

Cities beat suburbs at inspiring cutting-edge innovations

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Big cities like Chicago inspire unconventional innovation more than do suburbs.
Credit: The Ohio State University

The disruptive inventions that make people go "Wow!" tend to come from research in the heart of cities and not in the suburbs, a new study suggests.

Researchers found that, within metro areas, the majority of patents come

from innovations created in suburbs—often in the office parks of big tech companies like Microsoft and IBM.

But the unconventional, disruptive innovations—the ones that combine research from different technological fields—are more likely to be produced in cities, said Enrico Berkes, co-author of the study and postdoctoral researcher in economics at The Ohio State University.

These unconventional patents are ones that, for example, may blend research on acoustics with research on information storage—the basis for digital music players like the iPod. Or patents that cite previous work on vacuum cleaning and computing to produce the Roomba.

"Densely populated cities do not generate more patents than the suburbs, but they tend to generate more unconventional patents," said Berkes, who did the work as a doctoral student at Northwestern University.

"Our findings suggest that cities provide more opportunities for creative people in different fields to interact informally and exchange ideas, which can lead to more disruptive innovation."

Berkes conducted the study with Ruben Gaetani, assistant professor of strategic management at the University of Toronto. Their research was published online recently in *The Economic Journal*.

Previous research had shown that large metropolitan areas are where patenting activity tends to concentrate, Berkes said, suggesting that population density is an important factor for innovation.

But once Berkes and Gaetani started looking more closely at metro areas, they found that a sizable share of these patents was developed in the suburbs—the least densely populated part. Nearly three-quarters of patents came from places that had density below 3,650 people per square

mile in 2000, about the density of Palo Alto, California.

"If new technology is spurred by population density, we wanted to know why so much is happening in the least dense parts of the metro areas," Berkes said.

So Berkes and Gaetani analyzed more than 1 million U.S. patents granted between January 2002 and August 2014. They used finely geolocated data from the U.S. Patent and Trademark Office that allowed them to see exactly where in [metro areas](#)—including city centers and specific suburbs—that patented discoveries were made.

But they were also interested in determining the type of innovations produced—whether they would be considered conventional or unconventional. They did this by analyzing the previous work on which each patent was based.

The researchers tagged new patents as unconventional if the inventors cited previous work in widely different areas.

For example, a [patent](#) from 2000 developed in Pittsburgh is one of the first recorded inventions in wearable technologies and one of the precursors to products such as Fitbit. It was recognized as unconventional because it cites previous patents in both apparel and electrical equipment—two very distant fields.

After analyzing the data, the researchers found that both urban and suburban areas played a prominent role in the innovation process, but in different ways, Berkes said.

Large innovative companies, such as IBM or Microsoft, tend to perform their research in large office parks located outside the main [city](#) centers.

"These companies are very successful in taking advantage of formal channels of knowledge diffusion, such as meetings or conferences, where they can capitalize on the expertise of their scientists and have them work together on specialized projects for the company," Berkes said.

"But it is more difficult for them to tap ideas from other scientific fields because this demands interactions with inventors they're not communicating with every day or running into in the cafeteria or in the hallway."

That's where the urban cores excelled. In cities like San Francisco and Boston, researchers may meet people in entirely different fields at bars, restaurants, museums and cultural events. Any chance encounter could lead to productive partnerships, he said.

"If you want to create something truly new and disruptive, it helps if you have opportunities to casually bump into people from other scientific fields and exchange ideas and experiences and knowledge. That's what happens in cities," he said.

"Density plays an important role in the type, rather than the amount, of innovation."

These findings show the potential value of tech parks that gather technology startup companies in a variety of fields in one place, Berkes said. But they have to be set up properly.

"Our research suggests that informal interactions are important. Tech parks should be structured in a way that people from different startups can easily interact with each other on a regular basis and share ideas," he said.

More information: Enrico Berkes et al, The Geography of Unconventional Innovation, *The Economic Journal* (2020). [DOI: 10.1093/ej/ueaa111](https://doi.org/10.1093/ej/ueaa111)

Provided by The Ohio State University

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