The Facts About
Modern Manufacturing

5th edition

MANUFACTURING MAKES AMERICA STRONG
**Introduction**

As we enter a new century, the U.S. economy is achieving unprecedented levels of prosperity, innovation and job creation. America’s manufacturers and their workers are leading the charge, as detailed in this fascinating book on manufacturing.

The stratospheric growth of the Internet and e-commerce, the streamlining of supply chains, the revolution in digital communications and the shift in the workplace from brawn to brain are all enabled by new technology; America’s manufacturers are responsible for developing these leading-edge changes.

Federal Reserve Board Chairman Alan Greenspan has noted that this shift has been largely due to new technology that increases productivity — the amount of goods and services produced for each hour worked. Among industry sectors, manufacturing accounts for more than half — 57 percent — of technological advancement, both through R&D and through production-process improvements. This technology, combined with management vision and the creativity of the 18 million employees in manufacturing, has dramatically changed how manufacturing works and improved its productivity payoff.

Manufacturing’s productivity is increasing faster than that of any other sector of the economy and, as this report shows, it is higher productivity that leads to higher compensation and an improved standard of living. Consider a few facts that illustrate how technology has transformed the factory floor:

- From 1992 through 1997, GDP in manufacturing grew by 5.2 percent annually, compared to 3.1 percent for the economy overall: a 67-percent difference.
- Productivity in manufacturing has grown by nearly 4 percent per year during the current business cycle; it accelerated to 4.7 percent yearly in 1996–1999 — more than twice the rate of productivity growth in non-farm business.
- Throughout the decade of the 1990s, manufactured output contributed 29 percent of GDP growth, much more than its 21.5-percent contribution in the 1980s, and more than any other sector.

The verdict of these data is clear: Not only is manufacturing not in decline, it is thriving — and it is the undercurrent of the sustained productivity improvements and growth we’ve been enjoying throughout the decade.

This is the fifth edition of our popular book, *The Facts About Modern Manufacturing*, and it is supported by a generous grant from Johnson Controls, Inc. It is also available on our Web site, www.nam.org/institute, where the data will be updated periodically. The purpose of this book is to educate the public, opinion leaders, the media, elected officials and regulators about manufacturing’s important role in our economy. As you will see on the following pages, American manufacturers and their employees enter the 21st century internationally competitive and brimming with high productivity and innovation.

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The recent performance of American manufacturing has been exceptionally strong. Throughout the 1990s, its contribution to economic growth has been unrivaled, its investments in technology have been unparalleled and its productivity growth has surged.

These gains in manufacturing have had a spillover effect into other sectors of the economy, while reducing inflation. The whole economy benefits when manufacturing thrives. Specifically, manufacturing —

- makes the highest contribution to economic growth. In the 1990s, manufactured output accounted for 29 percent of GDP growth (i.e., growth in Gross Domestic Product) — more than any other sector;

- makes the largest contribution to technological advance. In the long run, growth is due to labor, capital and technology. Manufacturing produces the key technological advances that have been the engine of American economic growth; and

- consistently achieves the highest productivity growth rates. Productivity growth in manufacturing has averaged 3.7 percent since 1991 and has accelerated to 4.7 percent since 1996. These gains are largely responsible for the increase in the standard of living.

In short, manufacturing continues to drive the U.S. economy and supports its growth. While it accounts for the same one-fifth share of the economy as it did when Harry Truman was president 50 years ago, its impact on the American economy in the 1990s has become much greater. This section explores each of these contributions in more detail.
General Technology: Helping Spawn an Economic Boom

General Technology Corp. (GTC) is a small company — 225 employees — that demonstrates how manufacturing contributes strongly to the nation’s economic growth. Producing products with high reliance and low rejection rates for customers with drop-dead delivery dates has been the key to GTC’s success and growth.

The Albuquerque, N.M., company is a contract electronics manufacturer and printed wiring-board fabricator. GTC’s products are shipped to larger manufacturers, such as General Electric, Lucent Technologies and Sikorsky Aircraft.

Founded in 1981 with only 13 employees, GTC has grown from $6 million in sales in 1990 to $18 million in 1999. Its 44,000 square foot plant has been expanded to nearly twice that size to accommodate growth. Moreover, GTC operates two shifts of its professional engineers, technicians and assemblers to ensure its customers cost efficiency and on-time delivery. A nationwide network of representatives provide customers with on-site service.

Manufacturing contributed 29 percent of economic growth [i.e., real Gross Domestic Product (GDP) adjusted for inflation] between 1992 and 1997. This is the largest of any sector. By comparison, services contributed 19 percent; transportation and utilities, 10 percent; and finance, insurance and real estate, 13 percent.

U.S. economic growth increased at an average rate of 3.1 percent in 1992–1997. During the same period, manufacturing’s share grew faster, by 5.2 percent per year.

It has been generally under-reported that manufacturing achieved rapid growth during the 1990s and generated so much of the country’s economic boom. Manufacturing’s performance in the 1990s was much higher than in the 1980s.

Note: Percentages do not add up to 100 percent, due to a statistical discrepancy between national income and national product.

Intel: Boosting the Nation’s Production Capacity

Founded in 1971 with fewer than a dozen employees, U.S.-based Intel is now the leading provider of one of the world’s most complex products to manufacture — the microprocessor. Intel makes more than 100 million processors each year, generating about $20 billion in annual revenue.

Today, the company employs approximately 65,000 people around the world. The electronics manufacturing industry alone, which Intel helped spawn, has created hundreds of new companies and more than a million jobs.

Intel’s processors are recognized worldwide. They are an integral part of everyday items such as PCs, coffee makers, automobiles, airplanes and traffic signals. The smallest processors are in cell phones and pagers; the most powerful ones run the Internet. They’re also critical to other efforts, such as national defense and space exploration, contributing to the operation of such vehicles as the Space Shuttle and Mars Rover.

Intel’s growth demonstrates how manufacturing has generated the economy’s long-term expansion, primarily through technological advances like microprocessors.

Another way to look at economic growth is through the contribution of technological advances, hours worked and physical capital, such as factories and machines. Together, these factors make up the economy’s capacity to produce. Using this method, manufacturing’s contribution to growth in the 1990s was 33 percent.* (The accompanying chart shows how this 33-percent contribution is derived, by summing the percentage of growth from manufacturing: 21 percent in technological advance, 7 percent in labor and 5 percent in capital.)

Manufacturing’s main impact on growth is through technological advance, contributing 57 percent. Manufacturing also makes smaller, but significant, contributions to labor and capital investment.

*This number is based on the supply side of the economy, or production function. It differs from the number for GDP in the sense that GDP is measured as a sum of expenditures, while the production function measures the long-term capacity to produce.

Source: NAM calculations based on data from the U.S. Departments of Commerce and Labor and the National Science Foundation, 1990-98
Eastman Chemical: Raising Productivity With E-Commerce

Seizing the opportunity to improve customer service through e-commerce, Kingsport, Tennessee-based Eastman Chemical Company is one of the first chemical manufacturers to offer its customers the opportunity to order products over the Internet at www.eastman.com, the company's Web site.

This 24-hour-a-day service, using equipment manufactured by companies such as Dell Computers, makes it easier and faster to do business. In addition to ordering products, customers can also review the status of previously placed orders, revise orders, view a product-information catalog and perform a wide variety of other functions on-line.

The use of Internet technology also increases productivity for both Eastman and its customers. With many routine orders now being placed electronically, Eastman has been able to move people formerly performing the order-taking function into other jobs where they are making contributions of higher value to the company.

Eastman manufactures and markets plastics, chemicals and fibers in more than 30 countries and intends to expand this e-commerce service globally.

In 1991–1997, the average annual growth rate of investment in producer durables—business equipment—was more than 8 percent, compared to 5 percent during 1983-1990. The fastest-growing component of capital investment in producer durables is computers and peripherals— with a nearly 34 percent growth rate. Other types of investment have continued to do well: Information-processing equipment, such as telecommunications equipment, and industrial machinery have posted annual increases of more than 5 percent and 4 percent, respectively.

The rise in investment in computers has been due to both falling prices and increasing quality. It is now possible to do with the PC what was previously possible only with a mainframe. As a result, computer output now constitutes a much larger share of manufacturing than in the past.

Because it is possible to manufacture computers very efficiently, the increase in computer output has led to faster industrial productivity.

Manufacturers Perform the Largest Share of R&D

Robust R&D Spending Is Key To Guidant’s Strategy

Guidant Corp.’s motto — “new product flow, new product flow, new product flow” — reflects the strategy that success will be built on developing and marketing a continuing flow of innovative technology. The company’s spending on research and development bears this out: Guidant, a world leader in the design and development of cardiovascular solutions, spends as much as 15 percent of net sales on R&D. Guidant’s investment has paid off for the company, as it has seen its new products rapidly win market share and its stock price soar. Since spinning off from its parent company, Eli Lilly, in 1994, its sales have more than doubled.

Manufacturing plays a key role in inventing new products and processes that make the U.S. economy more productive.

Investment in research and development is the single most important source of technological advance. Industry — which includes manufacturing, communications and new fields like biotechnology — accounts for three-quarters of all the R&D performed in the country.

Manufacturing alone contributes 57 percent of total R&D. Three manufacturing industries — transportation equipment, electronics and chemicals — account for 38 percent of R&D.

The new technologies developed by manufacturing often spill over into other sectors of the economy. For example, the technology in ATM machines originated with equipment used on the factory floor. Antibiotics and vaccines developed by pharmaceutical manufacturers have been used by physicians and hospitals to nearly eradicate diseases such as pneumonia, measles and polio.

*Chain-weighted 1992 dollars

Source: National Science Foundation
Manufacturing Sets the Pace in Adapting New Technologies

Boeing: Beyond CAD/CAM

Seattle-based Boeing has used three-dimensional CAD/CAM to develop aircraft designs for many years. Even with traditional CAD/CAM, Boeing studies have shown that improving designs to create parts that would fit together more easily during the final assembly process would greatly improve efficiencies and cut costs.

Boeing devised an innovative application of computing technology to develop the designs for the 777 airplane, making it the first jetliner to be 100-percent digitally designed using three-dimensional solids technology, called CATIA.

Developed in France and marketed in the United States by IBM, CATIA allowed Boeing engineers to simulate an airplane design on the computer without costly and time-consuming investment in physical mock-ups. The 238 design and build teams, made up of about 2,500 employees, were linked together by a computer network, allowing them to work concurrently. The system also allowed designers to simulate assembly of the parts on the screen, so they could easily correct misalignments and other fit problems.

Using these technology tools, Boeing was able to reduce change and error in the manufacturing process by as much as 90 percent. Because the parts fit better than anticipated, the completed 777 was within one hundredth of an inch — the depth of a playing card — away from perfect alignment.

Manufacturers have been at the forefront of deploying new process technologies — improvements in the actual production process.

A leading example is CAD/CAM (Computer Aided Design/Computer Assisted Manufacturing), which enables engineers to design with a computer instead of paper and pencil, then transmit specifications to the factory floor.

Other examples of process technologies widely used in manufacturing include —

- Just-In-Time (JIT) inventory controls that reduce warehousing costs, and bar codes that simplify and expedite the manufacturing process;
- Local Area Networks (LAN) that allow operations in different geographic areas to share data more easily;
- manufacturing cells, small groups of workers and machines configured to produce a group of similar items, that reduce parts handling and increase productivity and quality; and
- robots, which have the flexibility to make a variety of products and generate high output at lower cost in situations that require high repetition, high precision, large capacity workloads and hazardous environments.

These process improvements also have wider economic benefits, because they help smooth the production cycle.

Source: Technology on the Factory Floor III, 1998, Paul Swamidass; a report sponsored by The Manufacturing Institute, the National Science Foundation and the Thomas Walter Center for Technology Management
Manufacturers Achieve High Rates of Productivity Growth

Productivity growth in manufacturing has been consistently strong since the early 1980s, growing by 3.4 percent annually since 1983. In the 1990s, there was a further rise, with manufacturing productivity surpassing 4.7 percent per year from 1996 to 1999.

Since 1995, there has been a dramatic acceleration in non-farm business productivity, which includes manufacturing. From 1996–1999, productivity has grown by 2.1 percent per year. By comparison, non-farm business productivity stagnated from the mid-1970s to 1995, growing by only 1.1 percent annually.

The increase in productivity has enabled the economy to achieve strong growth and modest inflation.

*Through 2nd Quarter, 1999
Source: Bureau of Labor Statistics

Team Approach Boosts Productivity at Telect

Lori Snow has seen firsthand how a team approach can boost employee productivity.

As a team leader at Telect, Inc., 1,100 employees, a Spokane, Wash.-based manufacturer of connectivity products used by telecommunications companies, Snow helped implement an employee-involvement team that’s empowering workers, boosting morale and raising productivity.

During its first three months, team leaders worked on the basics of the team approach: communication; brainstorming; and product, customer and performance awareness. Once trust and “buy in” occurred, frequent surveys kept the team focused on results rather than conflict.

In one year, Snow’s department reported steady efficiency-to-routing improvements from 78 percent to more than 96 percent, representing a labor savings of 5,000 man hours during that period. The team’s quality performance in making error-free products jumped to 96 percent, up from 87 percent at the onset of the team approach.

The bottom line? Higher quality, more efficient production and greater employee involvement among Telect’s employees.

“Our processes have become more streamlined, primarily due to input from team members,” Snow says. “We all take more ownership in the products we build.”
Nucor: Successfully Linking Productivity and Pay

One company that has tied its compensation program to the productivity growth of its 7,000 employees is Nucor Corp., headquartered in Charlotte, N.C. Nucor Steel is renowned for its modern manufacturing techniques that produce globally competitive steel. High productivity is a key ingredient to its success.

Nucor has been able to remain a growing, profitable steel and steel-products producer because of its performance-related compensation program, in which employees involved directly in manufacturing are paid weekly bonuses on the basis of the production of their work groups.

The bonuses average 100 percent to 180 percent of the base wage. Total average annual compensation for mill workers is $60,000. The plan creates incentives for each individual to perform well. Employees are encouraged to maintain equipment in top condition because no bonus is paid if the machines are not operating.

To foster an environment of equity, senior officers receive no profit-sharing, pension or discretionary bonuses. A significant share of their compensation is based on Nucor’s return on stockholder equity.

All employees are eligible for an extra bonus when the company does extremely well; these bonuses have been as high as $1,200 per employee.

In a market economy, employees’ pay and productivity are closely related: When employees become more productive, they earn higher compensation.

American productivity experienced two periods of strong growth since World War II: from 1950 to 1973 and from 1996 to the present. In the 1950s and ’60s, non-farm productivity growth averaged 2.6 percent and the hourly pay of workers rose at an average rate of 2.7 percent. Since 1996, productivity growth has averaged 2.1 percent a year and hourly pay has risen 2.2 percent annually, thanks to technology, process innovations and increased training.

These periods of high productivity — and corresponding economic growth — were interrupted as productivity slowed from 1973 until 1995, averaging a lackluster 1.1 percent a year. This affected workers, too, as their hourly compensation rose on average only 0.9 percent.

The implication is clear: Increased productivity means higher pay.

*Non-farm business

Source: Bureau of Labor Statistics and NAM calculations based on U.S. Department of Commerce data

Higher Productivity Leads to Higher Compensation

![Graph showing relationship between productivity and compensation over time]
Manufacturing’s Share of the U.S. Economy Is Stable …

Manufacturing’s share of the U.S. economy, as measured by real Gross Domestic Product (GDP*), has been stable since the late 1940s. During this time, the ratio of manufactured output to GDP has primarily been between 20 percent and 23 percent. During expansions, manufacturing grows more rapidly than GDP; during recessions, it contracts more rapidly. The overall share remains the same over the business cycle.

The reason for manufacturing’s stability is that there is a synergy between manufacturing and other sectors. Manufacturing generates most of the economy’s productivity and technology, while other sectors such as services generate the largest share of new employment.

The productivity generated by manufacturing raises the wages of workers employed in all sectors. The productivity enhancements generated in manufacturing boost activity in other sectors. As these sectors become more successful, they, in turn, create more demand for manufactured goods and its high-paying jobs.

*Adjusted for inflation

Note: Data were adjusted to eliminate the effect of change in definition in 1987.

Source: U.S. Department of Commerce and NAM calculations
Bethlehem Steel: A Key Part Of GM’s Economic Output

Bethlehem Steel is one of the nation’s largest steelmakers. Its Burns Harbor, Ind., plant ships about 4 million tons a year of flat-rolled sheet products, primarily to the automotive and steel service-center markets.

General Motors is one of Bethlehem’s biggest customers, fabricating the sheet metal into fenders, hoods, roofs and doors for many of GM’s most popular automobiles. It likes the steel it buys from Bethlehem so much that, for three years in a row, GM gave the steelmaker its coveted “Supplier of the Year” award.

The steel that rolls out of Bethlehem’s Burns Harbor plant is as tangible as the GM automobile in which it is used. Yet GDP counts the auto production, not the steel production that goes into the auto. Because of the way manufacturing’s contribution to the economy is counted, that steel is nearly invisible.

When intermediate activity — such as the steel that Bethlehem produces — is included, manufacturing’s share of output rises from about 23 percent to more than 27 percent of total U.S. output.

Gross Domestic Product (GDP) is based on final sales. However, 42 percent of the nation’s economic activity is not counted in GDP. This intermediate activity is the production of goods and services that goes into making up the final sales. Examples of intermediate activity are raw materials, components and some types of services, such as factory maintenance.

Three-fifths of the roughly $3 trillion in total manufacturing activity takes place at the intermediate level. Included are industries such as primary metals and semi-finished products, as well as goods that are used to make other products, such as engines for cars.

Manufacturing’s share of intermediate activity is nearly 40 percent. Its share of GDP is 23 percent. When the two are combined, manufacturing’s share of total output rises to more than 27 percent.

Because total manufacturing output is larger than final sales of manufactured goods, manufacturing’s contribution to job and business growth in other sectors is also larger.

*Final sales consist of consumer purchases, business investment, government and trade.

Source: U.S. Department of Commerce, Bureau of Economic Analysis, input-output tables and NAM calculations
Manufacturing's use of intermediate goods and services in its production process means that it generates substantial economic activity at the intermediate level. This is called a multiplier effect. Specifically, every $1 of a manufactured product sold to a final user generates an additional $1.19 of intermediate activity. Manufacturing's multiplier effect is greater than the general multiplier effect of 94 cents for all industries. It is far greater than that of the service sector, which generates only 77 cents of intermediate activity for a $1 sale to final users.
Emery Worldwide: Reducing Costs and Streamlining Shipping for Manufacturers

Emery Worldwide specializes in time-definite transportation services for business-to-business shippers of heavyweight cargo. A $2.2-billion company, Emery provides global air and ocean freight transportation; logistics management; and customs brokerage services to manufacturing, industrial, retail and government customers. More than half of Emery’s business is with manufacturing customers.

The company creates and implements transportation and logistics programs tailored to manufacturers’ unique requirements and Just-In-Time service demands. This manufacturing-services partnership reduces costs, streamlines shipping and enhances customer service for manufacturers. A prime example is an Emery customer that manufactures products for the automotive, electrical, construction and power and lighting industries. Emery provides service for the company’s eight divisions, moving parts and products between its manufacturing facilities and to its customers worldwide.

Based in Redwood City, Calif., and with more than 12,000 employees serving a customer base of more than 200,000, Emery operates in 229 countries through a network of more than 560 service centers and agent locations around the world.

Manufacturing’s Multiplier Effect Stimulates Employment in Other Sectors

![Bar Chart: Jobs Supported by $1 Million in Final Sales]

Every $1 million in final sales of manufactured products supports 10 jobs in the manufacturing sector and six jobs in other sectors such as services, construction and agriculture. Because the service sector is more labor intensive than the manufacturing sector, $1 million in final sales of services supports 17 jobs. However, since the service sector has a smaller multiplier effect on the rest of the economy, $1 million in its final sales supports only two jobs in sectors outside services.

Source: NAM calculations based on data from the U.S. Departments of Commerce and Labor
In today’s global marketplace, products move between countries with much the same ease that they move between states.

Once, manufacturers might have been content to serve only the U.S. market. In today’s economy, companies need to seek growth overseas as much as they do at home. It is clear why overseas markets have become so important: Whereas the well-developed U.S. market has 275 million consumers, there are 5.75 billion consumers in other countries — and with them, endless opportunities.

Manufacturing has driven a dramatic growth in exports that has helped the U.S. economy continue its remarkable expansion, particularly over the past decade. Manufacturing constitutes 62 percent of all U.S. exports. Manufacturing jobs supported by exports are better-paying, higher-skilled jobs that keep America’s standard of living rising.

Competing in the international marketplace is a win-win proposition for America. While some may see exports as a positive for the economy and imports as a negative, the fact is that both have benefits. Prosperous economies can purchase more American goods than flagging ones. Meanwhile, U.S. consumers benefit from the choices and lower prices that imports offer, and U.S. companies benefit from having multiple supplier choices.

This section describes how American manufacturers — and their employees — benefit from international trade.
Dana Corp.: Overseas Markets Spark Remarkable Growth

In January 1998, Dana Corp. was an auto-parts manufacturer with 49,000 people, generating sales of slightly more than $8 billion. By January 1999, it had more than 86,000 employees in 32 countries and expected sales to reach $13 billion. In fact, 1998 marked Dana's seventh consecutive year of sales growth. Coupled with an acquisition, much of this growth can be linked to Dana's strategic plan, “Beyond 2000,” which has as one of its goals to generate 50 percent of sales outside the United States. In 1989, the year before this plan was adopted, the Toledo, Ohio-based Dana exported $360 million; by 1998, exports exceeded $1 billion.

Dana has established 2,000 warehouse distributors and facilities in 32 countries and developed a global network of international sales offices. As a result, the company has made significant inroads in some traditionally closed markets including Russia, Vietnam and South Africa. Its overseas customers include U.K.-based BMW/Rover, for which it makes aluminum independent rear axles in Columbia, Mo.

Manufacturing Powers the U.S. Export Success Story

Exports are an important component of Gross Domestic Product (GDP) and, between 1992 and 1998, exports accounted for nearly a quarter — 24 percent — of U.S. economic growth. In 1999, the United States — for the first time — will most likely export more than $1 trillion.

Almost two-thirds of all exports are merchandise exports, which include products from the manufacturing, agricultural and mining sectors.

In 1985, a little more than 7 percent of U.S. manufactured products were exported. Now that share has doubled: Today, nearly 15 percent of the products made in America are destined for markets overseas. America’s top five manufactured exports are civilian aircraft and parts, semiconductors, computers, telecommunications equipment and electrical equipment.

*Chain-weighted 1992 dollars

**Merchandise includes agricultural, mined and manufactured goods, and other miscellaneous commodities.

Source: U.S. Department of Commerce, Bureau of Economic Analysis
Manufactured Products Lead the Way In Exports

For the past 12 years, exports have been called one of the engines of U.S. economic growth. Exports have risen dramatically since the late 1960s and more than doubled since 1988 alone. Because exports often increase during periods of slack, they have helped the United States to better weather economic downturns. In addition, the challenge of overseas markets has encouraged companies to be more competitive and more innovative than ever before.

If exports are the engine of U.S. economic growth, manufacturing is in the driver’s seat. Manufacturing is responsible for a full 62 percent of U.S. exports. Much of the impressive rise in U.S. exports since 1988 can be attributed to manufactured goods.

One of the main reasons for American manufacturers’ increased global competitiveness is the transformation of many developing nations into market economies. In general, developing nations tend to import capital equipment and intermediate products, such as industrial supplies, because they lack the resources and/or the know-how to produce these types of goods efficiently themselves. As they grow, they turn to U.S. manufacturers, which have a comparative advantage in producing the industrial equipment sought overseas.

More Than 235 Manufacturers Stand Behind Case Corporation’s Exports

Farmers are more productive when they use technologically advanced farm equipment, including massive combines that operate as “moving factories,” harvesting grain across the farm belt.

Case Corporation, based in Racine, Wis., is one of the best-known producers of combines. The company sells its products in 150 countries, shipping its combines to many of those markets from the company’s East Moline, Ill., plant. Case’s sales have increased, particularly in emerging markets such as Brazil, Russia and the Ukraine.

What isn’t well-known is that more than 235 companies, representing more than 100,000 employees, supply key parts and components to Case’s combine plant. For example, a combine’s window glass is made by a small company in Oklahoma; ignition switches in Massachusetts; and heaters in Texas.

In exporting nearly half of its U.S.-produced combines, Case has created a substantial market abroad for its 235 supplier companies that operate in 30 states. Through Case, these “invisible exporters” have a growing stake in international trade, even if they don’t directly export a product themselves.

Exports Support U.S. Job Creation

Exports mean jobs — literally.

Of the new jobs created since 1986, more than 6 million have been supported, directly or indirectly, by exports. That’s 29 percent of all new, private-sector jobs. Over the same period, the number of private-sector jobs supported by the domestic economy increased by 14.5 million.

These jobs are in large and small companies alike. A vast number of small manufacturers sell their products to larger companies that actually export. These “invisible exports” are an important part of the U.S. economic growth story, too. In the 21st century, expanding export opportunities will mean that this pace will continue, with more good, high-quality jobs in the United States being supported by exports.

*Jobs in terms of private-sector, full-time equivalent

Source: U.S. Department of Commerce, Economics and Statistics Administration, and NAM calculations
Exports are crucial to the health of the modern U.S. workforce. In 1997, more than 1 in 10 private-sector jobs in the United States were supported by exports. That’s a 50-percent increase over 1986, when only 1 in 15 jobs depended on exports.

Exports are even more important to manufacturing. In 1997, one of every five manufacturing jobs was supported by exports. While this is impressive, more so is the fact that jobs supported by exports are good quality jobs that, on average, pay 14 percent more than jobs supported by the domestic economy.

Note: Merchandise exports include all non-service industry exports

Source: U.S. Department of Commerce, Economic and Statistics Administration
Direct Exports Are Key to Success at Allen Filters

From its sole plant in Springfield, Mo., Allen Filters serves its U.S. customers and an increasing number of overseas clients. During some years, revenues from exports accounted for as much as 50 percent of total sales. The company is illustrative of the large number of small manufacturers that have recognized overseas markets are the key to increasing their growth and success.

The privately owned family business, with about 400 employees, manufactures a wide range of oil-reclamation equipment used in the utility, petrochemical, refining, gas production, automotive, pulp and paper, and steel industries. Its products filter out water and gases that cause harmful contamination in lubricating oil, reducing wear and tear on machinery, and benefiting the environment because customers don’t have to change and dispose of used oil. Instead, oil is used many times over.

As countries abroad have become more industrialized, Allen Filters has found ready markets for its products, such as Asia and Latin America.

Small Firms Are the Largest Number Of Exporting Manufacturers ...

Large and small manufacturers alike export, but there is a perception that fewer small manufacturers directly export.

In fact, the opposite is true: According to the U.S. government, 92.6 percent of all exporting manufacturers have fewer than 500 employees.

While large manufacturers are responsible for 70 percent of the value of exported goods, smaller companies have learned that export markets are key to their future as well.

In 1997, U.S. manufacturers exported nearly $600 billion in goods to all parts of the world. Smaller manufacturers are exporting more and more.

Bolstering this data are a decade of annual NAM surveys of 10,000 small manufacturers. These surveys demonstrate a steady trend toward the growing importance of exporting to the bottom line. Over the past 10 years, the number of small firms earning at least 25 percent of their revenues from exporting has more than doubled, and those generating 11 percent to 25 percent of revenues from exports has nearly tripled.

Higher Salaries Keep Positronic Industries Ahead In Exports

Competing internationally is a way of life for Springfield, Mo.-based Positronic Industries, which manufactures electronic connectors for a variety of industries. Positronic connectors can be found in Cray Research’s supercomputers, Cisco’s networking systems, the Space Shuttle, communications satellites and hospital brain scanners.

It is easy to see why these key components of the electronic era are in such demand around the world. Even though it is a smaller manufacturer, Positronic has plants in France and Singapore because its overseas customers want the company close by. Positronic sells about 40 percent of its products abroad.

With three Springfield plants and 650 U.S. employees, Positronic executives often find that they pay a premium to their employees compared to other local, non-exporting manufacturers. They need to attract highly skilled employees who can readily learn new production methods. The higher salaries Positronic pays are an important part of its strategy to remain competitive and grow its export business.

Export-Related Manufacturing Jobs Pay Better

Manufacturing jobs related to exports pay more than non-exporting manufacturing jobs.

First, exported products tend to be higher-valued products. These are produced at companies by highly skilled workers who receive premium wages.

Second, foreign competition requires exporting companies to be more competitive. This means that employees at exporting companies need to be more productive and, therefore, earn higher compensation.

This “export premium” is about 14 percent for manufacturing employees who directly rely on exporting for their jobs. In other words, employees earn 14 percent more than their counterparts who produce for the domestic economy. This premium also extends to other parts of the economy, such as companies in the supply chain. Employers at these companies — where jobs are indirectly supported by exporting — enjoy a 10-percent export pay premium.

Source: U.S. Department of Commerce, Economic and Statistics Administration
The Trade Deficit Does Not Lead to High Unemployment

To export products to world markets, the United States also must import from those same markets. In recent years, concerns have been raised that high levels of imports — reflected in a growing trade deficit — have increased overall unemployment.

In fact, the opposite is true. When trade deficits increase, unemployment rates actually fall; when trade deficits decrease, unemployment rates tend to go up.

The reason for this divergence is that the trade deficit rises and falls with the strength of the U.S. economy. When the economy is healthy and creating jobs, consumers can afford to buy more imported goods, thus the trade deficit rises. When the economy is weak, consumers and businesses put off both domestic and imported purchases, the trade deficit falls and unemployment rises because the economy is underperforming.

Another erroneous belief is that imports from low-wage countries take away jobs from U.S. workers. In fact, the majority of U.S. imports come from other industrialized countries with highly paid workers, principally Europe, Canada and Japan.

Wages and Productivity Go Hand in Hand in the Global Economy

When determining the competitiveness of U.S. manufacturing employees in the global economy, simply comparing their wages with wages in other nations is misleading because the differences in employee productivity across nations are not taken into account. There is a direct relationship between wages and employee productivity (measured as GDP per capita) across nations. Wages in developed nations are high because employee productivity in these countries is also high. The opposite is true for poor countries.

U.S. manufacturing employees are some of the most productive in the world and, accordingly, they earn higher wages. This higher level of productivity allows American employees to compete effectively in the global economy. If wage levels alone were the sole determinant of competitiveness, then the world’s premier exporters would include nations such as Sri Lanka, which has a relatively low wage level.

*Estimates in purchasing power parity (PPP) dollars

Sources: NAM calculations from Bureau of Labor Statistics and World Bank data, 1995
Ingersoll-Rand, a manufacturer of equipment for the compact-equipment market, such as Bobcat® skid-steer loaders and hydraulic excavators, invested $18 million in its two North Dakota plants. These investments will increase the size of both plants, allowing the company to rearrange production equipment in a manner that will improve overall efficiency. The increase in capacity is planned to meet future growth of the compact-equipment market while helping the company meet its strategic goals of being the worldwide market leader with competitively priced products.

When it comes to investment, U.S. manufacturers keep the vast majority of their money here in America.

*Chain-weighted 1992 dollars

Source: U.S. Department of Commerce, Bureau of Economic Analysis
In the past decade, American manufacturing has become increasingly involved in the world economy — and has become healthier as a result. The U.S. share of world exports has grown from 11.6 percent in 1990 to 13 percent in 1997. In turn, U.S. industrial production has outpaced its rivals in recent years.

The growth rate of U.S. industrial production far exceeds that of any other industrialized nation, including powerful competitors like Japan and Germany, and is twice that of its nearest current competitor, Great Britain.

Through productivity, cutting-edge technology and a talent for identifying new market opportunities, U.S. manufacturing is competing worldwide — and winning. Its future prosperity depends on its continued access to, and engagement in, those markets.

Source: Economic Report of the President, 1999
Every state is a home to modern manufacturing. While the Great Lakes remains the most industrialized, with manufacturing making up nearly 33 percent of the gross state product in this region, some less-traditional regions are becoming manufacturing centers in their own right. In the past 20 years, manufacturing activity gained significantly in these regions:

- the Great Plains, increased 23 percent;
- the Rocky Mountain states, increased 27 percent; and
- the Southwest, increased nearly 34 percent.

Today’s manufacturers are striving to hire, train and retain skilled employees by offering on-the-job training, competitive wages and premium compensation packages that include health care, retirement contributions, stock options and child care. All of these programs benefit the employee as well as the community, by generating good work environments and high-paying jobs. In addition, they strengthen the local tax base and attract new entrepreneurs.

The following pages tell in more detail how manufacturers contribute to the well-being of their employees and their communities.
While manufacturing’s contribution to total U.S. economic growth has remained relatively steady for decades, its geographic distribution has shifted during the past 20 years, with more manufacturing taking place outside of the traditional centers in the Northeast and Midwest. This broadening of manufacturing’s base is increasing its importance to regional economies.

Manufacturing is an important part of every state economy. It is the largest part of the state economy — more than 35 percent of Gross State Product — in Indiana, Kentucky, Wisconsin, Michigan, Ohio and North Carolina. In 15 states, manufacturing generates at least a quarter of the state’s economic activity, including those not associated with manufacturing just a generation ago, such as Mississippi, Tennessee, Oregon and Idaho.

Even in states where manufacturing’s share is a lower percentage, it is a major force of economic growth. For example, in California, manufacturing alone generates $133 billion in economic activity, larger than many entire state economies.

Source: NAM calculations based on U.S. Department of Commerce data, 1996
The manufacturing industry has never been as labor intensive as that of services. Manufacturing’s main contribution to economic growth lies in its contribution to technological advance and productivity.

Even so, manufacturing directly employs more than 18 million people in the United States, with sizeable workforce populations in nearly every state. The five states with the largest manufacturing workforces are California, Texas, Ohio, Illinois and Michigan. Together, they are home to about one-third of all U.S. manufacturing employees.

California’s manufacturing workforce of nearly 2 million is almost twice the size of the next state in this lineup.

Manufacturing Employment Has Stabilized

In the 1990s, manufacturing employment has stabilized, following a period of decline. Since the 1990-1991 recession, manufacturing employment has remained at around 18.5 million workers.

Historically, manufacturing employment has risen and fallen based on the health of the overall economy. Employment rose sharply during the 1940s, but then oscillated in the 1950s, reaching a low point in 1960. A new period of increasing manufacturing employment began in the early 1960s, peaking in 1979. The period from 1980 to 1991 was similar to the 1950s in that manufacturing employment declined.

Source: Bureau of Labor Statistics
Today’s manufacturing workers are earning higher wages and more generous benefits than those received by many other Americans.

In 1997, the average manufacturing worker earned $39,300 a year in wages, while his or her average total compensation (salary plus benefits, bonuses and Social Security contributions) was $48,000. The average U.S. worker earned $33,500 a year, with total compensation of just over $40,000.

While some other occupations have higher salaries, manufacturing provides millions of well-paying jobs, enhancing the well-being of families and communities. In general, manufacturing offers higher pay than construction, services and retail trade.

Note: Per full-time equivalent worker
Source: U.S. Department of Commerce, Bureau of Economic Analysis
Ashland Inc. Employees — Past and Present — Enjoy Health Coverage

Ashland Inc. is a diversified energy and chemical company headquartered in Covington, Ky. Its health care coverage is typical of that offered by American manufacturers.

Ashland sponsors a variety of medical plans for its different groups of employees. The largest of these plans is the Ashland Inc. Medical Plan, which covers approximately 20,000 active employees and retirees.

This plan provides comprehensive medical and prescription-drug coverage to employees, their families and retirees. Active employees can select from among three levels of coverage. Benefits and employee contributions vary among these options, allowing active employees to choose a level of coverage they can afford and that is appropriate to their personal needs.

Active employees can pay for their elected type of coverage on a pre-tax basis. They may also participate in a health care flexible spending account to put aside money, on a pre-tax basis, to cover deductibles and other items that may not be covered by the plan.

Though the cost and availability of health care has been a major concern for many U.S. workers in recent years, manufacturers lead the way in providing this benefit.

In 1997, 70.7 percent of manufacturing workers received direct health care coverage through their employers. Only government employees received similar coverage (73.2 percent). With National Association of Manufacturers members it is even higher; surveys show that 98 percent of NAM member companies provide health care coverage for their employees.

Fewer than half of all other private-sector companies offer direct health coverage.

Source: Employee Benefit Research Institute, 1998
Manufacturers Provide Employees With Non-Wage Compensation

Benefits — including medical coverage, retirement savings plans and training — are investments that most manufacturers make in their employees.

- More than 78 percent of manufacturers make contributions to employees’ retirement accounts, one of the most prevalent benefits. More than 91 percent of large manufacturers offer these plans.
- More than half of manufacturers offer bonus plans to their employees, with one-third providing pay-for-performance benefits or flexible work schedules. Incentive plans like these are increasingly becoming an important way for manufacturers to retain highly-skilled employees.

Small manufacturers offer many of the same plans that larger firms do. The NAM Small Manufacturers Operating Survey over the past 10 years (1988 through 1998) shows distinct trends —

- the number of small manufacturers offering the popular 401(k) retirement program has doubled to 82 percent;
- the number offering dental plans has increased from 39 percent to nearly 60 percent; and
- the number offering parental leave programs has jumped from 9 percent to nearly 33 percent.

Source: “The Skills Gap,” 1998, conducted by Grant Thornton LLP, the NAM and the Center for Workforce Success

At Pfizer, Non-Wage Compensation Means Career Advancement

Pfizer Inc offers a wide range of non-wage compensation and benefits to its employees, ranging from pension to stock options to tuition reimbursement.

“Pfizer afforded me an opportunity for advanced education,” Lois Clark says. “And the doors of opportunity opened, as a result.”

In 1970, Lois joined Pfizer as a secretary at the company’s Brooklyn, N.Y., plant. “I arrived with a high-school diploma and some community college coursework,” Lois recalls. “It was great when my management found ways to help me take advantage of the company’s tuition-reimbursement program, despite the demands of pharmaceutical manufacturing.” Pfizer was also flexible with her schedule, so that she could make it to class — especially during exams.

Taking classes at night, Lois earned her B.S. in sociology from Brooklyn College in 1989; her M.S. in human resources management in 1992; and certification in organization and development in 1999.

Today, Lois serves as equal opportunity affairs manager at Pfizer corporate headquarters in Manhattan, working to enable fellow employees “to be better at what they can do.” She benefits from the company’s pension plan, its contributions to her 401(k) plan and through stock options that Pfizer has regularly offered to all its U.S. employees since 1952.
Behlen Mfg. Co.: Advancement Through On-Site Training

Gary Schmale came to Nebraska-based Behlen Mfg. Co. in November 1995 as a welder trainee. He attended weeklong classes at Behlen that included basic welding terminology, lecture and video instruction and hands-on experience. By week’s end, Gary and his fellow “classmates” had the basic skills necessary to begin welding. They worked with Behlen’s training coordinator on the floor for two days, where they were introduced to experienced welders who shared tips and techniques. The next week, each trainee started a regular shift as a production welder.

Gary became a full-time permanent employee in February 1996 and, in less than two years, he was promoted to a high-performance welder. To qualify for this job, he took training classes to become certified to drive a forklift, and passed the sheet metal welding certification test at a local community college. Gary has also taken team leadership courses that helped him obtain a position as second-shift team leader in the rotational molding area.

Gary is a Behlen success story because he has taken advantage of training opportunities offered by the company to its 1,000 employees. Gary has always been willing to learn and recognized that training doesn’t end when school’s out.

U.S. manufacturers are committed to giving their workers the additional skills that are needed in a high-tech economy.

A recent survey conducted by the NAM and Grant Thornton revealed that nearly 40 percent of manufacturers are spending at least 2 percent of payroll to train their shop-floor and other hourly workers. This is a leap from the early ’90s, when the figure was less than 1 percent.

In another turnaround, the survey indicated a significant portion of that spending was going directly to front-line workers on the shop floor.

Manufacturers Train Employees …

Company Payroll Spent on Training Employees*

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*Exempt employees

Another 1998 survey showed that the vast majority of training, 77 percent, is done on the job. This on-the-job training represents more than $60 billion spent by U.S. business and remains one of the most effective learning experiences.

Manufacturers’ commitment to their employees is paying off: Plant owners say that 40 percent of their factory floor employees are extremely skilled and 47 percent are eager to learn new skills. For those willing to learn, there are many opportunities. For example, it is estimated that for every engineer hired, 15 to 16 technicians are needed for professional support. However, serious challenges remain. According to the 1997 survey, 36 percent lack the basic public school education for advanced training.

*Source:* Technology on the Factory Floor III, 1998
Crown Cork & Seal: Innovative Technology Creates A Safer Workplace

Crown Cork & Seal Co., headquartered in Philadelphia, is one of the world’s largest and oldest manufacturers of packaging products for consumer goods. The company operates 247 plants in 49 countries and employs about 40,000 people. Over the past 10 years, Crown has completed 20 acquisitions to meet its strategy of growth.

In conjunction with this strategy, Crown has invested in environmental health and safety projects (EHS) that emphasize injury prevention and are built around both training and observation programs, as well as an innovative use of technology. Crown has created an EHS intranet home page where employees can make suggestions for a safer workplace. It is available not only to employees with EHS responsibilities, but to the whole operations team and at all levels in the company. It is the primary communications tool to all facilities and has the ability to benchmark for continuous improvement in all EHS areas, including company policies and procedures, best practices, waste disposal and recycling.

This EHS system has significantly reduced external costs and reduced the number of injuries from a 4.5 to a 1.7 lost-workday case rate since 1992.

The 1950s image of a dirty, unsafe factory may linger, but it is not the workplace of today. Manufacturers’ investment in a safer workplace has paid off, with 30-percent fewer employee injuries in the 1990s.

One of the main reasons for the successive drops in injury rates at manufacturing plants is that business owners are taking voluntary steps to address workplace safety. A 1999 survey of National Association of Manufacturers members found that 79 percent of the responding companies have written Safety and Health Programs (SHPs). These plans may require employees to use personal protective equipment and take safety-related training courses, or they may be based on installation of safety controls on machinery, frequent inspections and explicit safety rules.

A more flexible and cooperative regulatory approach by federal and state officials has bolstered manufacturers’ voluntary efforts. Financial incentives — such as lower workers’ compensation premiums and lower fines from state and federal regulators — have also played a role in improving worker safety. In addition, workplace safety improves product quality while demonstrating to employees that their employers care about their well-being.

*Per 100 full-time employees

Source: Bureau of Labor Statistics
Manufacturers Invest Heavily in Environmental Protection

![Graph showing spending on environmental protection from 1972 to 1996.](image)

Most of America’s air and water is significantly cleaner today than it was 25 years ago, and a major reason is manufacturers’ commitment to the environment. Since the mid-1970s, for example, air quality has improved by more than 32 percent, even though the population has increased by 29 percent and vehicle miles traveled have increased 121 percent.

In 1999 alone, business will spend more than $100 billion to comply with environmental regulations. Environmental regulation is not free; by the early 1990s, such regulation had reduced GDP by an estimated 2.6 percent. If environmental progress is to be sustained in the face of other competing economic and social budgetary needs, the environmental regulatory structure must become more efficient and effective.

The amount of spending on the environment cited on this page is a conservative estimate because the chart does not include the expenditures that manufacturers voluntarily make to keep their communities clean and safe.

According to a 1999 survey, 84 percent of manufacturers responding said that they voluntarily reduce waste and emissions. Manufacturers reported that they took these steps even though only 46 percent said they saved money on such reductions. Nearly 30 percent of manufacturers noted that it cost them more money, but they voluntarily undertook the environmental steps anyway.


Johnson Controls Uses Best Practices To Clean Up Environment

The lead-acid battery is the most recycled consumer product in the United States. Each year, more than 96 percent of all battery lead and plastic is recycled, compared with recycling rates of 69 percent for newspapers, 66 percent for aluminum cans and 36 percent for glass.

Such efforts have been driven by U.S. battery manufacturers such as Johnson Controls. Headquartered in Milwaukee, Wis., the company is a market leader in automotive systems and facility management and controls.

Johnson Controls invests millions every year in continuous improvements that have increased battery life and reduced costs to consumers. To eliminate lead emissions, the company has developed many patented systems for the battery-manufacturing process.

Johnson Controls also has led the industry to work with state governments to enact legislation mandating battery recycling. Today, 37 states have lead-acid battery recycling laws and 10 more have mandatory deposit programs. Johnson Controls ensures a closed-loop product cycle by picking up spent lead-acid batteries when delivering fresh ones to customers throughout North America. The company takes the old batteries to a licensed smelter for recycling and purchases reclaimed lead to start the process again.
Interest Rates Determine Affordable Capital

New Hampshire-based Diamond Casting & Machine Co. manufactures high-quality aluminum castings. The high-end components manufactured by the firm’s 50 employees are used by companies such as Intel and Motorola in printed circuit boards; Exxon and Texaco in high-pressure valves and filters; and in the electric motors that power sophisticated medical equipment and computer printers.

For Diamond Casting, interest rates are a crucial factor in its ability to compete and maintain high levels of productivity. Each machine used at the Diamond Casting plant costs from $100,000 to $1,000,000. When the prime rate rises, it increases the cost of owning and operating equipment, so it means that Diamond Casting purchases less. As a result, productivity improves less and fewer U.S. jobs are created.

Manufacturing is a capital-intensive industry that needs reasonably priced funds to expand and grow. Firms borrow at a variety of interest rates, ranging from long bond rates to commercial paper rates. One of the most commonly used benchmark rates is the prime, which is the rate charged by banks to their prime customers. The real prime rate — the actual prime rate minus inflation — is currently at one of the highest levels in 40 years.

*Adjusted for inflation using the implicit price deflator
**Through first quarter

Source: 1999 Economic Report of the President and NAM calculations
Throughout the 1990s, manufacturers have been severely limited in their ability to raise prices on their products. This was due mainly to greater worldwide competition. The rate of inflation at the wholesale level, as measured by producer prices, dropped significantly after the recession of 1991. In 1998 and 1999, the rate of inflation was briefly negative. While this has been good news for consumers, it has forced manufacturers to redouble their efforts to cut costs and raise their productivity.

Source: U.S. Department of Commerce, Office of Business and Industrial Analysis and NAM calculations
Barr Laboratories, Inc.: Investing in Employees, Raising Profits

Barr Laboratories, Inc. is a Pomona, N.Y.-based manufacturer of generic and proprietary pharmaceuticals.

Like many manufacturers, Barr Labs suffered a pre-tax loss in the early ’90s, but has rebuilt its pre-tax profitability to 18 percent in 1999 by maintaining the company’s focus in three key areas.

Barr has increased research and development expenditures by 253 percent since 1992. To meet the increased demand for affordable medicines, Barr has invested more than $80 million in the expansion of laboratories, manufacturing, packaging and distribution facilities since 1996, and, with these expansions, has more than doubled its manufacturing capacity.

This focus on increased efficiency and the use of high-tech, specialized manufacturing equipment has allowed Barr to increase manufacturing margins by nearly 100 percent over the past five years. Finally, recognizing that employees are integral to increased productivity, the company has invested heavily — through annual internal and external development programs totaling $1 million — in a workforce that has increased 67 percent since 1992.

Manufacturing profits have recently recovered to their levels of the mid-1980s, following a significant drop in the early 1990s. Profits fell steeply from 1989 until 1992. The major reasons for this slide were a worldwide recession and extensive competition that prevented manufacturers from raising prices. Since 1992, margins have returned to more normal levels as manufacturers restructured. As of 1997, profit margins were at 8.5 percent. This is about where they were in the late 1970s and mid-1980s.

Despite the improvements, all is not well for manufacturing profits. The profits of manufacturing corporations dropped slightly in 1998. This was due to a combination of new recessions overseas and price declines. Because competitive markets continue to restrain price increases, manufacturers are profitable only when they can achieve strong productivity growth.

Source: U.S. Department of Commerce, Office of Business and Industrial Analysis and NAM calculations
Business Provides the Majority of National Saving

The majority of national saving — nearly three-fourths — is done by firms. National saving consists of household saving, the government surplus and saving by firms. Saving by firms includes both undistributed profits and depreciation charges — funds set aside to replace old capital.

In 1998, saving by firms was 74 percent of national saving. By comparison, total government saving was 26 percent; the federal, state and local governments were all running a surplus. The government has historically saved only a very small amount. Until the late 1990s, the federal budget was in deficit. Individuals also have had low savings rates and, in the past few years, household saving has fallen off sharply. In 1998, household saving was only 0.2 percent of national saving, and in the first half of 1999, household saving turned negative.

Since savings finance investment, the high business saving rate is critical to maintaining growth.

Source: U.S. Department of Commerce, Bureau of Economic Analysis
“Gross Saving and Investment,” Economic Report of the President, 1999
Taxes Rise for Working Americans

The good news for manufacturing employees — and most American workers — is that compensation has been rising faster than inflation. The bad news is that the standard of living has not been rising as sharply, because taxes as a share of income also have risen.

Between 1959 and 1998, workers’ inflation-adjusted total compensation nearly doubled, increasing by 97 percent. Unfortunately, the rise of government taxation has taken away much of that increase. Since 1959, the rate of total taxation on workers has risen from 24 percent to more than 36 percent of taxable compensation. Because of this increase in taxation, after-tax compensation has risen by only 67 percent. In other words, higher rates of taxation on earnings have siphoned away 30 percent of the increase in inflation-adjusted compensation over this time.

America’s manufacturing employees receive a substantial paycheck. They would enjoy an even higher standard of living if they could take more of it home.

Source: U.S. Department of Commerce, Bureau of Economic Analysis and NAM calculations
The purpose of The Manufacturing Institute is to build intellectual support among policy-makers, the media and the public for a pro-manufacturing, pro-employee agenda, while encouraging recognition of manufacturing’s contribution to the well-being of the nation. The Manufacturing Institute is a 501(c)(3) organization. All contributions support its mission and are fully tax deductible.

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