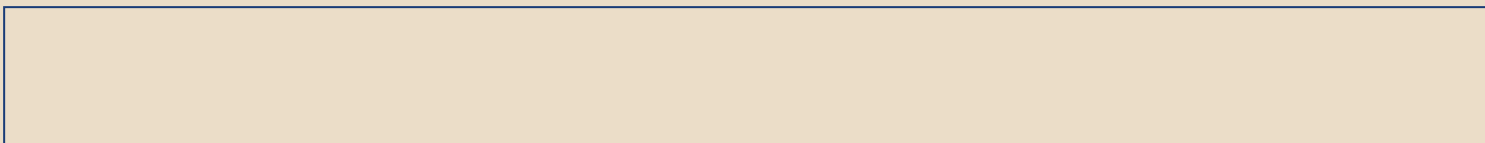
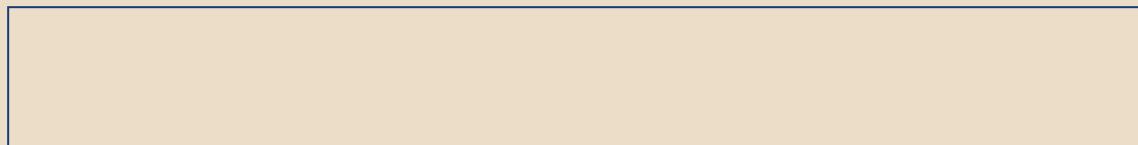
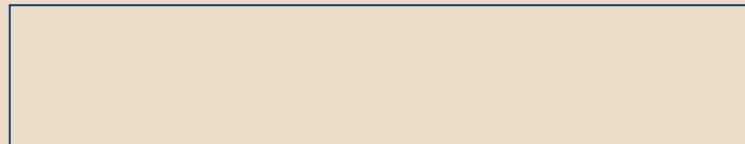
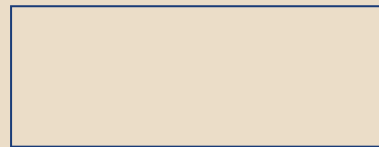




Executive Leadership in the Industrial Economy





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By Joel Kotkin and David Friedman

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I. Executive Summary

The Leadership Dimension

Perhaps no part of the American economy has undergone more change—or faces a more challenging future—than its industrial sector. Over the past three decades, manufacturing industries have both achieved large productivity increases and dramatically decreased their share of the U.S. workforce. Initially spurred by Europe and Japan, and most recently by China's rapid development, no other portion of the nation's economy has faced comparable global competitive pressures.

Many of America's industrial challenges are well recognized. Company executives must deal with rapidly changing global markets and constant technological change. They must compete against other national producers that are often supported by governments to an extent rarely observed in the U.S. or Canada. Finally, they must somehow chart a long-term, profitable path for their companies amidst relentless competition.

But perhaps the most difficult, yet unappreciated problem, facing industrial executives is that their companies, and even their industries, are increasingly considered passé or irrelevant by many in Wall Street, the media and government. In the current fashion, finance, information and marketing—not designing and making products—are heralded as the nation's economic priorities.

This report suggests a very different reality. For more than two centuries, including 19th Century Britain, 20th Century America, Germany and Japan, industry has been the bulwark of a country's economic power. Despite intellectual perspectives to the contrary, even now industrial development is driving the rapid economic advancement achieved by China, South Korea, India, Mexico and Brazil.

North American industrial executives must choose between two fundamental responses to their current competitive environment. One approach is to simply accept that their companies need to focus exclusively on marketing, finance and the design and development functions, while offloading their manufacturing needs and technologies to more accommodating locations, usually overseas. While this strategy can generate short-term profits, it almost inevitably guarantees that a company will lose control of its design and production capabilities. Eventually, if history is a reliable guide, even home office and corporate functions will cease to exist (please see Appendix, page 11).

The second option, identified from interviews with more than 20 successful industrial executives, focuses on maintaining control of a company’s “crown jewels” while pragmatically adjusting production to address America’s relatively high wages and costs. Certainly the global economy is not going away, nor is the requirement for local manufacturing demanded by many foreign governments. Modern industrial executives must balance cost-driven offshore outsourcing, and political and market factors with the need to retain and enhance their critical core skills and knowledge. Three executive traits closely correlate with achieving this difficult objective:

1. Passion

Industrial executives must have a visceral commitment to the business of manufacturing. Successful companies must be led by executives who understand, deeply value and have an intimate appreciation of how to design and make products while actively exposing their best people to new challenges, geographies, problems and customers. They must allow their emerging young leaders to make mistakes and take prudent risks. Mentoring and a personal touch are critical to the cultivation of a new generation of industry leaders.

2. Global Knowledge

Since the end of World War II, America has repeatedly underestimated the intensity and focus of its industrial competitors. This global challenge is not going away. The key is how to respond. American firms, in particular, often have been slow to pick up critical knowledge and techniques from other global players. The result has not only been lost market shares, but also the sustained erosion of the overall base of technical skills. A realistic, pragmatic appreciation of the strategic capabilities and ambitions of overseas governments and corporate competitors is essential for today’s industrial executive.

3. Strategic Vision

Top executives need to identify and defend the processes and technologies that define their companies and provide them with sustained competitive advantages. This can be a difficult task when foreign producers—often with political support—demand access to a firm’s most sophisticated capabilities. Identifying a company’s “crown jewels,” both in terms of technology and customer base, and insulating these assets from competitors, constitutes a key executive skill of the 21st Century.

II. Industrial Executive Skills and Perspectives

A Client Perspective

Interviews with key industrial executives showed that most top company leaders are grappling with concerns related both to their firm's own productivity and the challenges posed by shifting competitive pressures from abroad. Despite considerable geographical and other differences—the interviews included industrial executives in California, the Midwest, the Eastern Seaboard and Canada—the three areas identified above were widely agreed upon as critical to managing a successful industrial enterprise.

Passion

Alfred Sloan, the architect of General Motors' dramatic expansion, once remarked: "I believe in competition as an article of faith, a means of progress, and a way of life" (1972). All of the executives interviewed for this report exhibited a profound interest in and commitment to their firms' competitive challenges. Indeed, this passion for production was almost universally viewed as an essential management quality.

One of the biggest problems faced by industrial company leaders, suggests Robert S. "Steve" Miller, current Chairman and CEO of Federal Mogul and former President at Bethlehem Steel, stems from the notion that American firms should not even be in the manufacturing business. American CEOs are constantly being told by their own investors, the media and academics that they cannot compete against overseas competitors that can exploit lower costs, government support or possibly a better work ethic.

Miller disputes this view. "We spend too much energy worrying about foreigners," he suggests, "but the problems are really in ourselves." Bethlehem's most significant competition was not from overseas but rather from efficiently run American "upstarts," minimills that utilized innovative steel processing methods. Unlike many foreign companies, however, U.S. industrialists often neglect production improvement in favor of financial or other ephemeral management goals.

Lacking manufacturing passion, U.S. firms frequently lose their competitive edge over the long term. This has been particularly marked not only in the steel industry but in automobiles, noted Miller, whose career also included a stint in upper management at Chrysler Corporation. He suggests that a young executive with ambitions in the auto industry should not look first to Detroit. "I would go work for a Japanese company to learn the [auto] business" Miller says. "That's a discouraging notion but true" (Miller, 2004).

L. Patrick "Pat" Hassey, CEO of Allegheny Technologies, Inc., worries that too many U.S. companies, rather than improving their core manufacturing business, instead obsess on what is perceived to be more interesting or challenging research and development functions. The

problem lies in the fact that many real R&D breakthroughs depend on close coordination with real-world production concerns:



Pat Hassey

“Wherever you manufacture, the technology will flow there. Technology flows, first and foremost, to the production base. If you manufacture everything outside the United States, in 20 years, the technology will belong somewhere else.”

Hassey believes that reuniting technical functions with production improvements can be achieved by inspiring workers and managers within the current industrial system, even with heavy degrees of unionization. Other executives, such as Charles G. “Chip” McClure, think that such passion is more likely to be reignited in new “greenfield” factories in non-union environments. Recently named Chairman and CEO of ArvinMeritor, Inc., McClure believes changes in work rules, pensions and healthcare are necessary to build a competitive U.S. industrial firm.

Yet like Hassey, McClure, who is also the former CEO and President of auto parts manufacturer Federal Mogul, suggests that CEOs have to place greater emphasis on improvements to all aspects of the business. Industrial tasks cannot be piecemealed among a team of “experts” while the CEO focuses simply on financial or marketing issues. “Executives in the current environment need to do a lot of different jobs,” he says (McClure, 2004).

Key executives emphasize that manufacturing excellence must be the prime “calling” of an industrial firm. The more dependent a firm is on other companies, particularly when they are physically and culturally distinct, the less control it has over its long-term fate. Brian Sturgell, Executive Vice President at Montreal based-Alcan Inc., a firm representing \$24 billion in annual revenues, observes that:



Brian Sturgell

“Manufacturing is our business. We don’t contract out our manufacturing—our business is to build value for the long-term and you have to control that process.”

Another key executive task lies in inculcating such sentiments throughout the company. The cultivation of key talent should be a major priority. There is a distinct need to force open opportunities for the best leaders and not be hemmed in by, “Sorry, we don’t have a great opening now.” Savvy, aggressive executives are a critical resource, and human capital management must be supported by systems and metrics that promote the career advancement of key personnel. Diversity in management systems and using project teams, for example, help get younger executives in sync with the company’s mission and fundamental operations.

Perhaps the biggest challenge lies not so much at the top but in the middle and lower ranks. Executives at both large and mid-sized corporations stress that American education is not producing potential employees that have the necessary skills or attitudes to compete in the industrial marketplace. Too many schools, says Kellie Johnson, President of Ace Clearwater Enterprises, a Los Angeles-area manufacturer of welded assemblies for the aerospace and power generation industries, have abandoned teaching “industrial arts” in favor of marketing, technology or legal management.

“The problem is no one even thinks about raw materials, no one makes things anymore,” she says. “The industrial arts are gone from our schools and the appeal of [white collar] technology draws people away from manufacturing.” Johnson stresses that CEOs must communicate their enthusiasm for the industrial processes and competition if they hope to meet the challenges before them, particularly from abroad:



Kellie Johnson

“For us, part of the critical skill is understanding our industry...Also communication skills—having the ability to coach people, lead by example, wear more than one hat...Passion is also critical—passion to do the right thing, to be the best.”

Global Knowledge

Global knowledge is an indispensable ingredient of the modern industrial executive’s core skill set. Many CEOs asserted that American firms have been slow to recognize the intensity of foreign competition. “After World War II, we were the only industrial economy standing,” Hassey observes. “[America] lived in an unreal world for almost 25 years.” This “unreal world” came crashing down after 1970. Today, many executives are learning that even if their firms achieve rising productivity, so can their competitors. These overseas competitors also often enjoy added advantages of lower wages, government support and often better product development.

ArvinMeritor's McClure believes that CEOs must possess broad international experience to understand the global business environment. "One thing I would encourage in any potential CEO is go live overseas, learn another language," he says. "We have been too geo-centric. Dealing with the rest of the world has become a fact of life."

Robert D. "Bob" Johnson, President and CEO of Honeywell Aerospace, asserts that there is no way to keep all production in the U.S. in the current world economy:



Bob Johnson

"The manufacturing executive has to be culturally global. What is going on in aerospace is going on globally—the whole world is about more for less... The American executive is less and less running an American company. My customer is anywhere."

Johnson views foreign affiliates as sources of critical market intelligence and a way to keep in touch with diverse customer needs. His products cannot just work in the U. S., but must also function around the world. "I design and service our products globally," he says. "The closer you are to the customers, the better off you are."

Top executives also stress the ability to differentiate between opportunities presented by different segments of the global economy. Veteran manufacturing CEOs like Miller, for example, almost universally view Western Europe as having less labor flexibility than America. Yet, he sees better opportunities further east in the former Communist nations:



Steve Miller

"At Federal Mogul, we are moving as fast as possible to Eastern Europe—we are hoping to get out of Western Europe forever. We have a problem [there] when you put a million dollars of equipment in a plant and when you get the person into that plant, you're spending another million in benefits."

In some cases specific conditions such as high energy costs will force firms to specific markets. Allegheny Technologies' Hassey says that Alcoa had to move out of the U.S. to lower cost energy producers like Brazil. Similarly, Alcoa had no choice but to shift production to Iceland, where new geothermal projects provided a stable, relatively inexpensive energy supply.

Almost without exception, company CEOs believe that knowledge about China, India and rapidly growing Asian countries is critical to U.S. manufacturing success. Notes Johnson:

“India is becoming a very special place in design and software. No one else is close. China is developing a remarkably broad spectrum of competence. These places have such rich natural talent and IQ per capita, who are willing to work longer and harder. They don’t have the big distractions, yet...Is there a choice where to be? Honeywell is already there but the Mayor and head of the Communist Party in Shanghai invited my company to move its headquarters there. It wasn’t practical for us but someday, somebody will.”

Bob Johnson

Strategic Vision

CEOs and key executives stress the importance of putting conflicting imperatives into a coherent strategy. There are, for example, good reasons to keep production close at hand, while globalization tends to push for reliance on offshore sources. To assure long-term business survival, it is particularly important to comprehend the true motivations of a company’s overseas partners, suppliers and competitors.

One critical concern, suggests Miller, is to understand that a firm’s global partners often have the same aspirations for growth, power and achievement that motivate the American company. Even in newly developing countries, suppliers do not want to remain “low cost” or “low end” suppliers forever. Over time, they aspire to earn more, pay higher wages, generate better benefits and garner an increasing share of world markets:

“Like it or not, globalization is here—and we are way past the point where we can prevent it from spreading. I don’t know why the guy in China is any less entitled to a good quality of life as someone who lives in the U.S.”

Steve Miller

Miller and other CEOs also recognize that overseas competitors and collaborators are often motivated by national policies as well as their individual aspirations. The role of policy is particularly apparent in the offset and local sourcing requirements that many countries—including in Western Europe and Japan—imposed as a condition of doing business. Allegheny’s Hassey believes that U.S. companies must build their strategies with the clear appreciation that the American concept of “free trade” is not universally shared:

“There is no such thing as a ‘free’ economy in the world. The rules that exist in the world, and those in the United States are not the same. In the real world, if you want to participate in an economy, you have to give things up. You have to read between the lines. When you talk about a project in China, you are really talking about technology transfer—the code is everywhere.”

Pat Hassey

The generally agreed strategy for dealing with such challenges focuses on identifying which core company assets must be protected. This objective is particularly difficult when short-term economic incentives, like the lack of “legacy” pension costs in many foreign markets, make relocation attractive even at the cost of losing significant key technologies. This presents perhaps the greatest strategic challenge to American corporate CEOs. As Hassey notes:

“Why should you give up 60 years of technology for a one year deal?... You better read between the lines and understand the code. Someone with an MBA following the book and economic theory of a global economy will end up losing their company.”

Pat Hassey

At Allegheny Technologies, Hassey has tried to structure his overseas relationships to maintain the firm’s most important technology. He has a joint venture in China, for example, to produce precision specialty metals but has not surrendered his most cutting edge technology to his Chinese partner. “We haven’t parted with our best stuff,” Hassey maintains. “And we don’t intend to do it. We intend to protect the crown jewels.”

In some cases, protecting the “crown jewels” means having the discipline not to participate in an emerging market, or at least being very selective about doing so. Alcan’s Sturgell, for example, will participate in foreign markets but never if it means giving up the company’s core technology. “We have a product that is continuous cast technology. It’s the best in the world. We will let people use the equipment but not the box itself,” he explains. Control of technology, in his mind, is not just a brand issue, it is a matter of “customer interface.” When a firm sells its core technology, it no longer has the primary interface with the key source of profit, the customer. “You don’t want someone else in the process,” Sturgell insists. “We want to be the interface.”

At root, the need for strategic vision means learning to manage the process of globalization while protecting a company's future. Senior manufacturing executives must identify what to send overseas and what to retain within the firm's home market. Balancing the need to be in many different markets with the development and retention of unique corporate skills and identities it represents is one of the critical challenges for a successful industrial concern. According to Johnson:

"It's fascinating and the speed with which this is happening is pretty amazing. You can talk about globalization but the issue boils down to how do you get there and how can your company survive it. I can't get American machine tools anymore and a lot of my software is developed in India. My service is global...You can't answer the question of 'made in the U.S.' unless you define 'make'. Most of our products are designed here but made elsewhere...We have our secret technologies we keep close to us. As a company, you have to protect your intellectual property."

Bob Johnson

III. The Talent Attributes

A Korn/Ferry Perspective

From a holistic perspective, the key attributes of passion, global knowledge and strategic vision clearly define the current successful senior leader of multinational industrial companies. But in executing C-level searches across the world, there are a number of other key talent attributes that Korn/Ferry consultants have identified as critical to a successful candidate.

1. Cultural and Intellectual Openness

For more than four decades, the U.S. has been the dominant economic force in the world. This leadership position has fostered executives who are innovative, aggressive and focused on winning. But it has also bred complacency and an ethnocentric view of the world. It is clear that the business leaders in the new global paradigm must be culturally open, and receptive to new views and attitudes that emerge from different regions of the world. Needless to say, overseas operating experience is critical.

2. Long-Term View

Many of the troubles facing U.S. multinationals were fomented by a Wall Street-driven focus on quarterly results. To succeed in a global game, leaders must be able to withstand the short term pressure and stay focused on the end game—as their foreign-based competitors are.

3. World-Class Preparation

Korn/Ferry seeks candidates who have had the benefit of working for world-class organizations. These include companies that have actively exposed their managers to a range of geographies, cross-border challenges and diverse project teams. They are also environments where young leaders are allowed to make mistakes and take prudent risks. The best firms have perfected the art of growing and developing global managers.

4. Diversity

Diversity will be a standard-bearer for global executives going forward. Diversity of thought, diversity of workforce, diversity of customer base, diversity in design philosophy—these are the hallmarks of a truly global company and must be embraced and advanced by the leadership team.

IV. Final Thoughts

Despite truly tough times, this survey of top industrial executives identifies at least one encouraging trend, the fact that all of the respondents believe that American manufacturing need not necessarily decline. The key to success, almost all emphasize, lies in pragmatically engaging world markets with a strong sense of realism.

Ultimately, this requires executives to engage their employees and shareholders and make some difficult choices. To survive in the long run, a U.S. manufacturer must retain a strong domestic production capability, strive for manufacturing excellence and strategically balance global cost incentives with the protection of core corporate assets. Achieving these goals means, at the least, fostering executives with a passion for production and the knowledge and vision to deal with the demands—and often overlooked pitfalls—of the global economy.

If history is our guide, a society that does not value production gradually weakens its ability to generate wealth for itself and its future generations. Today, however, it may be possible to reinvigorate U.S. manufacturing by building on the experience and hard-won lessons of the country's industrial leaders and inspiring a new class of executives. Building this future represents the central challenge facing America's industrial executives as they compete in the 21st Century.

APPENDIX:

U.S. Industrial Base: Past, Present and Future

Introduction

Executive skills and capabilities develop to cope with specific market and strategic challenges. Unfortunately, there exists broad disagreement about the present status and future of manufacturing in contemporary America. This ambiguity profoundly affects how people view the skills that executives must have to succeed.

Many observers believe that recent manufacturing job losses, expanded outsourcing and stagnating domestic production are the natural, desirable consequences of significant productivity gains. U.S. industries, they believe, are undergoing the same kind of structural shift that transformed agriculture in the early 1900s. Manufactured goods can now be made with much less labor. New communications technologies and free trade agreements inevitably shift production to the lowest-cost countries. Driven by these changes, America's talent and capital can now be redeployed into new, more advanced pursuits.

The contrasting view is that U.S. manufacturing is being affected more by domestic and international policies rather than a welcome, natural, productivity-led process. Driving U.S. firms and jobs from the domestic economy are a strong dollar, one-sided trade with strategically motivated trading partners and indifference to the distortions caused by global wage, regulation and safety differentials. In this view, America's economic and technological vitality will continue to suffer unless policies that artificially hurt domestic manufacturing are corrected.

The "productivity-driven" and "policy-driven" views represent two competing theories about the future of manufacturing. The extent to which a company's management tends towards one of these perspectives shapes the set of executive skills a firm will cultivate to meet its future competitive challenges. The following sections provide background information about the historical development of American manufacturing that bears on its future path.

Historical Overview

Throughout history, manufacturing has first energized economic and social advancement, but then been viewed with increasing distaste by wealthy and influential leadership. Great Britain enjoyed an almost unchallenged industrial supremacy in the 19th Century. Yet, by the late 1800s, British industrial executives had become reluctant to invest or even immerse themselves in the nitty-gritty details of manufacturing. As Britain became wealthier, successive generations abandoned production for what was perceived to be more advanced or enlightened pursuits. This social development was so pronounced that one historian called it "the psychological and intellectual de-industrialization" of the nation (Weiner, 1980).

Reflecting these shifting priorities, and the growing British and European propensity to invest abroad, the U.S. assumed global industrial leadership by the early 20th Century. The hallmark of the nation's development was mass production and the incomparable passion that U.S. executives brought to improving manufacturing operations. General Motors' Alfred Sloan epitomized America's commitment to defining a new more "scientific" and "objective" form of production. Implicitly rejecting the stagnating British model, Sloan contended that the world had outgrown the "personal era of industrialists" and entered a period in which "the discipline of management by method and objective facts" would be preminent (Sloan, 1972).

Industrial development in the early to mid-20th Century was marked by the interplay between global tension and the build-up of military industries. Germany, Japan and the Soviet Union each stimulated substantial industrial expansion up to World War II. Following the war, only the U.S. retained a largely intact industrial infrastructure, a result that led to the country's unchallenged preeminence for the next three decades.

In the 1970s, however, America's industrial culture started to exhibit many of the same traits that had undermined British firms a century before. Motivated by short-term financial returns, many refused to invest in new technologies. Top graduates shifted their focus to non-manufacturing pursuits such as law, finance and consulting. By 1984, the New York Stock Exchange (NYSE) concluded in a published study that "a strong manufacturing sector is not a requisite for a prosperous economy" (Cohen and Zysman, 1989).

As these attitudes took hold in the U.S., foreign producers, particularly in Japan, continued to make significant technical advances in manufacturing just as Sloan and other Americans had out-innovated Britain decades before. In 1970, the U.S. enjoyed a modest \$2.6 billion goods trade surplus. Just 14 years later, America had built what was then an unthinkable large \$112.5 billion goods trade deficit. (U.S. International Trade Administration, U.S. International Trade In Goods And Services Balance Of Payments (BOP) Basis, 1960-2003 (<http://www.ita.doc.gov/td/industry/otea/usfth/aggregate/H03t01.html>).

Like the NYSE, many contended that these changes were inevitable. However, the cultural roots of U.S. manufacturing decline were also in evidence. When top executives like Gordon Moore at Intel Corporation recognized that "cost reduction by jumping to new technology is no longer sufficient," they proved capable of rebounding from market reversals and building major, world-class industries. For a time, even much maligned automakers like Ford and DaimlerChrysler repaired their design, supply and manufacturing operations and made substantial product quality improvements (*Forbes*, 1984; *Forbes*, 1986; Aguayo, 1990). U.S. manufacturing employment was growing as recently as the mid-1990s, largely in response to what seemed like perpetually sustainable growth in computer technology and related production.

But these positive trends were eventually overwhelmed by two, more overriding developments: the cultural abandonment of manufacturing by large, influential segments of U.S. leadership and the growing commitment of American competitors to dominate world production markets. Gradually, and with increasing speed over time, entire areas of manufacturing expertise and capacity, such as helicopters or long-distance passenger planes, evaporated from the domestic economy (*Wall Street Journal*, 2004). More challenging still, in the last ten years China has emerged as the latest, and possibly most significant, global force affecting manufacturing development since the dawn of the industrial age.

According to Georgetown University trade expert James Clad, China is rapidly gaining all the key capital, technology and infrastructure that will allow it to build industrial supremacy akin to what Britain and the U.S. achieved in the past. “Manufacturing production,” he believes, “goes to places where all the skills are concentrated. This helps China. All the elements are mutually supportive” (Clad, 2004).

Consistent with this view, firms like Huawei Technologies, a major telecom manufacturer, Techtronic and VTech Holdings are already significant multinational corporations capable of buying assets or competing anywhere in the world (*OECD International Direct Investment*, 2004; Kyngge, 2003; Bernstein and Munro, 1997; *Wall Street Journal*, 2003a, 2003b, 2003c, 2004). Coupled with an aggressive national commitment to developing industry as a facet of political power, U.S. executives face the possibility that not only blue-collar, but even top management jobs, will be eliminated from the American economy.

“There is no job that is America’s God-given right anymore,” Carly Fiorina, CEO of Hewlett-Packard recently observed. “We have to compete for jobs.” Ultimately, this trend may affect the highest levels of U.S. industrial corporations (*Los Angeles Times*, 2004). As trade expert Clad has argued:

“It’s hard to see how the U.S. executive can survive in this environment without a feeling for what is happening with production. It’s a dangerous conceit... There is no fundamental reason why the manufacturing executive has to be in White Plains or Scottsdale.”

James Clad

Contemporary trends only reinforce this sense of urgency and challenge.

America's Current Industrial Performance

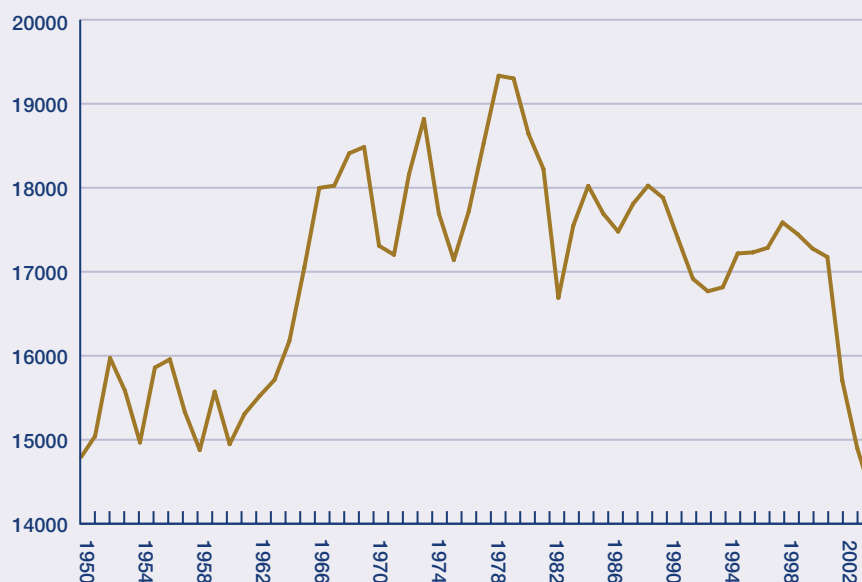
Four major trends characterize the condition of U.S. manufacturing:

- Manufacturing employment began a slight downward trend in the mid-1970s, but has precipitously fallen since the mid-1990s;
- Productivity (the value of output per labor hour) has trended upward since the late 1980s and showed increased growth in recent years;
- The value of U.S. manufacturing output has risen relatively little over the past 15 years and generates a steadily falling share of the nation's gross domestic product (GDP); and
- The value of U.S. manufactured imports, including components, subassemblies and finished goods, has increased much faster than domestic manufacturing output and is now approximately 70% of the value of U.S. annual production.

1. Declining Manufacturing Employment

American manufacturing employment reached its highest point—approximately 19.3 million workers—in 1978. Employment subsequently declined to approximately 16.8 million workers in 1992, rose slightly over the next five years to a peak of 17.6 million employees, and then collapsed. From 1998-2003, manufacturing employment fell by 3.3 million jobs, a 19% decline. Manufacturing employment registered slight gains in three of six months during 2004, but overall sector jobs remain substantially under the 1998 peak and have fallen below the 1950 level (see Chart 1).

Chart 1
U.S. Manufacturing Employment 1950-2003 (workers in '000s)

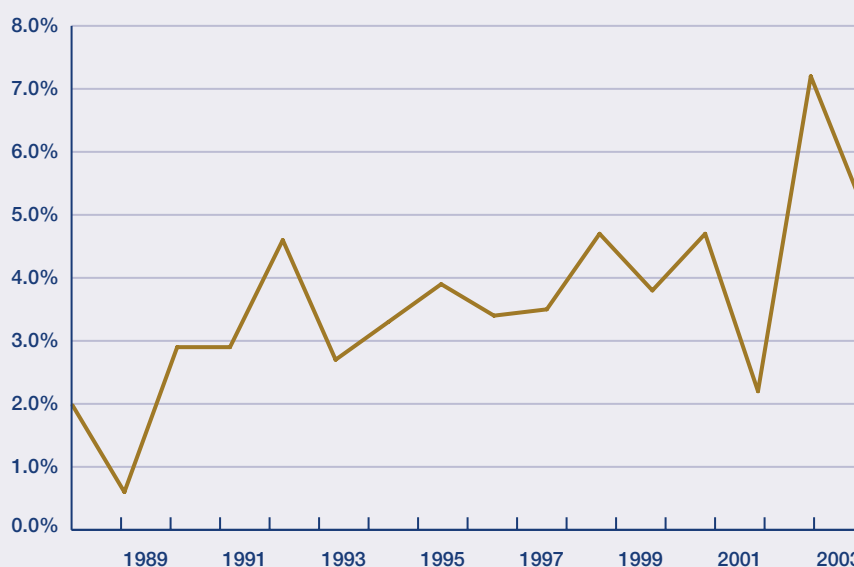


Source: U.S. Bureau of Labor Statistics, national employment data, seasonally adjusted employment data, December of each year.

2. Upward-Trending Productivity Rates

Reported Bureau of Labor Statistics productivity data—the ratio of the manufacturing sector’s net domestic output to total hours worked—indicates that U.S. production efficiency has steadily increased over time. This increase was particularly noteworthy between 1988 to 1992, when annual productivity gains rose from less than 1% to more than 4%. After remaining relatively stable over the next four years, annual productivity growth increased from about 3.5% to over 7% during 1997-2003 (see Chart 2).

Chart 2
U.S. Manufacturing Annual Productivity Increase 1987-2003 (percent growth)



Source: U.S. Bureau of Labor Statistics, national productivity and technology data, seasonally adjusted annual averages.

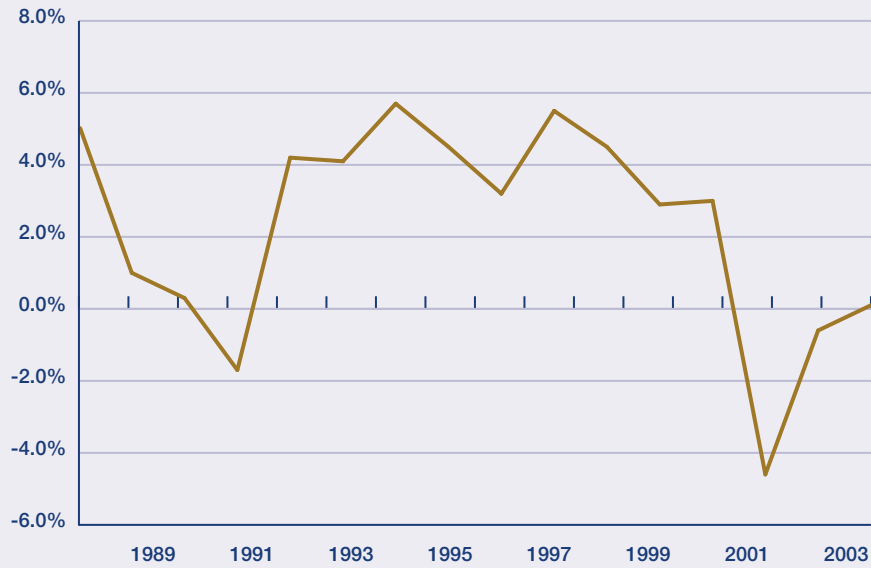
An unresolved question about the productivity data centers on the possible effects that imported components may have on the results. As discussed below (see Charts 5 and 6), a substantial amount of U.S. production is now comprised of foreign parts. If U.S. statistics do not accurately measure the contribution of these parts to the final goods assembled in the domestic economy, they may overstate the true efficiency gains that producers are actually achieving (Friedman, 2003).

3. Relatively Slow Manufacturing Output Growth

After expanding significantly from 1950, the rate of manufacturing output growth slowed relative to the rest of the economy. Since the late 1980s, manufacturing output rose as the economy expanded, but then declined more sharply than in previous recessionary periods (see Chart 3).

Chart 3

U.S. Manufacturing Annual Output Increase 1987-2003 (percent current value growth)

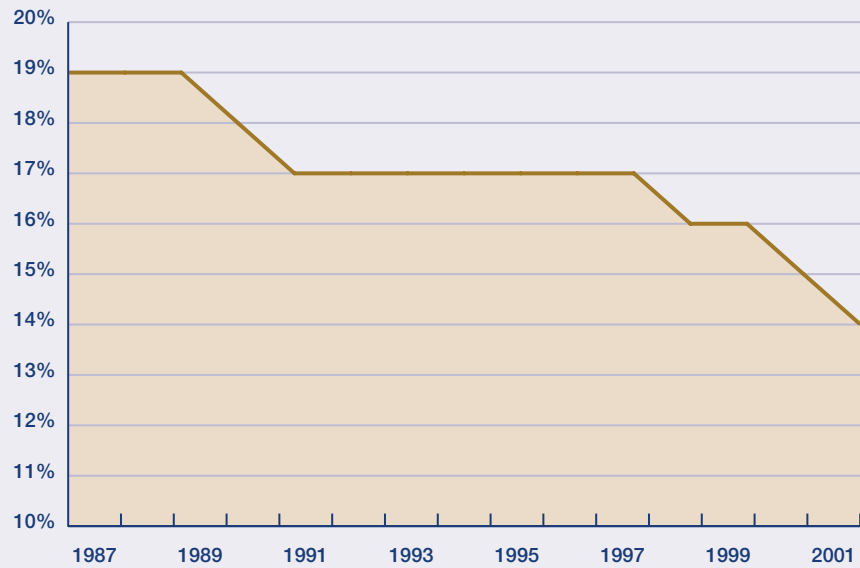


Source: U.S. Bureau of Labor Statistics, national productivity and technology data, seasonally adjusted annual averages.

Due to relatively slow growth, the share of manufacturing output in the nation's total GDP dropped from over 19% in 1989 to less than 14% in 2003 (see Chart 4).

Chart 4

U.S. Manufacturing Share of Total GDP 1987-2003 (percent)



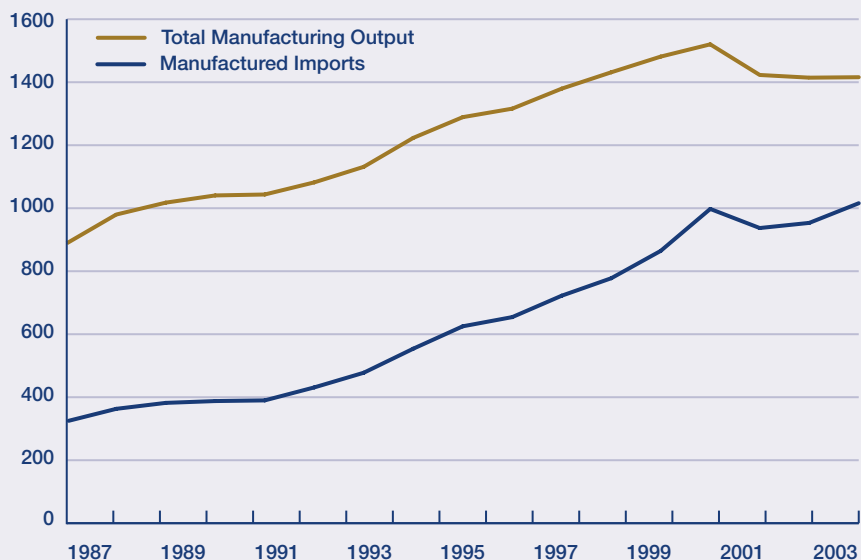
Source: Bureau of Economic Analysis National Income and Product (NIPA) tables, current dollars.

4. Manufacturing Import Growth

The value of U.S. manufactured imports increased by 212% over the last 15 years, rising from approximately \$325 billion in 1987 to \$1.02 trillion in 2003. Over the same period, the value of U.S. manufacturing output rose from \$888 billion to \$1.42 trillion, a 59% increase (see Chart 5).

Chart 5

U.S. Manufacturing Output and Import Growth 1987-2003 (\$ millions)

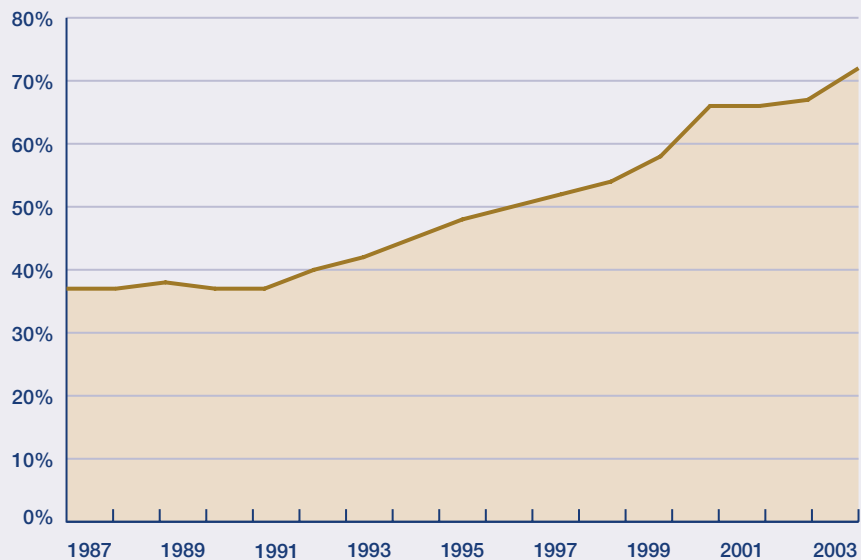


Source: Bureau of Economic Analysis National Income and Product (NIPA) tables, current dollars.

Due to more rapid import growth, the value of manufactured imports in the American economy rose from about 35% of U.S. output in 1987 to more than 70% in 2003 (see Chart 6). The ratio of manufactured imports to domestically produced goods is currently at the highest level in American history and is likely among the highest rates ever recorded for an advanced industrial economy.

Chart 6

Ratio of U.S. Manufacturing Imports to U.S. Output 1987-2003 (percent)



Source: Bureau of Economic Analysis National Income and Product (NIPA) tables, current dollars.

Perspectives on the Future

American manufacturing statistics have led to two competing perspectives regarding the future of U.S. production: (1) the productivity-driven and (2) the policy-driven viewpoints. Each provides different explanations of the nation's historical record and expectations regarding the future of American manufacturing.

1. The Productivity-Driven Perspective

The productivity perspective views declining manufacturing employment and rising output per hour as evidence of a natural and inevitable phase of industrial development. This transformation is often compared with the American agricultural economy of the early 1900s. At that time, a large proportion of the American workforce was employed in farming and related industries. Mechanized agriculture restructured the economy, shifted displaced farm workers into urban industrial occupations, and helped spark the Industrial Revolution.

In the productivity-driven perspective, manufacturing is undergoing similar innovation and restructuring. Information technology, and the ability to export labor-intensive, relatively undesirable work to lower cost countries, has allowed productivity to soar. Former manufacturing workers have been freed from the drudgery of the assembly line and are helping to create more interesting, lucrative service and technology-based industries. As a report published by a consortium of U.S. computer manufacturers, recently observed:

Perhaps the best way to understand how increased innovation and productivity improve our standard of living is to consider the change over time in the number of Americans working on farms. Through the introduction of mechanized farm equipment, improved seeds and modern farm management techniques, American farmers dramatically improved their productivity. In 1800, nearly 95 percent of workers made their living on a farm. By 1900, only about 40 percent of the American workforce was employed in agriculture. Today less than two percent of the workforce is needed to feed America—and to grow enough to export approximately \$55 billion per year, making the United States the largest exporter of agricultural goods in the world. Workers who are no longer needed on farms are now available to work as engineers, doctors, automobile assemblers, architects, fashion designers, Web designers, writers, entertainers and countless other jobs that make our lives richer, more comfortable and more enjoyable.

(Computer Systems Policy Project 2003).

Several pieces of evidence are frequently cited in support of the productivity-driven viewpoint. In late 2003, a capital analysis firm released a study suggesting that China—an apparent big winner in global manufacturing—was actually losing many more jobs, and at a faster pace, than American producers. Between 1995 and 2002, the study indicated that Chinese manufacturers had shed over 16 million employees, a decline of 15% compared with an 11% loss in the U.S. over the same period. Productivity gains seemed to be shrinking manufacturing employment almost everywhere in the world:

The way we see it, the evidence is clear that there is a global trend toward smaller manufacturing payrolls. Although we believe the strong global recovery may temporarily halt or reverse the fall-off in some regions, development of new technology over the next decade will work to make smaller manufacturing payrolls a permanent fixture of the global economy.

(Alliance Capital Management, 2003a and 2003b).

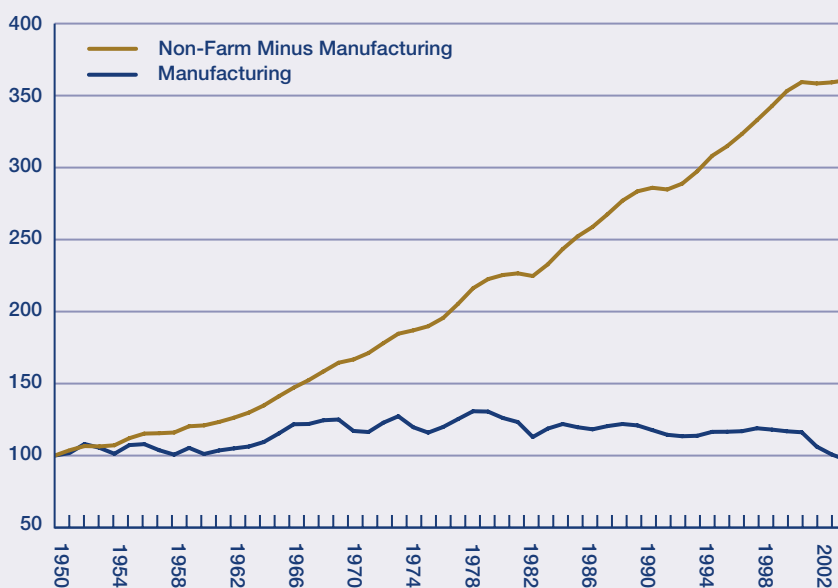
Consistent with the redeployment of people and capital that occurred in the agricultural revolution, other studies suggest that outsourcing and offshoring blue collar and service jobs from the U.S. generates net benefits for the American economy. The McKinsey Global Institute identified certain benefits associated with this process. Specifically, offshoring will allow the U.S. to capture economic value through multiple channels:

- **Reduced Costs** – Savings from reduced costs are passed back to consumers or to investors to reinvest.
- **New Revenues** – Offshoring creates demand in destination countries for U.S. products, especially for technology-based products.
- **Repatriated Earnings** – Several providers serving the U.S. market are incorporated in America, which means they repatriate their earnings back into the U.S.
- **Redeployed Labor** – U.S. workers who lose their jobs to offshoring will find employment in other sectors, which will in turn generate additional value for the economy.

According to the McKinsey Global Institute, the U.S. captures 78% of the total value of offshoring, or \$1.12-\$1.14, for every dollar spent abroad (2003).

Over the past several decades, moreover, the U.S. economy has generally absorbed displaced manufacturing workers in new, largely service-related jobs. Since 1950, while manufacturing employment was comparatively stable, employment in non-manufacturing sectors rose by nearly 350% (see Chart 7).

Chart 7
Index of Manufacturing and Non-Manufacturing Job Growth 1950-2003 (1950=100)

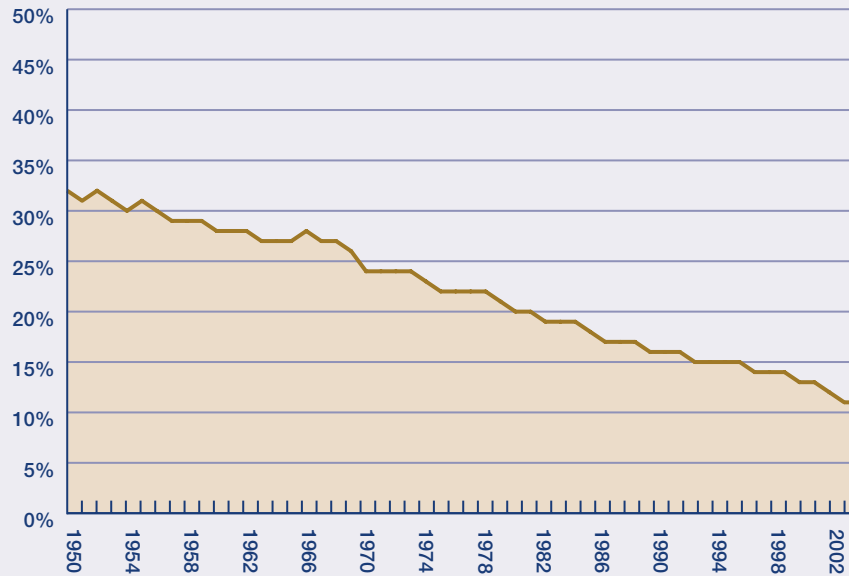


Source: U.S. Bureau of Labor Statistics, national employment data, seasonally adjusted employment data, December of each year.

As a result, the percentage of the U.S. workforce engaged in manufacturing has fallen from over 30% in 1950 to approximately 11% in 2003. This historical employment pattern is suggestive of agriculture’s restructuring in the past (see Chart 8).

Chart 8

Percentage of U.S. Non-Farm Employment in Manufacturing 1950-2003



Source: U.S. Bureau of Labor Statistics, national employment data, seasonally adjusted employment data, December of each year.

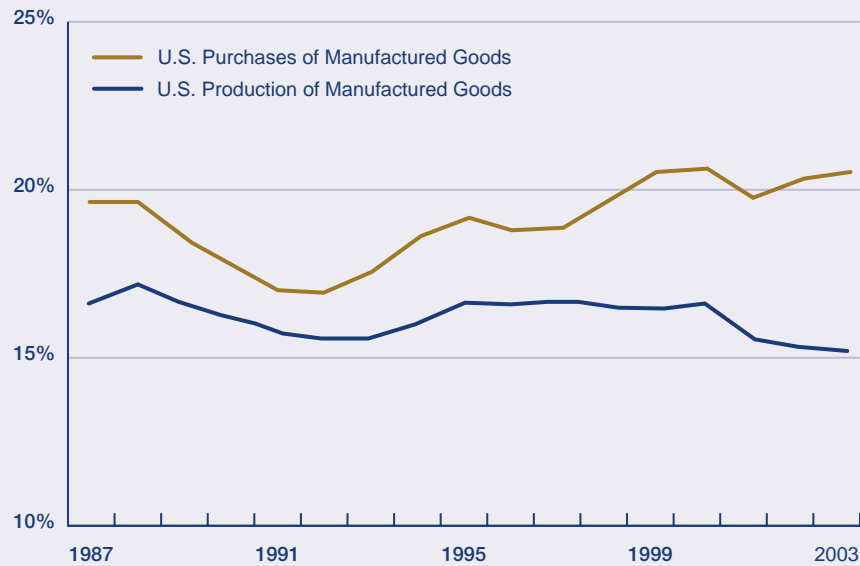
2. The Policy-Driven Perspective

In contrast with the productivity perspective, other analysts believe that American manufacturing has been primarily shaped by international and domestic policies, such as a strong dollar, unbalanced trade relations and other nations' mercantile strategies, rather than "natural" trends. In this view, the effects of these policies became especially acute in the mid-1990s and continue to damage U.S. manufacturing. The labor-aligned Economic Policy Institute contends, for example that, "The rapid decline of U.S. manufacturing was a policy-induced crisis that warrants policy solutions. For too long, dollar and trade policies have hurt domestic manufacturing" (Faux, 2004).

Evidence in support of the policy-driven perspective includes the fact that, despite historical productivity gains, U.S. manufacturing employment generally ranged around a mean of approximately 18 million workers from 1968 to 1998 (see Chart 1). In 1998, however, U.S. manufacturing employment suddenly dropped below baseline levels, precisely when the dollar was appreciating dramatically against European and Asian currencies. At the same time, imports and the U.S. trade deficit skyrocketed, and countries such as India and China began focused attempts to capture an increasing share of global production (Faux, 2004). While the competitive position of U.S. producers eroded, foreign manufacturers captured all of the growth in domestic demand during 1998-2003 (see Chart 9).

Chart 9

U.S. Manufactured Goods Consumption and Domestic Production Growth 1987-2003



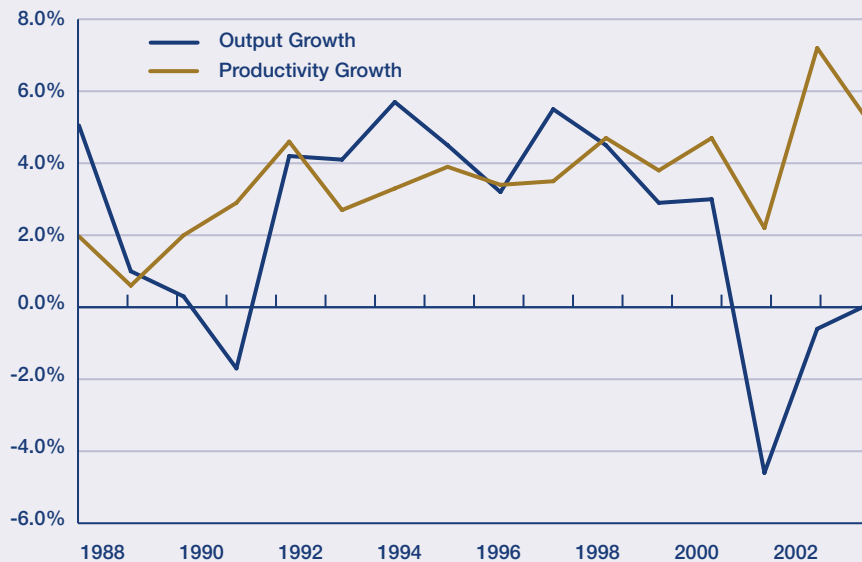
Source: *Economic Policy Institute, 2003 (www.epinet.org)*.

Similarly, the tendency to analogize manufacturing with agriculture may be misguided because, unlike previous historical eras, displaced domestic workers and assets cannot be easily redeployed in a period of unprecedented global competition. Recent trends suggest, in fact, that instead of generating new service or other jobs, politically favored white collar and management functions may be increasingly at risk as blue collar production employment falls. About 5% of the U.S. information technology workforce is expected to relocate outside of the country by 2005.

Other sources suggest that 3.3 million technology and service industry jobs—a payroll of more than \$135 billion—will be lost over the next ten years and that the pace of white collar job displacement is increasing (Teicher, 2003; Forrester, 2004).

Given these trends, productivity gains may not be associated with a positive redeployment of U.S. skills and assets as in the past. The most current annual data indicates that manufacturing productivity growth is actually associated with falling net manufacturing output. Measured productivity expansion could be spurred by job cutbacks that are more rapid than output declines as much as sustainable production improvements (see Chart 10).

Chart 10
Annual Manufacturing Productivity and Output Growth 1987-2003



Source: US Department of Labor, Bureau of Labor Statistics, Major Sector Productivity and Cost Index, “Productivity: Percent Change from Year Ago” and “Output: Percent Change from Year Ago (seasonally adjusted),” March, 2004.

The policy-driven viewpoint suggests that long-term know-how and skills needed to sustain innovation and new growth could be at risk. “If you don’t have a critical mass of people, you won’t get innovation,” Norman Matloff, computer science professor at the University of California, Davis has argued. “Companies that offshore all of their entry-level positions will be shooting themselves in the foot” (Teicher, 2003). Reflecting these strategic concerns, some management consultants caution that manufacturing restructuring, including the reallocation of work to low-cost areas, can generate significant corporate risks, including:

- **Loss of Future Talent** – Entry level and college trained workers may shun displaced industries like manufacturing and exacerbate permanent domestic job and knowledge losses;
- **Loss of Intellectual Assets** – Companies need to determine what kind of knowledge they must retain or develop to maintain a competitive advantage, but predicting where such knowledge will arise is difficult and imprecise; and
- **Loss of Organizational Performance** – Policy-driven manufacturing and other workforce transformations can scramble organizational roles and structures, generating substantial management and efficiency problems (Gartner, 2003).

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