

FEATURE

# Measuring innovation

## The Industrial Manufacturing Innovation Index

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DELOITTE'S ENERGY, RESOURCES & INDUSTRIALS GROUP

Presenting an index to grasp the impact of industrial manufacturing on the broader innovation ecosystem in the United States.

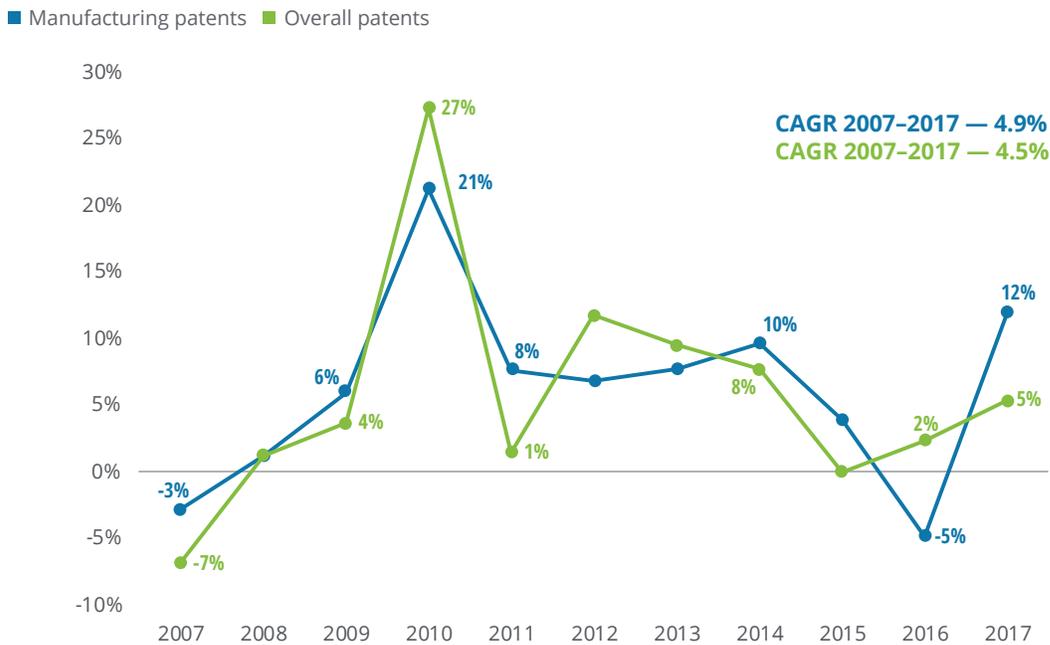
IN “CREATING AN innovation index from patent data,” Deloitte first unveiled the Innovation Index.<sup>1</sup> Now, we have applied this method to a set of representative industrial manufacturing companies to explore how patent activity has evolved, affecting innovation in the industrial manufacturing space. Its purpose is to help innovation leaders understand industrial manufacturing’s contribution to innovation year by year with respect to the US patent universe. Leaders can use this information to make decisions related to patent-based R&D investments as well as evaluate how industrial manufacturing contributes to the broader innovation ecosystem.

How does patent activity in industrial manufacturing stack up against overall patent activity?

Patent activity in industrial manufacturing seems to follow the same knowledge acquisition growth as the overall US patent universe. In fact, during the 2006–2017 period, patent activity in industrial manufacturing (for a select subset of Fortune 100 companies) outpaced patent activity across all industries, which includes the “other manufacturing” and “nonmanufacturing” sectors, growing 4.9 percent in 11 years, compared to 4.7 percent overall (figure 1). The Great Recession showed an

FIGURE 1

Patent activity in industrial manufacturing outpaced overall patent activity



Source: Deloitte analysis of the USPTO filings data.

understandable decline in patent grants (2008–2009), but all industries recovered and rapidly developed new intellectual property after 2009. In 2016, a slight decline in all US patent activity occurred with no consequence the following year. However, knowledge acquisition among industrial manufacturing companies remained stable through 2016.

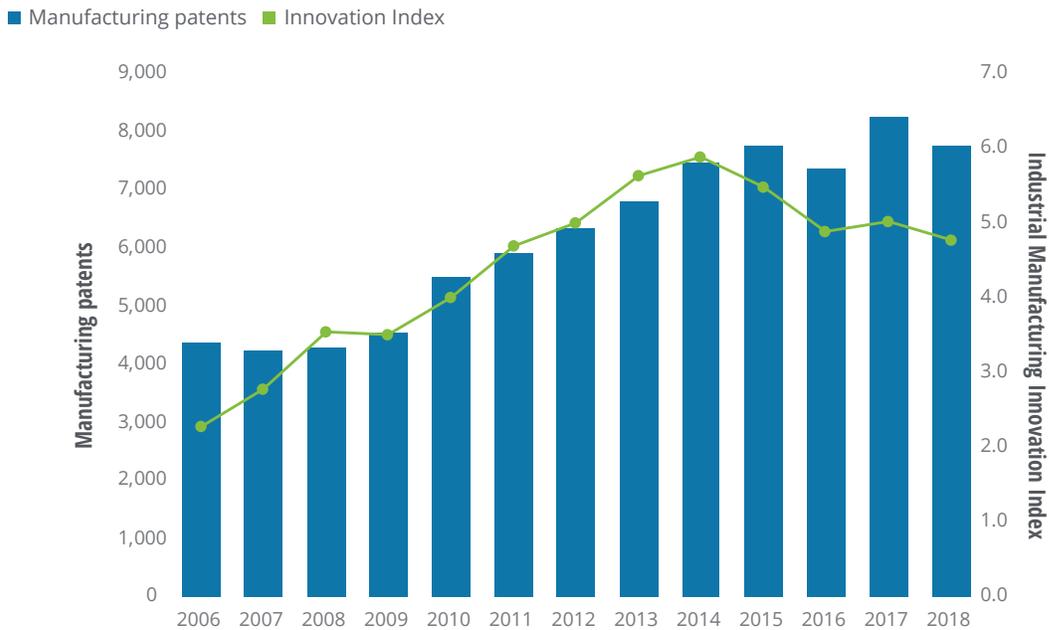
Our scan of patent filings indicates that the industrial manufacturing patent activity has been comparable to overall US patent filings. Given the robust volume of industrial manufacturing patents, we set out to determine the impact they have on innovation. To measure this, we use the group of manufacturing patents to get an Innovation Index for each year.

## Computing the Industrial Manufacturing Innovation Index and its impact on the overall patent universe

Deloitte Research & Insights came up with a patent-analysis-based index to measure innovation.<sup>2</sup> The Industrial Manufacturing Innovation Index considers prevalent technologies among manufacturing patents, the frequency in which those patents are being cited, and how these factors compare to the broader universe. The approach uses intricate data science techniques, but the result is a simple number. The measure quantifies industrial manufacturing’s contribution to innovation year by year with respect to the US patent universe. When viewed as a network, major technologies would appear centered; in other words, a higher Innovation Index implies that the industry could be considered closer to the “center of innovation.”

FIGURE 2

### The Industrial Manufacturing Innovation Index, 2006–2018



Source: Deloitte analysis of the USPTO filings data.

When Deloitte computed the current Industrial Manufacturing Innovation Index, it revealed that after years of steady growth, the industry's position seems to be moving away from the center of innovation. This occurrence, despite the consistent trajectories in both the industry and universe of patents, implies only a few situations. Industrial manufacturers are developing patents classified under technologies that are not as prevalent after

2014, or simply developing patents that fall under fewer classifications in general. Similarly, manufacturing patents are experiencing fewer citations. It will likely be valuable for industrial manufacturing innovation leaders to continue to track the Industrial Manufacturing Innovation Index as one input for evaluating industry-led impact on the US patent universe.

## Endnotes

1. Tiffany Schleeter et al., "Creating an innovation index from patent data," Deloitte, 2019.
2. Ibid.

## Acknowledgments

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