennessee).

**TABLE 7: Manufacturing Statistics per Production Worker:
Tennessee Counties, 2002**

Area	Number of estab- lishments	Per Production Worker (dollars)			
		Value added	Total cost of materials	Total value of shipments	Total capital expenditures
Anderson	118	239,664	94,633	332,996	a
Bedford	57	100,408	190,497	293,631	6,927
Benton	19	99,003	51,833	154,233	6,009
Bledsoe	13	a	a	a	a
Blount	117	226,110	357,887	576,357	25,435
Bradley	128	249,445	166,702	416,974	a
Campbell	46	100,438	96,992	199,378	a
Cannon	—	—	—	—	—
Carroll	44	82,801	151,238	240,018	9,554
Carter	43	107,573	62,778	170,216	3,210
Cheatham	39	88,103	82,631	169,721	a
Chester	20	86,626	82,861	169,572	2,339
Claiborne	38	80,354	62,507	141,897	1,319
Clay	—	—	—	—	—
Cocke	35	150,007	177,813	325,227	9,008
Coffee	67	a	a	a	a
Crockett	21	176,022	88,389	265,191	9,323
Cumberland	55	125,616	175,209	305,428	9,118
Davidson	666	168,090	166,389	331,943	7,000
Decatur	33	116,407	109,407	227,144	8,209
DeKalb	25	101,575	97,275	199,097	10,784
Dickson	54	119,244	136,567	255,278	22,002
Dyer	42	151,564	129,210	279,860	18,578
Fayette	37	148,866	109,232	258,402	4,303
Fentress	—	—	—	—	—
Franklin	47	a	a	a	a
Gibson	77	136,504	96,488	232,046	5,246
Giles	43	146,077	119,282	266,354	4,005
Grainger	36	79,148	110,104	188,629	a
Greene	107	98,549	146,219	251,455	10,963
Grundy	—	—	—	—	—
Hamblen	123	113,968	109,482	222,070	7,692
Hamilton	498	153,743	129,612	281,955	10,780
Hancock	—	—	—	—	—
Hardeman	38	147,035	128,691	279,518	27,718
Hardin	51	170,720	161,050	332,221	21,425
Hawkins	48	a	a	a	a
Haywood	22	67,401	124,537	188,648	5,470
Henderson	42	87,145	199,301	288,809	4,596
Henry	52	77,663	100,199	183,174	2,973
Hickman	32	53,896	92,122	158,129	a
Houston	—	—	—	—	—
Humphreys	30	263,396	290,658	553,683	25,261
Jackson	8	131,039	134,897	265,643	a
Jefferson	59	226,796	183,665	409,271	a
Johnson	19	105,832	99,950	205,449	4,330
Knox	458	a	a	a	a
Lake	—	—	—	—	—
Lauderdale	16	83,412	51,490	134,281	3,809
Lawrence	65	97,618	207,197	311,401	4,233

TABLE 7: Manufacturing Statistics per Production Worker:
Tennessee Counties, 2002 (Continued)

Area	Number of estab- lishments	Per Production Worker (dollars)			
		Value added	Total cost of materials	Total value of shipments	Total capital expenditures
Lewis	—	—	—	—	—
Lincoln	48	213,520	167,616	377,869	7,449
Loudon	53	297,735	185,648	483,179	a
McMinn	65	178,388	162,369	341,388	17,500
McNairy	43	96,998	118,832	215,671	5,229
Macon	38	35,289	34,640	70,366	1,830
Madison	127	219,720	212,084	434,448	14,141
Marion	27	91,406	77,594	168,846	a
Marshall	48	98,586	119,853	214,616	6,086
Mauzy	77	217,438	303,474	519,698	a
Meigs	11	79,859	227,930	308,179	2,235
Monroe	73	104,036	152,831	259,845	8,617
Montgomery	75	185,267	130,207	314,503	9,351
Moore	—	—	—	—	—
Morgan	—	—	—	—	—
Obion	40	100,561	96,790	198,068	a
Overton	27	112,637	92,357	203,872	a
Perry	11	81,998	102,411	184,653	2,509
Pickett	—	—	—	—	—
Polk	—	—	—	—	—
Putnam	122	111,637	91,049	202,497	3,129
Rhea	38	85,981	74,260	158,876	4,304
Roane	32	a	a	a	a
Robertson	71	104,557	173,515	281,186	5,690
Rutherford	190	95,274	472,039	566,761	a
Scott	46	77,720	91,963	166,041	4,618
Sequatchie	11	159,778	228,318	395,942	a
Sevier	82	95,792	72,528	170,018	4,896
Shelby	800	239,613	301,125	537,487	20,491
Smith	24	154,821	259,917	411,205	a
Stewart	13	96,083	76,316	171,035	1,687
Sullivan	167	231,955	291,588	520,765	82,143
Sumner	216	112,174	118,518	231,362	9,452
Tipton	39	135,433	116,093	250,061	7,984
Trousdale	—	—	—	—	—
Unicoi	26	76,908	71,161	147,720	8,124
Union	19	108,901	95,752	202,661	a
Van Buren	—	—	—	—	—
Warren	65	115,919	168,327	286,919	5,817
Washington	143	95,565	131,854	226,493	4,678
Wayne	25	69,079	77,146	145,060	1,719
Weakley	42	163,222	160,314	327,841	2,505
White	50	104,302	153,588	257,890	6,993
Williamson	121	102,826	113,844	217,050	6,458
Wilson	110	616,194	1,131,274	1,747,560	8,084

NOTE: Includes data for industry groups and industries with 500 employees or more only.

a. Withheld to avoid disclosing data for individual companies; data are included in higher level totals.

Source: 2002 Economic Census, Manufacturing: Geographic Area Series (Tennessee).

goods (chemicals, paper and miscellaneous nondurable goods). Jobs in computers and electronics offer the highest wage in the durable goods sector, \$50,489 per year.

RIMS II Multipliers

Multipliers are often used to measure the ripple effects of changes in industrial activity across the entire economy: the larger is the multiplier, the greater is the economic impact. Generally multipliers will get smaller as one considers smaller and less diversified economic areas. The reason is that small, local areas see more substantial leakages of spending at each stage of the multiplier process; more business inputs need to be imported and more consumer spending leaks out to metropolitan areas where there are more extensive shopping opportunities.

Table 10 lists state-level multipliers for broad industry sectors in Tennessee acquired from the U.S. Bureau of Economic Analysis. The final demand output and

earnings multipliers show the total dollar changes that would follow from an additional dollar of output or earnings. For example, if a manufacturer in the wood products sector was to produce one more dollar of output, total output (i.e. state gross domestic product) in Tennessee would expand by \$2.33. The final demand employment multiplier indicates the total number of jobs that would be supported by an additional \$1 million of output produced by a manufacturer. The direct effect earnings and employment multipliers show the statewide consequences of a firm paying an additional dollar of payroll or hiring one more worker.

As is clear from the table, different industries have multipliers that can differ by a wide margin. For example, petroleum and coal products manufacturing has relatively low multipliers, aside from the direct employment multiplier. This is probably because most of the equipment and technology used in this subsector is imported into Tennessee from other places, while workers are relatively

TABLE 8: Projected Growth in Output per Worker, Tennessee

Sector	OUTPUT PER WORKER (thous, real 2000 \$)		Change 2006-2016 CAGR (%)
	2006	2016	
Total Manufacturing	112.5	176.5	4.61
Total Durable Goods	118.6	204.2	5.58
Wood Products	46.4	50.0	0.75
Nonmetallic Minerals	98.2	105.5	0.72
Primary Metals	107.4	148.1	3.27
Fabricated Metals	81.8	106.2	2.64
Machinery	89.5	108.4	1.94
Computers & Electronics	781.6	2,921.4	14.09
Electrical Equipment, Appliances, Components	120.1	183.0	4.30
Transportation Equipment	110.3	162.1	3.92
Furniture	46.8	51.9	1.05
Miscellaneous Durables	113.1	162.7	3.70
Total Nondurable Goods	102.1	123.0	1.87
Food & Beverage & Tobacco	119.3	122.8	0.29
Textile Mills & Textile Product Mills	77.4	131.3	5.42
Apparel	70.8	134.6	6.63
Paper	109.9	136.2	2.17
Printing & Related Support	69.1	83.3	1.88
Chemicals	135.8	170.1	2.27
Plastics & Rubber	84.1	99.9	1.73
Miscellaneous Nondurables	41.9	70.3	5.31

Source: Bureau of Economic Analysis; CBER-UT, *An Economic Report to the Governor of the State of Tennessee*, January 2007; and CBER-UT, *Tennessee Business and Economic Outlook*, June 2007.

well paid supporting a relatively strong payroll multiplier effect. Most of the multipliers for the wood products sector are above the simple average multipliers shown at the bottom of the table. The inputs used to produce wood products may have a greater likelihood of being drawn from Tennessee and worker payrolls may very well stick in Tennessee as well. For given industries, the multipliers also differ by category. For example, miscellaneous manufacturing has a final demand output multiplier that is below average, while its earnings multiplier is above average. These differences result from the subtle underlying linkages across sectors and households of the state economy.

The various multipliers warrant consideration in designing economic development strategies. If there is only one dollar that can be allocated to an industry or firm, all else the same that dollar should be used where the multiplier effects will be most pronounced. Unique

policy goals and community needs may also be important. For example, if job maintenance or job creation is of paramount importance, the focus of industry support should fall on sectors where the employment multipliers are the largest. On the other hand, if income is more important, then the focus should fall on sectors with high earnings multipliers.

Linking the Pieces Together

Providing any form of assistance to the state's manufacturing sector is problematic in practice. The global environment must be assessed since global considerations may be most vital to survival in manufacturing today. State and local economic conditions are also important, factors like the quality of the workforce and the presence or absence of key types of infrastructure. Information at the level of the business enterprise is the third piece of the

TABLE 9: Average Annual Wage and Salary, 2005 (dollars)

Sector	Amount
Total Manufacturing	\$43,088
Total Durable Goods	\$42,043
Wood Products	\$31,345
Nonmetallic Minerals	\$41,824
Primary Metals	\$48,610
Fabricated Metals	\$41,868
Machinery	\$41,647
Computers & Electronics	\$50,489
Electrical Equipment, Appliances, Components	\$40,522
Transportation Equipment	\$47,210
Furniture	\$29,824
Miscellaneous Durables	\$41,248
Total Nondurable Goods	\$44,813
Food & Beverage & Tobacco	\$39,928
Textile Mills & Textile Product Mills	\$36,638
Apparel	\$27,761
Paper	\$57,746
Printing & Related Support	\$38,451
Chemicals	\$60,797
Plastics & Rubber	\$39,281
Miscellaneous Nondurables	\$52,657

Calculated using data from the Bureau of Economic Analysis and CBER-UT,
Tennessee Business and Economic Outlook, June 2007.

TABLE 10: RIMS II Multipliers for Output, Earnings and Employment by Industry Aggregation, Tennessee

	Multiplier				
	Final Demand		Direct Effect		
	Output (dollars) ¹	Earnings (dollars) ²	Employment (jobs) ³	Earnings (dollars) ⁴	Employment (jobs) ⁵
Wood product manufacturing	2.3264	0.4914	15.5572	2.9178	2.7676
Nonmetallic mineral product manufacturing	2.1669	0.4998	13.3419	2.4806	2.8834
Primary metal manufacturing	2.2464	0.4268	10.8603	3.2563	4.2774
Fabricated metal product manufacturing	2.1620	0.5170	13.7627	2.2645	2.5806
Machinery manufacturing	2.2795	0.4975	13.0537	2.7537	3.2408
Computer and electronic product manufacturing	1.8952	0.4081	10.0746	2.4022	3.2786
Electrical equipment and appliance manufacturing	2.2143	0.4686	12.4151	2.8492	3.2975
Motor vehicle, body, trailer, and parts manufacturing	2.5996	0.5006	11.9653	3.7507	6.5488
Other transportation equipment manufacturing	2.2524	0.5649	13.9021	2.3057	3.0323
Furniture and related product manufacturing	2.3411	0.5723	17.9655	2.3813	2.2436
Miscellaneous manufacturing	2.1447	0.5110	12.8457	2.3241	2.9997
Food, beverage, and tobacco product manufacturing	2.3339	0.4091	12.3259	3.6229	4.6245
Textile and textile product mills	2.4930	0.4970	14.8902	3.1506	3.1634
Apparel, leather, and allied product manufacturing	2.3515	0.5150	17.0337	2.7736	2.4990
Paper manufacturing	2.2419	0.4436	11.1490	3.0743	4.4164
Printing and related support activities	2.3835	0.5962	15.9538	2.3372	2.6287
Petroleum and coal products manufacturing	1.6737	0.2746	5.9308	2.7463	6.2754
Chemical manufacturing	1.9930	0.3808	9.0186	3.0054	4.8702
Plastics and rubber products manufacturing	2.2156	0.4880	13.3348	2.5180	2.7546
	2.2271	0.4770	12.9148	2.7850	3.5991

* Includes Government enterprises.

¹ Each entry in column 1 represents the total dollar change in output that occurs in all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

² Each entry in column 2 represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

³ Each entry in column 3 represents the total change in number of jobs that occurs in all industries for each additional 1 million dollars of output delivered to final demand by the industry corresponding to the entry. Because the employment multipliers are based on 2003 data, the output delivered to final demand should be in 2003 dollars.

⁴ Each entry in column 4 represents the total dollar change in earnings of households employed by all industries for each additional dollar of earnings paid directly to households employed by the industry corresponding to the entry.

⁵ Each entry in column 5 represents the total change in number of jobs in all industries for each additional job in the industry corresponding to the entry.

NOTE -- Multipliers are based on the 1997 Benchmark Input-Output Table for the nation and 2003 regional accounts data.

SOURCE -- Regional Input-Output Modeling System (RIMS II), Regional Economic Analysis Division, Bureau of Economic Analysis.

puzzle. Outdated equipment, arcane business practices, a poorly skilled workforce and the like can compromise a firm's competitiveness regardless of the global and local external environment.

The challenges to the design of economic development strategies, including effective industry assistance, are highlighted in the following quote drawn from a recent report on the manufacturing sector in the state of Washington:

Which types of manufacturing should be targeted? The data presented in this paper show patterns of growth and decline in specific manufacturing subsectors. While some of these problems are cyclical (i.e. aircraft), changing market conditions and business strategies could significantly alter traditional patterns, making it harder to predict sector decline, recovery and economic importance. Targeting growing and emerging sectors raises questions about the stage of development, types of support needed, and the use of public investment, especially in emerging areas."¹⁰

Using the data presented in this report to design and target assistance to manufacturers is also problematic simply because there is so much information to consider. To address this problem, much of the data shown above is presented in summary form in Table 11. This includes 13 indicators drawn from the data for each subsector within manufacturing. For example, the table shows whether or not projected state job growth by subsector is above (+) or below (-) the average for manufacturing as a whole. Similarly, it shows whether or not the 2005 subsector average wage is above or below the prevailing manufacturing average wage.

A simple index has been constructed using the data shown in the table by assigning a value of 1 to a positive entry and a value of -1 to a negative entry. Each

entry receives equal weighting in this index. The larger is the subsector's index value, the greater is the number of attributes that are above average. One weakness of this approach is that it does not distinguish between orders of magnitude. That is, regardless of how far above or below the average a subsector falls on a particular measure, that subsector will still receive a simple 1 or -1.

Only three subsectors—transportation equipment, food and tobacco, and miscellaneous nondurable goods—have positive index values.¹¹ Transportation equipment takes the top spot with an index value of 5. Five sectors have indexes valued at -1, indicating a nearly equal matching of positive and negative components. Based on the data considered here, these subsectors offer the greatest potential to contribute to the state's economic base.

Electrical equipment has the weakest index value of -9. Despite projected job growth for this subsector and high output per worker in 2006, all remaining index components are below average and take on negative values. Furniture, apparel and printing each have indexes of -7. These subsectors appear to be the weakest candidates for offering positive contributions to the economy.

The important caveat here is that these are generally aggregate state (or national) data that do not speak to the unique circumstances of specific businesses in specific Tennessee communities. At the same time, the data do capture the broad pattern of strengths and weaknesses across industry subsectors. As such, the data can and should be used in tandem with other information to help design economic development policies and focus assistance strategies on specific sectors, firms and communities.

¹¹ Because averages are used in the calculations, there generally isn't symmetry in plus and minus values for each data component. For example, capital spending per production worker shows 13 minus values and only 5 positive values. This reflects the skewed pattern of investment per worker across manufacturing subsectors.

¹⁰ "Manufacturing in Washington State 1990-2002: Trends and Implications for the Industry and the State," Social and Economic Sciences Research Center-Puget Sound Division, Washington State University, Olympia, Washington, December 24, 2002, pp. 21.

TABLE 11: Index of Manufacturing Sectors' Performance

Sector	INDEX	COMPONENTS											
		2006-16 Job growth		2005 Avg wage	Per production worker		Final Demand Multiplier		97-05 Change in mfg estabs	2006-16 U.S. Ind prod index	2006-16 GDP growth	2006 Output per worker	1999-06 Exports growth
					2002 Value added	2002 Capital spend							
		TN	U.S.										
Durable Goods													
Wood products	-3	+	+	-	-	-	+	+	-	-	-	-	-
Nonmetallic minerals	-5	+	-	-	-	-	+	+	-	-	-	-	+
Primary metals	-1	+	-	+	+	-	+	-	+	-	-	-	-
Fabricated metals	-3	+	+	-	-	-	+	+	+	-	-	-	-
Machinery	-1	+	+	-	-	-	+	+	+	-	-	-	-
Computers & Electronics	-1	-	-	+	+	-	-	-	-	+	+	+	+
Electrical Equipment, Appliances, and Components	-9	+	-	-	-	-	-	+	-	-	+	+	-
Transportation Equipment	5	+	-	+	+	+	+	+	+	+	-	-	+
Furniture	-7	-	-	-	-	-	+	+	+	-	-	-	+
Miscellaneous durables	1	-	+	-	+	-	-	-	-	-	-	-	+
Nondurable Goods													
Food & Beverage & Tobacco	2	+	+	-	+	+	+	-	+	↕	-	+	-
Textile Mills and Textile Product Mills	-5	-	-	-	-	-	+	+	+	-	-	-	+
Apparel	-7	-	-	-	-	-	+	+	+	-	-	-	-
Paper	-1	+	-	+	+	-	+	-	-	-	-	-	-
Printing & related support	-7	-	-	-	-	-	+	+	+	-	-	-	-
Chemicals	-1	-	+	+	+	+	-	-	+	-	+	+	-
Plastics & Rubber	-5	+	-	-	-	-	-	+	-	-	-	-	-
Miscellaneous nondurables	-4	-	-	+	+	+	-	-	-	↕	-	-	-
Components were assigned the following values based on how the sector compared to the overall average:													

Components were assigned the following values based on how the sector compared to the overall average:

+ above average

- below average

↔ combined sectors with one sector above average, one sector below average

Source: Center for Business and Economic Research, The University of Tennessee.

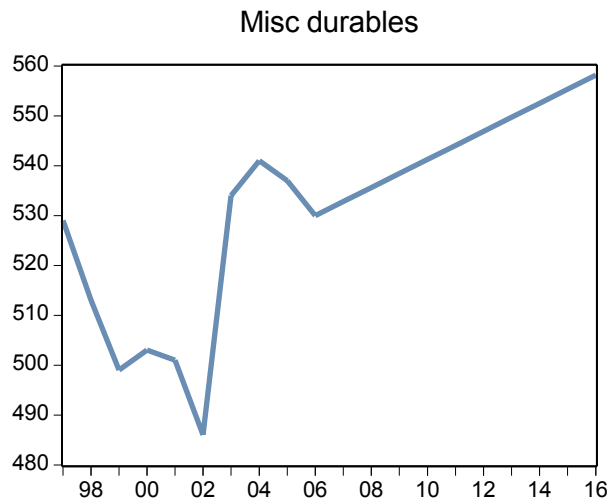
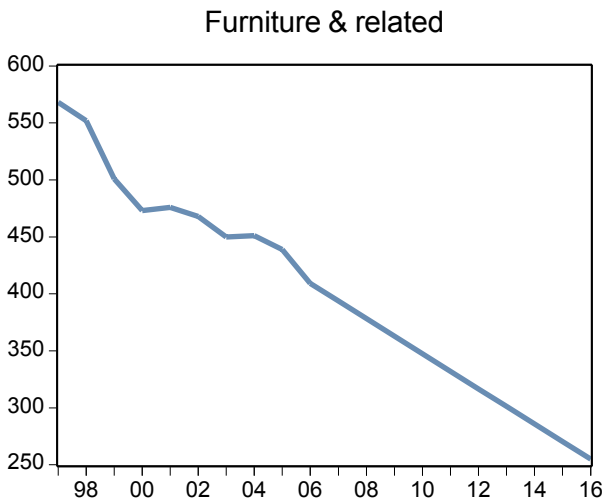
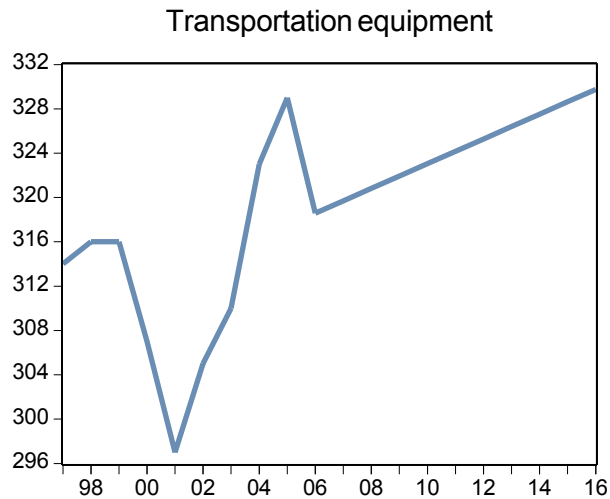
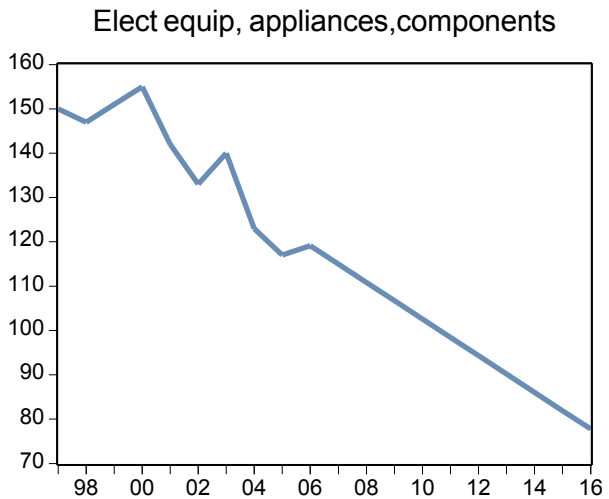
Appendices

Appendix A: Trend Projections for Durable and Nondurable Goods Subsectors

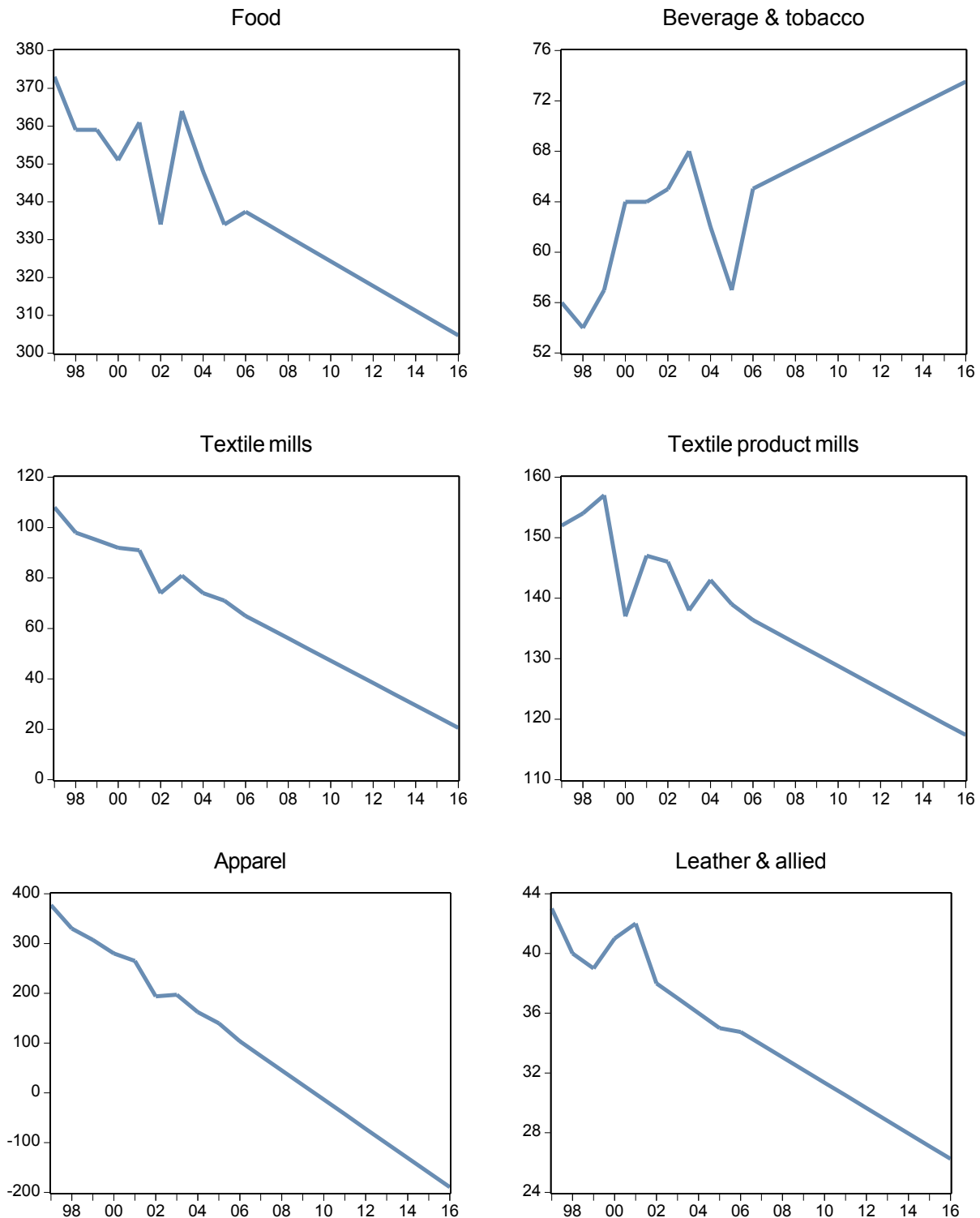
Appendix A: Durable Goods Manufacturing Trend Projections of Plants: 1997-2016



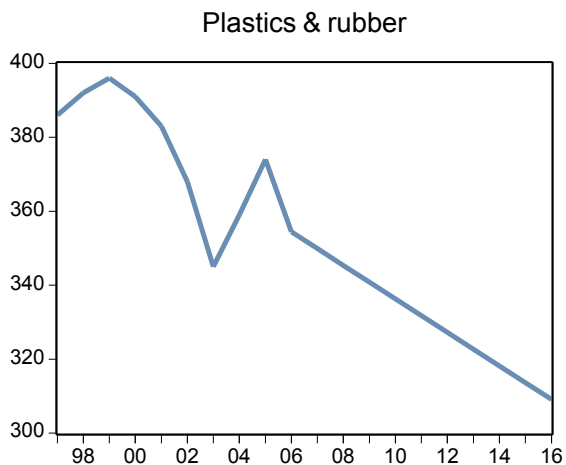
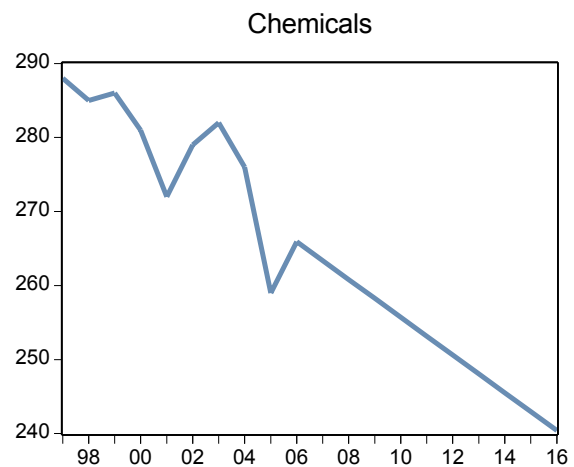
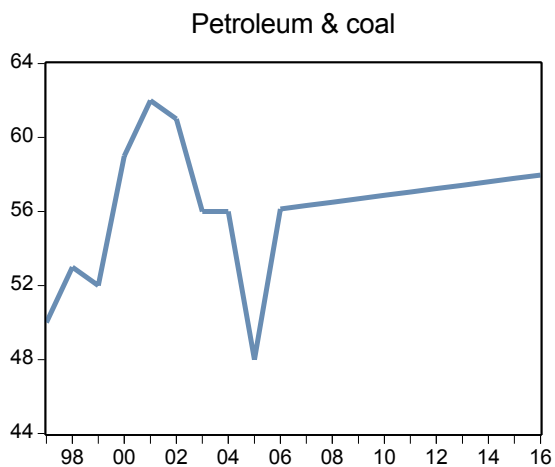
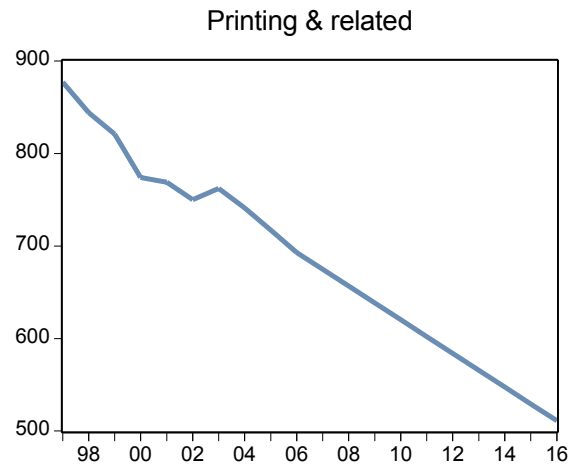
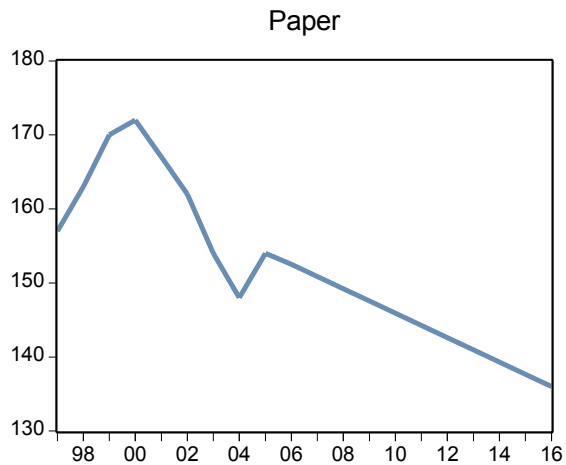
Appendix A: Durable Goods Manufacturing Trend Projections of Plants: 1997-2016



Appendix A: Nondurable Goods Manufacturing Trend Projections of Plants: 1997-2016



Appendix A: Nondurable Goods Manufacturing Trend Projections of Plants: 1997-2016



Appendix B: County Profiles

COUNTY MANUFACTURING PROFILES						
Area	Sector	Establishments		Employment		2005 Average annual pay
		1997	2005	1997	2005	
Anderson	Total Covered	1,628	1,577	34,983	37,256	41,642
	Total Private	1,576	1,533	30,447	32,848	41,477
	Manufacturing	112	117	10,285	9,924	53,305
	Textile mills	—	1	—	—	—
	Textile product mills	—	2	—	—	—
	Apparel	—	1	—	—	—
	Wood	5	7	290	333	43,300
	Paper	—	1	—	—	—
	Printing & related	10	7	38	95	32,639
	Chemicals	—	6	—	505	43,064
	Plastics & rubber	5	6	866	811	36,615
	Nonmetallic minerals	—	2	—	—	—
	Primary metals	4	3	336	82	44,305
	Fabricated metals	—	29	—	5,167	63,764
	Machinery	10	11	472	370	46,983
	Computer & electronics	13	13	664	475	54,202
	Electrical equip & appliances	—	2	—	—	—
	Transportation equipment	12	15	1,623	1,516	41,925
	Furniture	6	7	177	229	31,829
	Misc durables	8	6	129	31	29,456
Bedford	Total Covered	672	752	13,214	16,970	29,260
	Total Private	639	719	11,257	14,664	29,661
	Manufacturing	64	65	5,576	6,443	34,075
	Food	—	4	—	—	—
	Textile mills	—	1	—	—	—
	Textile product mills	—	1	—	—	—
	Apparel	—	2	—	—	—
	Leather & allied products	—	3	—	26	19,275
	Wood	—	2	—	—	—
	Paper	—	1	—	—	—
	Printing & related	—	5	—	—	—
	Petroleum & coal products	—	1	—	—	—
	Chemicals	—	1	—	—	—
	Plastics & rubber	—	4	—	380	47,890
	Nonmetallic minerals	—	3	—	—	—
	Primary metals	—	2	—	—	—
	Fabricated metals	10	9	273	69	30,870
	Machinery	7	5	36	17	40,065
	Transportation equipment	6	7	1,308	1,482	44,359
	Furniture	—	7	—	225	24,583
	Misc durables	10	9	1,468	1,131	33,576

COUNTY MANUFACTURING PROFILES

Area	Sector	2005				
		Establishments		Employment		Average annual pay
		1997	2005	1997	2005	pay
Benton	Total Covered	339	317	4,685	3,889	23,728
	Total Private	319	290	3,888	3,126	23,148
	Manufacturing	18	19	1,295	689	25,714
	Textile product mills	—	1	—	—	—
	Apparel	—	1	—	—	—
	Wood	5	6	82	134	21,787
	Chemicals	—	1	—	—	—
	Primary metals	—	1	—	—	—
	Fabricated metals	4	6	103	110	37,572
	Machinery	—	1	—	—	—
	Transportation equipment	—	1	—	—	—
	Misc durables	—	1	—	—	—
Bledsoe	Total Covered	135	130	2,091	1,400	24,060
	Total Private	119	111	1,593	764	24,745
	Manufacturing	11	8	613	128	30,959
	Chemicals	—	1	—	—	—
	Nonmetallic minerals	—	1	—	—	—
	Fabricated metals	—	2	—	—	—
	Machinery	—	1	—	—	—
	Transportation equipment	—	1	—	—	—
	Furniture	—	2	—	—	—
Blount	Total Covered	1,770	2,103	30,401	41,230	35,730
	Total Private	1,714	2,039	25,724	34,721	36,456
	Manufacturing	133	116	8,067	7,776	49,357
	Food	8	4	101	66	35,162
	Beverage & tobacco	—	1	—	—	—
	Textile product mills	—	4	—	—	—
	Apparel	—	1	—	—	—
	Leather & allied products	—	1	—	—	—
	Wood	7	8	193	150	55,869
	Printing & related	15	10	108	79	30,257
	Chemicals	5	4	45	51	95,340
	Plastics & rubber	—	3	—	—	—
	Nonmetallic minerals	13	8	190	160	29,782
	Primary metals	—	3	—	—	—
	Fabricated metals	20	21	103	283	34,448
	Machinery	12	9	140	97	31,419
	Computer & electronics	—	6	—	164	45,395
	Electrical equip & appliances	—	4	—	462	30,494
	Transportation equipment	11	13	2,733	3,178	47,440
	Furniture	10	11	130	135	30,371
	Misc durables	7	7	59	41	32,708

COUNTY MANUFACTURING PROFILES

Area	Sector	2005				
		Establishments		Employment		Average
		1997	2005	1997	2005	annual pay
Bradley	Total Covered	1,585	1,645	36,545	37,523	32,643
	Total Private	1,549	1,612	32,083	32,486	32,862
	Manufacturing	145	127	13,292	9,945	40,479
	Food	10	8	1,163	1,227	46,753
	Beverage & tobacco	—	1	—	—	—
	Textile mills	—	3	—	—	—
	Textile product mills	—	3	—	—	—
	Apparel	8	6	1,858	914	26,893
	Leather & allied products	—	1	—	—	—
	Wood	9	7	172	87	28,104
	Paper	5	7	831	513	48,579
	Printing & related	13	10	108	93	26,661
	Chemicals	—	5	—	775	67,061
	Plastics & rubber	11	8	260	171	30,995
	Nonmetallic minerals	—	4	—	97	32,721
	Primary metals	—	2	—	—	—
	Fabricated metals	16	24	76	385	33,373
	Machinery	—	6	—	71	42,634
	Electrical equip & appliances	6	6	4,088	3,082	41,602
	Transportation equipment	—	2	—	—	—
	Furniture	30	18	1,559	1,197	25,702
	Misc durables	—	8	—	355	41,086
Campbell	Total Covered	603	611	9,294	10,260	28,362
	Total Private	574	582	7,149	7,962	28,778
	Manufacturing	50	51	2,082	2,243	40,417
	Food	—	3	—	—	—
	Textile product mills	—	1	—	—	—
	Apparel	—	1	—	—	—
	Wood	—	3	—	25	22,341
	Printing & related	—	2	—	—	—
	Chemicals	—	2	—	—	—
	Plastics & rubber	—	2	—	—	—
	Nonmetallic minerals	6	4	85	42	23,041
	Primary metals	—	4	—	61	18,293
	Fabricated metals	—	9	—	580	35,033
	Machinery	—	2	—	—	—
	Computer & electronics	—	1	—	—	—
	Electrical equip & appliances	—	1	—	—	—
	Transportation equipment	11	10	236	261	29,136
	Furniture	—	2	—	—	—
	Misc durables	—	4	—	141	22,533

COUNTY MANUFACTURING PROFILES

Area	Sector	Establishments		Employment		2005 Average annual pay
		1997	2005	1997	2005	
Cannon	Total Covered	133	162	1,707	1,975	27,163
	Total Private	118	148	1,293	1,422	28,268
	Manufacturing	15	18	291	321	47,271
	Apparel	—	1	—	—	—
	Wood	—	3	—	5	65,531
	Printing & related	—	1	—	—	—
	Chemicals	—	1	—	—	—
	Plastics & rubber	—	2	—	—	—
	Primary metals	—	1	—	—	—
	Fabricated metals	—	1	—	—	—
	Machinery	—	5	—	52	35,511
	Electrical equip & appliances	—	1	—	—	—
	Furniture	—	2	—	—	—
	Misc durables	—	1	—	—	—
Carroll	Total Covered	507	479	8,846	7,990	27,336
	Total Private	468	439	7,546	6,555	27,631
	Manufacturing	43	41	3,389	2,045	37,300
	Food	—	2	—	—	—
	Textile mills	—	1	—	—	—
	Apparel	—	3	—	207	13,840
	Wood	10	5	103	59	15,157
	Printing & related	—	1	—	—	—
	Chemicals	—	1	—	—	—
	Plastics & rubber	—	2	—	—	—
	Nonmetallic minerals	—	3	—	—	—
	Primary metals	—	1	—	—	—
	Fabricated metals	6	8	336	423	27,629
	Machinery	5	5	22	48	37,805
	Transportation equipment	—	1	—	—	—
	Furniture	—	7	—	—	—
	Misc durables	—	1	—	—	—
Carter	Total Covered	662	673	10,865	10,458	26,156
	Total Private	632	643	9,001	8,393	25,839
	Manufacturing	48	40	2,077	1,452	34,525
	Textile mills	—	3	—	—	—
	Apparel	—	1	—	—	—
	Wood	—	3	—	21	19,483
	Paper	—	2	—	—	—
	Printing & related	—	3	—	11	13,349
	Chemicals	—	2	—	—	—
	Nonmetallic minerals	—	3	—	—	—
	Primary metals	—	1	—	—	—
	Fabricated metals	10	12	497	862	35,585
	Machinery	8	4	72	41	31,287

COUNTY MANUFACTURING PROFILES

Area	Sector	Establishments		Employment		2005
		1997	2005	1997	2005	Average
						annual
pay						
Carter (continued)						
	Computer & electronics	—	1	—	—	—
	Transportation equipment	—	1	—	—	—
	Furniture	—	1	—	—	—
	Misc durables	—	4	—	—	—
Cheatham	Total Covered	397	513	6,016	7,747	30,324
	Total Private	369	485	4,717	6,330	30,787
	Manufacturing	34	46	2,418	2,945	36,985
	Food	—	1	—	—	—
	Textile product mills	—	1	—	—	—
	Leather & allied products	—	2	—	—	—
	Wood	8	6	71	128	28,618
	Paper	—	2	—	—	—
	Printing & related	—	4	—	26	26,359
	Chemicals	—	3	—	34	42,666
	Plastics & rubber	—	1	—	—	—
	Nonmetallic minerals	—	1	—	—	—
	Fabricated metals	5	7	51	48	40,455
	Machinery	—	2	—	—	—
	Electrical equip & appliances	—	5	—	1,710	37,769
	Transportation equipment	—	2	—	—	—
	Furniture	—	5	—	13	22,342
	Misc durables	—	4	—	21	38,502
Chester	Total Covered	212	238	3,205	3,505	26,043
	Total Private	197	225	2,534	2,686	26,624
	Manufacturing	24	28	793	562	33,562
	Apparel	—	1	—	—	—
	Wood	—	3	—	13	10,092
	Printing & related	—	2	—	—	—
	Nonmetallic minerals	—	2	—	—	—
	Fabricated metals	9	13	529	451	35,862
	Machinery	—	4	—	25	35,847
	Computer & electronics	—	—	—	—	—
	Electrical equip & appliances	—	1	—	—	—
	Furniture	—	2	—	—	—
	Misc durables	—	1	—	—	—

COUNTY MANUFACTURING PROFILES

Area	Sector	2005				
		Establishments		Employment		Average annual pay
		1997	2005	1997	2005	pay
Claiborne	Total Covered	452	485	8,648	9,306	25,078
	Total Private	412	444	6,904	7,249	25,609
	Manufacturing	35	32	2,271	2,895	25,562
	Beverage & tobacco	—	1	—	—	—
	Textile mills	—	2	—	—	—
	Textile product mills	—	1	—	—	—
	Apparel	—	1	—	—	—
	Wood	—	3	—	—	—
	Printing & related	—	2	—	—	—
	Fabricated metals	—	1	—	—	—
	Machinery	—	3	—	59	30,836
	Transportation equipment	—	3	—	—	—
	Furniture	5	8	463	1,591	24,396
	Misc durables	—	7	—	—	—
Clay	Total Covered	124	148	1,714	1,691	26,149
	Total Private	106	130	1,332	1,251	26,470
	Manufacturing	9	8	591	336	36,978
	Textile mills	—	1	—	—	—
	Apparel	—	1	—	—	—
	Wood	—	4	—	226	41,113
	Machinery	—	1	—	—	—
	Electrical equip & appliances	—	1	—	—	—
	Transportation equipment	—	1	—	—	—
Cocke	Total Covered	459	470	7,992	8,037	25,413
	Total Private	427	440	6,632	6,398	25,280
	Manufacturing	42	41	2,118	1,996	32,891
	Food	—	3	—	—	—
	Leather & allied products	—	1	—	—	—
	Wood	7	7	65	41	17,544
	Paper	—	1	—	—	—
	Printing & related	—	1	—	—	—
	Chemicals	—	2	—	—	—
	Plastics & rubber	—	6	—	178	28,258
	Nonmetallic minerals	—	3	—	29	21,936
	Fabricated metals	5	7	267	372	29,323
	Machinery	—	1	—	—	—
	Computer & electronics	—	1	—	—	—
	Furniture	7	5	602	—	—
	Misc durables	—	3	—	—	—

COUNTY MANUFACTURING PROFILES

Area	Sector	2005				
		Establishments		Employment		Average annual pay
		1997	2005	1997	2005	
Claiborne	Total Covered	452	485	8,648	9,306	25,078
	Total Private	412	444	6,904	7,249	25,609
	Manufacturing	35	32	2,271	2,895	25,562
	Beverage & tobacco	—	1	—	—	—
	Textile mills	—	2	—	—	—
	Textile product mills	—	1	—	—	—
	Apparel	—	1	—	—	—
	Wood	—	3	—	—	—
	Printing & related	—	2	—	—	—
	Fabricated metals	—	1	—	—	—
	Machinery	—	3	—	59	30,836
	Transportation equipment	—	3	—	—	—
	Furniture	5	8	463	1,591	24,396
	Misc durables	—	7	—	—	—
Clay	Total Covered	124	148	1,714	1,691	26,149
	Total Private	106	130	1,332	1,251	26,470
	Manufacturing	9	8	591	336	36,978
	Textile mills	—	1	—	—	—
	Apparel	—	1	—	—	—
	Wood	—	4	—	226	41,113
	Machinery	—	1	—	—	—
	Electrical equip & appliances	—	1	—	—	—
	Transportation equipment	—	1	—	—	—
Cocke	Total Covered	459	470	7,992	8,037	25,413
	Total Private	427	440	6,632	6,398	25,280
	Manufacturing	42	41	2,118	1,996	32,891
	Food	—	3	—	—	—
	Leather & allied products	—	1	—	—	—
	Wood	7	7	65	41	17,544
	Paper	—	1	—	—	—
	Printing & related	—	1	—	—	—
	Chemicals	—	2	—	—	—
	Plastics & rubber	—	6	—	178	28,258
	Nonmetallic minerals	—	3	—	29	21,936
	Fabricated metals	5	7	267	372	29,323
	Machinery	—	1	—	—	—
	Computer & electronics	—	1	—	—	—
	Furniture	7	5	602	—	—
	Misc durables	—	3	—	—	—

COUNTY MANUFACTURING PROFILES

Area	Sector	2005				
		Establishments		Employment		Average annual pay
		1997	2005	1997	2005	
Coffee	Total Covered	1,111	1,205	22,740	24,973	32,130
	Total Private	1,067	1,154	20,002	21,989	32,241
	Manufacturing	80	75	4,948	5,303	36,641
	Food	—	2	—	—	—
	Beverage & tobacco	—	2	—	—	—
	Apparel	—	4	—	—	—
	Leather & allied products	—	2	—	—	—
	Wood	—	3	—	12	17,275
	Paper	—	4	—	483	43,527
	Printing & related	8	8	211	126	24,586
	Petroleum & coal products	—	1	—	—	—
	Chemicals	—	1	—	—	—
	Plastics & rubber	—	4	—	275	36,836
	Nonmetallic minerals	—	2	—	—	—
	Primary metals	—	2	—	—	—
	Fabricated metals	16	15	654	584	53,620
	Machinery	6	4	345	248	28,124
	Computer & electronics	—	2	—	—	—
	Electrical equip & appliances	—	1	—	—	—
	Transportation equipment	6	7	744	1,468	37,319
	Furniture	—	1	—	—	—
	Misc durables	12	10	1,061	772	36,064
Crockett	Total Covered	303	266	3,827	3,519	28,148
	Total Private	280	240	3,233	2,837	28,779
	Manufacturing	21	16	1,641	1,108	35,061
	Food	—	1	—	—	—
	Textile product mills	—	—	—	—	—
	Apparel	—	2	—	—	—
	Wood	—	2	—	—	—
	Printing & related	—	1	—	—	—
	Chemicals	—	2	—	—	—
	Plastics & rubber	—	2	—	—	—
	Fabricated metals	—	1	—	—	—
	Machinery	—	1	—	—	—
	Computer & electronics	—	1	—	—	—
	Electrical equip & appliances	—	1	—	—	—
	Transportation equipment	—	1	—	—	—
	Furniture	—	1	—	—	—

COUNTY MANUFACTURING PROFILES

Area	Sector	2005				
		Establishments		Employment		Average annual pay
		1997	2005	1997	2005	
Cumberland	Total Covered	858	1,011	12,862	16,341	25,688
	Total Private	826	979	11,417	14,424	25,604
	Manufacturing	55	61	2,712	2,375	31,840
	Food	—	7	—	—	—
	Beverage & tobacco	—	2	—	—	—
	Textile product mills	—	1	—	—	—
	Apparel	—	1	—	—	—
	Wood	7	7	326	342	31,972
	Printing & related	—	4	—	11	15,460
	Chemicals	—	2	—	—	—
	Plastics & rubber	—	4	—	—	—
	Nonmetallic minerals	6	11	564	862	32,131
	Fabricated metals	5	9	87	118	27,064
	Machinery	—	2	—	—	—
	Computer & electronics	—	1	—	—	—
	Transportation equipment	—	2	—	—	—
	Furniture	—	3	—	17	26,662
	Misc durables	—	4	—	—	—
Davidson	Total Covered	16,988	17,758	410,175	438,397	40,793
	Total Private	16,847	17,610	346,407	367,178	41,015
	Manufacturing	840	737	37,725	27,978	46,328
	Food	44	46	2,228	4,037	34,331
	Beverage & tobacco	5	4	1,091	844	58,052
	Textile mills	13	12	1,235	1,239	44,116
	Textile product mills	29	16	813	467	33,616
	Apparel	13	18	1,189	757	51,077
	Leather & allied products	—	5	—	—	—
	Wood	20	17	864	839	34,622
	Paper	18	15	1,106	746	43,309
	Printing & related	186	158	4,227	3,456	39,746
	Petroleum & coal products	—	3	—	—	—
	Chemicals	37	37	2,120	1,546	59,710
	Plastics & rubber	31	23	1,983	559	39,631
	Nonmetallic minerals	32	34	2,688	2,095	57,233
	Primary metals	10	11	553	422	57,955
	Fabricated metals	110	86	3,504	2,203	41,009
	Machinery	58	48	3,647	1,644	55,353
	Computer & electronics	35	39	2,143	882	75,778
	Electrical equip & appliances	13	13	313	322	48,488
	Transportation equipment	41	27	4,981	3,283	56,426
	Furniture	57	54	823	989	32,535
	Misc durables	81	72	1,677	1,375	35,734

COUNTY MANUFACTURING PROFILES

Area	Sector	2005				
		Establishments		Employment		Average annual pay
		1997	2005	1997	2005	
Decatur	Total Covered	250	247	3,984	3,538	29,163
	Total Private	232	229	3,300	2,857	30,181
	Manufacturing	33	28	1,463	663	29,632
	Apparel	—	1	—	—	—
	Wood	12	13	99	145	25,994
	Petroleum & coal products	—	1	—	—	—
	Nonmetallic minerals	—	3	—	23	24,127
	Fabricated metals	—	1	—	—	—
	Machinery	—	5	—	418	32,956
	Transportation equipment	—	3	—	38	22,756
	Furniture	—	1	—	—	—
De Kalb	Total Covered	288	316	5,178	6,063	27,474
	Total Private	267	293	4,538	5,275	27,547
	Manufacturing	35	29	1,925	2,062	31,456
	Food	—	1	—	—	—
	Apparel	—	3	—	—	—
	Wood	—	2	—	—	—
	Printing & related	—	2	—	—	—
	Petroleum & coal products	—	1	—	—	—
	Chemicals	—	1	—	—	—
	Nonmetallic minerals	—	1	—	—	—
	Primary metals	—	2	—	—	—
	Fabricated metals	—	3	—	—	—
	Machinery	—	4	—	—	—
	Electrical equip & appliances	—	1	—	—	—
	Transportation equipment	—	3	—	—	—
	Furniture	—	5	—	—	—
	Misc durables	—	1	—	—	—
Dickson	Total Covered	731	893	13,982	14,552	29,550
	Total Private	688	855	12,113	12,377	29,567
	Manufacturing	53	55	4,601	3,636	36,250
	Food	—	1	—	—	—
	Beverage & tobacco	—	1	—	—	—
	Textile product mills	—	1	—	—	—
	Wood	11	11	118	191	37,940
	Printing & related	—	7	—	—	—
	Chemicals	—	1	—	—	—
	Plastics & rubber	—	2	—	—	—
	Nonmetallic minerals	—	3	—	150	38,776
	Primary metals	—	2	—	—	—
	Fabricated metals	5	8	207	584	35,948
	Machinery	—	3	—	—	—

COUNTY MANUFACTURING PROFILES

Area	Sector	Establishments		Employment		2005
		1997	2005	1997	2005	Average annual pay
Dickson (continued)						
	Computer & electronics	—	1	—	—	—
	Electrical equip & appliances	—	1	—	—	—
	Transportation equipment	—	6	—	875	38,535
	Furniture	—	5	—	—	—
	Misc durables	—	3	—	—	—
Dyer	Total Covered	851	929	16,770	17,115	29,369
	Total Private	809	896	14,709	14,922	29,279
	Manufacturing	42	48	5,616	5,827	35,842
	Food	—	3	—	—	—
	Beverage & tobacco	—	1	—	—	—
	Textile mills	—	1	—	—	—
	Textile product mills	—	2	—	—	—
	Apparel	—	2	—	—	—
	Leather & allied products	—	1	—	—	—
	Wood	—	3	—	24	13,253
	Printing & related	—	4	—	—	—
	Chemicals	—	3	—	366	28,378
	Plastics & rubber	—	4	—	1,002	40,756
	Nonmetallic minerals	—	1	—	—	—
	Primary metals	—	2	—	—	—
	Fabricated metals	—	3	—	37	29,415
	Machinery	—	5	—	—	—
	Electrical equip & appliances	—	4	—	817	37,551
	Transportation equipment	—	4	—	—	—
	Furniture	—	2	—	—	—
	Misc durables	—	3	—	12	28,161
Fayette	Total Covered	368	467	5,061	6,039	33,497
	Total Private	342	439	3,734	4,572	36,788
	Manufacturing	42	48	1,666	1,793	44,447
	Food	—	2	—	—	—
	Wood	—	3	—	109	25,992
	Paper	—	1	—	—	—
	Printing & related	—	3	—	7	17,134
	Chemicals	—	2	—	—	—
	Plastics & rubber	6	10	475	535	47,818
	Nonmetallic minerals	5	8	78	84	36,497
	Primary metals	—	1	—	—	—
	Fabricated metals	6	9	297	370	35,066
	Machinery	—	2	—	—	—
	Electrical equip & appliances	—	1	—	—	—
	Furniture	—	2	—	—	—
	Misc durables	—	3	—	—	—

COUNTY MANUFACTURING PROFILES

Area	Sector	2005				
		Establishments		Employment		Average annual pay
		1997	2005	1997	2005	
Fentress	Total Covered	259	289	4,316	3,943	24,592
	Total Private	239	264	3,575	3,192	24,207
	Manufacturing	22	20	1,161	542	22,247
	Beverage & tobacco	—	1	—	—	—
	Textile product mills	—	1	—	—	—
	Apparel	—	3	—	—	—
	Wood	5	8	133	115	19,999
	Chemicals	—	1	—	—	—
	Nonmetallic minerals	—	2	—	—	—
	Fabricated metals	—	3	—	—	—
	Furniture	—	1	—	—	—
Franklin	Total Covered	631	676	9,343	9,639	27,134
	Total Private	604	643	7,906	7,934	27,365
	Manufacturing	51	49	1,989	2,073	34,801
	Food	—	5	—	14	8,628
	Textile mills	—	2	—	—	—
	Textile product mills	—	1	—	—	—
	Apparel	—	4	—	90	33,633
	Wood	5	3	86	—	—
	Printing & related	—	2	—	—	—
	Plastics & rubber	5	5	753	1,003	33,094
	Nonmetallic minerals	—	6	—	41	25,128
	Fabricated metals	10	5	243	141	36,602
	Machinery	—	2	—	—	—
	Computer & electronics	—	1	—	—	—
	Transportation equipment	—	3	—	137	51,690
	Furniture	—	7	—	76	27,351
	Misc durables	—	4	—	35	29,718
Gibson	Total Covered	975	900	18,238	14,838	28,385
	Total Private	926	849	15,947	12,355	28,291
	Manufacturing	101	81	8,249	4,469	36,696
	Food	—	3	—	—	—
	Textile mills	—	2	—	—	—
	Textile product mills	—	2	—	—	—
	Apparel	—	4	—	67	15,870
	Wood	8	7	154	140	24,982
	Paper	5	4	379	288	39,175
	Printing & related	8	8	23	20	13,649
	Chemicals	—	2	—	—	—
	Plastics & rubber	—	3	—	27	25,262
	Nonmetallic minerals	—	3	—	50	28,323
	Primary metals	—	1	—	—	—
	Fabricated metals	18	15	2,329	1,284	40,447
	Machinery	12	12	433	232	28,859

COUNTY MANUFACTURING PROFILES

Area	Sector					2005
		Establishments		Employment		Average
		1997	2005	1997	2005	annual pay
Gibson (continued)						
	Computer & electronics	—	2	—	—	—
	Electrical equip & appliances	—	2	—	—	—
	Transportation equipment	8	6	1,183	1,425	39,599
	Furniture	—	3	—	—	—
	Misc durables	—	3	—	—	—
Giles						
	Total Covered	514	557	9,827	9,193	29,737
	Total Private	478	524	8,624	7,890	30,332
	Manufacturing	52	50	4,350	3,043	39,881
	Food	—	2	—	—	—
	Beverage & tobacco	—	2	—	—	—
	Apparel	—	2	—	—	—
	Wood	8	9	521	420	26,803
	Paper	—	2	—	—	—
	Printing & related	—	1	—	—	—
	Chemicals	—	1	—	—	—
	Plastics & rubber	4	4	160	275	31,856
	Nonmetallic minerals	—	2	—	—	—
	Primary metals	4	4	589	500	43,355
	Fabricated metals	—	4	—	—	—
	Machinery	—	3	—	7	45,080
	Computer & electronics	—	1	—	—	—
	Electrical equip & appliances	—	1	—	—	—
	Transportation equipment	—	4	—	543	45,040
	Furniture	—	6	—	11	15,891
	Misc durables	—	1	—	—	—
Grainger						
	Total Covered	231	244	3,528	3,348	26,902
	Total Private	214	222	2,910	2,549	27,300
	Manufacturing	38	33	1,613	1,326	30,213
	Food	—	1	—	—	—
	Beverage & tobacco	—	1	—	—	—
	Textile mills	—	1	—	—	—
	Textile product mills	—	3	—	65	18,545
	Apparel	—	1	—	—	—
	Wood	—	7	—	—	—
	Chemicals	—	1	—	—	—
	Fabricated metals	—	1	—	—	—
	Machinery	—	2	—	—	—
	Transportation equipment	—	3	—	60	21,351
	Furniture	14	11	416	209	19,008
	Misc durables	—	1	—	—	—

COUNTY MANUFACTURING PROFILES

Area	Sector	2005				
		Establishments		Employment		Average annual pay
		1997	2005	1997	2005	
Greene	Total Covered	1,050	1,106	25,215	28,516	29,812
	Total Private	1,008	1,066	21,191	24,153	29,608
	Manufacturing	123	117	8,766	8,420	34,832
	Food	6	6	235	278	37,413
	Beverage & tobacco	—	2	—	—	—
	Textile mills	—	3	—	—	—
	Textile product mills	—	1	—	—	—
	Apparel	—	1	—	—	—
	Wood	14	12	205	163	23,582
	Paper	5	6	1,180	1,374	36,351
	Printing & related	10	12	252	281	34,309
	Chemicals	—	1	—	—	—
	Plastics & rubber	5	5	328	1,392	32,580
	Nonmetallic minerals	—	3	—	226	34,962
	Primary metals	—	5	—	498	43,125
	Fabricated metals	22	30	872	1,667	34,374
	Machinery	16	13	1,075	1,234	38,119
	Computer & electronics	—	1	—	—	—
	Electrical equip & appliances	—	2	—	—	—
	Transportation equipment	—	3	—	—	—
	Furniture	—	8	—	—	—
	Misc durables	—	3	—	8	27,390
Grundy	Total Covered	175	173	2,076	2,130	22,330
	Total Private	156	156	1,499	1,393	21,816
	Manufacturing	16	16	351	435	27,680
	Food	—	3	—	—	—
	Beverage & tobacco	—	1	—	—	—
	Apparel	—	2	—	—	—
	Wood	—	1	—	—	—
	Chemicals	—	1	—	—	—
	Plastics & rubber	—	1	—	—	—
	Nonmetallic minerals	—	1	—	—	—
	Fabricated metals	—	1	—	—	—
	Transportation equipment	—	1	—	—	—
	Furniture	—	4	—	41	23,439
Hamblen	Total Covered	1,280	1,345	31,745	34,328	31,996
	Total Private	1,221	1,289	29,200	31,216	32,096
	Manufacturing	134	137	15,555	12,237	35,705
	Food	—	8	—	—	—
	Beverage & tobacco	—	1	—	—	—
	Textile mills	—	1	—	—	—
	Apparel	—	3	—	—	—
	Wood	17	15	554	565	30,363
	Paper	5	6	738	598	52,650

COUNTY MANUFACTURING PROFILES

Area	Sector	Establishments		Employment		2005
		1997	2005	1997	2005	Average annual pay
Hamblen (continued)						
	Printing & related	11	10	397	472	37,869
	Chemicals	8	4	883	—	—
	Plastics & rubber	11	14	647	708	32,122
	Nonmetallic minerals	—	4	—	41	56,157
	Primary metals	—	2	—	—	—
	Fabricated metals	21	21	975	785	44,501
	Machinery	8	11	581	604	39,511
	Computer & electronics	—	—	—	—	—
	Electrical equip & appliances	—	1	—	—	—
	Transportation equipment	8	12	2,150	2,743	41,071
	Furniture	22	18	6,536	3,854	31,318
	Misc durables	—	7	—	—	—
Hamilton						
	Total Covered	7,708	8,325	173,288	191,463	35,166
	Total Private	7,614	8,231	148,617	166,867	33,970
	Manufacturing	530	471	30,098	24,881	42,800
	Food	36	30	6,420	6,309	35,880
	Beverage & tobacco	—	4	—	430	44,851
	Textile mills	17	10	2,483	819	42,653
	Textile product mills	16	12	276	255	36,120
	Apparel	16	10	553	—	—
	Leather & allied products	—	4	—	166	23,174
	Wood	14	8	223	184	25,168
	Paper	19	12	1,274	971	42,300
	Printing & related	70	55	1,496	1,514	40,370
	Petroleum & coal products	—	1	—	—	—
	Chemicals	33	38	2,695	2,293	66,475
	Plastics & rubber	21	17	547	742	34,499
	Nonmetallic minerals	18	23	617	1,180	43,826
	Primary metals	17	14	3,426	867	41,406
	Fabricated metals	95	92	3,251	3,498	44,426
	Machinery	41	43	2,744	2,987	46,645
	Computer & electronics	16	11	845	573	47,142
	Electrical equip & appliances	8	8	453	381	44,084
	Transportation equipment	11	10	596	716	40,304
	Furniture	36	25	717	362	28,864
	Misc durables	37	43	691	463	36,542
Hancock						
	Total Covered	72	60	1,185	900	20,349
	Total Private	60	49	800	515	19,114
	Manufacturing	—	3	—	153	19,916
	Wood	—	1	—	—	—
	Transportation equipment	—	1	—	—	—
	Furniture	—	1	—	—	—

COUNTY MANUFACTURING PROFILES

Area	Sector	2005				
		Establishments		Employment		Average annual pay
		1997	2005	1997	2005	
Hardeman	Total Covered	397	374	6,887	7,253	29,802
	Total Private	370	345	5,053	5,182	30,555
	Manufacturing	46	30	2,319	2,001	37,477
	Textile mills	—	1	—	—	—
	Leather & allied products	—	1	—	—	—
	Wood	27	16	292	277	20,628
	Printing & related	—	2	—	—	—
	Chemicals	—	2	—	—	—
	Plastics & rubber	—	1	—	—	—
	Fabricated metals	—	2	—	—	—
	Machinery	—	2	—	—	—
	Electrical equip & appliances	—	1	—	—	—
	Transportation equipment	—	1	—	—	—
	Furniture	—	1	—	—	—
Hardin	Total Covered	509	515	8,027	7,513	28,435
	Total Private	478	486	6,702	5,984	28,720
	Manufacturing	44	43	2,645	2,100	42,395
	Food	—	1	—	—	—
	Wood	12	11	474	452	29,794
	Paper	—	2	—	—	—
	Printing & related	—	2	—	—	—
	Chemicals	—	1	—	—	—
	Plastics & rubber	—	2	—	—	—
	Nonmetallic minerals	—	3	—	43	32,485
	Primary metals	—	3	—	—	—
	Fabricated metals	4	5	87	62	20,625
	Machinery	—	4	—	285	31,395
	Transportation equipment	—	3	—	15	20,544
	Furniture	9	5	287	—	—
	Misc durables	—	1	—	—	—
Hawkins	Total Covered	567	603	12,292	12,608	30,199
	Total Private	534	569	10,235	10,301	30,150
	Manufacturing	55	48	5,997	4,294	39,947
	Textile mills	—	3	—	—	—
	Wood	—	5	—	58	20,116
	Printing & related	—	4	—	—	—
	Chemicals	—	2	—	—	—
	Plastics & rubber	—	4	—	542	28,621
	Nonmetallic minerals	—	6	—	873	42,566
	Primary metals	—	2	—	—	—
	Fabricated metals	7	9	110	209	23,596
	Machinery	4	4	32	23	52,792

COUNTY MANUFACTURING PROFILES

Area	Sector	2005				
		Establishments		Employment		Average annual pay
		1997	2005	1997	2005	
Jackson	Total Covered	110	128	2,022	1,867	26,729
	Total Private	96	113	1,663	1,373	28,214
	Manufacturing	8	10	873	555	23,473
	Wood	—	3	—	—	—
	Plastics & rubber	—	1	—	—	—
	Nonmetallic minerals	—	3	—	—	—
	Fabricated metals	—	1	—	—	—
	Transportation equipment	—	2	—	—	—
Jefferson	Total Covered	569	664	10,778	10,856	30,073
	Total Private	524	619	8,929	8,993	30,519
	Manufacturing	54	56	2,980	2,634	36,763
	Food	—	3	—	—	—
	Beverage & tobacco	—	1	—	—	—
	Textile product mills	—	1	—	—	—
	Apparel	—	1	—	—	—
	Leather & allied products	—	1	—	—	—
	Wood	6	7	258	319	31,083
	Paper	—	1	—	—	—
	Printing & related	—	5	—	68	18,169
	Chemicals	—	1	—	—	—
	Plastics & rubber	—	1	—	—	—
	Nonmetallic minerals	—	1	—	—	—
	Primary metals	—	1	—	—	—
	Fabricated metals	4	8	131	164	47,751
	Machinery	—	2	—	—	—
	Computer & electronics	—	1	—	—	—
	Electrical equip & appliances	—	1	—	—	—
	Transportation equipment	—	2	—	—	—
	Furniture	15	14	932	291	19,834
	Misc durables	—	4	—	60	21,085
Johnson	Total Covered	207	236	3,438	3,787	27,080
	Total Private	196	220	2,845	3,032	28,194
	Manufacturing	20	19	1,372	616	31,929
	Textile mills	—	1	—	—	—
	Leather & allied products	—	2	—	—	—
	Wood	7	8	108	189	26,357
	Paper	—	1	—	—	—
	Chemicals	—	1	—	—	—
	Plastics & rubber	—	2	—	—	—
	Nonmetallic minerals	—	1	—	—	—
	Fabricated metals	—	1	—	—	—
	Furniture	—	1	—	—	—
	Misc durables	—	1	—	—	—

COUNTY MANUFACTURING PROFILES

Area	Sector					2005
		Establishments		Employment		Average
		1997	2005	1997	2005	annual pay
Knox	Total Covered	9,798	10,360	190,516	217,890	35,039
	Total Private	9,708	10,271	158,678	185,981	34,591
	Manufacturing	535	505	22,327	17,245	43,029
	Food	32	31	1,984	1,477	33,699
	Beverage & tobacco	7	7	624	768	41,065
	Textile mills	10	7	204	106	25,871
	Textile product mills	—	15	—	—	—
	Apparel	22	15	4,771	660	24,837
	Wood	19	20	564	630	33,883
	Paper	12	12	490	437	43,167
	Printing & related	96	82	1,499	948	31,221
	Petroleum & coal products	—	3	—	—	—
	Chemicals	17	19	682	954	38,489
	Plastics & rubber	19	22	667	517	38,754
	Nonmetallic minerals	26	20	741	687	39,800
	Primary metals	5	10	130	258	42,850
	Fabricated metals	81	85	2,382	2,239	41,396
	Machinery	27	18	437	351	46,013
	Computer & electronics	25	26	2,693	1,621	79,852
	Electrical equip & appliances	9	16	237	398	47,789
	Transportation equipment	28	26	2,165	3,491	46,806
	Furniture	29	21	456	260	25,190
	Misc durables	53	53	1,430	1,357	33,937
Lake	Total Covered	119	109	1,262	982	21,985
	Total Private	103	90	963	630	20,428
	Manufacturing	—	2	—	—	—
	Chemicals	—	1	—	—	—
	Primary metals	—	1	—	—	—
Lauderdale	Total Covered	366	353	7,989	6,066	27,786
	Total Private	335	330	6,772	4,809	28,196
	Manufacturing	26	24	3,769	1,934	34,882
	Beverage & tobacco	—	1	—	—	—
	Apparel	—	1	—	—	—
	Wood	—	6	—	—	—
	Paper	—	1	—	—	—
	Printing & related	—	1	—	—	—
	Petroleum & coal products	—	1	—	—	—
	Plastics & rubber	—	1	—	—	—
	Nonmetallic minerals	—	1	—	—	—
	Primary metals	—	1	—	—	—
	Fabricated metals	—	5	—	—	—
	Machinery	—	2	—	—	—
	Electrical equip & appliances	—	1	—	—	—
	Transportation equipment	—	2	—	—	—

COUNTY MANUFACTURING PROFILES

Area	Sector	2005				
		Establishments		Employment		Average annual pay
		1997	2005	1997	2005	pay
Lawrence	Total Covered	724	734	13,565	11,213	27,412
	Total Private	690	700	11,814	9,414	27,139
	Manufacturing	63	61	5,576	3,181	33,860
	Food	—	4	—	29	25,021
	Textile product mills	—	1	—	—	—
	Apparel	—	2	—	—	—
	Wood	7	7	45	73	31,427
	Paper	—	3	—	—	—
	Printing & related	—	2	—	—	—
	Chemicals	—	1	—	—	—
	Plastics & rubber	—	1	—	—	—
	Nonmetallic minerals	—	3	—	—	—
	Fabricated metals	11	9	194	280	28,706
	Machinery	—	9	—	—	—
	Electrical equip & appliances	—	1	—	—	—
	Transportation equipment	—	5	—	327	32,456
	Furniture	—	4	—	60	20,972
	Misc durables	6	9	206	249	27,110
Lewis	Total Covered	198	216	2,595	2,454	20,980
	Total Private	185	201	2,080	1,837	20,213
	Manufacturing	21	19	653	318	22,902
	Food	—	1	—	—	—
	Beverage & tobacco	—	1	—	—	—
	Apparel	—	1	—	—	—
	Wood	—	3	—	36	19,875
	Petroleum & coal products	—	1	—	—	—
	Chemicals	—	1	—	—	—
	Plastics & rubber	—	3	—	—	—
	Nonmetallic minerals	—	1	—	—	—
	Fabricated metals	—	2	—	—	—
	Computer & electronics	—	2	—	—	—
	Electrical equip & appliances	—	1	—	—	—
	Furniture	—	1	—	—	—
	Misc durables	—	1	—	—	—
Lincoln	Total Covered	557	562	7,622	9,188	26,600
	Total Private	531	535	5,352	6,771	27,515
	Manufacturing	50	44	2,110	2,856	33,677
	Food	—	1	—	—	—
	Beverage & tobacco	—	1	—	—	—
	Leather & allied products	—	2	—	—	—
	Wood	10	8	110	179	21,054
	Printing & related	—	4	—	83	24,698
	Chemicals	—	1	—	—	—

COUNTY MANUFACTURING PROFILES

Area	Sector	Establishments		Employment		2005
		1997	2005	1997	2005	Average annual pay
Lincoln (continued)						
	Plastics & rubber	—	2	—	—	—
	Nonmetallic minerals	—	2	—	—	—
	Primary metals	—	1	—	—	—
	Fabricated metals	8	11	75	177	27,512
	Machinery	—	5	—	—	—
	Computer & electronics	—	1	—	—	—
	Furniture	5	2	104	—	—
	Misc durables	—	2	—	—	—
Loudon	Total Covered	650	780	9,970	13,212	31,331
	Total Private	622	751	8,524	11,287	31,197
	Manufacturing	51	55	2,968	3,044	38,951
	Food	—	4	—	480	44,944
	Beverage & tobacco	—	1	—	—	—
	Textile mills	—	1	—	—	—
	Textile product mills	—	1	—	—	—
	Apparel	—	2	—	—	—
	Wood	—	2	—	—	—
	Petroleum & coal products	—	1	—	—	—
	Chemicals	—	1	—	—	—
	Plastics & rubber	—	5	—	320	45,382
	Nonmetallic minerals	—	5	—	—	—
	Primary metals	—	1	—	—	—
	Fabricated metals	10	14	557	528	36,655
	Machinery	—	6	—	337	47,000
	Computer & electronics	—	2	—	—	—
	Transportation equipment	—	6	—	704	35,051
	Furniture	—	1	—	—	—
	Misc durables	—	2	—	—	—
McMinn	Total Covered	796	833	17,303	17,640	33,876
	Total Private	756	797	15,173	15,313	34,533
	Manufacturing	77	78	7,315	6,516	47,293
	Food	—	2	—	—	—
	Beverage & tobacco	—	1	—	—	—
	Textile product mills	—	1	—	—	—
	Apparel	10	7	1,134	372	29,677
	Wood	5	6	48	51	28,998
	Paper	—	2	—	—	—
	Printing & related	—	1	—	—	—
	Chemicals	—	4	—	310	65,976
	Plastics & rubber	5	8	819	889	36,879
	Nonmetallic minerals	—	3	—	307	53,567

COUNTY MANUFACTURING PROFILES

Area	Sector	Establishments		Employment		2005	
		1997	2005	1997	2005	Average annual pay	
McMinn (continued)							
	Primary metals	—	4	—	—	—	
	Fabricated metals	6	9	89	213	30,565	
	Machinery	6	8	624	654	37,791	
	Transportation equipment	—	5	—	—	—	
	Furniture	15	11	1,305	385	28,725	
	Misc durables	—	6	—	77	26,775	
McNairy	Total Covered	452	453	7,694	7,768	26,194	
	Total Private	424	425	6,511	6,579	26,633	
	Manufacturing	57	54	3,093	2,969	30,236	
	Apparel	11	5	641	331	15,809	
	Wood	14	14	136	158	21,696	
	Paper	—	1	—	—	—	
	Printing & related	—	1	—	—	—	
	Petroleum & coal products	—	1	—	—	—	
	Plastics & rubber	—	5	—	—	—	
	Primary metals	—	2	—	—	—	
	Fabricated metals	—	8	—	305	28,733	
	Machinery	—	6	—	—	—	
	Computer & electronics	—	1	—	—	—	
	Electrical equip & appliances	—	1	—	—	—	
	Transportation equipment	—	2	—	—	—	
	Furniture	5	6	61	61	28,173	
	Misc durables	—	1	—	—	—	
	Macon	Total Covered	268	299	3,949	4,637	23,346
		Total Private	255	284	3,038	3,717	23,202
Manufacturing		36	34	1,018	890	21,390	
Textile product mills		—	2	—	—	—	
Apparel		5	3	374	176	15,030	
Wood		11	6	280	173	28,191	
Printing & related		—	2	—	—	—	
Chemicals		—	1	—	—	—	
Plastics & rubber		—	2	—	—	—	
Nonmetallic minerals		—	2	—	—	—	
Primary metals		—	1	—	—	—	
Fabricated metals		—	2	—	—	—	
Machinery		7	5	58	21	41,081	
Furniture		5	8	35	63	18,080	

COUNTY MANUFACTURING PROFILES

Area	Sector					2005
		Establishments		Employment		Average
		1997	2005	1997	2005	annual pay
Madison	Total Covered	2,249	2,324	50,844	54,034	33,756
	Total Private	2,198	2,274	41,797	43,799	33,304
	Manufacturing	158	125	11,026	10,058	43,083
	Food	9	8	1,912	1,623	47,163
	Textile mills	—	1	—	—	—
	Textile product mills	—	1	—	—	—
	Apparel	—	1	—	—	—
	Leather & allied products	—	1	—	—	—
	Wood	16	10	707	593	33,180
	Paper	7	7	641	677	40,366
	Printing & related	18	16	354	208	25,615
	Petroleum & coal products	—	1	—	—	—
	Chemicals	8	6	197	237	52,355
	Plastics & rubber	9	7	310	366	36,170
	Nonmetallic minerals	7	6	461	265	39,995
	Primary metals	—	7	—	737	56,603
	Fabricated metals	24	23	1,167	1,816	40,670
	Machinery	9	5	1,793	1,554	46,356
	Computer & electronics	—	1	—	—	—
	Electrical equip & appliances	—	3	—	—	—
	Transportation equipment	7	6	1,021	799	41,308
	Furniture	—	5	—	81	32,687
	Misc durables	12	10	73	49	26,443
Marion	Total Covered	409	466	6,277	6,794	26,166
	Total Private	375	437	5,336	5,641	26,297
	Manufacturing	31	30	1,627	1,369	37,687
	Food	—	1	—	—	—
	Beverage & tobacco	—	1	—	—	—
	Textile mills	—	1	—	—	—
	Apparel	—	3	—	—	—
	Wood	—	6	—	48	34,233
	Paper	—	1	—	—	—
	Printing & related	—	1	—	—	—
	Chemicals	—	2	—	—	—
	Plastics & rubber	—	1	—	—	—
	Nonmetallic minerals	—	3	—	—	—
	Primary metals	—	1	—	—	—
	Fabricated metals	—	4	—	153	28,303
	Machinery	—	1	—	—	—
	Electrical equip & appliances	—	1	—	—	—
	Furniture	—	2	—	—	—
	Misc durables	—	1	—	—	—

COUNTY MANUFACTURING PROFILES

Area	Sector	2005				
		Establishments		Employment		Average annual pay
		1997	2005	1997	2005	
Marshall	Total Covered	451	498	11,447	9,643	29,522
	Total Private	412	454	10,329	8,283	29,280
	Manufacturing	48	53	6,873	4,195	35,837
	Food	—	3	—	19	16,169
	Leather & allied products	—	2	—	—	—
	Wood	—	2	—	—	—
	Paper	—	2	—	—	—
	Chemicals	—	2	—	—	—
	Plastics & rubber	6	5	250	213	34,071
	Nonmetallic minerals	—	3	—	42	24,161
	Primary metals	—	3	—	612	40,398
	Fabricated metals	9	10	299	301	23,563
	Machinery	—	7	—	271	50,333
	Computer & electronics	—	3	—	—	—
	Transportation equipment	—	5	—	1,058	36,074
	Furniture	—	2	—	—	—
	Misc durables	—	4	—	—	—
Maury	Total Covered	1,370	1,484	31,631	31,404	38,228
	Total Private	1,309	1,428	27,133	25,815	39,080
	Manufacturing	88	82	11,437	7,724	61,340
	Textile mills	—	2	—	—	—
	Textile product mills	—	2	—	—	—
	Apparel	—	3	—	—	—
	Wood	8	6	130	78	34,409
	Paper	—	3	—	124	37,382
	Printing & related	8	5	167	—	—
	Petroleum & coal products	—	1	—	—	—
	Chemicals	6	8	301	236	63,206
	Plastics & rubber	—	3	—	210	40,541
	Nonmetallic minerals	—	7	—	88	30,297
	Primary metals	—	3	—	233	42,181
	Fabricated metals	14	15	329	343	30,687
	Machinery	6	6	395	98	45,034
	Electrical equip & appliances	—	1	—	—	—
	Transportation equipment	—	5	—	—	—
	Furniture	—	6	—	37	28,884
	Misc durables	4	7	38	79	31,435

COUNTY MANUFACTURING PROFILES

Area	Sector	2005				
		Establishments		Employment		Average annual pay
		1997	2005	1997	2005	pay
Meigs	Total Covered	81	97	1,571	1,637	29,807
	Total Private	71	85	1,230	1,229	30,552
	Manufacturing	9	6	640	623	36,766
	Food	—	1	—	—	—
	Textile mills	—	1	—	—	—
	Chemicals	—	1	—	—	—
	Machinery	—	1	—	—	—
	Transportation equipment	—	1	—	—	—
	Furniture	—	1	—	—	—
Monroe	Total Covered	599	687	10,900	13,844	29,338
	Total Private	570	659	9,675	12,176	29,702
	Manufacturing	85	67	5,279	5,676	35,548
	Food	—	4	—	25	27,672
	Beverage & tobacco	—	1	—	—	—
	Textile mills	—	1	—	—	—
	Textile product mills	—	1	—	—	—
	Apparel	24	7	782	536	19,583
	Wood	14	10	166	414	27,856
	Paper	—	1	—	—	—
	Printing & related	—	1	—	—	—
	Chemicals	—	1	—	—	—
	Plastics & rubber	—	4	—	398	38,178
	Nonmetallic minerals	—	4	—	683	39,986
	Primary metals	—	3	—	—	—
	Fabricated metals	—	7	—	142	31,578
	Machinery	—	2	—	—	—
	Computer & electronics	—	1	—	—	—
	Electrical equip & appliances	—	1	—	—	—
	Transportation equipment	9	13	1,554	2,871	39,264
	Furniture	—	4	—	28	18,757
	Misc durables	—	1	—	—	—
Montgomery	Total Covered	1,986	2,264	33,780	42,482	28,572
	Total Private	1,945	2,221	26,763	34,870	27,572
	Manufacturing	85	77	5,616	5,991	42,136
	Food	—	3	—	—	—
	Beverage & tobacco	—	2	—	—	—
	Textile product mills	—	4	—	—	—
	Apparel	—	1	—	—	—
	Wood	—	2	—	—	—
	Paper	—	2	—	—	—
	Printing & related	15	10	535	1,310	36,867
	Petroleum & coal products	—	1	—	—	—

COUNTY MANUFACTURING PROFILES

Area	Sector					2005
		Establishments		Employment		Average
		1997	2005	1997	2005	annual pay
Montgomery (continued)						
	Chemicals	—	2	—	—	—
	Plastics & rubber	—	2	—	—	—
	Nonmetallic minerals	—	6	—	482	34,463
	Primary metals	—	2	—	—	—
	Fabricated metals	12	14	260	163	31,048
	Machinery	—	4	—	—	—
	Electrical equip & appliances	—	4	—	79	71,715
	Transportation equipment	4	5	357	943	42,217
	Furniture	11	8	102	28	21,695
	Misc durables	7	7	37	42	24,950
Moore	Total Covered	66	60	1,382	1,382	32,901
	Total Private	54	50	744	807	35,932
	Manufacturing	—	3	—	—	—
	Beverage & tobacco	—	1	—	—	—
	Apparel	—	1	—	—	—
	Wood	—	1	—	—	—
Morgan	Total Covered	168	173	3,368	2,542	23,473
	Total Private	148	150	2,584	1,390	28,539
	Manufacturing	26	19	1,626	261	33,728
	Textile product mills	—	1	—	—	—
	Wood	—	3	—	53	26,156
	Chemicals	—	1	—	—	—
	Primary metals	—	1	—	—	—
	Fabricated metals	5	6	57	71	29,392
	Machinery	—	4	—	81	43,208
	Electrical equip & appliances	—	2	—	—	—
	Furniture	—	1	—	—	—
Obion	Total Covered	705	700	13,489	13,477	33,998
	Total Private	665	656	12,072	11,948	34,659
	Manufacturing	43	38	5,664	4,670	48,591
	Food	—	2	—	—	—
	Beverage & tobacco	—	2	—	—	—
	Apparel	—	3	—	127	17,618
	Wood	—	4	—	119	26,529
	Printing & related	—	3	—	—	—
	Plastics & rubber	—	3	—	—	—
	Nonmetallic minerals	—	2	—	—	—
	Fabricated metals	7	10	184	224	39,299
	Machinery	7	8	712	654	33,590
	Transportation equipment	—	1	—	—	—
	Misc durables	—	1	—	—	—

COUNTY MANUFACTURING PROFILES

Area	Sector	2005				
		Establishments		Employment		Average
		1997	2005	1997	2005	annual pay
Overton	Total Covered	267	279	4,456	4,390	26,783
	Total Private	246	253	3,465	3,264	27,466
	Manufacturing	29	27	1,426	1,177	31,324
	Beverage & tobacco	—	1	—	—	—
	Textile product mills	—	1	—	—	—
	Wood	—	5	—	49	23,748
	Paper	—	1	—	—	—
	Printing & related	—	2	—	—	—
	Plastics & rubber	—	2	—	—	—
	Nonmetallic minerals	—	3	—	33	37,486
	Primary metals	—	1	—	—	—
	Fabricated metals	—	3	—	6	25,478
	Machinery	—	4	—	48	34,573
	Transportation equipment	—	1	—	—	—
	Furniture	—	2	—	—	—
	Misc durables	—	2	—	—	—
Perry	Total Covered	125	110	2,863	2,501	25,999
	Total Private	112	97	2,568	2,151	26,115
	Manufacturing	22	12	1,753	1,384	28,800
	Wood	—	7	—	138	25,845
	Chemicals	—	1	—	—	—
	Plastics & rubber	—	2	—	—	—
	Machinery	—	1	—	—	—
	Transportation equipment	—	1	—	—	—
Pickett	Total Covered	92	93	1,101	930	22,733
	Total Private	82	84	872	665	22,743
	Manufacturing	9	9	407	144	20,897
	Beverage & tobacco	—	1	—	—	—
	Wood	—	4	—	52	24,569
	Chemicals	—	1	—	—	—
	Fabricated metals	—	1	—	—	—
	Machinery	—	1	—	—	—
	Furniture	—	1	—	—	—
Polk	Total Covered	209	239	2,974	2,693	23,485
	Total Private	182	214	2,261	1,898	22,294
	Manufacturing	23	15	975	298	32,312
	Beverage & tobacco	—	1	—	—	—
	Textile product mills	—	1	—	—	—
	Apparel	—	1	—	—	—
	Wood	—	3	—	—	—
	Chemicals	—	2	—	—	—
	Plastics & rubber	—	1	—	—	—

COUNTY MANUFACTURING PROFILES

		Establishments		Employment		2005 Average annual pay
Area	Sector	1997	2005	1997	2005	
Polk (continued)						
	Fabricated metals	—	1	—	—	—
	Computer & electronics	—	1	—	—	—
	Furniture	—	1	—	—	—
	Misc durables	—	3	—	—	—
Putnam						
	Total Covered	1,476	1,644	29,832	31,857	28,881
	Total Private	1,425	1,593	23,628	25,596	28,077
	Manufacturing	141	123	9,260	7,595	33,682
	Food	—	8	—	3,016	25,908
	Beverage & tobacco	—	1	—	—	—
	Textile product mills	—	2	—	—	—
	Wood	14	12	229	140	27,228
	Paper	—	3	—	132	26,262
	Printing & related	—	8	—	34	21,464
	Petroleum & coal products	—	1	—	—	—
	Chemicals	—	2	—	—	—
	Plastics & rubber	10	10	294	174	23,581
	Nonmetallic minerals	—	5	—	50	22,915
	Primary metals	—	4	—	87	33,228
	Fabricated metals	21	20	585	689	45,848
	Machinery	17	17	340	272	45,065
	Computer & electronics	8	3	306	—	—
	Electrical equip & appliances	—	3	—	—	—
	Transportation equipment	6	5	2,129	1,742	44,786
	Furniture	13	11	281	262	28,087
	Misc durables	9	11	563	479	30,533
Rhea						
	Total Covered	455	477	9,936	10,787	30,870
	Total Private	428	450	7,817	8,576	27,390
	Manufacturing	46	32	4,432	4,593	32,340
	Textile mills	—	2	—	—	—
	Textile product mills	—	1	—	—	—
	Apparel	—	4	—	622	34,937
	Wood	5	6	165	182	19,309
	Paper	—	1	—	—	—
	Printing & related	—	2	—	—	—
	Chemicals	—	1	—	—	—
	Plastics & rubber	—	1	—	—	—
	Nonmetallic minerals	—	4	—	—	—
	Machinery	—	5	—	—	—
	Computer & electronics	—	1	—	—	—
	Transportation equipment	—	—	—	—	—
	Furniture	—	3	—	—	—
	Misc durables	—	1	—	—	—

COUNTY MANUFACTURING PROFILES

Area	Sector	2005				
		Establishments		Employment		Average annual pay
		1997	2005	1997	2005	pay
Roane	Total Covered	685	735	20,031	17,447	42,853
	Total Private	638	690	16,702	13,892	45,204
	Manufacturing	41	39	5,491	1,537	30,817
	Food	—	3	—	—	—
	Beverage & tobacco	—	1	—	—	—
	Apparel	—	1	—	—	—
	Wood	—	5	—	47	26,782
	Paper	—	1	—	—	—
	Printing & related	—	2	—	—	—
	Plastics & rubber	—	1	—	—	—
	Nonmetallic minerals	—	5	—	638	25,753
	Primary metals	—	3	—	—	—
	Fabricated metals	—	8	—	113	36,827
	Machinery	—	4	—	—	—
	Electrical equip & appliances	—	1	—	—	—
	Transportation equipment	—	2	—	—	—
	Furniture	—	1	—	—	—
	Misc durables	—	2	—	—	—
Robertson	Total Covered	797	956	12,439	17,741	28,673
	Total Private	764	928	10,119	14,743	28,402
	Manufacturing	79	79	4,568	6,284	32,824
	Food	—	2	—	—	—
	Beverage & tobacco	—	3	—	128	32,292
	Textile product mills	—	1	—	—	—
	Apparel	—	2	—	—	—
	Wood	8	5	204	102	26,824
	Printing & related	6	3	27	11	16,769
	Chemicals	—	1	—	—	—
	Plastics & rubber	—	3	—	—	—
	Nonmetallic minerals	—	5	—	118	37,313
	Fabricated metals	17	21	486	367	38,359
	Machinery	6	8	184	152	53,044
	Electrical equip & appliances	—	3	—	—	—
	Transportation equipment	9	12	547	817	36,984
	Furniture	—	4	—	—	—
	Misc durables	—	6	—	283	31,382
Rutherford	Total Covered	2,801	3,762	68,096	94,666	35,720
	Total Private	2,754	3,718	58,487	83,487	35,744
	Manufacturing	210	218	20,645	22,377	52,480
	Food	15	11	1,887	1,458	40,115
	Textile product mills	—	6	—	13	17,678
	Apparel	—	3	—	12	24,045
	Wood	11	8	138	—	—
	Paper	6	6	414	231	50,014

COUNTY MANUFACTURING PROFILES

Area	Sector	Establishments		Employment		2005
		1997	2005	1997	2005	Average annual pay
Rutherford (continued)						
	Printing & related	19	26	393	394	34,530
	Petroleum & coal products	—	1	—	—	—
	Chemicals	—	11	—	931	43,664
	Plastics & rubber	11	16	1,805	2,063	55,485
	Nonmetallic minerals	13	14	633	554	50,462
	Primary metals	—	3	—	—	—
	Fabricated metals	27	27	1,192	1,419	40,741
	Machinery	22	19	959	1,895	40,720
	Computer & electronics	9	10	348	483	39,937
	Electrical equip & appliances	7	6	1,445	1,275	61,592
	Transportation equipment	13	17	8,135	10,361	60,290
	Furniture	18	24	396	666	41,812
	Misc durables	13	13	237	295	30,364
Scott	Total Covered	312	349	5,172	6,335	24,064
	Total Private	285	321	4,043	5,130	23,741
	Manufacturing	38	41	1,728	2,133	25,717
	Food	—	1	—	—	—
	Textile mills	—	1	—	—	—
	Textile product mills	—	1	—	—	—
	Apparel	—	1	—	—	—
	Wood	11	9	724	841	29,532
	Printing & related	—	1	—	—	—
	Plastics & rubber	—	2	—	—	—
	Nonmetallic minerals	—	3	—	44	21,979
	Fabricated metals	9	9	105	109	25,354
	Machinery	—	5	—	41	23,306
	Transportation equipment	—	7	—	—	—
	Misc durables	—	1	—	—	—
Sequatchie	Total Covered	160	199	2,581	2,687	24,353
	Total Private	145	186	2,138	2,155	24,099
	Manufacturing	10	12	1,009	805	24,775
	Food	—	1	—	—	—
	Chemicals	—	1	—	—	—
	Plastics & rubber	—	1	—	—	—
	Nonmetallic minerals	—	1	—	—	—
	Primary metals	—	1	—	—	—
	Fabricated metals	—	2	—	—	—
	Machinery	—	2	—	—	—
	Furniture	—	1	—	—	—
	Misc durables	—	2	—	—	—

COUNTY MANUFACTURING PROFILES

Area	Sector					2005
		Establishments		Employment		Average
		1997	2005	1997	2005	annual pay
Sevier	Total Covered	2,147	2,460	29,767	37,115	23,760
	Total Private	2,114	2,426	26,417	33,002	22,706
	Manufacturing	99	87	2,297	1,315	35,866
	Food	14	13	127	193	35,814
	Beverage & tobacco	—	3	—	35	25,069
	Textile mills	—	1	—	—	—
	Textile product mills	—	2	—	—	—
	Apparel	—	1	—	—	—
	Wood	7	6	84	107	40,381
	Paper	—	1	—	—	—
	Printing & related	15	10	54	25	38,500
	Chemicals	—	1	—	—	—
	Plastics & rubber	—	3	—	29	43,466
	Nonmetallic minerals	12	10	103	101	29,810
	Primary metals	—	1	—	—	—
	Fabricated metals	5	9	161	83	32,618
	Machinery	—	4	—	23	26,345
	Computer & electronics	—	3	—	—	—
	Transportation equipment	—	3	—	—	—
	Furniture	12	12	79	98	19,489
	Misc durables	—	4	—	8	25,426
Shelby	Total Covered	18,883	19,596	475,789	498,806	41,324
	Total Private	18,732	19,450	410,913	431,701	40,901
	Manufacturing	974	822	48,079	39,502	55,687
	Food	70	52	3,709	3,464	55,275
	Beverage & tobacco	12	7	1,922	1,676	51,784
	Textile mills	12	7	191	227	43,119
	Textile product mills	25	21	327	—	—
	Apparel	—	8	—	—	—
	Wood	37	29	2,266	944	30,169
	Paper	37	30	6,381	6,420	76,391
	Printing & related	162	139	3,990	3,077	43,008
	Petroleum & coal products	13	8	520	504	112,550
	Chemicals	77	70	6,011	4,361	64,046
	Plastics & rubber	21	26	848	625	36,623
	Nonmetallic minerals	39	48	1,228	1,273	42,783
	Primary metals	14	11	407	325	33,636
	Fabricated metals	148	121	4,061	3,295	44,219
	Machinery	69	57	4,632	3,485	48,079
	Computer & electronics	18	17	309	655	55,425
	Electrical equip & appliances	24	18	3,999	2,769	55,622
	Transportation equipment	36	26	2,204	1,344	38,149
	Furniture	63	45	1,179	697	29,892
	Misc durables	86	86	3,495	3,930	61,757

COUNTY MANUFACTURING PROFILES

Area	Sector	2005				
		Establishments		Employment		Average annual pay
		1997	2005	1997	2005	
Smith	Total Covered	304	326	5,039	5,090	29,042
	Total Private	267	292	4,370	4,248	29,401
	Manufacturing	23	21	1,686	1,310	36,400
	Textile mills	—	1	—	—	—
	Wood	—	2	—	—	—
	Paper	—	2	—	—	—
	Printing & related	—	1	—	—	—
	Plastics & rubber	—	1	—	—	—
	Nonmetallic minerals	—	1	—	—	—
	Primary metals	—	1	—	—	—
	Fabricated metals	—	4	—	—	—
	Machinery	—	2	—	—	—
	Computer & electronics	—	2	—	—	—
	Transportation equipment	—	4	—	436	38,689
Stewart	Total Covered	161	171	1,899	2,485	35,509
	Total Private	138	150	965	1,379	26,640
	Manufacturing	11	15	172	434	31,521
	Wood	—	3	—	35	20,408
	Chemicals	—	1	—	—	—
	Plastics & rubber	—	1	—	—	—
	Nonmetallic minerals	—	2	—	—	—
	Fabricated metals	—	2	—	—	—
	Machinery	—	1	—	—	—
	Transportation equipment	—	3	—	—	—
	Furniture	—	2	—	—	—
Sullivan	Total Covered	3,203	3,235	70,797	66,925	37,294
	Total Private	3,162	3,193	64,006	60,345	37,855
	Manufacturing	200	159	20,777	13,986	60,045
	Food	—	4	—	170	43,854
	Beverage & tobacco	—	1	—	—	—
	Textile mills	—	3	—	—	—
	Textile product mills	—	5	—	82	17,412
	Apparel	—	4	—	212	18,509
	Leather & allied products	—	1	—	—	—
	Wood	10	5	336	184	22,011
	Paper	—	3	—	—	—
	Printing & related	31	22	1,791	1,177	36,089
	Petroleum & coal products	—	1	—	—	—
	Chemicals	—	10	—	—	—
	Plastics & rubber	12	9	497	354	34,080
	Nonmetallic minerals	14	10	649	544	41,325
	Primary metals	13	7	781	398	41,471

COUNTY MANUFACTURING PROFILES

Area	Sector					2005	
		Establishments		Employment		Average	
		1997	2005	1997	2005	annual pay	
Sullivan (continued)							
	Fabricated metals	29	30	462	461	32,496	
	Machinery	13	11	188	234	36,513	
	Computer & electronics	—	2	—	—	—	
	Electrical equip & appliances	—	3	—	—	—	
	Transportation equipment	6	7	341	205	38,239	
	Furniture	9	7	100	106	32,286	
	Misc durables	18	15	98	113	31,260	
Sumner	Total Covered	2,201	2,649	33,874	39,120	32,791	
	Total Private	2,158	2,610	28,832	32,955	32,850	
	Manufacturing	193	196	10,900	7,478	39,277	
	Food	—	5	—	—	—	
	Beverage & tobacco	—	3	—	—	—	
	Textile product mills	—	2	—	—	—	
	Apparel	—	2	—	—	—	
	Wood	—	8	—	476	34,778	
	Paper	5	5	103	164	34,552	
	Printing & related	16	15	1,093	611	42,883	
	Petroleum & coal products	—	1	—	—	—	
	Chemicals	—	5	—	314	33,857	
	Plastics & rubber	10	15	816	520	33,508	
	Nonmetallic minerals	7	10	111	148	42,811	
	Primary metals	6	6	524	406	47,211	
	Fabricated metals	40	46	1,927	1,532	39,442	
	Machinery	30	32	641	590	44,774	
	Computer & electronics	—	3	—	—	—	
	Transportation equipment	18	14	2,328	1,809	40,588	
	Furniture	18	12	1,406	451	33,431	
	Misc durables	8	13	101	106	31,189	
	Tipton	Total Covered	614	730	10,141	11,127	28,569
		Total Private	586	703	8,057	8,807	28,578
		Manufacturing	45	34	3,204	2,480	37,029
		Food	—	6	—	663	42,100
Textile mills		—	1	—	—	—	
Textile product mills		—	1	—	—	—	
Printing & related		—	1	—	—	—	
Petroleum & coal products		—	1	—	—	—	
Chemicals		—	1	—	—	—	
Plastics & rubber		—	4	—	—	—	
Nonmetallic minerals		—	1	—	—	—	
Primary metals		—	1	—	—	—	
Fabricated metals		11	8	346	274	37,357	

COUNTY MANUFACTURING PROFILES

Area	Sector	Establishments		Employment		2005
		1997	2005	1997	2005	Average annual pay
Tipton (continued)						
	Machinery	—	2	—	—	—
	Electrical equip & appliances	—	2	—	—	—
	Transportation equipment	—	1	—	—	—
	Furniture	—	2	—	—	—
	Misc durables	—	2	—	—	—
Trousdale	Total Covered	120	109	1,372	1,455	26,013
	Total Private	105	94	1,079	1,051	24,922
	Manufacturing	11	7	537	251	34,528
	Leather & allied products	—	1	—	—	—
	Fabricated metals	—	2	—	—	—
	Machinery	—	2	—	—	—
	Transportation equipment	—	1	—	—	—
	Furniture	—	1	—	—	—
Unicoi	Total Covered	233	251	4,288	4,773	33,005
	Total Private	216	231	3,415	3,756	34,348
	Manufacturing	25	27	1,540	1,824	41,048
	Wood	—	3	—	6	12,714
	Chemicals	—	1	—	—	—
	Plastics & rubber	4	6	223	460	31,406
	Nonmetallic minerals	—	2	—	—	—
	Primary metals	—	2	—	—	—
	Fabricated metals	—	4	—	151	38,801
	Machinery	—	3	—	12	31,052
	Electrical equip & appliances	—	6	—	—	—
Union	Total Covered	195	232	2,658	2,466	30,186
	Total Private	181	216	2,212	1,772	31,690
	Manufacturing	27	30	965	769	41,456
	Food	—	2	—	—	—
	Textile product mills	—	1	—	—	—
	Apparel	—	2	—	—	—
	Wood	—	5	—	175	68,928
	Paper	—	1	—	—	—
	Printing & related	—	3	—	—	—
	Plastics & rubber	—	2	—	—	—
	Nonmetallic minerals	—	3	—	160	54,157
	Fabricated metals	—	5	—	70	32,646
	Transportation equipment	—	1	—	—	—
	Furniture	—	2	—	—	—
	Misc durables	—	4	—	—	—

COUNTY MANUFACTURING PROFILES

Area	Sector					2005
		Establishments		Employment		Average
		1997	2005	1997	2005	annual pay
Van Buren	Total Covered	48	47	817	912	33,485
	Total Private	40	39	627	690	35,989
	Manufacturing	—	6	—	—	—
	Wood	—	2	—	—	—
	Fabricated metals	—	3	—	—	—
	Furniture	—	1	—	—	—
Warren	Total Covered	694	770	14,699	14,671	33,911
	Total Private	667	739	13,094	12,892	34,690
	Manufacturing	72	79	6,563	6,106	45,351
	Food	—	1	—	—	—
	Textile product mills	—	1	—	—	—
	Wood	13	10	456	378	28,500
	Printing & related	—	1	—	—	—
	Chemicals	—	4	—	42	25,858
	Plastics & rubber	—	7	—	—	—
	Nonmetallic minerals	—	5	—	50	31,439
	Primary metals	—	1	—	—	—
	Fabricated metals	14	15	301	333	32,801
	Machinery	19	21	1,917	2,130	43,473
	Electrical equip & appliances	—	2	—	—	—
	Transportation equipment	—	4	—	—	—
	Furniture	—	5	—	172	25,777
	Misc durables	—	2	—	—	—
Washington	Total Covered	2,338	2,639	54,183	59,314	30,235
	Total Private	2,286	2,593	45,633	49,731	29,173
	Manufacturing	149	145	10,444	7,780	36,993
	Food	11	4	255	62	70,984
	Beverage & tobacco	—	5	—	158	39,654
	Textile mills	3	4	812	—	—
	Textile product mills	4	5	16	40	17,734
	Apparel	—	4	—	22	19,499
	Leather & allied products	—	1	—	—	—
	Wood	14	12	556	588	32,896
	Paper	—	5	—	155	32,015
	Printing & related	15	12	519	338	28,738
	Chemicals	—	4	—	132	53,522
	Plastics & rubber	5	8	344	213	31,855
	Nonmetallic minerals	—	5	—	287	52,898
	Primary metals	—	1	—	—	—
	Fabricated metals	23	23	846	928	37,391
	Machinery	13	14	1,099	1,379	35,487

COUNTY MANUFACTURING PROFILES

Area	Sector	Establishments		Employment		2005
		1997	2005	1997	2005	Average annual pay
Washington (continued)						
	Computer & electronics	7	7	899	655	47,553
	Electrical equip & appliances	—	6	—	—	—
	Transportation equipment	—	4	—	—	—
	Furniture	8	9	866	235	26,988
	Misc durables	14	13	922	362	31,614
Wayne	Total Covered	239	234	4,196	3,765	23,471
	Total Private	220	213	3,431	2,648	23,684
	Manufacturing	29	23	1,513	779	27,266
	Food	—	1	—	—	—
	Beverage & tobacco	—	1	—	—	—
	Apparel	—	2	—	—	—
	Leather & allied products	—	1	—	—	—
	Wood	14	11	322	425	26,122
	Printing & related	—	1	—	—	—
	Fabricated metals	—	2	—	—	—
	Machinery	—	2	—	—	—
	Computer & electronics	—	2	—	—	—
	Misc durables	—	1	—	—	—
	Weakley	Total Covered	585	545	11,414	10,456
Total Private		552	513	8,743	7,411	26,577
Manufacturing		55	42	3,573	1,818	29,762
Food		—	3	—	—	—
Textile product mills		—	1	—	—	—
Apparel		6	4	882	—	—
Wood		—	3	—	56	16,436
Printing & related		7	5	781	57	28,808
Chemicals		—	1	—	—	—
Plastics & rubber		—	4	—	162	25,060
Nonmetallic minerals		—	2	—	—	—
Primary metals		—	1	—	—	—
Fabricated metals		—	2	—	—	—
Machinery		11	11	874	948	30,262
Electrical equip & appliances		—	1	—	—	—
Furniture		—	4	—	22	19,118
Misc durables		—	1	—	—	—
White		Total Covered	398	382	6,667	6,807
	Total Private	372	354	5,700	5,573	27,133
	Manufacturing	54	48	3,243	2,280	31,105
	Food	—	2	—	—	—
	Apparel	—	6	—	195	26,334
	Wood	16	11	520	306	26,728
	Paper	—	1	—	—	—

COUNTY MANUFACTURING PROFILES

Area	Sector					2005
		Establishments		Employment		Average
		1997	2005	1997	2005	annual pay
White (continued)						
	Printing & related	—	1	—	—	—
	Chemicals	—	1	—	—	—
	Plastics & rubber	4	5	273	405	28,594
	Nonmetallic minerals	—	2	—	—	—
	Fabricated metals	—	4	—	—	—
	Machinery	6	6	43	177	33,640
	Computer & electronics	—	1	—	—	—
	Electrical equip & appliances	—	2	—	—	—
	Transportation equipment	—	3	—	422	39,057
	Furniture	—	1	—	—	—
	Misc durables	—	3	—	8	25,712
Williamson	Total Covered	3,229	5,023	45,540	73,316	43,125
	Total Private	3,194	4,989	40,776	65,811	44,092
	Manufacturing	137	121	4,859	3,180	39,269
	Food	6	8	111	142	32,698
	Textile product mills	—	5	—	32	19,039
	Apparel	—	1	—	—	—
	Leather & allied products	—	2	—	—	—
	Wood	—	5	—	157	44,786
	Paper	—	2	—	—	—
	Printing & related	23	26	128	247	57,013
	Petroleum & coal products	—	3	—	15	41,536
	Chemicals	7	4	139	—	—
	Plastics & rubber	14	12	424	451	28,233
	Nonmetallic minerals	5	6	49	93	58,561
	Primary metals	—	2	—	—	—
	Fabricated metals	5	4	92	67	58,818
	Machinery	13	10	455	244	38,283
	Computer & electronics	11	7	732	654	32,097
	Electrical equip & appliances	—	5	—	—	—
	Transportation equipment	—	6	—	169	36,549
	Furniture	9	4	51	22	32,973
	Misc durables	12	11	505	45	39,495
	Wilson	Total Covered	1,507	1,952	22,568	31,818
Total Private		1,453	1,917	19,866	28,265	35,927
Manufacturing		128	116	5,032	6,628	45,144
Food		8	10	249	265	41,929
Textile mills		—	3	—	8	19,105
Textile product mills		—	3	—	5	8,553
Leather & allied products		—	2	—	—	—
Wood		5	4	146	165	24,629
Paper		6	8	411	444	72,971
Printing & related		11	12	137	129	31,752

COUNTY MANUFACTURING PROFILES

Area	Sector					2005
		Establishments		Employment		Average
		1997	2005	1997	2005	annual pay
Wilson (continued)						
	Petroleum & coal products	—	1	—	—	—
	Chemicals	—	5	—	23	33,253
	Plastics & rubber	10	9	221	199	31,261
	Nonmetallic minerals	7	7	194	212	43,921
	Fabricated metals	22	20	635	589	37,207
	Machinery	15	8	236	181	39,814
	Computer & electronics	—	3	—	—	—
	Electrical equip & appliances	—	2	—	—	—
	Transportation equipment	—	4	—	—	—
	Furniture	15	10	75	60	41,941
	Misc durables	—	6	—	—	—

– indicates either zero (0) or that data was not disclosed

Source: Bureau of Labor Statistics.

