

ABSTRACT

Global Innovation in Nanotechnology: Visualization and Modeling

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This work presents examples of visual and econometric analyses of nanotechnology research and commercialization activities of the nanotechnology corporate panel developed in the Georgia Tech as part of the Center for Nanotechnology in Society at Arizona State University (National Science Foundation Award No. 0937591). Network visualizations in the 1999-2009 time period indicate that corporate nanotechnology research interrelationships center on groups of companies in different global regions, whereas co-assignment of patents are concentrated around large companies such as Samsung and IBM. Over time, corporate research and inventive activity tends to be consistent from year-to-year whereas pattern in small and medium-sized nanotechnology enterprises (nano SMEs) occurs to a greater extent in bursts of innovative activity. A transition from research to patenting is observed beginning in the early 2000s. To understand this transition, researchers specify a model focusing on nano SMEs. Factors associated with patent applications (in 2008 and 2009) among nano SMEs are modeled as a function of prior scientific publication, small business innovation research or SBIR funding, trademarks, and inter-firm and other collaboration, with company size, industry sector, and year of establishment as controls. The model suggests that there is not a transition from research to commercialization within a given firm rather that there are firms that do research and firms that do patenting and at this point in time, there is a new group of larger firms that are patenting at ever higher rates, supported by SBIR funding.