

Construction Productivity in Decline

Innovation and cutting-edge are not words frequently associated with the US construction industry, at least not in comparison to industries like robotics or aerospace, but even more unfortunate is that the industry's poor image may be deserved. Data from federal agencies shows US construction industry productivity has a long history of decline that continues today.

"If you look at curves of labor productivity, the manufacturing industry has been taking off for quite a long time at a rate of five to six percent a year," says Stanford University Civil and Environmental Engineering Research Professor Emeritus Paul Teicholz. "If you look at the growth data for the whole [construction] industry, if anything, labor productivity is getting worse."

When Teicholz calculated the US construction industry's labor productivity from 1964 to 2012 for the online architecture, engineering, and construction publication *AECbytes* last year, he found the industry has been experiencing declining productivity at a rate of roughly 0.32% per year. More recently, University of Melbourne Senior Lecturer in Construction Matt Stevens calculated the US construction industry's labor productivity from 1993 to 2013 in a white paper for his management research, advice, and education firm Stevens Construction Institute. He likewise found, with the exception of a productivity surge in 2008 and 2009, the construction industry's productivity is in decline, lower now than it was in 1993.

Additionally, data from federal agencies used by Teicholz and Stevens to calculate

the US construction industry's labor productivity does not count any undocumented labor. If the number of industry workers and work hours is larger than what government data indicates because of undocumented workers, then the decline in labor productivity is larger as well.

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"Generally, the negative changes over the last three decades have outpaced the positive changes," Stevens says. "Lack of consistent engagement by construction project stakeholders to each other has made project information flow unevenly, causing chaos. The contracts continue to be draconian, so each party acts with as much legal insulation as possible."

"If you have the right team members and they have the right kind of contract, that makes, I think, the biggest difference," Teicholz says.

Stevens also says better engagement and team friendly contracts would be beneficial. "One example of this is Japan and Korea, where contracts are shorter and people are expected to interact with each other with the project in mind," Stevens says. "'The main thing is the main thing,' so problems and solutions are discussed fully and compensation is agreed to with less legal people involved."

Teicholz also believes better use of data—teams using BIM, with each team member inputting their information into one model so it can be evaluated as a team from the beginning of a project—is imperative. This will reduce the waste that goes into the building process, and both Teicholz and Stevens think increased use of prefabrication can increase efficiency as well.

"When you have a big building, there are a lot of repetitive elements that you can prefabricate in a factory, and anything that you can prefabricate, unless it has to be trucked an enormous distance, normally is very cost effective and the quality is higher," Teicholz says. "If you can put the proper design content for prefabrication into the design from the beginning, you can achieve a very significant improvement."

Finally, Stevens believes the US construction industry's productivity would benefit from requiring design students to complete internships on jobsites. This, he says, would reduce conflict between designers and contractors and help designers create more constructible designs and be a better bridge between the desires of owners and practical construction possibilities.

US Construction Value Put in Place per Employee

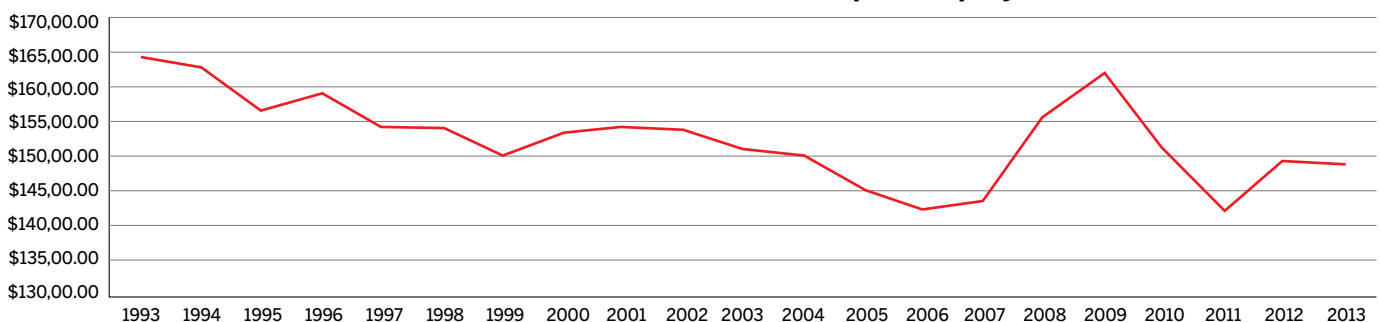


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