

Overseas Manufacturing and the Smiley Curve¹

Every iPhone is "Designed by Apple in California; Assembled in China." A 2010 study examined where the various parts of the iPhone originally came from, which shows us how much China gets from manufacturing (or more accurately, assembling) products, and how much money the designers & retailers of the products actually make.

A good way to understand how Apple (and the United States as a whole) benefits from products sold in America, designed in America, but manufactured overseas, is the Smiley Curve, which illustrates profit margins in the various areas of a product's lifetime, from product design to the ultimate sale to a consumer. American companies still enjoy a huge amount of revenue, even when a product is made in a foreign country. The components of the iPod were analyzed, and a surprising conclusion was arrived at. Hardware for the iPod costs \$144 (the largest bits being the hard drive and the display). For sales in retail outlets, Apple's profit was \$80; with the rest being \$30 for distribution and another \$45 for retail.

The significance is that China's activity is in the middle stages--manufacturing, plus some component supply and engineering design--but America's is at the two ends, and those are where the money is. The smiley curve, which shows the profitability or value added at each stage, starts high for branding and product concept, swoops down for manufacturing, and rises again in the retail and servicing stages.

This can be seen in the following table, documenting the various costs of the iPhone, current as of 2010. Apple's revenues were even greater when the iPhone was delivered to customers when part of a mobile phone service package:

Apple's iPhone 3G Revenues when Distributed via Mobile Carriers	
Hardware	\$172.46
Manufacturing/assembly	\$6.50
Cost to mobile carriers of the iPhone 3G	\$500 (8 gb) & \$600 (16 gb)
Apple's Revenues	\$275/\$360

Other examples: A carrying case for an audio device from a big-name Western company retails for just under \$30. That company pays the Chinese supplier \$6 per case, of which about half goes for materials. The other \$24 stays with the big-name company. An earphone-like accessory for another U. S.-brand audio device also retails for about \$30. Of this, \$3 stays in China.

¹ This first page has excerpted and summarized "How the iPhone Widens the United States Trade Deficit with the People's Republic of China," by Yuqing Xing and Neal Detert, ADBI Working Paper No. 257.

US Multinational Corporations Investing Abroad

Studies show that when US multinationals invest abroad, they also invest at home as well. Why would this be the case? Firms combine home and foreign production to generate final output at a lower cost than would be possible in just one country, resulting in increased output and profits. Capital spending is investment in hard goods such as land, factories, and equipment.

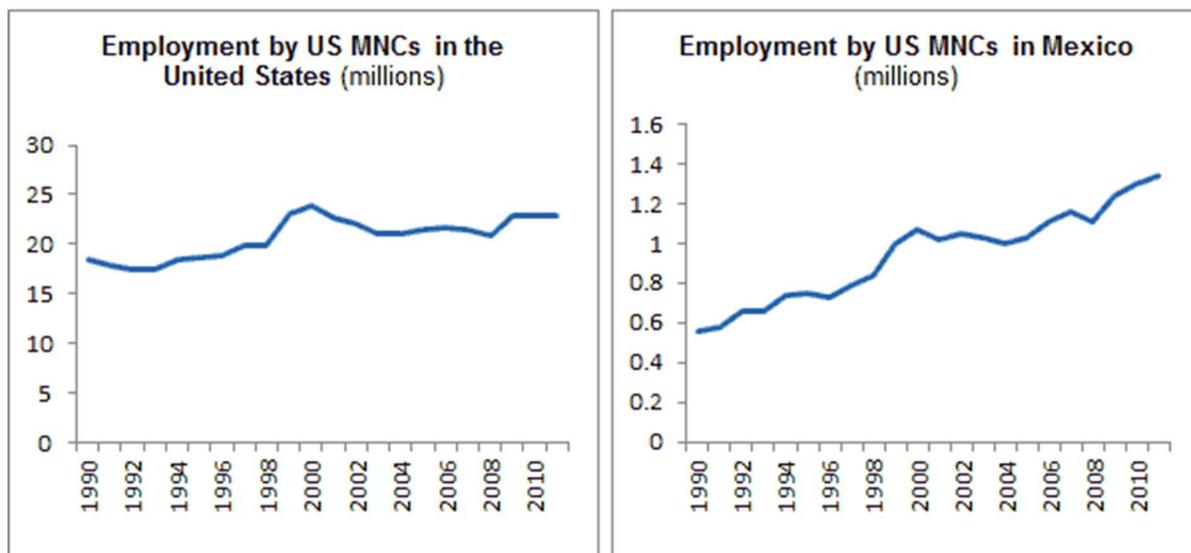
US Department of Commerce (Bureau of Economic Analysis) reports from 2008 & 2017 show the following numbers, from 1983 to 2007. **For every dollar US multinationals were investing overseas, they were still investing over three dollars in America.** The takeaway is that both domestic and foreign investment rose together.

US multinational capital investments	1983	2007	2016	Increase (1983 to 2016)
Foreign	\$36 billion	\$170 billion	\$215 billion	\$179 billion
Domestic (US)	\$160 billion	\$495 billion	\$713 billion	\$553 billion

When US companies hire abroad, how does that impact US jobs in those same companies?

Further, when multinationals hire abroad, they also expand employment here at home. The graphic below displays employment by US based multinational corporations, both here and in Mexico. You can see that as these corporations invested in Mexico and created jobs there (see the graph on the right), they were also doing the same thing in the US—investing and creating jobs (the graph on the left).

Figure 2 Employment by US multinational corporations (MNCs) in the United States and at affiliates in Mexico



Source: US Bureau of Economic Analysis.

Please note that two downward blips in the left hand graph coincide with recessions, one from 2000 onward, the other from 2008-2009. Those downward swings were not caused at all by hiring abroad, but by decreasing demand inside the US, by recessions in America.

To use an American multinational on everyone’s minds—Apple—let’s look at how Apple’s US and foreign employment have both changed in recent years.

Employees of Apple	Employed in the US	Employed in foreign countries
2012	43,000	20,000
2017	77,000	46,000

As you can see from the table, both numbers have gone up. And it is easy to see how these two numbers would go up together. If Apple is increasing its employment overseas (in assembling products, or selling them), it would also be interested in designing these products, and of course, in selling them to more and more Americans (advertising and retail outlets). Why just sell iPhones in China, when you can sell them to Chinese and American consumers? And just as importantly, if Apple is investing more resources in the United States to create more products, why not also increase their presence around the world, to sell them in other nations as well?

Decline in American Manufacturing?

There are many voices in the media lamenting a so called “decline in US manufacturing,” but the numbers simply don’t bear this out. US manufacturers have ridden a secular wave higher and higher, and have shown no sign of stopping yet. In fact, at \$6 trillion, if **US manufacturing was its own country, it would have the third largest economy (GDP) in the world**, behind only the rest of the US, and China. To show how the US manufacturing base has grown steadily in recent years, let’s start with the early 1990s, when NAFTA went into effect. When NAFTA was passed, many predicted the demise of American manufacturing, because of competition from Mexico. But the exact opposite has taken place. US Manufacturing reached a record \$3 trillion in 1993. And in 1994, NAFTA was implemented. But instead of declining, that \$3 trillion figure steadily rose, until 2008, when it hit \$5.5 trillion. There was a slight drop because the Great Recession, but the recent years 2012 through 2017 **have all been higher** than that 2008 peak. So clearly, there has not been a decline in US manufacturing.

Although some Americans decry the presence of “Japanese cars” on our roads and freeways, the fact of the matter is that in the first half of 2018, 7 of the top 8, and 16 of the top 20 selling trucks and cars were made in the US. The other four (Toyota Rav4, Honda CR-V, Nissan Sentra, and Chevrolet Equinox) were made in Canada or Mexico. Apart from the Rav4, the CR-V, and the Sentra, the other so-called “Japanese cars” on the list were all made in America: the Toyota Camry, Corolla, Highlander, and Tacoma; the Honda Civic and Accord; and the Nissan Altima.

How about jobs in manufacturing?

Now what has not increased along with US manufacturing sales and production, has been employment. In 1965, there were 16.5 million Americans employed in manufacturing. That number peaked in 1979 at 19.4 million, dropping to 11.5 million in 2010 during the Great Recession. But from that point, it has started rising again, to 12.3 million in 2015.

It is common for people to blame imports for this loss in jobs. In reality, it is much more accurate to blame rises in productivity per worker, which is really brought about by increased automation. We simply don't need as many workers in manufacturing as we did before.

	2003	2015
US Vehicle Production	12,115,000	12,100,000
US Auto Industry Employment	1,300,000	900,000

This connection between a decline in the number of workers needed in a sector of the American economy, and increasing productivity is not just part of manufacturing. It is also part of the story of American agriculture. In 1910, the US produced 685 million bushels of wheat, on 45 million acres planted (total US agricultural labor force was 11.5 million). In 2002, the US, still with 45 million acres of wheat fields, produced 1.95 *billion* bushels of wheat—and the total US agricultural work force was only 716 thousand