What hampers innovation?

Revealed versus deterring barriers to innovation

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Why obstacles to innovation?

- Relevance for public policy:
  - Removing obstacles to innovation is a **necessary condition** to innovate
  - (Traditional) incentives to innovation are not a **sufficient condition** to innovate
  - Guidelines for policy makers on detailed areas of intervention rather than indiscriminate incentives
- Relevance for business strategy
  - Identifying firms‘ and contextual characteristics that are more likely to encounter barriers

Why obstacles in the current crisis context?

- Exacerbation of systemic failures, barriers and mis-trust
- Backlash of financial resources' shrink on other barriers
- Over–emphasis on financial difficulties undermines other equally important obstacles (knowledge, market, institutional)
- At the same time, the crisis has been sparked by a substantial increase of innovation in the financial sector: opening or shutting down the tap?
- How to 'redirect' efforts toward 'real innovation'?

What contribution for Innovation Studies?

- Over–emphasis on factors of success and innovative firms
- Under–exploration of determinants of failure and characteristics of non–innovative firms
- Few innovation survey–based studies dealing with barriers
- Methodological implications for CIS data collection
- Relevant econometric issues raising from the assessment of obstacles and reverse causality

Outline

- Background on barriers to innovation
- Our own conjectures of **deterring** versus **revealed** barriers
  - Deterring barriers hamper firms to enter the innovation context
  - Revealed barriers are experiences 'in the making' of innovation – i.e. 'disclosing' outcome based on learning experience
- Taxonomy of innovators, potential innovators and not innovation–oriented
- Empirical analysis of engagement in innovation and perception of obstacles
- Discussion of results
- Further avenues of research

Types of barriers - Community Innovation Survey

- Financial
  - Excessive perceived economic risk
  - Direct innovation costs too high
  - Cost of finance
  - Availability of finance
- Knowledge
  - Lack of qualified personnel
  - Lack of information in technology
  - Lack of information on markets
- Market
  - Market dominated by established firms
  - Uncertain demand for innovative products
- Regulation
  - Need to meet UK government regulation
  - Need to meet EU regulation

Overview of literature

- Factors affecting the perception of the importance of barriers (Mohnen and Rosa, 2000; Baldwin and Lin, 2002; Galia and Legros, 2004; Iammarino et al., 2009)
- Impact of (mainly financial) obstacles on the propensity/intensity of innovation (Arundel, 1997; Tourigny and Le, 2004; Mohnen and Roller, 2001, 2005; Savignac, 2006 and 2008; Tiwari et al., 2007; Mancusi and Vezzulli, 2010)

Perception of obstacles

- General (counter–intuitive!) finding: a positive relation between engagement in /intensity of innovation and assessment of barriers as highly important
- Interpretation as a signal of 'the ability of the firm to overcome the barrier' (Baldwin and Lin, 2002; Tourigny and Le, 2004)
- Management literature confirms that setbacks and failures characterise innovation processes (Ferriani et al., 2008)

Impact of (financial) obstacles on innovation

- Firms innovative effort is significantly reduced by the presence (or perception) of financial osbtacles (Savignac, 2006 and 2008)
- No evidence on the other obstacles: it is impossible to find suitable instruments to correct for endogeneity with obstacles other than the financial ones
- Potential sources of bias for the positive relation:
  - Heterogeneous unobserved factors
  - Simultaneity of decision to innovate and to finance it
  - Selection bias against 'not innovation–oriented' rather than 'constrained non–innovators'

Deterring barriers

- Management literature drawing on in–depth case studies
- Large established firms suffer from lock–in and resistance to adjust (Ferriani et al., 2008)
- Resistance to engage in radical innovation to avoid cannibalising existing products or destabilising core competences (Henderson, 1993)
- Small new firms suffer from lack of knowledge or financial resources (Katila and Shane, 2005) or market structure (Nelson and WInter, 1982; Malerba and Orsenigo, 1993,1995)

Conjectures

- There are two types of barriers, revealed and deterring
- **Revealed barriers** – a learning process associated to innovation 'in the making'
- Firms differ in their propensity to innovate - so that 'not innovation–oriented' should be distinguished from 'potential innovators' (who might suffer barriers)
- Knowledge, Marketing and Regulation barriers to innovation are equally – if not more – important than financial ones

Translating conjectures into empirical estimation

- Testing how the degree of firms innovation engagement affects the perception of barriers as being important
- Accounting for all type of barriers (Finance, Knowledge, Market and Regulation)
- Controlling for firms and context fixed effects (size, group, age, region, sectors, internationalisation)
- Multivariate Probit Model estimating simultaneously the factors affecting the joint perception of different set of barriers (for technicalities see DEste et al., 2008, 2012)

Sample

- **Non–innovation oriented** are excluded: 3,126 firms who declare to be non–innovation active either due to prior innovation or to market condition and did not experience any barrier
- **Potential innovators**: 12,024 firms who engaged in innovation activities or did not do so due to one or more obstacles of which:
  - *Actual innovators*: 5,820 firms introducing product/process innovation
  - *Innovative–active*: 3,078 firms devoting financial resources to innovation activities though not introducing any innovation

Engagement in innovation and perception of obstacles

Share of firms reporting barriers as important by degree of engagement in innovative activities (number of observations: 12024)

Type of Barriers	Zero	1–2	3–4	5–7	Chi-square (2)
Cost	30.7	29	36.6	42.8	136.69*
Knowledge	12.1	10.8	13.1	15.2	25.26*
Market	19	15.3	17.4	19.7	23.95*
Regulation	16.8	14.5	15.4	18.5	18.03*

Engagement in innovation and perception of obstacles

MPM results: Dep. Var. At least 1-barrier item assessed as highly important

Expl. Vars.	Cost	Knowledge	Market	Regulation
No innov	Reference	Reference	Reference	Reference
1–2 Innov	-0.077 **	-0.07	-0.188 ***	-0.06
3–4 Innov	0.140 ***	0.089 **	-0.101 **	0.04
5–7 Innov	0.299 ***	0.219 ***	-0.03	0.241 ***
Ln Empl	-0.049 ***	-0.070 ***	-0.037 ***	-0.074 ***
Group	0.03	-0.04	0.01	-0.079 **
Start up	0.111 ***	0.05	0.072 **	-0.076 **
Intl mkt	0	-0.035 **	0.041 ***	-0.096 ***
Constant	-0.311 ***	-0.831 ***	-0.722 ***	-0.776 ***
Regions	Included	Included	Included	Included
Sector	Included	Included	Included	Included
Rho1	1			
Rho2	0.431 ***	1		
Rho3	0.372 ***	0.399 ***	1	
Rho4	0.359 ***	0.337 ***	0.297 ***	1
No. obs	11747			
Log Likelihood	-21049.7			
Wald 2(96)	723.0 ***			

Results

Deterring versus revealed

- Making sense of the seemingly counter–intuitive evidence
- U–shape relationship between engagement in innovation and perception of osbtacles: **deterring** effect for cost and market barriers
- **Revealed** effect is stronger for knowledge and regulation barriers
- Market concentration and lack of demand are actual **deterrent** and there is not much 'learning' effects

Control vars

- Large firms are less likely to perceive obs as relevant
- Mature firms are less likely to assess market and cost obs as relevant
- Internationalisation helps releasing the pressure of knowledge and regulation (but not of cost and market related barriers)

Wrapping up

- Deterring and revealed effects require distinct policy interventions
- Cost and market barriers seem to be most deterrent when starting engaging in innovation
- While knowledge and regulation are mostly perceived 'in the making' of innovation
- Revealed and deterring effects might co-occur depending on the phase of the innovation trajectory
- Overall, financial constraints are over–emphasised by the literature
- Market structure (i.e. dominated by established incumbents) and lack of demand are major obstacles (in the Schmooklerian vein)

Future avenues of research

- Reprising the role of Schmooklerian demand in fostering innovation and releasing a major deterrent for firms
- Disentangling the role of geographical location of firms in affecting the perception of barriers (extending results in Iammarino et al., 2009)
- Looking more in depth at the sectoral differences in the perception of obstacles
- Assessing the impact of policy on attenuating deterring barriers
- Availability of longitudinal data would allow to look at the perception of barriers and their effects in relation to the economic cycle