

By Paul Belleflamme, 17 September 2010

## R&D cooperation or competition?



R&D cooperation across firms is often celebrated as it allows firms to better manage the R&D process by pooling risks, sharing costs, eliminating useless duplication of efforts, pooling complementary skills, or exploiting economies of scale. However, a [recent publication](#) by Bernard T. Ferrari and Jessica Goethals from McKinsey&Company advocates instead the use of rivalry to spur innovation: according to the authors,

*“Productive rivalry stimulated artistic innovation during the Renaissance, and according to the director of General Electric’s Global Research Group, it also has helped his company develop better products and services.”*

Where is the truth? As usual with economic phenomena, there is no clear-cut answer: the best way to spur innovation is R&D competition or cooperation depending on the circumstances. One key variable is the degree of R&D spillovers (i.e., the extent to which the R&D performed by one firm freely benefits other firms). This argument is beautifully developed in a neat and elegant way by Claude d’Aspremont and Alexis Jacquemin in their classic paper: [“Cooperative and Noncooperative R&D in Duopoly with Spillovers”](#) (*American Economic Review* 78: 1133-1137; quoted 1883 times according to Google Scholar consulted on November 8, 2012). The main lesson to be drawn from their analysis is the following:

*When firms behave strategically, R&D cooperation leads to more R&D than R&D competition when spillovers are large but to less R&D when spillovers are small.*

The intuition behind this result goes as follows: if spillovers are large enough, the competitive advantage motivation to invest in R&D is weak, whereas the temptation to

free-ride on the other firm's effort is high; as a result, cooperation leads to larger investments in R&D, which benefits society as a whole.

Bernard T. Ferrari and Jessica Goethals nicely extend this theoretical intuition to inform managerial practice. There may be, however, other factors affecting the choice between cooperation and competition in R&D. I'd be happy to hear your views about this issue.

(Past comments on this post can be found [here](#).)