

## Decline of Manufacturing: “Why worry?” May 25, 2011

Some analysts dismiss concerns about the decline in manufacturing jobs by highlighting large productivity gains in manufacturing. They point out that manufacturing’s share of value added has not fallen as much as jobs. They also note large manufacturing profits. In some cases, they draw comparisons with the decline in agricultural employment in the first half of the 20<sup>th</sup> century.

Productivity gains in manufacturing have been large and real value added has not fallen much. Manufacturing’s share of real value added declined from 12.1 percent in 1998 to 11.4 percent in 2009, and all of this decline is attributable to the recession. Manufacturing’s share of total real value added was 12.2 percent in 2008. However, this picture of stability is very strongly influenced by the computer and electronics industry, for which the share of real value added is estimated to have increased from 0.4 percent in 1998 to 2.1 percent in 2008 and 2009. Almost every other manufacturing industry saw its share of overall value added decline; one notable exception was petroleum and coal.

The rise in value added is due in large part to major quality improvements in computers. These “output” gains are characterized as a decline in computer prices. Because the capabilities of the computers of the past were much lower than the computers of today, we treat them as much higher cost and deflate historic computer output by a much higher price index to derive a measure of real value added that is comparable to today. If we look at nominal value added, we see a modest decline in the computer industry’s share of value added, from 1.7 to 1.5 percent, rather than a sizable increase and a much more pronounced decline in the value added of the total manufacturing sector – from 15.1 percent of value added in 1998 to 12.1 percent in 2007 and 11.2 percent in 2009.

The point is not that the quality improvements and productivity gains in computers and some other manufacturing industries are not real. But the large increase in estimates of real computer value added and the modest decrease in real manufacturing value added present a somewhat misleading impression of the state of the industry. One would generally associate increases in real value added with an expanding industry. One would expect to see strong growth in dollar sales. But that is not the case for computers.

The dollar value of gross computer output was almost 20 percent less in 2009 than in 1998. Gross output was down substantially even before the recession. Nominal value added did not actually fall, however. A second unusual feature of the computer industry and one that may distort impressions of the industry’s contribution to the U.S. economy is that the dollar value of intermediate inputs to computers has fallen dramatically. Value added equals gross output less

intermediate inputs. In the case of computers, nominal gross output has declined by about 20 percent since the late 1990s but the nominal value of intermediate inputs has fallen close to 50 percent. This has left a modestly higher nominal value added, which has gone primarily to operating surplus and profits, with some increase in compensation in the form of rapid wage growth. The number of workers in the computer industry has fallen sharply.

This pattern is consistent with the story of the U.S. computer – and other high technology industries – focusing more on research and development and relying on low cost imports for more routine components and parts. Thus, Apple imports much of its product from abroad – yet under the Apple name. Apple makes large profits from being able to sell a high quality product that is produced at low cost abroad. U.S. manufacturing gets credited for big productivity gains for the increase in output delivered by the Apple product. But our system does not fully recognize that a lot of the profit comes about because low cost foreign producers are substituting for higher cost American suppliers. The missing piece in the puzzle is that we are attributing all the productivity gain from higher quality to the home U.S. Apple, whereas key enablers are the foreign producers. And it will be a battle over time to see who captures these gains. But it is doubtful that it will be American workers.

The sharp fall-off in spending on intermediate inputs is not characteristic of manufacturing generally. A few industries show similar, but much less pronounced tendencies, and for others, the value of intermediate products has increased relative to gross output.

The point is simply that we should not dismiss concerns about the decline of manufacturing because real value added has not declined. These figures are strongly influenced by developments in one particular industry that has very unusual features that may present a misleading picture of what is actually taking place.

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Added August 19, 2021: Data were calculated in 2011 using the Industry Economic Account Data interactive tables on the website of the U.S. Bureau of Economic Analysis ([www.bea.gov](http://www.bea.gov))