

Starting an R&D project under uncertainty*

Sabien Dobbelaere[†] Roland Iwan Luttens[‡] Bettina Peters[§]

May 2009

Abstract

We study a two-stage R&D project with an abandonment option. Demand uncertainty, modelled as a lottery between a proportional increase and decrease in demand, and technical uncertainty, modelled as a lottery between a decrease and increase in the cost to continue R&D, influence the decision to start R&D. We relate differences in uncertainty to differences in risk premia. We deduct testable hypotheses on the basis of which we empirically analyze the impact of uncertainty on the decision to start R&D. Using data for about 4000 German firms in manufacturing and services (CIS IV), our model predictions are strongly confirmed.

JEL classification : D21, D81, L12, O31.

Keywords : Investment under uncertainty, R&D, demand uncertainty, technical uncertainty, entry threat.

*This research initiated when the first author was visiting the Centre for European Economic Research (ZEW) whose hospitality is greatly acknowledged. We are grateful to Paul Belleflamme, Boris Lokshin, Stephane Robin, LiWei Shi and participants at the International Industrial Organization Conference (Washington, 2008), the ZEW Conference on the Economics of Innovation and Patenting (Mannheim, 2008), the Danish Research Unit for Industrial Dynamics (DRUID) Conference (Copenhagen, 2008), the International Schumpeter Society Conference (Rio de Janeiro, 2008) and the European Association for Research in Industrial Economics (EARIE) Conference (Toulouse, 2008) for helpful comments and suggestions. All remaining errors are ours.

[†]Free University Amsterdam, Ghent University, Tinbergen Institute, IZA Bonn. Postdoctoral Fellow of the Research Foundation - Flanders (FWO). Corresponding author: sdobbelaere@feweb.vu.nl

[‡]SHERPPA, Ghent University and CORE, Université Catholique de Louvain. Postdoctoral Fellow of the Research Foundation - Flanders (FWO).

[§]Centre for European Economic Research (ZEW).