Accessibility, utility and learning effects in university-business collaboration

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What Drives SME Growth?

Our research is project based and reflects a number of core themes each linked to growth

- **Growth Ambition,**
- **Management and Leadership**
- **Diversity**
- **Finance and Governance**
- **Innovation and Exporting**
- **Business Demography**

Policy Context

Protection of science and research funding: £1.5bn Global Challenges Research Fund (2016-2021); £.6.9bn capital investment in new equipment, labs and research institutes (2015-2021)
Autumn Statement announcement of £2bn new R&D spend by 2020

UK Research and Innovation (UKRI)

- **Purpose**: 'to integrate research and Innovate UK functions, which offers an opportunity to strengthen the **strategic approach** to future challenges and **maximise value** from Government's investment of over £6 billion per annum in research and innovation'.

- Improved collaboration between the research base and the commercialisation of discoveries in the business community, ensuring that research outcomes can be fully exploited for the benefit of the UK
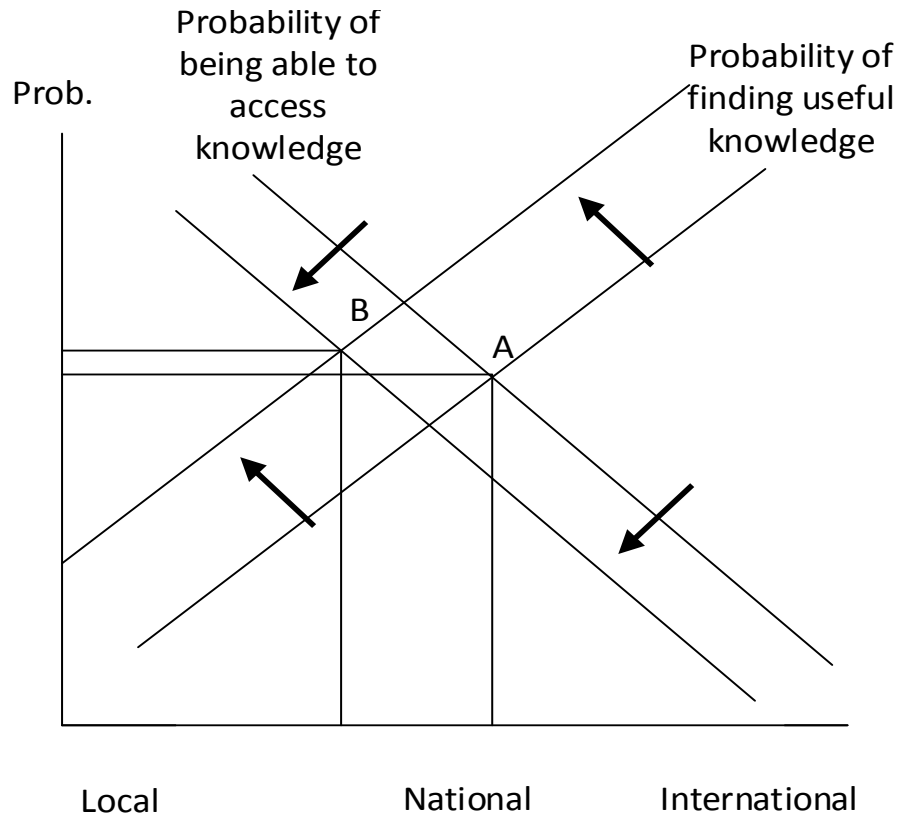
Profiling UK Innovators
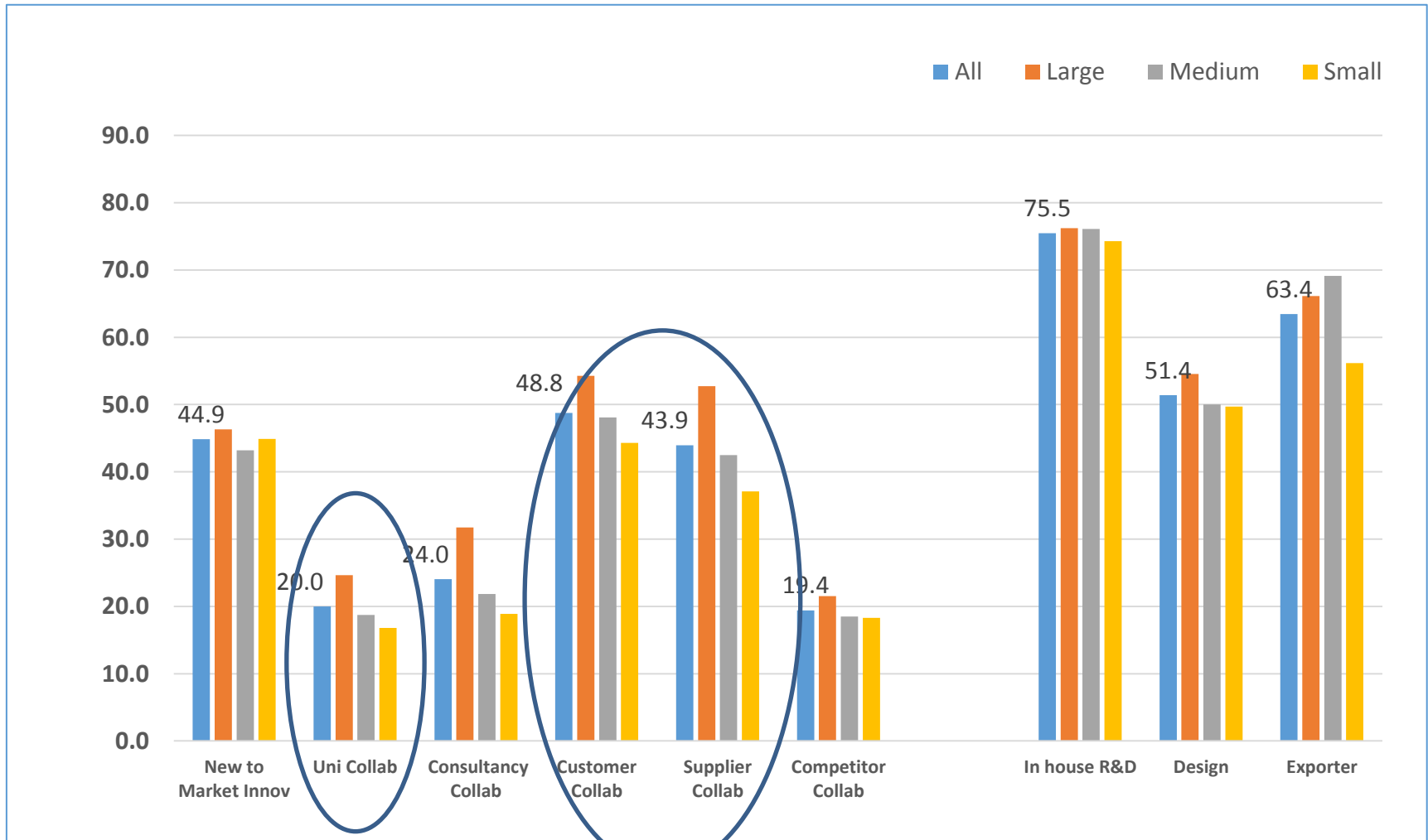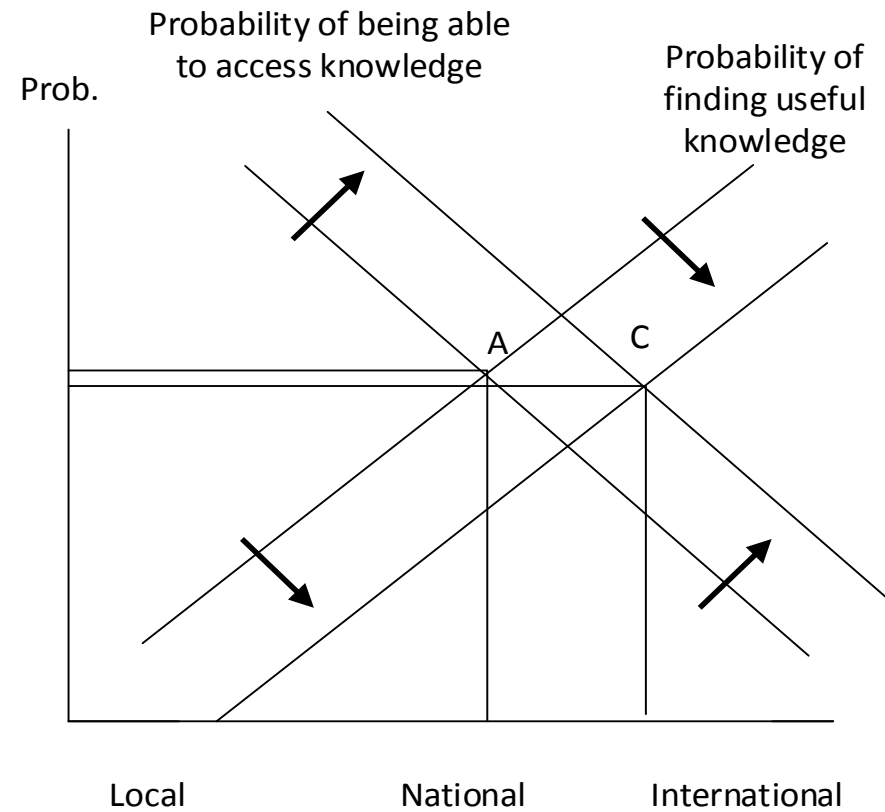
The knowledge utility-accessibility trade-off
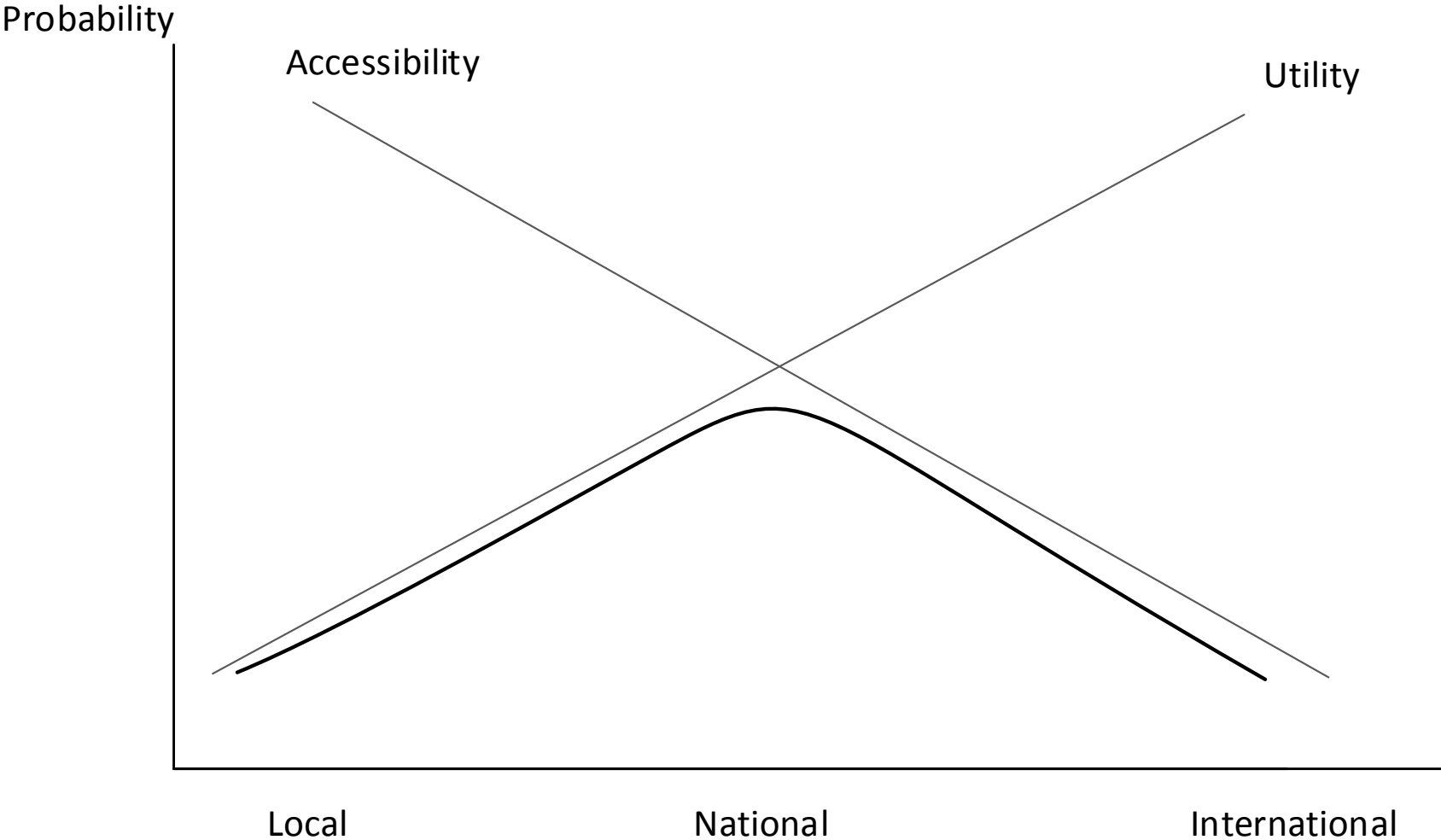
Size matters?

Data & Method

- UK Innovation Surveys (UKIS) 2004-2012 (5 waves)

- Stratified sample, postal, non-compulsory, bi-annual, response rate 51% (2008-10) - 58% (2002-04): unbalanced panel. Focus on responses for 2 consecutive waves; c.1000 obs per double-wave; N=3,581

  Dependent variable 1: New to the market innovation (0/1)

  Dependent variable 2: Regional University Collaboration (0/1)

  Dependent variable 3: National University Collaboration (0/1)

  Dependent variable 4: International University Collaboration (0/1)

- C.20% collaborate & more likely for larger firms

- Multivariate dynamic and recursive probit model allowing the simultaneous estimation of the probability of introducing NTM innovation, conditional on the likelihood of collaborating with a University at regional, national and international level :

$$\text{NTMI}_t^* = \alpha_0 + \alpha_1 \text{UNICOLLAB\_REG}_t + \alpha_2 \text{UNICOLLAB\_NAT}_t$$
$$+ \alpha_3 \text{UNICOLLAB\_INT}_t + \alpha_4 \text{OTHCOLLAB\_REG}_t + \alpha_5 \text{OTHCOLLAB\_NAT}_t + \alpha_6 \text{OTHCOLLAB\_INT}_t + \alpha_7 \text{FLC}_t + \varepsilon_{1t}$$

$$\text{UNICOLLAB\_REG}_t = \beta_0 + \beta_1 \text{NTMI}_{t-1} + \beta_2 \text{UNICOLLAB\_REG}_{t-1} + \beta_3 \text{OTHCOLLAB\_REG}_{t-1} + \beta_4 \text{FLC}_t + \varepsilon_{2t}$$

$$\text{UNICOLLAB\_NAT}_t = \gamma_0 + \gamma_1 \text{NTMI}_{t-1} + \gamma_2 \text{UNICOLLAB\_NAT}_{t-1} + \gamma_3 \text{OTHCOLLAB\_NAT}_{t-1} + \gamma_4 \text{FLC}_t + \varepsilon_{3t}$$

$$\text{UNICOLLAB\_INT}_t = \delta_0 + \gamma_1 \text{NTMI}_{t-1} + \delta_2 \text{UNICOLLAB\_INT}_{t-1} + \delta_3 \text{OTHCOLLAB\_INT}_{t-1} + \delta_4 \text{FLC}_t + \varepsilon_{4t}$$

$$\epsilon = (\varepsilon_{1t}, \varepsilon_{2t}, \varepsilon_{3t}, \varepsilon_{4t},)' \sim N(0, \Sigma)$$

Distance matters: Don't go too far!

	All	Small	Medium	Large
Collaboration with a Regional University	**0.062**	+	+	(+)
Collaboration with a National University	**0.084**	+	+	+
Collaboration with a International University	**(0.011)**	-	+	(+)

Note: estimation results of marginal effects, numbers in parentheses denote non statistically significant estimation results

Size also matters!

	All	Small	Medium	Large
Collaboration with a Regional University	0.062	0.071	0.068	(0.038)
Collaboration with a National University	0.084	0.103	0.082	0.066
Collaboration with a International University	(0.011)	-0.063	0.082	(0.039)

Note: estimation results of marginal effects, numbers in parentheses denote non statistically significant estimation results

Summarizing

- An **inverted-U shape trade-off relationship** exists wrt *distance between collaborating B-U partners* and *the likely cost-benefit of collaboration*.

- **Small firms** facing resource constraints may find it difficult to access distant knowledge but, at the same time, may derive greater benefit due to their weaker internal knowledge resources.

- **Larger firms** with stronger internal resources may be able to access more distant knowledge but benefit less from that knowledge.

Thank you for your attention!