# Product Market Competition and Managerial Employment Choices

Jean-Etienne de Bettignies and John Ries

**Abstract:**

A common belief among economists – and generally consistent with empirical evidence[1] - is that product market competition leads to innovation improvements in firms. Much of the theoretical work on the subject has focused on efficiency gains and innovations that result from the mitigating effects of competition on agency costs (Hart, 1983, Scharfstein, 1988, Hermalin, 1992, Schmidt, 1997, Raith, 2003, and Baggs and Bettignies, 2007).[2] More recently, however, Aghion and his co-authors (Aghion et al. 2001, 2005) presented empirical evidence of, and theoretical justification for, an inverted-U relationship between product market competition and innovation. In this paper we propose a general theory of agency and information that is consistent with both a positive relationship, or with an inverted-U relationship, between competition and innovation.

We examine a labour market in which a risk-neutral but wealth-constrained candidate manager is hired to exert innovation effort, but depart from related work on the subject in three primary ways: First, we consider *heterogeneity in managerial talent*: the candidate manager is either a "star" whose effort increases the probability of innovation, or a "dud" whose effort has not impact on innovation. Second, we allow the candidate manager to *choose the industry* in which to work and exert effort; with industries indexed by their degree of competition. Third, following Boone (2000), we assume that an increase in competition is associated with two characteristics that are common to many well-known parameterizations of competition, including Dixit-Stiglitz monopolistic competition, Hotelling, Cournot-to-Bertrand switch, etc.: an increase in the profits of an efficient firm relative to those of a less efficient one; and a reduction in profits of the least efficient firm in the industry. We use our simple model to examine three key scenarios:

1) In the benchmark case where managerial talent is observable to employers and effort is contractible, agency problems can be circumvented, and two results emerge: First, innovation effort increases with competition, reflecting a positive relationship between competition and the marginal product of effort. Second, employers are able to extract all rents in all industries, leaving the candidate manager of either type indifferent between industries ex ante.

2) When managerial talent is observable to employers but effort is not contractible, agency problems can no longer be circumvented, and incentive contracts offered by employers allow the star manager to extract rents in equilibrium. Moreover, the marginal product of star effort, the power of incentives, and the star's residual rents, all increase with competition, making the most competitive industry the optimal choice for the star ex ante. The dud, on the other hand, still extracts no rents and remains indifferent between industries ex ante. Thus in this second scenario we still obtain an positive relationship between competition and innovation effort, but here unlike in case 1) the increased effort comes from a change in the

[1] See, e.g. Geroski (1990), Bertschek (1995), and Blundell et al. (1999).

[2] See also Vives (2008) which, though not focusing on agency problems specifically, does give a comprehensive account of the relationship between competition and innovation under different demand parameterizations.

distribution of talent across industries: employers in more competitive industries hire more talented managers, and this in turn leads to more innovation.

3) When managerial talent is not observable to employers and effort is not contractible, not only do agency problems remain, but hidden information issues also appear. In that case, a signalling situation may emerge, whereby in equilibrium the star and the dud choose different industries, thus revealing their type. Note that in these equilibria, the star does not choose the most competitive industry as in scenario 2, as such a choice would be imitated by the dud, thus defeating the purpose of signalling. Thus in equilibrium the star chooses an intermediate level of competition, low enough to prevent imitation from the dud.

Thus, depending on the degree of information asymmetry about talent, two different relationships between competition and innovation may appear. If managerial talent information is readily available to employers and the situation resembles scenario 2, a positive relationship ought to emerge between competition and innovation. As talent information becomes more asymmetric and the situation approaches scenario 3, an inverted-U relationship becomes more probable, with the highest levels of innovation occurring at intermediate degrees of competition.

**References:**


Aghion, Philippe, Nick Bloom, Richard Blundell, and Peter Howitt (2005), "Competition and Innovation: An Inverted-U Relationship," *Quarterly Journal of Economics*, 701-728.

Aghion, Philippe, Christopher Harris, Peter Howitt, and John Vickers (2001), "Competition, Imitation, and Step-by-Step Innovation," *Review of Economic Studies*, 68, 467-492.

Baggs, J and J-E. de Bettignies. (2007), "Product Market Competition and Agency Costs," *Journal of Industrial Economics,* 55(2): 289-323.

Bertschek, I. (1995), "Product and Process Innovation as a Response to Increasing Imports and Foreign Direct Investment," *Journal of Industrial Economics*, 43, 341-357.

Blundell, R., Griffith, R., and Van Reenen, J. (1999), "Market Share, Market Value, and Innovation in a Panel of British Manufacturing Firms," *Review of Economic Studies*, 66, 529-554.

Boone, Jan (2000), "Competition," Working Paper, Tilburg University.

Geroski, P. (1990), "Innovation, Technological Opportunity, and Market Structure," *Oxford Economic Papers*, 42, 586-602.

Hermalin, B., (1992), "The Effects of Competition on Executive Behavior," *RAND Journal of Economics*, 23, 350-365.

Raith, M., (2003), "Competition, Risk and Managerial Incentives," *American Economic Review*, 93, 1425-1436.

Scharfstein, D., (1988), "Product Market Competition and Managerial Slack," *RAND Journal of Economics*, 19, 147-155.

Schmidt, K., (1997), "Managerial Incentives and Product Market Competition," *Review of Economic Studies*, 64, 191-213.

Vives, X. (2008), "Innovation and Competitive Pressure," *Journal of Industrial Economics*, 56(3), 419-469.