

Labor Mobility of Scientists and Engineers and the Pace of Innovation
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ABSTRACT

This paper presents empirical evidence of the impact of knowledge dissemination generated by the inter-firm labor mobility of highly skilled workers on a measure of the pace of innovation. The early economic literature on innovation and patenting, such as Dasgupta and Stiglitz (1980), has assumed that the pace of innovation is determined by each firm's rate of investment and by the number of firms that enter the patent race. Later literature however (e.g., Scotchmer and Green, 1990) emphasizes the idea that the pace of innovation depends critically on the amount of knowledge transferred among firms since current research can build on the previous technological knowledge disclosed.

The empirical analysis uses an unbalanced panel of firms across eight innovative industries observed from 1989 to 1998, along with a measure of the labor mobility of scientists and engineers and a measure of the pace of innovation. The pace of innovation is constructed from patent citation data, as the lag in years between two consecutive generations of technology. This measure captures the length of the technology cycle by identifying the time lag between prior art and the current generation of technology. The data for the paper come from three data sets. The patent and patent citation data come from the National Bureau of Economic Research/Case Western Reserve University dataset on all utility patents granted by the U.S. Patent Office matched with Compustat, with additional financial firm level data supplemented from Compustat. The data on the labor mobility of scientists and engineers are constructed from the Current Population Survey March Supplements. The resulting data set will be an unbalanced panel of firms across eight industries, observed between 1989 and 1998. The empirical analysis employs a fixed effects estimation strategy. The overall results show that a ten percent increase in the annual measure of the labor mobility of scientists and engineers is associated with a 1.8 years decrease in the lag between two consecutive generations of technology. Firms in industries with levels of labor mobility of scientists and engineers that differ by 1%, have an expected backward lag in citations that differs by 0.56 years.

Key Words: patents, knowledge flows, labor mobility of scientists and engineers, pace of innovation

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