R&D Dynamics and Its Impact on Productivity and Export Demand in Swedish Manufacturing

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1 Introduction

In today’s global economy, the need for firms to innovate in order to remain competitive in export markets has become increasingly important for many countries and industries. Investments in R&D that can generate new product or process innovations are one important way through which firms improve their competitive position in world markets. R&D investment is particularly important in developed countries that are trying to maintain a technological advantage for their products over lower-cost manufacturers from Asia. Sweden is an excellent example of a country that both invests heavily in R&D, it is one of the top EU countries in R&D expenditures, and is heavily dependent on export markets for sales of its technologically-advanced products.

Firm R&D investment can have different impacts on firm’s profitability depending on the characteristics of the firm. One dimension that has been emphasized in the literature is that firms operating in international markets may have more opportunities to exploit innovations developed from their R&D efforts. Grossman and Helpman (1993) develop models that incorporate a larger return to R&D investment by exporting firms as a result of the larger set of opportunities they face in international markets.

In this article we develop a structural empirical model that allows us to estimate the impact of R&D on firm profitability through two channels. In the first channel, R&D investment by the firm can impact the firm’s production efficiency and lower its marginal cost. This productivity channel raises the firm’s sales and profits in both the domestic and export market. The second channel is specific to exporting firms where R&D acts to increase the demand for the firm’s products in foreign markets. Both of these channels can be in operation and, if important, will both contribute to the return the firm earns on its R&D investment. If both channels are important, this leads to differences in the return to R&D, and thus to differences in the incentives to invest in R&D, between non-exporting and exporting firms.

Using micro data for Swedish manufacturing firms from 2000-2010 we estimate the impact of R&D investment on the unobserved component of the firm’s productivity and export market demand. The empirical model builds on the exogenous stochastic productivity framework developed by Olley and Pakes (1995) and extended to endogenous productivity evolution by