

## The Effect of Globalization and Mechanization on Employment in the U.S.

The loss of American jobs, particularly in manufacturing, was an important issue for both political parties in the last election, although the many candidates had different ideas about how to deal with the problem. Employment in a modern society is a complex issue, not easily addressed. For example, every workday in the US about 75,000 workers will lose their jobs. Many, if not most of them, will find new jobs relatively quickly, for some it will take longer, but some will give up and leave the labor force. At the same time, every workday thousands of new workers will enter the labor force. This means that over any given time period, there is a constant flux of workers, both in and out of the workforce and between growing and shrinking industries. Add to this the movement of some labor-intensive jobs overseas and employment dynamics become very complicated.

Since the 1930s, when the number of workers in agriculture, manufacturing and services was roughly equal, the distribution of workers among these three sectors has radically shifted. Agricultural employment was the first to decline, now making up less than 5% of all workers. After the 1940s, the percentage of workers in services and manufacturing rapidly diverged. The percentage of American workers in manufacturing peaked in the late 1940s. Today services employ more than 75% of all workers and manufacturing about 20%. However, real output per worker in manufacturing is considerably greater than output per worker in services.

This trend in employment doesn't mean that manufacturing has declined as a share of GDP. It is still the largest single sector in the American economy, although it has been surpassed in total by all services taken together. Nonetheless, the absolute level of real manufacturing output is near an all time high.

A key point is that manufacturing employment has fallen even as the value of manufacturing output has continued to grow. The principal reason is massive increases in productivity due to mechanization and automation. This means in turn that labor's share of output has fallen, because productivity gains have gone mainly to capital. This raises a key question: if a worker's output increases because of automation, how should the increase be allocated? Without the machine, output would not have increased, but without the worker, the machine is worthless. Over the last 20 years, the increase has gone mainly to the machine—to profits.

Perhaps the best example of this dynamic is not in manufacturing, but coal mining. Employment in coal mining fell sharply from 1985 to 2000 (it has risen slightly since then). This fall was due primarily to two factors: (1) a shift from deep shaft mining to less labor intensive strip mining and (2) a rapidly declining price of natural gas, which has become the go to power source for electricity generation. Strip mining is machine intensive, requiring fewer workers to produce a ton of coal. Cheap natural gas is the analog of the effects of cheap foreign labor on manufacturing. The point is no matter what we do, employment in the coal industry will never equal the levels we saw in the 1980s.

The problem facing the coal industry is not unique: automation is rapidly reducing employment across a wide range of industries: from car manufacturing to computing, robots and artificial intelligence are increasingly taking over roles traditionally performed by humans. In banking and retail, computers and scanners are displacing human workers. The movement abroad of industries from semiconductors to clothing means that jobs in those industries are lost. A market economy ensures that companies go where the profits take them. Increasingly, this means fewer employees in the industries that remain and lost jobs in industries that move production overseas. There appears to be wide agreement that we don't like this outcome very much. The question is what do we do about it?

Two approaches seem to dominate: bring back the jobs or assist those who are displaced. The first approach centers around two strategies— (1) the federal government should punish companies who move production overseas and/or (2) place tariffs on foreign produced goods in an attempt to shift production back to the US.

The first strategy would bring little leverage except in cases where the company does substantial business with the federal government. And even there the bulk of such business is done through competitive bidding and American production would have to be made a factor in bid evaluation. Beyond small gains from presidential jawboning, this approach would seem to be of limited value.

The second strategy—raising tariffs on foreign produced goods—has been more widely discussed. It is important to raise a few points on why dramatically raising import tariffs is a bad idea. First, higher tariffs would harm the American consumer. This is simply because if imports turn out to be more expensive than before, it is the American consumers, and no one else, who will have to pay for the extra tariff that will be added to goods' price tags. Alternatively, one may think, Americans can start consuming more local goods. However, if these goods were being imported before, it is because American producers were not competitive enough to begin with; therefore, the American goods are already more expensive. Also, in the absence of foreign competition, American producers would have an incentive to raise prices; therefore further reducing the purchasing power of consumers.

In addition, imposing tariffs would not unequivocally protect American workers. By increasing import tariffs on other countries, the U.S. will be more prone to retaliations by its trade partners. Other countries could decide to retaliate by increasing their own import tariffs, putting American jobs in jeopardy. This is important to consider, as most of the countries that export to the U.S. also import from the U.S. (China, Canada, and Mexico being the top three).

Balancing our domestic economic needs with the global economic demands is a challenge that often involves political as well as economic policy decisions. Some suggest that the U.S. should develop economic policies that focus on protecting workers who are at risk, rather than their jobs. Such policies should aim to do two things during difficult transitions: (1) help workers get through the hard times and (2) help workers, both current and future, become more flexible and adaptive in skills so they meet the kinds of job-market changes that the global economy demands.

The core problem is that labor market disruption has grown more frequent and pervasive than before. "Dislocation" is no longer an incidental "bug" in the labor market system but a feature of it, at a scale not seen since the 1930s. It says something, for instance, that McKinsey & Co. concluded that 60 percent of all occupations are at risk of partial or full automation given current technology. This environment is creating pervasive anxiety and visiting dislocations on employees and regions that have far reaching impacts.

The nation's present set of relevant programs is well intentioned and helpful. The problem, though, is that while adjustment is hard in any event, the programs are modest in scale and disjointed and often reactive in structure and effect. Here are some of the issues:

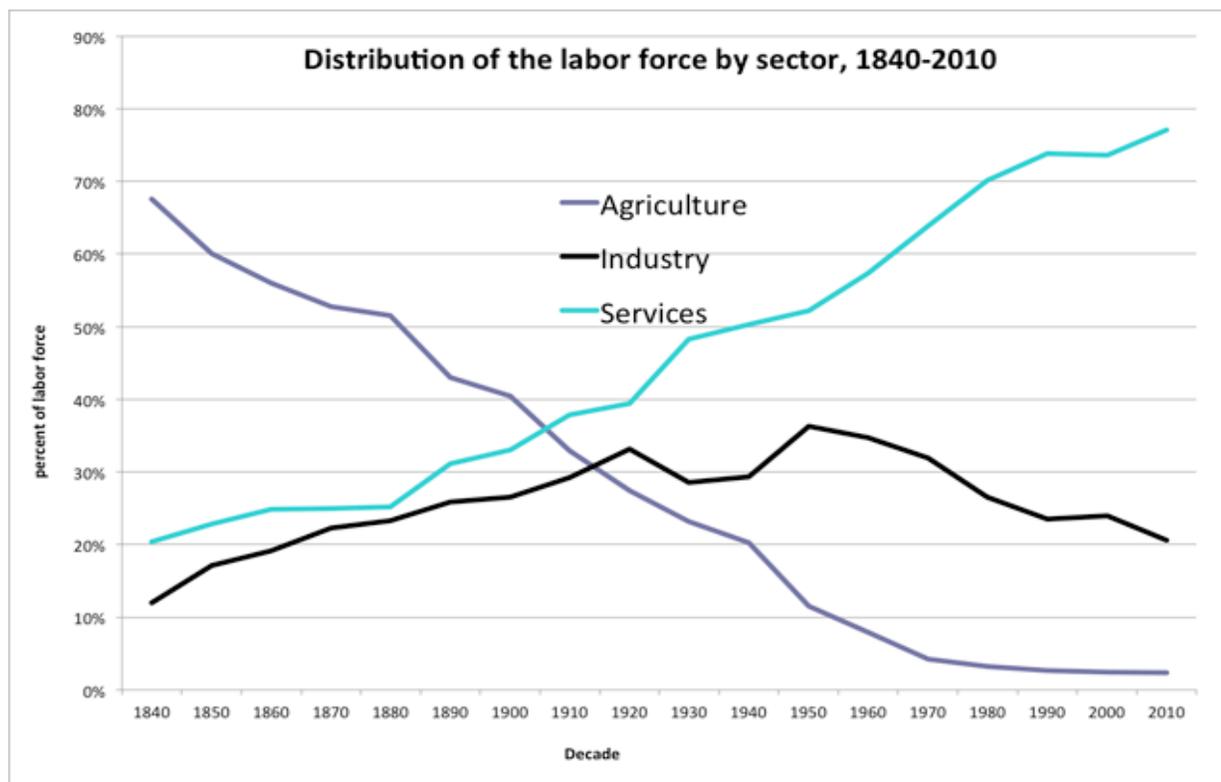
Currently, other industrialized countries spend much more than the United States does on labor-market adjustment programs. Relative to five other industrialized peers the nation's adjustment offerings are not just small but overly segmented. The programs address

particular challenges with multiple discrete, small-bore programs focused narrowly on individual causes of disruption.

Perhaps the greatest concern is that the programs provide help only after the fact—and in increasingly old-school circumstances. Tuition, counseling, and training, for example, are usually made available only after a plant has closed or workers have been laid off. Moreover, the dated assumptions of the programs tend to tilt them toward tangible manufacturing dislocations when much broader sources of labor market disruption are now resulting from game-changing technologies (like robotics and automation) or disruptive business models (such as those powered by online digital platforms for freelance worker matching). Similarly, the available programs do not reflect recent thinking that suggests that government should do more to help people who want to physically move to areas with more jobs and opportunity.

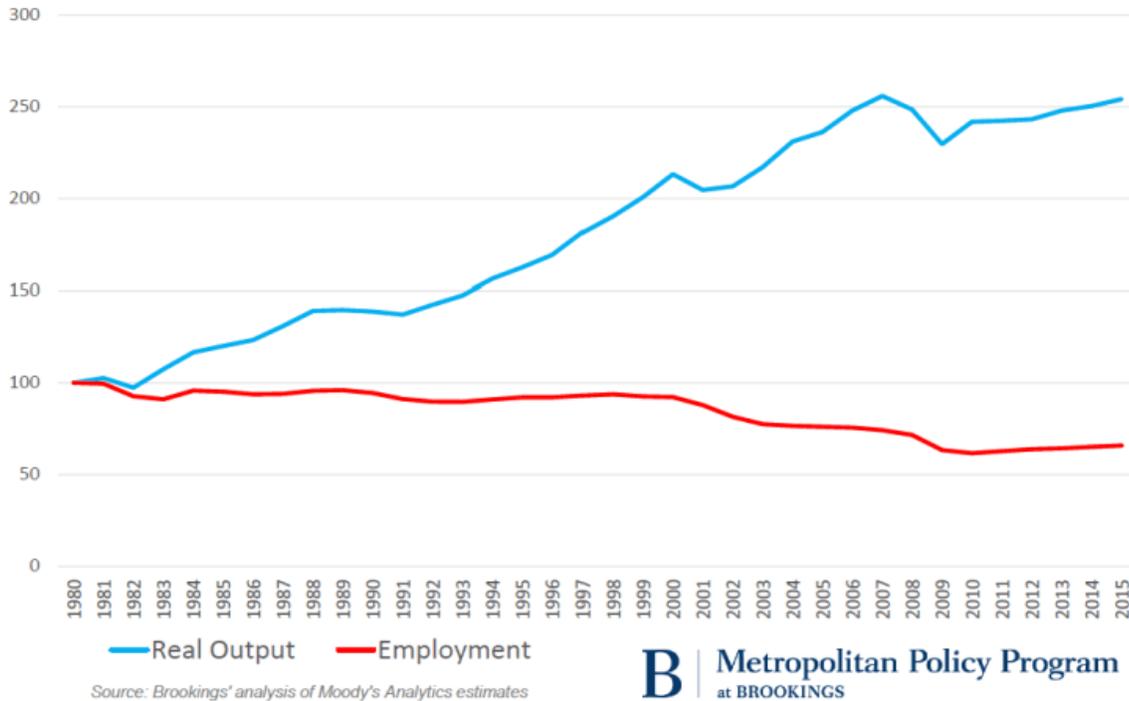
The simple fact that the United States operates at the forefront of globalization and radical technology change argues for a greater level of effort for adjustment activities. U.S. expenditures for adjustment efforts as a share of GDP should at least be on a par with those of other advanced economies such as Canada or the United Kingdom. Benefits and programs should also be big enough to be meaningful and to change lives.

Realistically, there is no way to stem the tide of globalization and automation. The gains to the rest of the world have been significant. Across the globe income inequality is falling. To be sure many American workers have suffered from geographical movements of production and increased automation. Their plight should not be ignored. But the cure should not be worse than the disease. America is a rich country and can afford to fund the transition of workers who are affected by these forces.

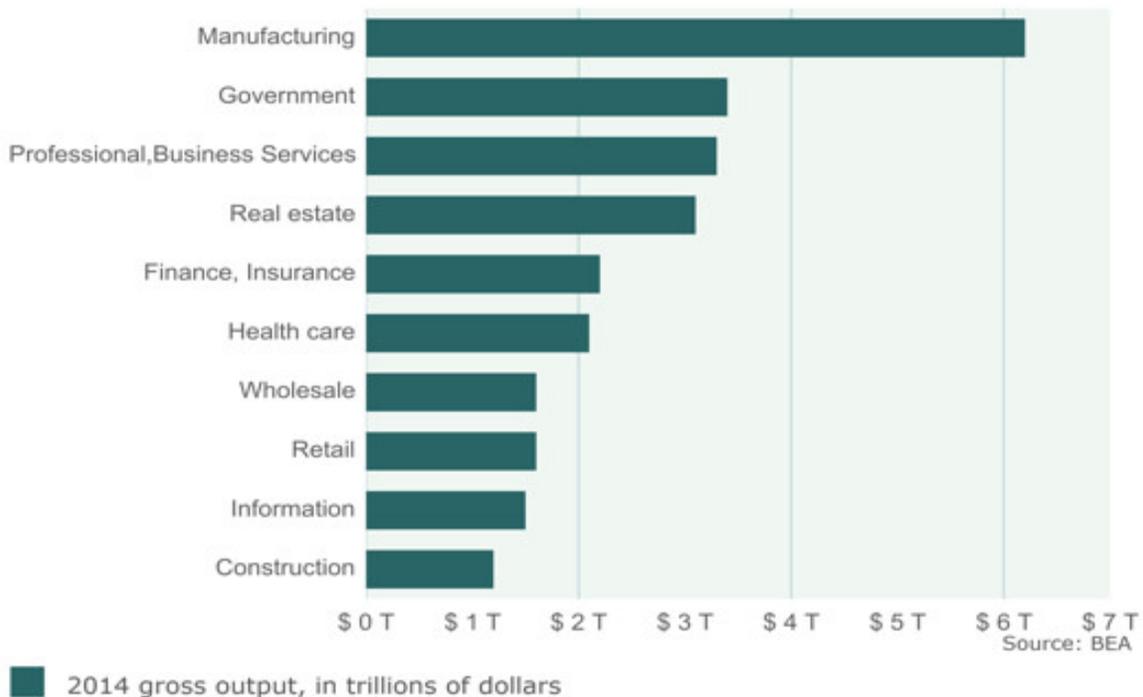


## More Output, Less Employment

The manufacturing sector has gotten more productive, while giving fewer people jobs (normalized as a percent of levels in 1980).



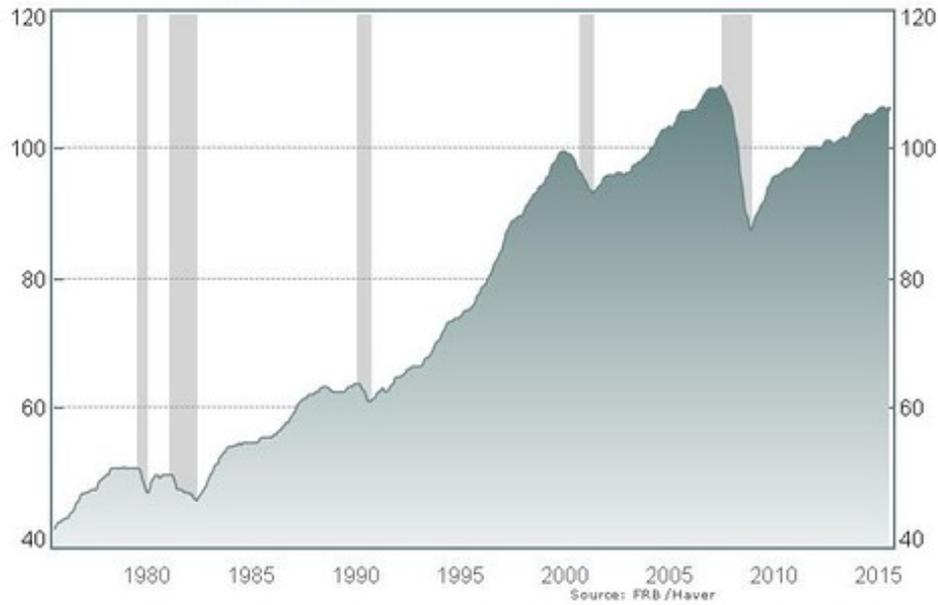
## Manufacturing is largest sector



# Manufacturing output near record

Index 2012 = 100

Three-month moving average



## Layoffs and Discharges: Total Nonfarm (JTSLDL)

DOWNLOAD

Observation:  
Nov 2016: 1,637 (+ more)  
Updated: Jan 10, 2017

Units:  
Level in Thousands,  
Seasonally Adjusted

Frequency:  
Monthly

1Y | 5Y | 10Y | Max

2007-09-01 to 2016-11-01

EDIT GRAPH

### FRED — Layoffs and Discharges: Total Nonfarm



Shaded areas indicate U.S. recessions

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### NOTES

Source: U.S. Bureau of Labor Statistics [Release: Job Openings and Labor Turnover](#)

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