

Product Innovations by Young and Small Firms

Jose Plehn-Dujowich, Plehn Analytical Economic Solutions, LLC, Fountainville, Pa. 28 pages.
Under contract number SBAHQ-11-M-0204.

Purpose

This study investigates whether the age of a business is linked to innovation and productivity, specifically whether young firms have an edge on older firms. Previous research on innovation has shown that small businesses are more efficient at innovation than large businesses.

Background/History

Innovative productivity is closely related to the life cycles of firms: the flow from exuberant startup to mature firm. Large and older firms are expected to have an innovative advantage because of their resources (large labs, equipment, financing, experience, etc.); small and younger firms have a different kind of innovative advantage in the ease with which they may engage in unrestrained brainstorming (with no cost justification needed).

Overall Findings

The author generated patent citations per dollar of research and development stock for firms of varying sizes and ages. The results for small vs. large firms and young vs. old firms were similar. Small firms averaged 1.2626 patent citations per million dollars of R&D stock versus 0.5712 for large firms. Young firms averaged 1.2117 patent citations per million dollars of R&D stock, while old firms averaged 0.5344.

Narrowing the study focus to young small firms showed them to be highly productive innovators. Firms below the median size (290 employees) and age (18 years) averaged more patent citations per

million dollars of R&D stock than old large firms, 1.7535 versus 0.3424, respectively.

The author created an econometric model to control for industry, to see if the results were more of a reflection of the industries the firms operated in rather than of their size and age. The results held, with both size and age having a negative effect on R&D productivity.

The research also found, as expected, small manufacturing firms have a narrower product range than large firms. In 2007, small manufacturing firms averaged about 12 products while large firms averaged about 17 products. The average firm sold 13 products. Relatively young manufacturers (under about 10 years old), sell 5 to 6 products while relatively old manufacturers (about 50 years or older) sell 16 to 18 products. A more focused product range from small business could help them in innovating, as they are in a better position to understand their products and markets.

Policy Implications

Based on the research findings—that innovation is characteristic of both young and small firms—policymakers should realize supporting innovative small firms is often akin to supporting innovative young firms.

Scope and Methodology

The research relies upon two data sources: the Thomas Registry of American Manufacturers and a National Bureau of Economic Research (NBER) dataset. The Thomas Registry contains product cat-

egory data for over 1 million publicly and privately held establishments, including firm size and age; data for 2002 and 2007 were used. A model of R&D productivity with firm age and size (measured in terms of employment and sales) was tested that used the NBER data from 1965 to 1995. The NBER data set matched patenting data with a Compustat database on R&D expenditures of publicly held companies.

The report understates firm age, in that it was defined by the year that the firm went public or was listed in Compustat; firms born before 1950 were excluded. In addition, the Compustat data overrepresents large firms, as its average firm size is 977 employees with \$145 million in sales.

This report was peer-reviewed consistent with Advocacy's data quality guidelines. More information on this process can be obtained by contacting the director of economic research at advocacy@sba.gov or (202) 205-6533.

Additional Information

This report is available on the Office of Advocacy's website at www.sba.gov/advocacy/7540. To receive email notices of new Advocacy research, news releases, regulatory communications, publications, and the latest issue of *The Small Business Advocate* newsletter, visit www.sba.gov/updates and subscribe to the Small Business Regulation & Research Listservs.