Manufacturing in the US Situation and Trends
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I Introduction and Conclusions

Marxism, like any science, needs to be continually updated in light of changing conditions; the relative decline of manufacturing has provided much discussion amongst Marxists. That discussion is far beyond the scope of this paper. Nonetheless, the concept that commodity production is the fundamental source of value and of surplus value, while it might be broadened in the current period, provides an overall context for the discussion of the role of manufacturing today.

The concept of modern imperialism as a (final) stage of capitalism was seminally developed by Lenin in 1916. He described many features we see in today's capitalist globalization, including the domination of finance over industrial capital, the export of capital replacing export of goods, the competition amongst leading capitalist powers for markets, and uneven rates of development amongst major powers. There have been many developments and changes in the last 92 years, but these Leninist concepts provide a starting point for understanding and developing a theory of capitalist globalization today.

This report is mainly placed in conventional terms of productivity, technology, trade, etc. It should be understood that these do not happen in some pure, abstract environment. Trade takes place in a world dominated by imperialist relations, with the United States using its economic, political and military power to enforce dominance of the biggest US corporate interests. Technological innovation takes place in the context of class struggle and capitalist relations of production -- its purpose is to increase profits, not to help people. These concepts are not developed and discussed in this paper, but any conclusions that are drawn should take this context into account.

Some main points and conclusions:

1. Manufacturing plays a vital role in the US economy as a primary producer of value, and a driver of productivity increases.
2. Manufacturing output continues to grow in the US, although slowly and unevenly. Growth and world leadership continue in some strategic sectors like aerospace, construction equipment, advanced electronics and computer equipment.
3. The sharp drop in manufacturing employment beginning in the late 1990s represents a qualitatively new situation. The most obvious cause is the growth of net imports; but that growth may itself be a symptom of underlying structural changes. These include the growing financialization of the US economy and growth of non-productive and parasitic sectors, characteristics of an advanced and decaying stage of imperialism. While a discussion of this is beyond the scope of this paper, the brief section *the benefits of productivity* is indicative.

The most significant long-term reason for the relative decline of manufacturing is technological change leading to higher productivity. As with earlier advances in agriculture, this increased productivity ultimately provides the basis for higher living standards. When adequate production can be maintained with a smaller proportion of the workforce engaged in agriculture and manufacturing, it is possible for more people to be employed in health care, education, arts and entertainment, research, and other socially useful activities. Under capitalism, increasingly, the shift instead is to socially wasteful activities, eg, most of finance, insurance, advertising, prisons. And under capitalism, these changes are accompanied by the most brutal treatment of workers who are displaced in the "creative destruction" by which technological change is implemented.

Since the mid 1990s, the decline of some industries and overall manufacturing job loss has greatly accelerated due to the growing imbalance between imports and exports.

An industrial policy must confront changes due both to technology and to trade. The challenge regarding technological change and productivity growth is to develop policies so that the benefits are applied in socially useful ways, and to minimize the harm done to workers and their communities.

Export of capital and jobs has been a feature of US imperialism at least since WWII. The trade imbalance has developed in the context of the renewal of the drive of US imperialism for world domination. I contend that there is no socially useful aspect of this imbalance for the working class in the US or in other countries. Policies to remedy these imbalances cannot succeed without challenging the global role of US imperialism, starting, of course, with ending the war in Iraq.

Manufacturing and other sectors

This report discusses manufacturing as defined by government statistical agencies. Other sectors are also important.

1. Manufacturing is part of primary production of values and of surplus value. As a minimum, we should include in productive industries (as does the BLS) construction, mining, and forestry. I would submit that substantial parts of agriculture, transport, warehousing and distribution, and utilities are also tightly integrated with and essential to the production process, and should be included in any view of an industrial policy. This will be explored in other reports.

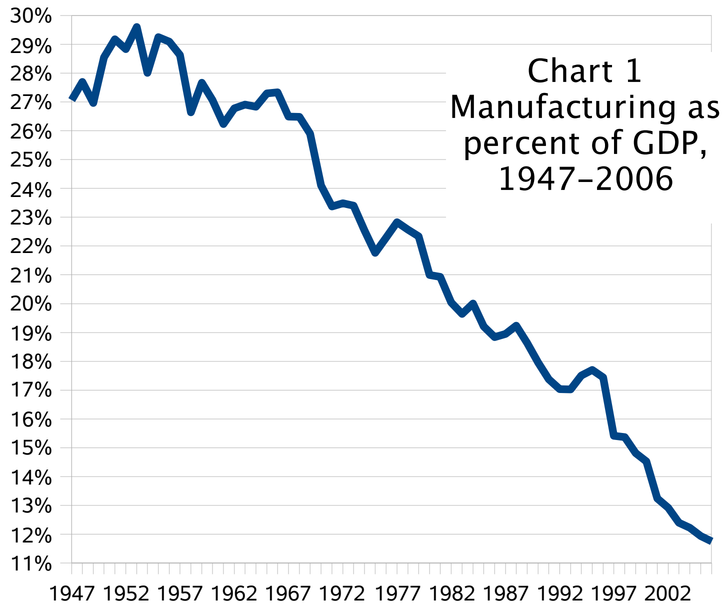
2. Manufacturing has been historically important because the conditions of production bring together large number of workers in a cooperative endeavor, in direct and open confrontation with the capitalist class over working conditions and the division of values created. Therefore these workers play a key role in the class struggle. Conditions in the related industries listed in (1) above have become more industrial in character. A recent Fortune article described the time-and-motion study techniques, along with GPS technology, being used with UPS delivery drivers. The discipline and speedup are comparable to any assembly line. Workers in other sectors, even if not as integral to the production process, labor in increasingly industrial conditions -- including retail workers in big box stores, custodial and food service workers in the hospitality industry, and others. Some of the largest concentrations of workers are in hospital, university, or government settings, although the working environment may be less regimented than in industry.

II Manufacturing in the US Economy

Manufacturing Production

Chart 1 shows that manufacturing has declined from about 30% of GDP in 1950 to less than 12% today. The trend is continuing: From 1997 to 2006, manufacturing declined from 15.4% to 11.7% of GDP.

However, chart 2 shows that the absolute value of manufacturing continues to increase. The chart shows value added by manufacture in chained 2000 dollars (billions). This is probably the best measure of actual physical production of manufactured goods in the US. There are many grains of salt that should be taken with these figures. Still, they probably provide the best overall picture.



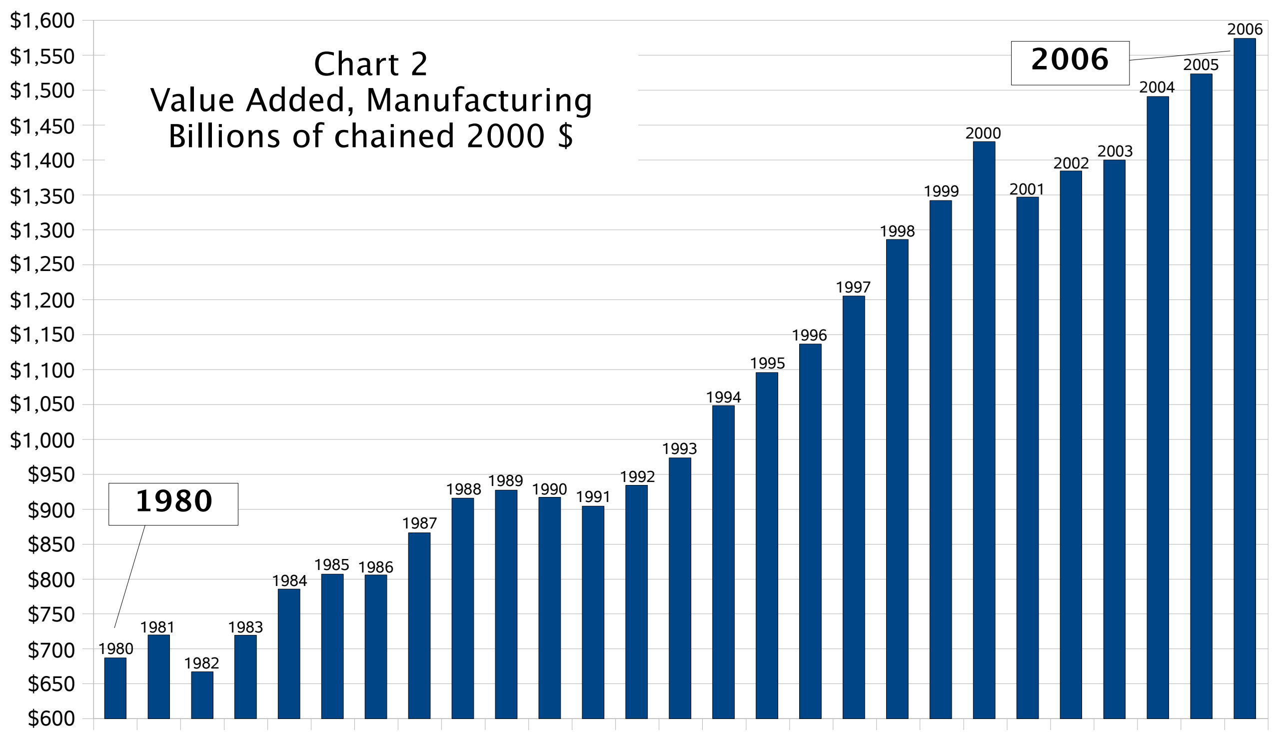


Chart 2 shows that manufacturing production falls during recessions, but the overall trend is up. It is particularly noteworthy that since 1998, while employment has fallen by about 20%, value added (production) has increased by 22%.

Productivity

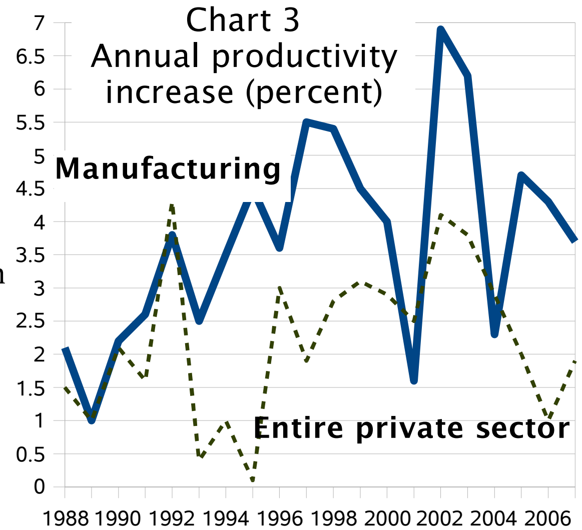


Chart 3 shows the annual rate of increase in productivity for manufacturing, and for all private business. Productivity increases are a key factor in economic growth -- they also mean that more goods can be produced with fewer workers. The chart shows that manufacturing productivity is increasing faster than the rest of the economy. The difference may be even greater than shown in the chart -- measures of manufacturing productivity are reasonably accurate, while productivity in some parts of the service sector is difficult to measure.

Imports and Trade

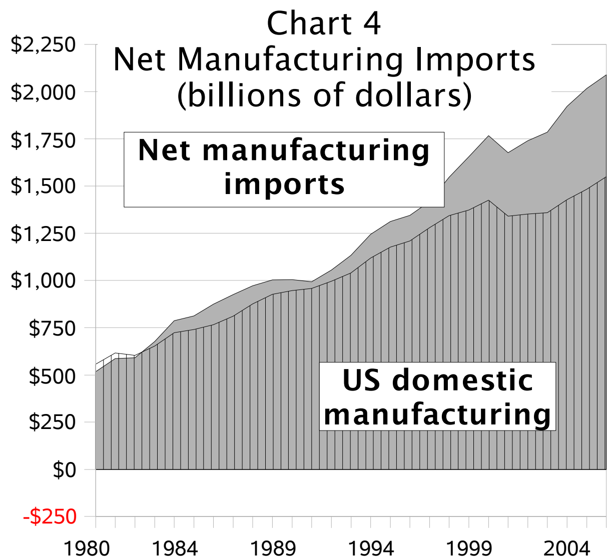


Chart 4 shows the growing impact of trade. Although imports became significant in specific industries as early as the 1960s (eg, consumer electronics), the overall impact was modest. Until 1994, net imports were usually less than 10% of domestic manufacture. In just two years, from 1997 to 1999, net imports increased from 11% to 21% of domestic manufactures. In 2005, the figure peaked at 36%.

The implications will be discussed in the section on jobs.

Benefits of Productivity

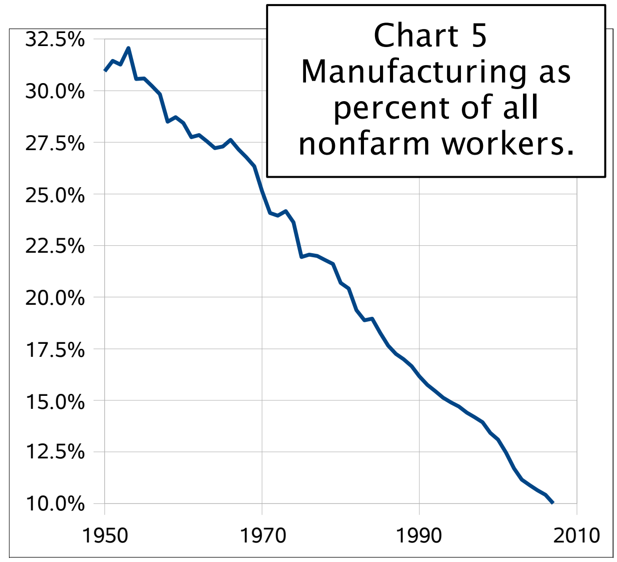
According to my calculations (see endnotes), for 1998-2006, in all manufacturing industries, and adjusted for inflation: **1)** wages increased 1%. **2)** actual production per worker increased 48%. **3)** market value of goods produced increased 18%.

This shows that workers received virtually none of the benefits of the greatly increased productivity. And their direct employers received, on average, little benefit. For whatever reason (increased global competition is one factor), they were unable to increase prices as fast as the overall rate of inflation. While output per worker increased 48%, marketable value per worker increased only 18%. And while wages didn't increase, benefit costs (which I don't show here) did increase, eating into the employer's 18%. The greater productivity of manufacturing workers ended up benefiting employers in other sectors more than manufacturing employers.

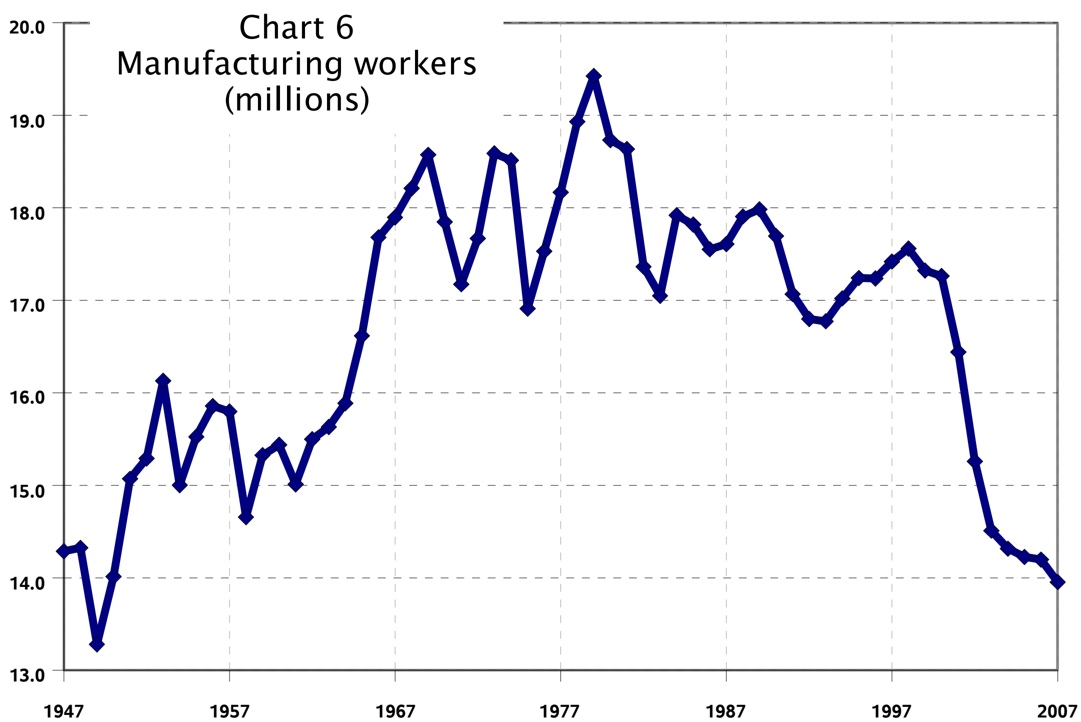
III Manufacturing and US Workers

Manufacturing jobs -- numbers

Chart 5 shows that manufacturing jobs have been declining as a percentage of the total. Chart 5 shows a declining tendency from 1950 to 1969, then a sharper downward trend, and a particularly sharp drop from 2000-2003. The decline of manufacturing employment can be compared to the earlier decline in agricultural employment in scope and economic impact, although the analogy can be overstated. By the end of 2007, manufacturing employment fell below 10% of all employed workers.



The number of manufacturing workers began a slow decline in the 1970s (chart 6), interrupted by cyclic



peaks in 1979, 1989 and 1998. A dramatic, unprecedented decline began in 2000 and, for the first time, manufacturing jobs continued to decline throughout the recent recovery. In its implications for the economy and for the working class, this may represent a qualitative change equal to or greater than that of the structural crisis of the 1980s. Manufacturing job losses accelerated in the second half of 2007 and are continuing at a high rate in 2008 as the economy enters a new recession.

Geography

Table 1 shows the 10 states with the most manufacturing jobs.

Table 2 shows the ten states with the highest manufacturing density, ie, the highest proportion of manufacturing jobs. These states form a belt from north to south along the Mississippi and Ohio rivers. Ten years earlier, most of the same states were in the list, but the top 5 states all had more than 20% manufacturing jobs.

The percentage point change in manufacturing jobs is probably the best measure of the impact of manufacturing job loss on a state (table 3). Here, we see that the South has been hardest hit. For many, workers, industry's big move to the South in the 1970s and 1980s turned out to be only a brief stopover.

Table 1

2006 mfg jobs (K)	
California	1504
Texas	926
Ohio	796
Illinois	682
Pennsylvania	671
Michigan	648
New York	567
Indiana	565
N Carolina	553
Wisconsin	504

Table 2

2006 mfg/alljobs	
Indiana	19.0%
Wisconsin	17.6%
Arkansas	16.6%
Iowa	15.4%
Mississippi	15.3%
Alabama	15.3%
Michigan	14.9%
Ohio	14.6%
Tennessee	14.4%
Kentucky	14.2%

Table 3

Pct pts lost 97 to 06	
North Carolina	-8.2%
South Carolina	-6.5%
Rhode Island	-6.3%
New Hampshire	-5.7%
Mississippi	-5.3%
Arkansas	-5.1%
Tennessee	-5.1%
Michigan	-4.7%
Maine	-4.7%
Pennsylvania	-4.4%

Race, Age, Union representation

Table 4 shows that Black and Hispanic workers have suffered the biggest decline in manufacturing employment. The disproportionate effect is aggravated because it is even harder for Black and Hispanic workers, laid off from manufacturing jobs, to find comparable jobs in other sectors.

Table 4

Mfg as percent of all workers

	1979	2007
white	23.5	11.7
Black	23.9	9.8
Hispanic	30.2	12.0

Table 5

Percent represented by unions

	2000	2007
white	14.4%	13.0%
Black	19.0%	15.8%
Hispanic	12.5%	10.8%
age 25-35	13.0%	11.4%

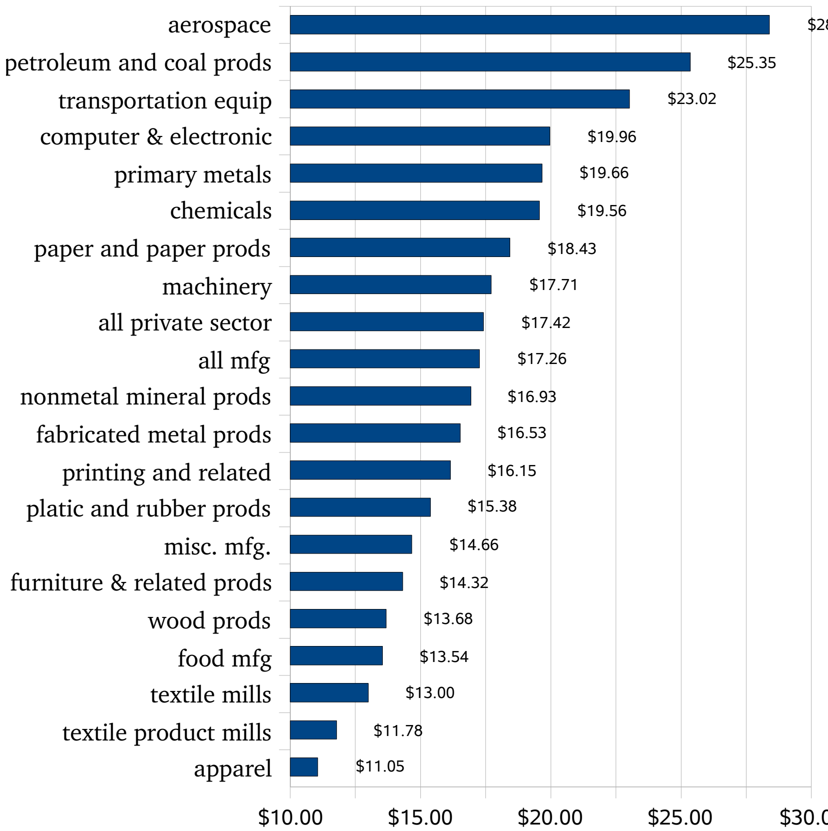
Table 5 shows the decline in union representation for all workers (I could not locate figures of union representation for manufacturing workers only). Black workers suffered the biggest drop by a large margin. It is interesting to note that younger workers have almost as high a unionization rate as older workers. *(Source for table 4: Center for Economic and Policy Research, www.cepr.net, February 2008; table 5: BLS)*.

I was unable to get statistics for the age distribution of manufacturing workers. It seems likely that on average, manufacturing workers have an older profile than the workforce in general, and I have read many stories about companies that cannot find skilled workers to replace their retiring work force. On the one hand, with large numbers of older workers retiring in the next decade, there could be more opportunities for young workers in manufacturing. On the other hand, rather than training a whole new cohort, some companies may simply close or relocate, accelerating the decline of manufacturing. This is an area where public policy can have a significant impact.

Wages

Average wages (in 2007 dollars) in manufacturing declined from $18.54/hr in 1973 to $17.26/hr in 2007. For all private sector workers, the decline was from $19.34/hr to $17.42/hr. The figures are for production workers. For service sector workers, this means all non-supervisory workers.

Chart 7 -- Hourly wages of production workers, 2007



	2007	1990 to 2007
aerospace	$28.39	21.8%
petroleum	$25.35	-6.0%
transportation	$23.02	0.5%
computer/elect	$19.96	15.5%
primary metals	$19.66	-4.4%
chemicals	$19.56	-4.0%
paper	$18.43	-3.7%
machinery	$17.71	-4.8%
all pvt sector	**$17.42**	**7.7%**
all mfg	**$17.26**	**0.9%**
nonmetal mineral	$16.93	-3.9%
fabricated metal	$16.53	-2.1%
printing, etc.	$16.15	-8.4%
plastic and rubber	$15.38	-0.7%
misc. mfg.	$14.66	4.2%
furniture, etc.	$14.32	5.8%
wood prods	$13.68	-2.2%
food mfg	$13.54	-5.6%
textile mills	$13.00	0.3%
textile products	$11.78	0.8%
apparel	$11.05	12.0%

(source: BLS CES series)

Chart 7 shows the wide variation in manufacturing wages. The column at the right shows the change in inflation-adjusted wages between 1990 and 2007. Some of the industries with the largest job losses (eg, textile, apparel) showed no wage loss and even increases. I assume this is because the lowest-paying jobs were the first to be offshored, while the higher-paying specialties were more likely to stay in the US. This may also explain why manufacturing wages as a whole declined 7.7% from 1973 to 1990, but apparently gained 0.9% from 1990 to 2007. The more recent period saw major job losses due to trade. It is probable that the jobs that stayed, on average, saw continued decline in real wages. But the jobs that left tended to be lowest paying, so the overall average increases slightly. Note that on average, manufacturing jobs do not pay significantly more than other private sector jobs on . **Manufacturing jobs today are no more likely to be "good, well-paid union jobs" than other jobs.**

Causes of Job Loss -- technology

The overall, long-term cause of the relative decline of manufacturing is changing technology. As noted earlier, since 1998, manufacturing employment has fallen by about 20% while value added (production) has increased by 22%. This implies that, in 10 years, each worker is producing 53% more. (But a note of caution -- it is probable that the least productive, most labor-intensive jobs product lines are those that have been offshored. This makes the productivity increases for the remaining jobs seem larger than they are.)

There is an interaction between technology, speed-up, and the class struggle. Where the workers are weak, technology can often impose greater regimentation and intensify work. Look at conditions in meat packing today, as an example. But technology can also alleviate hard, dangerous and repetitive work -- especially if the workers are in a strong position.

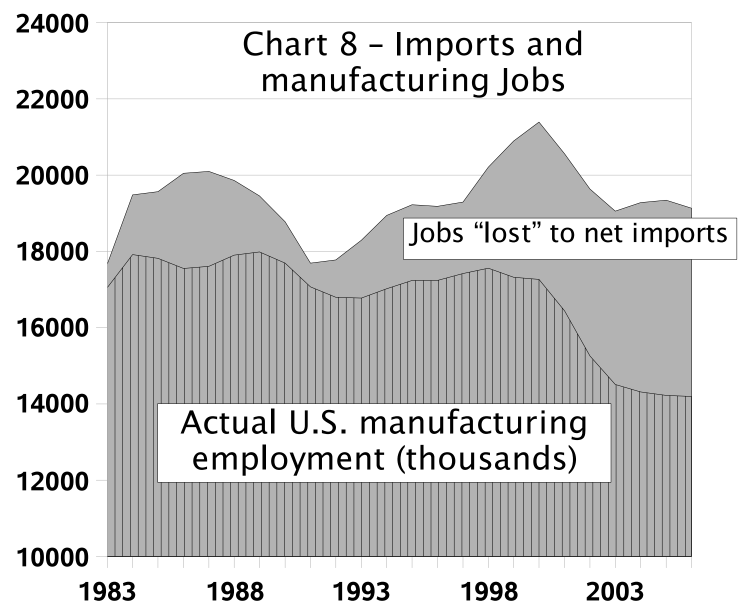
Technology should be interpreted broadly. It refers not only to methods of production (machinery, robots, etc.) but organization of production. Breakup of large manufacturing complex into smaller specialty companies with just-in-time delivery probably introduces real efficiencies, as well as serving as a weapon in the class war against the workers. And incidentally, these changes increase the importance of nominally non-manufacturing workers (transport, warehouse, etc.) in the production process.

Causes of Job Loss -- trade

From the 1960s (or earlier), there was a real loss of jobs in the US *in selected industries*. For example, the consumer electronics industry began to disappear from the US in the 1960s. But until the mid-1990s, the overall effect was not large. Losses in some industries were balanced by gains in others (like aerospace), which had increasing export sales.

In 1983, the US became a net importer of manufactured goods by my calculations. But the net imports (excess of imports over exports) stayed under 10% of domestic manufacture until 1994 (except for 1986-1988 where they reached almost 15%). In just two years, from 1997 to 1999, imports increased from 11% to 21% of domestic manufactures. In 2005, the figure peaked at 36%.

In 2006, there were 14.2 million manufacturing workers. Net imports of manufactured goods amounted to about 35% of domestic production. If trade was balanced, ie, if imports were no greater than exports, there could have been 35% more domestic manufacturing jobs -- **an additional 4.9 million jobs!** This is shown in chart 8 -- without the increasing impact of trade, manufacturing jobs in 2006 would have stayed at their level in the mid-1990s, instead of falling by almost 4 million.



It should be noted that these figures for jobs "lost" to net imports are rough estimates. It could be argued that they understate the loss, or that they overstate the loss. It is also argued by many that manufacturing jobs lost are more than made up for by job gains in other sectors. I find these arguments specious, but this is not the place to address them.

IV Notes

Chart 1 -- figures for 1947 to 1996 from Bureau of Economic Analysis (BEA) at http://www.bea.gov/scb/account_articles/national/1197gpo/table11.htm. Figures for 1997 thru 2006 from main BEA website. The two series are not strictly compatible, but the differences are minor for this purpose.

Chart 2 -- from BEA

Chart 3 -- From Bureau of Labor Statistics (BLS) at www.bls.gov. series PRS30006092 and PRS84006092. Productivity figures calculated from BEA tables are significantly different, but the overall trends are similar.

Chart 4 -- From BEA NIPA tables. Net imports is (estimated manufacturing imports) minus (estimated manufacturing exports). Estimated imports is (imported non-petroleum goods) minus (food, feeds, beverages). Estimated exports is (exported goods) minus (food, feeds, beverages). I excluded food, feeds, etc. to remove agricultural production. The value of this category is small (less than 10% of the total) and exports and imports are quite close in value. Note that these figures are not adjusted for inflation.

Benefits of productivity -- wage figures from BLS, deflated by CPI-UW index. from BEA, we got thousands of FTE workers. Also GDP in current dollars, manufacturing as percent of GDP, GDP deflator, manufacturing deflator, and GDP in chained 2000 dollars. It appears that the BEA uses the manufacturing deflator to calculate value added by manufacture in chained 2000 dollars. This price index increased more slowly than the GDP price index, reflecting the lower price increases for manufactured goods. Therefore, it is the best reflection of overall production. I also calculated value added in 2000 dollars using the GDP deflator. Since manufacturing companies exist in the whole economy, this should give the best measure of the realizable dollar value of their production.

Charts 5 and 6 -- from BLS Establishment Survey (CES). There are a number of ways in which the decline in manufacturing jobs is exaggerated, but taking those into account would not change the overall trend. These include:
1) increasing use of temps (eg, Manpower) in manufacturing. The BLS counts these as service workers, not manufacturing.
2) increase in manufacture in the underground economy, often employing undocumented workers, and avoiding reporting or under-reporting employment.
3) Work formerly done within large manufacturing complexes (eg, moving material, warehousing, custodial, office work) is now contracted out to specialty firms in transport, HR, etc. The work is just as integral to the production process, but the workers are now in the service sector instead of the manufacturing sector.

Chart 7 and table -- BLS CES survey, BLS CPI calculator.

The End of Manufacturing