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Innovation in the North Staffordshire Ceramics District - stimulation through international trade fairs.

J. Robert Branston, Felicia Fai, Phil Tomlinson
School of Management, University of Bath.

This report arises from a programme of academic research conducted in 2013 on firms in the North Staffordshire Ceramics district. In this specific briefing, we report on our examination of the benefits of attending international trade fairs and business conferences for innovation. Such events are normally used purely to maintain or grow market presence, but the presence of many international firms at such events may also create a temporary ecology of 'global buzz' which can potentially enhance innovative performance for firms that attend. We found this to be true for the firms in this cluster. There is also some evidence to suggest that global buzz complements 'local buzz' to further enhance innovation within the North Staffordshire cluster.

We recommend that efforts by the North Staffordshire Chamber of Commerce to encourage local ceramics firms to attend international events continues both to support the growth of international markets but also to further stimulate their dynamic ability to generate innovations for the future.

Background

1) Industrial clusters are concentrations of firms in the same or related industrial sectors that are 'permanently' and geographically located together. Clusters provide advantages to firms by offering access to pools of skilled labour and efficient transport and communication infrastructures. Additionally, intangible benefits arise: through local formal and informal social and business networks, firms can access information and knowledge, which others outside of the cluster cannot access, this can stimulate new ideas. Firms may collaborate on specific projects eased by their physical co-location and mutual understanding of local institutions and practices. The activities undertaken by, and communications shared between organisations within the cluster (firms, universities, trade associations, local government etc.) can create a sense of 'local buzz', not replicable elsewhere, which in itself may be a source of competitive advantage relative to other clusters in the world.

2) The North Staffordshire ceramics district is just such an industrial cluster. Firms located here have access to the local labour market and industry-wide research and testing facilities, such as those organised by Lucid-eon. Key main industry bodies, such as the British Ceramics Confederation (BCC), the Ceramic Skills Academy, the International Clay Technology Association (ICTa) and the Ceramic Development Group are also located in the cluster and help facilitate 'local buzz'. Indeed, in recent years their combined efforts have helped re-energise 'local buzz' and innovation within the district.

3) In a globally competitive world, 'local buzz' may not be sufficient. Firms may try to access 'local buzz' in other clusters around the world but this normally requires some form of foreign direct investment or at least partnership with a foreign firm. This costly form of access to additional sources of knowledge is simply not possible for many firms in the North Staffordshire cluster. However, another way to access globally dispersed knowledge is to participate in 'global buzz'. This is created when firms from around the world gather in temporary settings for a few days to either purposively or unintentionally share information and knowledge, for example, International Trade Fairs (ITFs) and International Business Conferences/Seminars (IBCSs). Similar to 'local buzz', access to 'global buzz' is only attainable by a presence at such events.

4) IBCSs, are an opportunity for participants to keep updated on new industry trends, techniques, and technologies whilst traditionally, ITFs have been seen purely as a means to promote products, liaise with clients, and to enter new markets. However, both types of events bring together international experts and business leaders from different organisations, in a particular location for a few days, who may have similar roles and often face similar challenges. They are away from everyday distractions and are energised by being 'away from the office' and can talk about their business to others. As such, these temporary gatherings of expertise can provide both informal and formal opportunities for participating firms to benefit in terms of sharing and acquiring new knowledge and ideas.

The expectation is that firms might subsequently exploit knowledge gained from 'global buzz' at these events to further enhance their business at home.

5) It can also be envisaged that firms may combine the new knowledge they acquire from 'global buzz' with the 'local buzz' they access from their permanent home cluster. Linking the two sources of knowledge in this way may have wider benefits for innovation and other firms in the permanent cluster, as new knowledge is dispersed.

Research Questions

6) In the context of North Staffordshire, ceramics firms have long participated in ITFs and IBCSs¹. Indeed, the North Staffordshire Chamber of Commerce (NSCC) provides guidance and support for local firms to participate in such events². However, the motivation for attendance has largely been identified as being for traditional 'marketing' purposes alone in the current academic literature. Our research question examined "Is there a direct link between attending ITFs and IBCSs and a ceramics firm's innovative performance?" If so, this would give further grounds for the NSCC to support attendance at, and motivation for local firms to participate in, ITFs and IBCs. We also examined whether ceramics firms are able to combine local and global knowledge and if this also had a significant impact upon innovation.

Methodology

7) We surveyed 282 Managing Directors of North Staffordshire based ceramics manufacturers from across the industry spectrum between June and October 2013 asking about their background, innovation outputs, network activities and in particular, their involvement in ITFs and IBCSs during their past five years of business trading (2007/8-2012/13). There were 121 responses (42.9% response rate), with 112 (39.7%) providing complete information for the current study. Statistical tests confirmed the reliability and validity of the survey data. Full details of the econometric specification and of the variables created are available in Appendix A1 and A2 and detailed results of the regression in A3.

8) Between July and September 2013, we also conducted a set of 25 semi-structured interviews with Senior Managers of ceramics firms in the district and high level representatives from institutions including the BCC, Lucid-eon and the NSCC. These interviews broached a range of issues relating to the industry, including firms' global linkages. A further set of 14 follow-up telephone interviews were also conducted between late April and early July 2015, explicitly focusing upon firms' involvement in International Trade Fairs and International Business Conferences/Seminars.

¹ These include (among others) ceramics IFTs in Frankfurt, New York, Shanghai and Ahmedabad. For further details see <http://www.brendle.es/2015-ceramics-exhibitions-conferences-calendar/>

² See <http://staffordshirechambers.co.uk/business-support/international-trade/>

Results

9) Local buzz is an important facilitator of innovation within the North Staffordshire ceramics industrial cluster. This may, in part, reflect recent initiatives to generate greater inter-firm networking, collaboration, and knowledge transfer activities within the district.

10) Firms who participate regularly in ITFs and IBCSs in Europe, North America, and Asia appear to enhance their innovative performance; local firms benefit from accessing global buzz. Among these three regions, 'feedback loops' from Asia are the most important for North Staffordshire ceramics firms. This result suggests a significant change in recent years since the initial basis of links to Asia were largely outsourcing by North Staffordshire firms in the 1980s-'90s but now rising incomes in Asia have led it to become a focal market for sales and as a source of new ideas.

11) There is a positive if weak relationship between local buzz and global buzz for innovation from our statistical analysis but our interviews gave a clear sense that firms participate in ITFs because they present opportunities to interact with existing partners (suppliers and customers), enable them to find new potential partners, gather intelligence about competitors, and generate new ideas from such interactions. These interactions were clearly and often identified as a source of ideas for innovation, with many reporting advances in product lines, packaging, materials, and production methods, as a direct result. Most often these were adaptive incremental changes whilst on occasion they were more significant innovations leading the business in new directions.

12) Given the changing fortunes of the North Staffordshire cluster in recent decades it was no surprise that virtually all interviewees reported that one further function of attending international events was to signal their (continued) existence to the wider industry. Interviewees consistently commented if they were not present at such events which they had previously attended, the market would interpret this as a signal of the firm's demise (real or not) and there would be a significant negative impact upon their future business opportunities.

Conclusions

13) Whilst strengthening relationships between local firms and organisations in the North Staffordshire ceramics cluster is helping to reinvigorate local buzz and the innovative performance of firms, the innovative performance of local firms is also positively related to their attendance at international events such as ITFs and IBCSs and accessing global buzz which is created there:

- a) By attending international trade fairs and international business conference/seminars the cache and marketability of the “Made in Staffordshire” marque can be leveraged to access new markets for design focussed firms.
- b) Attendance at these events can help raise the profile of Staffordshire’s technical ceramics and equipment firms internationally and may enable them to become suppliers to internationally oriented customers and link to other industrial clusters around the world. Demanding international customers can stimulate innovative behaviour from the North Staffordshire firms and contribute to the cluster’s economic prosperity.
- c) An additional benefit is that when local firms attend such international events, ‘local buzz’ itself may also be strengthened, especially where attendees from the North Staffordshire cluster are encouraged to travel/socialise together.

Recommendations

- a) Firms from this cluster should attempt to attend trade fairs (particularly in Asia) both for market reasons and innovation-related reasons.
- b) Both Stoke-on-Trent City Council and the local industry institutions should continue in their efforts to establish closer links between firms themselves so as to propel ‘local buzz’ and enhance innovation.
- c) The North Staffordshire Chamber of Commerce should be encouraged – and if need be, given additional funding - to support the attendance of local firms at international trade fairs and business conferences, across Europe and North America, but particularly Asia.

Appendix A1: The Econometric Model

$$I_i = \beta_0 + \beta_1 [X_{i..k}] + \beta_2 L + \beta_3 \sum_{i=1}^n G_{i...k} + \epsilon_i \quad \text{Equation (1)}$$

where the dependent variable, I is a measure of innovation in each firm. This is determined by :

X_i , a set of variables capturing a Firm's internal resources dedicated to enhancing innovation (e.g. R&D Expenditure),

L which represents a firm's access to local knowledge linkages (in North Staffordshire)

G which captures the extent of a firm's global linkages.

Appendix A2: Variable Construction (survey items used)

Innovation i). The number of new product lines introduced ii) The number of changes/improvements to existing product lines iii). The Number of new equipment/technology introduced in the production process iv). The number of new input materials introduced in the production process v). The number of organisational changes/improvements made in the production processes (Based upon Tsai and Ghoshal (1998), Molina-Morales and Martinez-Fernandez (2006, 2009, 2011))

Firm Size: Number of employees on farm (Scale 1-7; where 1 = less than 10, 2 = 10-49, 3 = 50-99, 4 = 100-249, 5 = 250-499, 6=500-999 and 7=greater than 1000. (Based upon De Propris (2002), Freel and Harrison (2006)).

R&D expenditure % of turnover spent on R&D. (Scale 1-6; where 1 = 0%, 2=1-5%, 3 = 6-10%, 4 = 11-20%, 5 = 21-30%, 6 = Greater than 30%). (Based upon De Propris (2002), Freel and Harrison (2006))

Overseas Manufacturing facility Yes/No (1/0)

Local Linkages: To what extent does your firm access and benefit from the following local (district) linkages? i). A network of trustworthy and local client and supplier firms ii). Provision of public facilities to support our own specific R&D and design activities (e.g. through Ceram or Hothouse) iii). General R&D activities carried out for the benefit of all firms in the district (e.g. by Ceram) iv). Access to and sharing of information relevant to the industry v). Provision of local training facilities/specific training courses (Based upon Molina-Morales and Martinez-Fernandez (2006).

(Likert Scale: 1 = No benefit and 7= Very High benefit)

Global linkages: How often does your firm (or representatives from your firm) attend a business seminar (including training and technology related events), conference, trade fair or undertake a business visit where such events are held in i) Europe, ii) Asia, iii) North America and iv) Rest of the World

(Likert Scale: 1 = Never and 7= Highly Regularly (once a week))

Appendix A3. Econometric Results

Table 1. Innovation in the North Staffordshire Ceramics Industrial District

Dependent Variable: Innovation

Variable	(1)	(2)	(3)	(4)
Constant	-1.615*** (0.243)	-1.433*** (0.241)	-1.585*** (0.231)	-1.303*** (0.238)
Firm Size	0.273*** (0.055)	0.265*** (0.053)	0.198*** (0.052)	0.206*** (0.055)
R&D Expenditure	0.369*** (0.064)	0.312*** (0.064)	0.356*** (0.066)	0.310*** (0.062)
Overseas manufacturing plant	0.160 (0.205)	0.128 0.197	0.091 (0.186)	0.021 (0.194)
Local Linkages		0.281*** (0.089)	0.181** (0.087)	0.271*** (0.095)
Asia Wide Linkages			1.793*** 0.527	
Europe Wide Linkages			0.377** (0.171)	
North America Linkages			0.929** (0.437)	
Rest of the World Linkages			-0.332 (0.423)	
Global Linkages				0.243*** (0.091)
Local*Global Links				0.111 (0.132)
Adjusted R ²	0.30	0.352	0.446	0.394
F Statistic	16.675***	16.055***	12.185***	13.04***
N = 112				

*** p<0.01; ** p<0.05; * p < 0.10, Non-standardized regression coefficients (errors in brackets)

All using a hierarchical Ordinary Least regression method. Further iterations of the model were estimated using a quadratic technique to capture potential non-linear effects.

The models perform well with reasonable R-squared statistics for survey based studies. The estimated coefficients indicate the magnitude and relative importance of the explanatory variables (starred coefficients indicate statistically significant results). As one might expect, both firm size and R&D expenditure have a positive and significant impact upon innovation. Both larger ceramics firms and those that invest in R&D achieve a higher level of innovation output.