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Innovation and Competition in a Memory Process

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Abstract

Does innovation increase or decrease with more competition when innovation follows a memory process? Most of the literature analysing the innovation and competition relationship assumes that the probability to innovate is independent of succeeding in innovating in the past (memoryless process). However, Hausman et al. (1984, Econometrica), and Hall et al. (1986, International Economic Review), among others, show that contemporaneous innovation intensity is correlated with past research intensity. This paper provides a theoretical and empirical framework which analyses the innovation and competition relationship assuming that innovation follows a memory process, i.e. the current probability of innovation success depends on previous periods' innovation successes. I find innovation increases with more product market competition, even under the Schumpeterian context where inventions are not completely appropriable. Assuming the probability to innovate increases with past innovations; a follower firm has a large incentive to innovate, even in a highly competitive environment, since the knowledge obtained after innovating increases its probability to innovate again and become a leader. Therefore, firms will be neck-and-neck most of the time, where they innovate in order to escape from competition. Using the same dataset of Correa and Ornaghi (2014, Journal of Industrial Economics), I also find that there is a positive empirical relationship between innovation and competition when industries follow a memory process. For the memoryless industries, I find that there is no relationship between innovation and competition.

Keywords innovation; R&D; competition; memory process

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