SHIFTING BLAME FOR MANUFACTURING JOB LOSS

Effect of rising trade deficit shouldn't be ignored

by Josh Bivens

Many economic observers have recently exonerated international trade flows for the hemorrhaging job losses in the manufacturing sector of the United States, generally claiming that either *changing demand patterns* or *rapid productivity growth* are the cause of manufacturing's decline. But the evidence shows that trade imbalances in manufacturing have accounted for 59% of the decline in manufacturing employment since 1998. A close examination of net imports, demand for manufactured goods, and productivity growth reveals that these three factors influence the U.S. manufacturing industry in the following ways:

- U.S. consumers and businesses have not shifted their purchasing away from manufactured goods. In fact, demand for manufactured goods as a share of total demand in the United States has actually grown over the past 10 years.

- The rising trade deficit has led to an unprecedented divergence between domestic manufacturing output and demand. Domestic output is now just 76.5% of domestic demand, nearly 14% less than the 1987 to 1997 average. Raising output closer to this previous relationship with demand (around 90%) would generate millions of jobs in manufacturing.

- The rising trade deficit in manufactured goods accounts for about 58% of the decline in manufacturing employment between 1998 and 2003 and 34% of the decline from 2000 to 2003. This translates into about 1.78 million jobs since 1998 and 935,000 jobs since 2000 that have been lost due to rising net manufactured imports.

The manufacturing sector lost more than three million jobs between 1998 and 2003, with 2.7 million lost since the immediate pre-recession year of 2000. Roughly coinciding with this manufacturing employment loss, the trade deficit in manufactured goods increased by over $230 billion. The synchronicity of large-scale manufacturing job loss and growing trade deficits has led to a debate about whether international trade flows have contributed to the loss of manufacturing jobs.

Those economic observers that dismiss trade as a primary driver of manufacturing job loss claim that either changing consumer and investment demand patterns and/or fast productivity growth in the manufacturing sector is the culprit for this job loss. These analyses share two underlying messages: that there is little that policy makers can do to avert manufacturing's employment decline, and more specifically, that international trade is not a contributor to this decline because it has been driven mostly by domestic factors (i.e., demand and productivity).

In reality, the manufacturing jobs crisis in the United States can be resolved, and to do so, it is crucially important for the trade account to move closer to balance through rising exports and/or falling imports. The single best way to influence these import and export flows is by encouraging a further (and wider) depreciation of the U.S. dollar to make domestically produced goods more competitive on global and domestic markets.

Accounting for manufacturing job loss

Changing demand patterns

The decline of manufacturing as a share of total GDP over the past 30 years is often highlighted as evidence of a long-term trend away from consumer and business demand for manufacturing output. However, while manufacturing's share of GDP has fallen steadily and rapidly over the past couple of decades, this has been largely caused by lower inflation for manufactured goods than for services, driven by higher productivity growth rates in manufacturing.

A different pattern emerges when using the share of *real* (inflation-adjusted) manufacturing output in *real* GDP. Real measures account for the faster price declines for manufacturing goods. In real terms, manufacturing's share has actually been quite stable over the past 25 years. Since 2000, however, it has dropped a full percentage point.[1] A portion of this drop is surely reflecting the large fall in business investment that began in 2000. **Figure 1** shows trends in manufacturing's share of real and nominal GDP.

Even given the relative stability of manufacturing's share of total (real) GDP, it could be argued that Americans have begun demanding less in the way of manufacturing output in the very recent past (since 2001), and that this shift in demand explains a good portion of both manufacturing job loss and the entire jobless recovery, as aggregate job loss has been driven by the manufacturing sector.

FIGURE 1

Real and nominal shares of manufacturing output in GDP
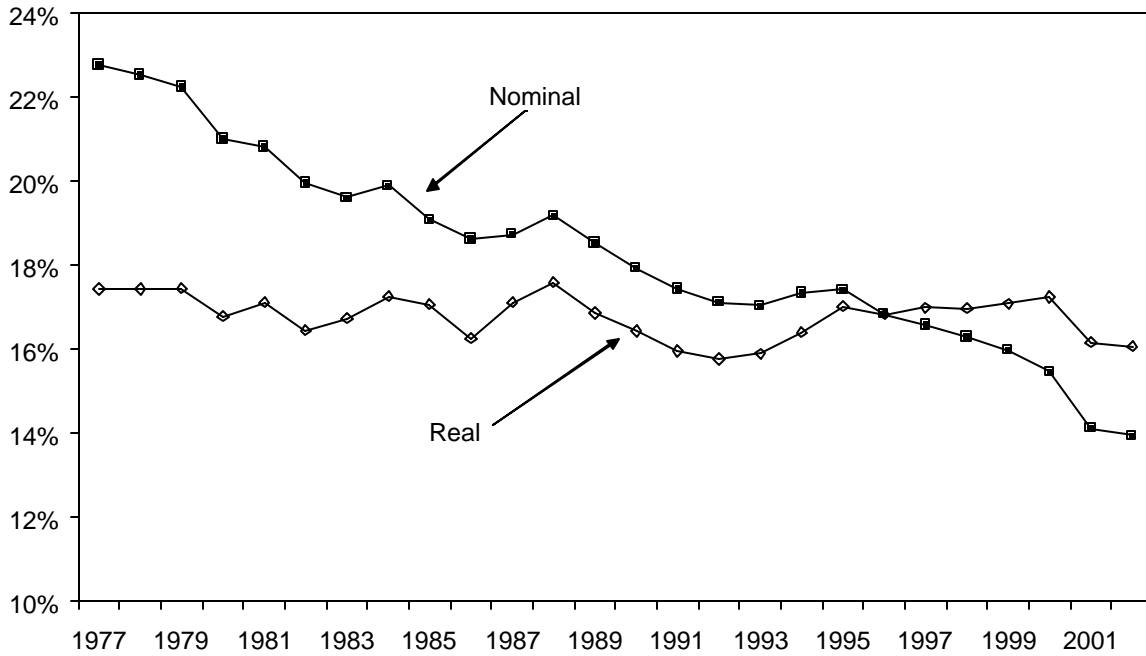
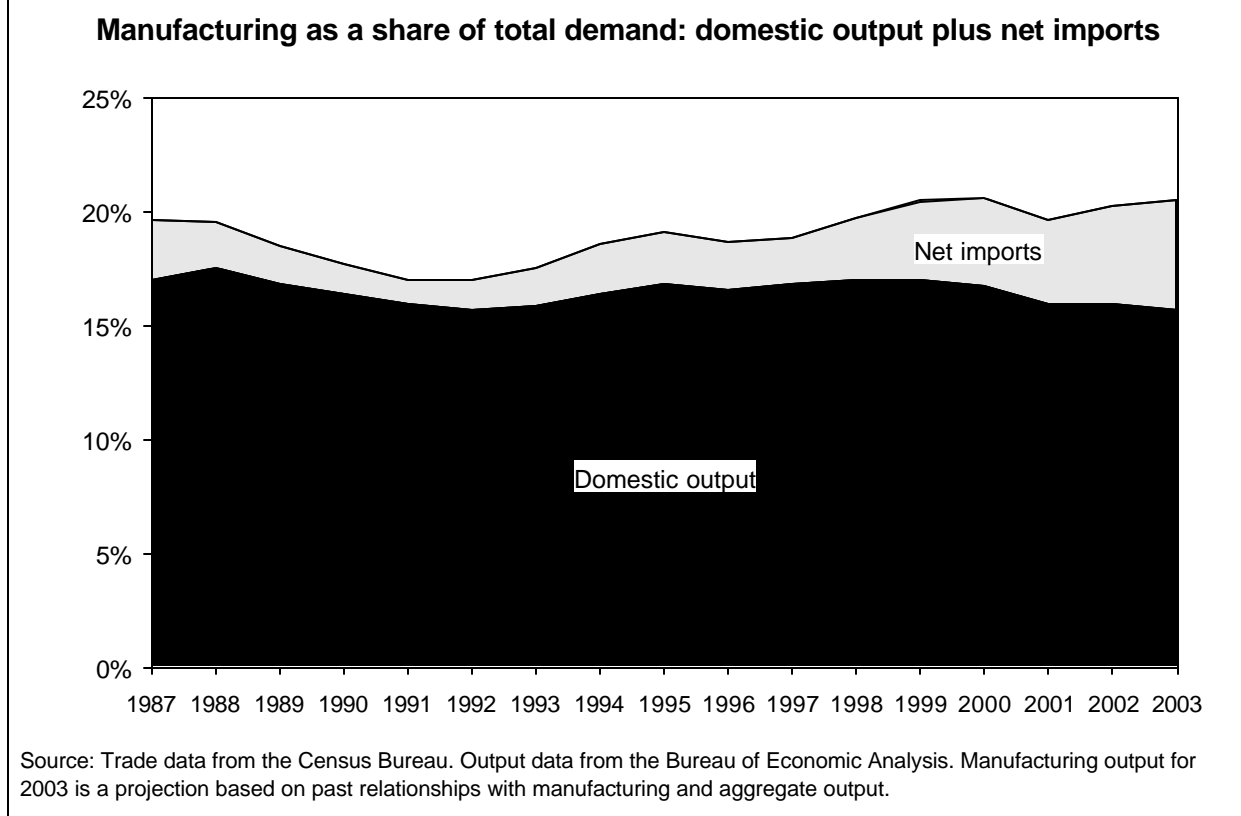Source: GDP series from the Bureau of Economic Analysis (BEA).

A recent Congressional Budget Office (CBO) report on manufacturing employment presents evidence on a long-term shift in demand away from manufacturing goods by referencing the relationship between real manufacturing output and real GDP. This, however, is the wrong comparison. **Figure 2** shows that there has actually been very little change in the domestic demand, properly measured, for manufactured goods in the U.S. economy in the recent past.

While domestic manufacturing *output* has declined as a share of GDP, there has been an enormous surge of net imports in the manufacturing sector. To measure whether or not consumers and businesses are really demanding less in the way of manufactured output, net imports as well as domestic production must be included. Figure 2 shows the share of domestic manufacturing demand as a share of total domestic demand for all goods and services in real terms. Manufacturing demand is the sum of domestic manufacturing output plus net manufactured imports into the United States (i.e., imports minus exports). Total domestic demand is GDP plus net imports of all goods and services.

Gross domestic product and the net imports of goods and services are much better representations of demand. This properly measured series is remarkably stable over time, and even increases in recent years, refuting the widely held view that there is a long-term demand shift away from manufactured goods on the part of U.S. consumers and businesses.

Given that the demand for manufacturing output has grown even faster than other demands in recent years, the hemorrhaging of manufacturing jobs has not resulted from long-run trends in spending patterns.

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FIGURE 2

Manufacturing as a share of total demand: domestic output plus net imports

Net imports

Domestic output

Source: Trade data from the Census Bureau. Output data from the Bureau of Economic Analysis. Manufacturing output for 2003 is a projection based on past relationships with manufacturing and aggregate output.

Domestic production as a share of total demand

While demand for manufacturing output has remained constant (or even grown) as a share of the U.S. economy, domestic *production* of manufactured goods has lagged this demand by a widening margin in recent years. This "wedge" between demand and production means that manufacturing purchases by U.S. consumers and businesses do not translate into expanded employment and output.

This wedge is equal to net imports. One way to measure this is to chart domestic manufacturing production as a share of total manufacturing demand over time. This measure varies greatly over the 1987 to 2003 period, but it sets new lows in every year since 1998 (see **Figure 3**). Raising this share back to its more normal historic level (for example, to 90%, the average level between 1987 and 1997) would be the single most effective lever in spurring manufacturing output and employment, with output rising 16% and employment following along closely.

Contributions to manufacturing job loss

Three influences on manufacturing employment have been identified: demand, productivity, and international trade. Examining the aggregate data on these influences reveals how much each factor has contributed to manufacturing's employment decline during various time periods. A formal accounting

FIGURE 3

Ratio of domestic manufacturing output to demand
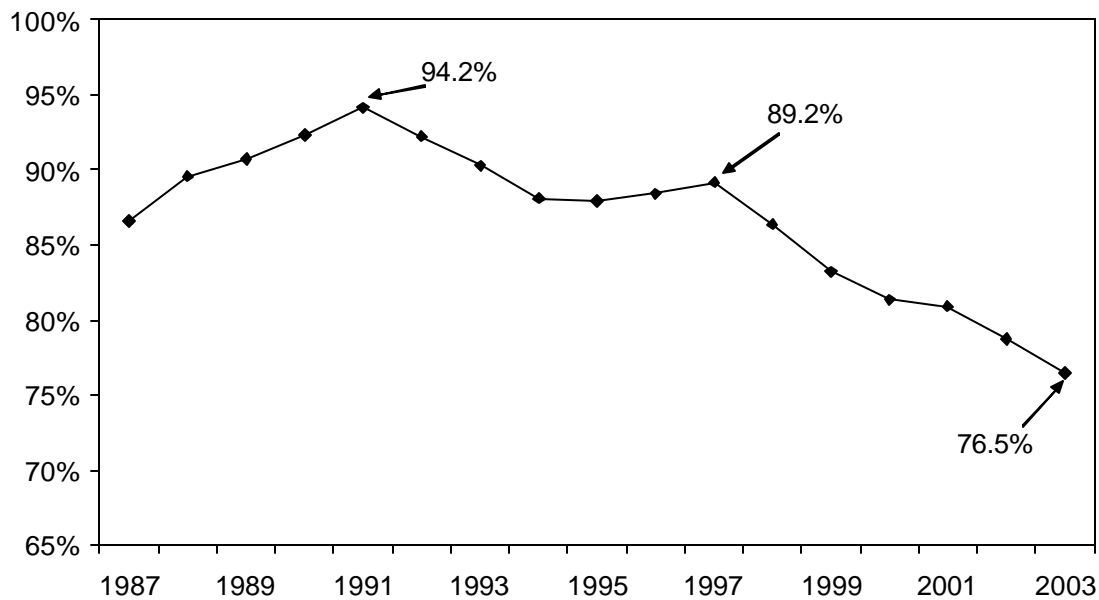
Source: Trade data from the Census Bureau. Output data from the Bureau of Economic Analysis. Manufacturing output for 2003 is a projection based on past relationships between manufacturing and aggregate output.

framework for parsing out these contributions is laid out in the technical appendix. Essentially, employment in manufacturing will rise as demand for manufacturing output rises, but will fall as productivity rises and/or domestic demand is satisfied by manufacturing imports.

Figures 4 and 5 summarize the contributions of demand growth, productivity growth, and net import growth to manufacturing employment over 1998-2003 and 2000-2003. (These figures are based on the numbers in **Table A1** in the technical appendix.)
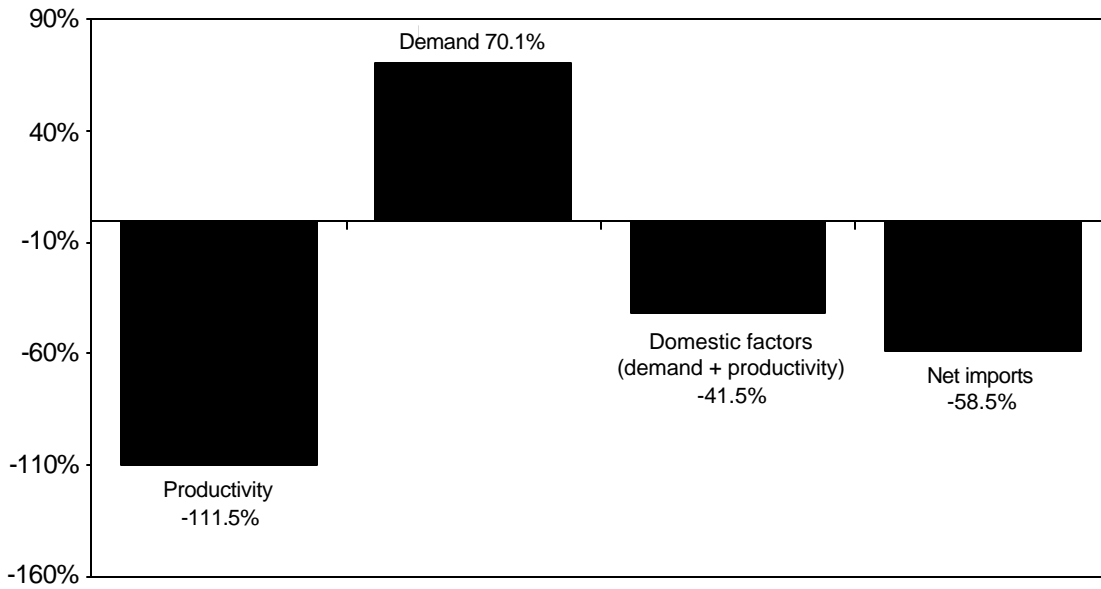
Growing net imports in this decomposition explains 59% of the decline in manufacturing employment since 1998 and 34% of the decline since 2000. Domestic factors (demand growth and productivity growth) cannot come close to explaining the total drop in manufacturing employment from 1998 to 2003. Over this period, productivity rose extraordinarily quickly in manufacturing, but so did domestic demand.[2] Even in the 2000 to 2003 period, when productivity growth was fast and the recession led to sluggish demand growth, domestic factors do not explain a large portion of the total job loss. From 1998 to 2003, 3.04 million jobs were lost in manufacturing, with rising net imports accounting for about 1.78 million of them. Between 2000 and 2003, 2.70 million jobs were lost in manufacturing, with rising net manufactured imports explaining about 935,000 of this decline.

Conclusion

The U.S. economy has been shedding manufacturing jobs since 1998, with the current level of manufacturing employment at its lowest point since 1958. Some have argued that this could be the manifestation of
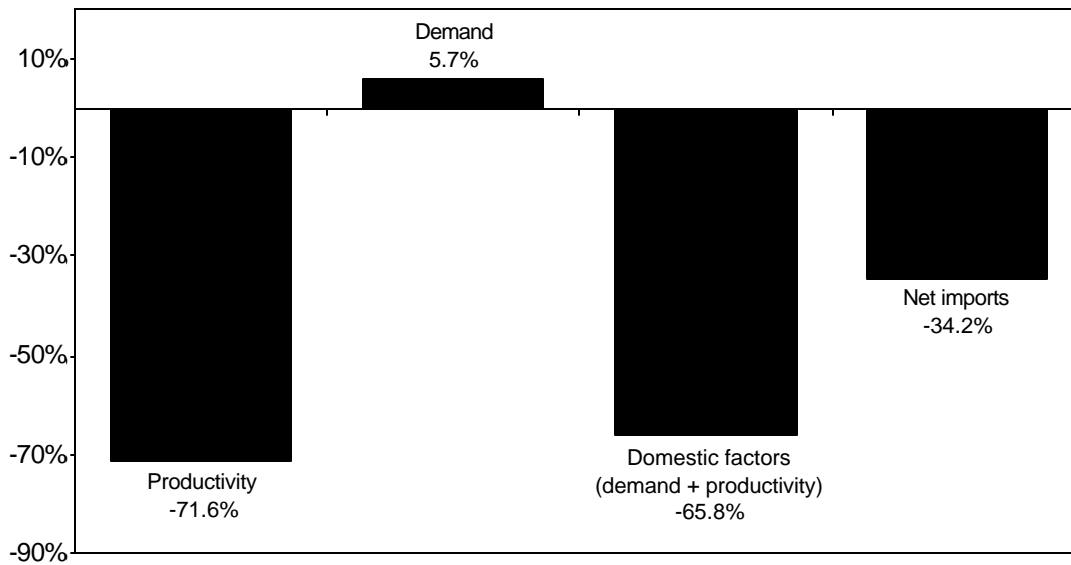
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FIGURE 4

Contributions to manufacturing employment (1998-2003)

Demand 70.1%

Productivity
-111.5%

Domestic factors
(demand + productivity)
-41.5%

Net imports
-58.5%

90%

40%

-10%

-60%

-110%

-160%

Source: See Table A1.

FIGURE 5

Contributions to manufacturing employment (2000-2003)

Demand
5.7%

Productivity
-71.6%

Domestic factors
(demand + productivity)
-65.8%

Net imports
-34.2%

10%

-10%

-30%

-50%

-70%

-90%

Source: See Table A1.

changing demand patterns and rapid productivity growth in this sector. This argument is often linked to admonitions against those who would blame international trade flows for the loss of manufacturing jobs in the United States.

It is premature to shift responsibility for the struggles of the manufacturing industry away from international trade. Demand for manufacturing output, properly measured, remains in line with the historical average of the past couple of decades. There has been no long-term shift away from the relative share of manufacturing goods in total demand. Furthermore, the domestic factors influencing manufacturing employment (demand and productivity) cannot by themselves explain the scale of job loss in manufacturing—rising trade deficits have made a significant contribution to the industry's employment decline.

The rising trade deficit in manufactured goods, which has not been compensated for by growth in other sectors' net exports, can explain 34% of the decline in manufacturing employment between 2000 and 2003. Some will argue that the trade deficit in manufactured goods is, in fact, a long-run trend in the U.S. economy that will not be reversed. The idea seems to be that the United States can afford to run large trade deficits in manufactured goods as long as it runs large surpluses in services, reflecting the shift to a post-manufacturing economy. This trade-off between manufacturing and services is theoretically possible, but given that the U.S. service surplus is 11% the size of its manufacturing deficit and that this service surplus has shrunk by 0.5% of GDP over the past seven years it is unrealistic to expect that the current enormous trade deficit in manufactured goods can be sustained through burgeoning service exports.

The manufacturing employment situation calls for attention from policy makers. First and foremost, the value of the dollar should be encouraged to fall against a wider range of currencies. In the past year, the dollar has lost almost 40% of its nominal value against the euro. Although this was a necessary adjustment, it is now time for other countries to allow their currencies to fall. A block of East Asian countries (China, Malaysia, and Taiwan) account for 30% of the total U.S. trade deficit by pegging their currencies firmly against the dollar and impeding necessary adjustments. These nations should be pressured to revalue their currencies. If these countries allow their currencies to adjust, this will relieve the competitive pressure on other nations to allow their currencies to move against the U.S. dollar as well.

There are other steps not directly related to trade that can also be taken to aid U.S. manufacturing firms. Given that much of the manufacturing industry's distress is caused by events and policies outside its own control (i.e., the overvalued dollar), it seems appropriate for policy makers to lend support to the manufacturing industry. One way to do this is for the federal government to relieve the burden of the fixed costs of U.S. manufacturing firms by picking up some legacy costs that firms have incurred for retiree health and pension benefits. Manufacturing firms are far more likely to have offered sufficient retiree health and income benefits and are now suffering financially as a result. Firms with large legacy costs should not be punished for being good employers, and workers and retirees should not be punished for economic events outside their purview.

Lastly, the proposition must be abandoned that trade is blameless for the recent loss of manufacturing jobs and that the decline in manufacturing employment is a natural phenomenon that cannot (and should not) be arrested. There is nothing desirable, sustainable, or irreversible about the present enormous trade deficits in manufactured goods that the United States currently carries.

APPENDIX 1: References on the debate over manufacturing job loss

In opposition to the view that trade has been a primary driver of manufacturing job loss, a number of economic observers have declared changing consumer demand patterns and/or fast productivity growth in the manufacturing sector to be the culprits for this job loss. The common core of these analyses is that there is little that policy makers can do to avert manufacturing's employment decline, and, more specifically, that international trade is not a contributor to this decline.

Earlier debates about the loss of manufacturing jobs brought forward the notion that manufacturing employment loss is due mainly to changing demand patterns by consumers in the United States—substituting services for manufacturing output. In this view, first put forward by Clark (1957), manufacturing's decline is the natural consequence of growth in an advanced economy. A recent Congressional Budget Office (CBO) report summarizes this view as follows:

> The share of consumer spending devoted to manufactured goods has declined over time both in the United States and in other industrialized nations. As consumers' income has risen, they have increased their purchases of good but boosted their spending on services—including medical care, notably—even more. In 2000, 42% of U.S. consumer spending was devoted to goods, down from 52% in 1979 and 67% in 1950. (CBO 2004)

Another argument put forward to explain manufacturing's decline is fast rates of productivity growth in the manufacturing sector relative to other sectors in the economy. All else equal, rapid productivity growth in manufacturing implies that fewer workers are needed to produce a given amount of output. Unless demand for manufacturing output rises quicker for manufacturing than other sectors, this rapid productivity growth will imply a decline in the *share* of workers employed in the manufacturing sector. Manufacturing's share of total employment has indeed steadily declined through the years, giving some ring of truth to the rapid productivity growth rate argument.

Berry (2003) is typical of this view, arguing that "most [manufacturing jobs] by far were eliminated because companies used new technologies, management techniques, and other methods to achieve huge gains in productivity." He continues by stating that "the jobs lost to productivity gains will not come back, regardless of what policy makers do in Washington."

Federal Reserve Chairman Alan Greenspan has blamed manufacturing employment's decline on the combination of demand and productivity:

> The loss of jobs over the past three years is attributable largely to rapid declines in the demand for industrial good and to outsized gains in productivity that have caused effective supply to outstrip demand. (Greenspan 2004)

Manufacturing job loss and trade

There has long been a debate about the relationship between international trade and the loss of manufacturing jobs in the U.S. economy, started largely by Bluestone and Harrison (1982). Most economists have taken the stand that trade flows play a trivial role in the loss of manufacturing jobs in the American economy (Rowthorn and Ramaswamy 1999, Krugman 1994, Lawrence and Slaughter 1993). Implicit (at least) in their arguments is that the decline of manufacturing work in the United States is a natural part of a growing economy, and one that would occur regardless of trade flows.

Even economists who believe that domestic factors (changing demand patterns and rapid relative productivity growth) explain the lion's share of manufacturing's decline acknowledge that trade flows theoretically can impact manufacturing employment, as identified by Rowthorn and Ramaswamy (1999):

> More recent studies seeking to explain the declining share of manufacturing employment , such as for instance those by Sachs and Shatz (1994), Wood (1994 and 1995) and Saeger (1996) broadly concur with the importance assigned to "internal" factors in accounting for deindustrialization. They recognize, however, that "external" factors such as the growth of north-south trade may also have played a significant role in accelerating the decline of manufacturing employment. (Rowthorn and Ramaswamy 1999)

The same CBO report that identifies internal factors as driving manufacturing's decline also recognizes this: "A portion of the long-term decline in employment some manufacturing industries can be linked to the expansion of trade" (CBO 2004).

In essence, the argument is not *whether* international trade contributes to manufacturing job loss, rather, it is *how much* trade has contributed recently. This paper attempts to provide a framework for answering this question.

TECHNICAL APPENDIX: Accounting framework for decomposing domestic and net imports' effects on manufacturing job loss

A familiar identity in economics relates employment, output, and productivity.

$$(1) \quad Y = yL$$

Y in this case is output, *y* is productivity, and *L* is employment. Output is often assumed equivalent to demand. Over the long-run, output and demand will equalize, yet long periods of time can pass with output diverging from demand, even in the aggregate economy, let alone for specific sectors.

This identity is updated to reflect the fact that domestic output is not always and everywhere equivalent to demand:

$$(2) \quad dY_d = yL$$

Y_d is domestic demand, while *d* represents the ratio of domestic output to domestic demand. Domestic demand is the sum of domestic output in manufacturing plus net manufactured imports (imports minus exports). This expression is the proper representation of demand for manufacturing output in the U.S. economy. The ratio *d* is domestic output divided by this demand figures. *L* and *y* remain the same as before.

Expression (2) can be expressed in rates of change as follows:

$$(3) \quad \hat{d} + \hat{Y}_d = \hat{y} + \hat{L}$$

Then, re-arranging terms gives us a simple expression for employment growth:

$$(4) \quad \hat{L} = \hat{Y}_d - \hat{y} + \hat{d}$$

The first two terms on the right-hand side of (4) are domestic demand growth and productivity growth. The difference between their influences on employment is referred to in this paper as "domestic" factors. The last term on the right-hand side (*d*) is the gap between manufacturing output and demand, and is equivalent to *net import growth*.

The levels and changes from 1998-2003 and 2000-2003 for each of these influences, as well as the contributions of the right-hand side terms of (4) to manufacturing employment loss are presented in **Table A1**.

The data on employment, productivity, and output come from the Bureau of Labor Statistics (BLS) manufacturing productivity series and are expressed as indices. The ratio of domestic output to demand is calculated by dividing the output series from manufacturing compiled by the Bureau of Economic Analysis by the sum of this output series plus net manufactured imports (imports minus exports) data from the Census Bureau's foreign trade statistics measures.

In each period, the combined influences of domestic factors and net imports tend to slightly *overexplain* the fall in manufacturing employment (see the column titled "residual"). To get the final numbers for this paper, it is assumed that this residual reduces the contribution of each influence on manufacturing employment proportionately. The numbers reported in the text are then the numbers for each influence in the table mulitplied by *(1+residual)*.

This analysis makes a couple of simplifying assumptions. The first is the assumption that all current demand has to be satisfied by current production. In fact, some demand will be met through selling goods that are stored as inventory, while some current production will not be sold in the same period it is produced and will instead end up as inventory itself.

Data on inventories through 2003 are not available, so this paper assumes that inventory/sales ratios have remained constant over the periods in question. This could be untrue, but it still seems unlikely that this changes the results implied by the accounting framework in any serious fashion.

TABLE A1
Demand, productivity, and net imports:
levels, percentage changes, and contributions to employment loss

				Percentage change	
VALUES	1998	2000	2003	1998-2003	2000-2003
(1) employment (index, 1992 = 100): (L)	104.6	102.5	86.4	-17.4%	-15.7%
(2) ratio of output to demand: (d)	86.4%	81.4%	76.5%	-11.5%	-6.0%
(3) domestic output (index, 1992 = 100): (Y_d*d)	130.7	138.6	131.6	0.7%	-5.1%
(4) domestic demand (index, 1992 = 100): (Y_d)	151.3	170.3	172.1	13.7%	1.0%
(5) productivity (index, 1992 = 100): (y)	125.0	135.3	152.3	21.8%	12.6%

Implied employment changes,	(Thousands of jobs)		(Share of total)	
all else equal, resulting from:	1998-2003	2000-2003	1998-2003	2000-2003
(6) productivity growth: (5)/(1)	-3,810	-2,190	-125.5%	-80.0%
(7) demand growth: (4)/(1)*(-1)	2,392	175	78.8%	6.4%
(8) domestic factors: (4) + (5)	-1,417	-2,015	-46.7%	-73.6%
(9) net import growth: (2)/(1)*(-1)	-1,998	-1,045	-65.8%	-38.2%
(10) domestic factors + net imports	-3,415	-3,060	-112.5%	-111.8%
(11) acutal employment loss	-3,035	-2,738	100%	100%
(12) residual	-380	-322	-12.5%	-11.8%

Implied employment changes,	(Thousands of jobs)		(Share of total)	
all else equal, constrained to 100%	1998-2003	2000-2003	1998-2003	2000-2003
(13) productivity growth: [(5)/(1)]*(11/10)	-3,385	-1,960	-111.5%	-71.6%
(14) demand growth:](4)/(1)*(-1)]*(11/10)	2,126	157	70.1%	5.7%
(15) domestic factors: (4) + (5)	-1,259	-1,803	-41.5%	-65.8%
(16) net import growth: [(2)/(1)*(-1)]*(11/10)	-1,776	-935	-58.5%	-34.2%
(17) domestic factors + net imports	-3,035	-2,738	-100.0%	-100.0%

Source: Employment, output, and productivity indices from the Bureau of Labor Statistics productivity series. Ratio of output to demand same as Figure 3. Total domestic demand is output divided by ratio of output to demand.

The second simplifying assumption is that increases in demand lead to a proportionate increase in the number of *employees*, not just the number of *hours*. If there is room to increase the hours of *current* manufacturing employees, then some of the increase in demand that could be spurred through lower net imports will not lead to proportionate gains in new hires—some of it will be met through higher hours.
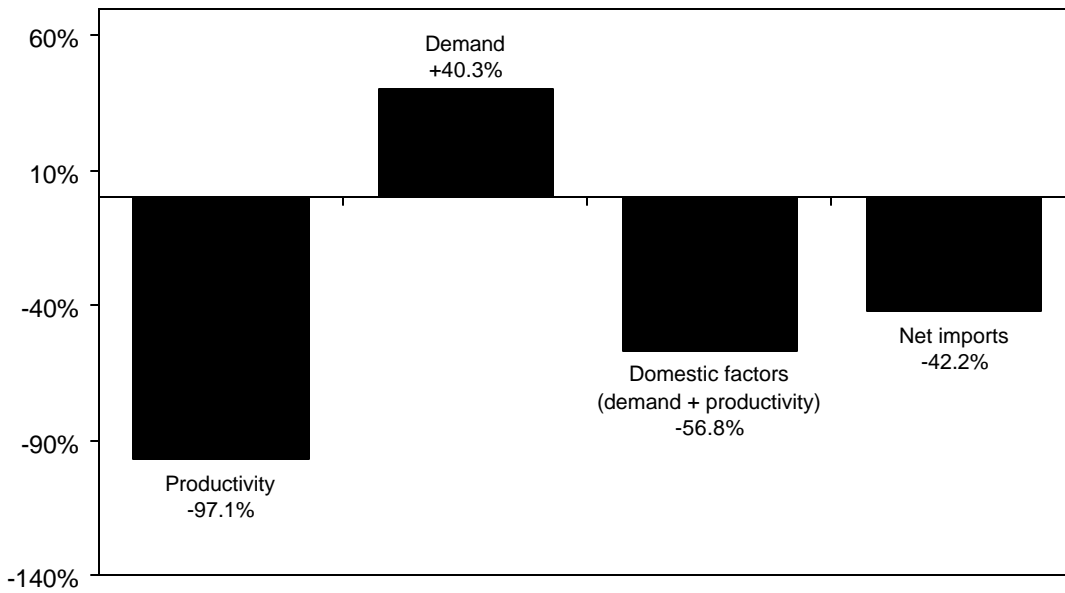
There could be some room for hours to expand in the manufacturing sector—average weekly hours are down by about 2% since 2001 in this sector. Again, however, it seems unlikely increasing hours could soak up any significant increase in manufacturing demand that was spurred by serious improvement in the manufacturing trade balance.

The finding that trade has had large effects on manufacturing employment is not affected by the choice of end-points. **Figure A1** shows the same analysis performed for the 2001-2003 period. Net imports actually account for a larger portion of the employment loss in manufacturing for this period, as demand began rising briskly again in the years after 2001 and then fell back afterwards. Rising net imports account for 42% of the 1.9 million jobs lost from 2001 to 2003 (about 897,000 jobs).[3]

During the 1987 to 2003 period (the data window we have on this accounting framework), there are only very short spans of years in which the share of manufacturing demand satisfied by domestic output has consistently risen. One such span was between 1987 and 1989. During this time, manufacturing employment rose by about 2.3%. The employment-depressing effects of rising productivity (domestic factors) were more than counterbalanced by a rising share of domestic output to demand (falling net imports).
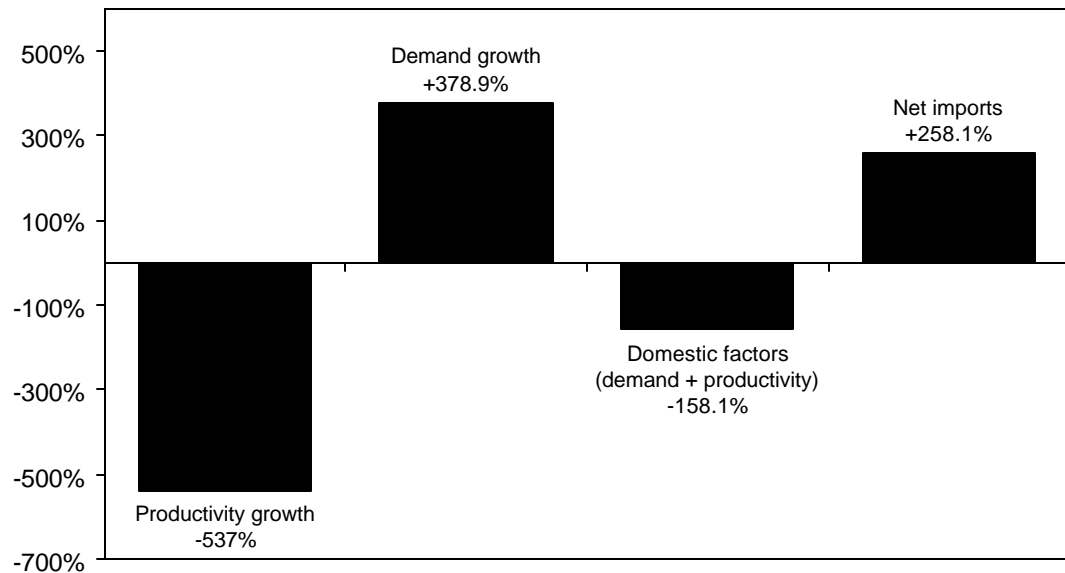
FIGURE A1

Contributions to manufacturing employment (2001-2003)

Demand
+40.3%

Net imports
-42.2%

Domestic factors
(demand + productivity)
-56.8%

Productivity
-97.1%

60%

10%

-40%

-90%

-140%

Source: Employment, output, and productivity indices from the Bureau of Labor Statistics productivity series. Ratio of output to demand same as Figure 3. Total domestic demand is output divided by ratio of output to demand.

FIGURE A2

Contributions to manufacturing employment (1987-1989)

Demand growth
+378.9%

Net imports
+258.1%

Domestic factors
(demand + productivity)
-158.1%

Productivity growth
-537%

500%

300%

100%

-100%

-300%

-500%

-700%

Source: Employment, output, and productivity indices from the Bureau of Labor Statistics productivity series. Ratio of output to demand same as Figure 3. Total domestic demand is output divided by ratio of output to demand.

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Endnotes

1. It should be noted that due to the technical issues that arise when using chain-weighted measures of real output, there is a problem in doing this sort of comparison of shares across time. However, for the short timespan highlighted in this paper (1998-2003), the chain-weighting seems unlikely to make a substantial difference in the point being depicted.

2. It should be noted that this is not completely unexpected: fast productivity increases lead invariably to lower relative prices for manufactured goods, which should increase demand for them. Demand for manufactured goods would have to be extraordinarily unresponsive to price changes (or, in the jargon, to have a very low price elasticity of demand) to not compensate in a significant way for the rapid productivity increases in generating employment.

3. Experiments were performed using different measures of productivity and output obtained from the Bureau of Labor Statistics (BLS) program on international productivity comparisons. This measure uses the value-added output measure constructed by the Bureau of Economic Analysis (BEA), which is only currently available for manufacturing through 2002. The measure of output reported in Table A1 is a "sectoral output" measure, which includes intermediate non-manufacturing inputs into production.

   This value-added measure of output behaves a bit differently than the one reported above, in ways that cast doubt on their strict comparability. However, substituting in different output and productivity measures does *not* change the outcome that rising trade deficits are a prime contributor to job loss. Over both the 1998-2003 and 2000-2002 periods, trade's contribution to job loss is at least as large using the value-added output measure as is reported in Table A1.