

Innovation Complementarity and Scale of Production

Eugenio J. Miravete^{†*}

José C. Pernías[‡]

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Abstract

This paper is an empirical study on the existence of complementarity between product and process innovation for numerous firms in a wide range of industries, accounting for the existence of unobservable heterogeneity across firms. Using a lattice theoretical structural approach we estimate a simultaneous-equations model with dichotomous endogenous variables to test whether firms' profit functions are supermodular in production, demand enhancing, and/or cost reducing innovations. We compute several pairwise parametric and nonparametric estimates of correlations between decision variables to evaluate the existence of complementarity among firms' strategies. In order to evaluate the robustness of our results, we account for differences in firms' characteristics, and test whether the cross-equations sign restrictions of the structural parameters of the model are fulfilled. Finally, but most importantly we estimate a random effects, simultaneous equations, panel data model to show that even when cross-section evidence is clearly favorable to the complementarity hypothesis, this result is not robust to the existence of unobservable heterogeneity. JEL: C52, L20, O32.

Keywords: Complementarity; Supermodularity; Non-observed heterogeneity; Product innovation; Process innovation.

[†] Department of Economics, New York University, 269 Mercer Street 7th floor, New York, NY 10003; and Instituto de Análisis Económico, CSIC, Barcelona, Spain. Phone: 212-998-8904. Fax: 212-995-4186. E-mail: *miravete@fasecon.econ.nyu.edu*

[‡] Departament d'Economia. Universitat Jaume I. Campus del Riu Sec. 12071 Castellón, Spain. Phone: 34-964-345-780. Fax: 34-964-345-849. E-mail: *pernias@uji.es*

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