

Philadelphia surpasses US average in rate of global innovation connectedness

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The city of Philadelphia has reason to be proud: It outpaces the nation as a whole in terms of innovation connectedness. About 9 percent of patents with at least one Philadelphia-based inventor are internationally connected, compared to approximately 7 percent of patents with inventors in the United States overall. However, there is also some bad news: Philadelphia's share of all U.S. innovative activity has dropped by half in 35 years.

A research team led by Professor of Strategic Management Ram Mudambi at Temple University's Fox School of Business analyzed patents in the United States from 1975 to 2010 and extracted relevant data from more than 7 million observations to analyze innovation trends in the United States. To map out where [inventors](#) are located, the research team looked at all 917 geographical areas that make up the country, as defined by the U.S. Office of Management and Budget.

Top findings of the Temple Knowledge Maps Project, an ongoing research effort to explore global connectivity as the basis for local innovation, include:

The top six foreign locations of inventors collaborating with Philadelphia-based colleagues are the United Kingdom, Germany, Canada, France, Japan and China, which has risen to prominence only in recent years.

Industries represented by Philadelphia-based innovative activity include chemicals, computer and communications, drugs and medical, electrical

and electronics, as well as mechanical industries.

Philadelphia is the seventh-largest core based statistical area (CBSA) in the United States, and the city has a long history of innovative activity commensurate with its population size.

However, Philadelphia ranks 34th of the top 35 CBSAs in terms of growth of number of local inventors from 1975 to 2010.

Although the growth of local inventors is low, "our inventors are more connected, which is good news," Mudambi said. "They also collaborate with networks of inventors that are overall more internationally dispersed."

Despite the growing trends in connectedness and total patenting that Philadelphia has experienced over the past 35 years, the share of Philadelphia's CBSA patents as a percentage of U.S. patents has fallen from about 4.8 percent in 1975 to about 2.1 percent in 2010. In other words, Philadelphia is becoming a much smaller contributor in the national production of knowledge.

The team also noticed another worrying trend between Philadelphia and its traditional knowledge partners, such as the United Kingdom, Germany and Japan. Over a 30-year period, the number of inventors who collaborated with Philadelphia from the United Kingdom dipped from about 125 inventors to 40. Inventors from Japan and Germany also dropped by more than half. These drops could be due to the relocation of research-and-development activities by pharmaceutical and chemical firms – some of the Philadelphia region's traditional innovative sectors.

However, there has been an increase in collaboration with China. Over two years, from 2005 to 2007, inventors from China collaborating with Philadelphia rose from about 18 to 130.

"China's come in this huge way recently," Mudambi said. "So we wanted to know, why China? We did a little digging and found there's one company that accounts for much of this connectedness: Metrologic."

Metrologic Instruments is an automated identification and data-capture company based in Blackwood, N.J. (part of the Philadelphia CBSA). The company makes barcode scanners that are used in retailing, healthcare, postal services, logistics services and other industry verticals. By operating in a variety of verticals, Metrologic innovates in a way that is resilient to shifts in the economic fortunes of individual sectors.

Metrologic holds 446 patents, with 3,189 participating inventor locations. Honeywell acquired it in 2008. According to Mudambi and his team, Metrologic represents about 70 percent of the Philadelphia CBSA's connectedness to China.

Metrologic is one of the reasons why Philadelphia surpasses the United States in terms of innovation connectedness. Philadelphia-based inventors also collaborate with South American countries (Colombia and Chile), Africa (Botswana and Madagascar), as well as Sweden, Turkey, Syria and Australia.

"Mapping the innovative connections of inventor networks gives us a picture of the dependence and linkages of a location in terms of other locations, industries and individuals," Mudambi said.

Provided by Temple University

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