

The Potential Economic Consequences of a Highly Automated Construction Industry

What If Construction Becomes the Next Manufacturing?

January 2018 | By Jill Manzo; Frank Manzo IV, MPP; and Robert Bruno, PhD

EXECUTIVE SUMMARY

What if construction is the next manufacturing, with automation replacing hundreds of thousands of middle-class workers over the next generation? In the future, technological changes that displace human labor in the construction industry could have consequences for workers, families, and the U.S. economy. [This report](#) is a theoretical assessment of the potential economic impacts of a highly automated construction industry.

The Rise of Capital in the Construction Industry

- Automation has increased productivity, reduced costs, and improved quality.
- Contractors are addressing worker shortages by utilizing more machinery, equipment, and robots.
- Blue-collar labor costs, including wages and fringe benefits paid to workers in construction occupations, have been declining as a share of total construction costs for decades.
- Capital's share of the construction market increased by 6.9 percentage points in Illinois, 2.8 percentage points in Indiana, 2.8 percentage points in Iowa, 1.9 percentage points in Minnesota, and 9.6 percentage points in Wisconsin from 1997 to 2015.
- Robots are now able to lay more bricks per day, build more yards of road per day, and construct buildings in fewer days than human labor.

The Potential Economic Consequences of a Highly Automated Construction Industry

- Approximately 49 percent of all construction tasks can be automated.
- The estimated automation potential is 35 percent for laborers, 50 percent for carpenters, 42 percent for electricians, 50 percent for plumbers, and 88 percent for operating engineers.
- Nearly 2.7 million construction workers could be displaced or replaced by 2057, including 435,000 carpenters, 411,000 laborers, and 404,000 operating engineers.
- In the Midwest, the number of displaced or replaced construction workers could reach as high as 96,000 in Illinois and 55,000 in Minnesota.
- The most common jobs for workers who separate from the construction trades are currently in transportation and material moving; production; building and grounds crew; installation, maintenance, and repair; and food preparation and service occupations.
- Construction worker displacement could reduce labor income by a net of \$31.5 billion (in current dollars) as former construction workers are forced to find jobs in these other, generally lower-paying, occupations.
- An increasingly capital-intensive construction industry over the next 40 years would have consequences that mirror the impact of automation in manufacturing, with another 498,000 jobs and \$45.4 billion (in current dollars) in output lost in the United States from reduced demand.
- Drops in consumer demand could cause 18,000 job losses in Illinois, 13,000 job losses in Indiana, 7,000 job losses in Iowa, 9,000 job losses in Minnesota, and 11,000 job losses in Wisconsin.

Three Public Policy Recommendations

1. Apprenticeship programs in the building trades should be utilized and adapted to train new workers and re-skill employees as specific trades become more automated. Since joint labor-management programs currently graduate 79 percent of all apprentices in the United States, lawmakers should be discouraged from restricting collective bargaining or repealing state prevailing wage laws that fund these programs.
2. States and local communities should collaborate with educational institutions to invest in vocational training and worker re-training to prepare individuals for the jobs of the future.
3. As construction becomes more automated, lawmakers should consider taxing capital owned by contractors and investing the proceeds into young and displaced workers.

An increasingly capital-intensive construction industry could cause both economic prosperity and economic hardship. It is imperative that lawmakers, public officials, and industry stakeholders start preparing for this potential economic change. Proactive steps can be taken to ensure that the benefits of a highly automated construction industry are shared broadly across the economy.