Connecting to Temporary Spaces in Far Off Places – implications for innovation in the North Staffordshire Ceramics District, UK

Felicia Fai

Philip R Tomlinson

J.Robert Branston

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Abstract

We investigate the role of global pipelines formed by temporary translocal clusters for the innovation performance of the UK's North Staffordshire Ceramics industry. ~~Using s~~Survey data ~~derived~~ from 112 firms finds~~,~~ both local linkages and global linkages ~~are found~~ to have positive and significant impacts upon innovation; intensifying the use of ~~extensive use of local linkages~~ local linkages leads to significant increasing returns to innovation, however ~~more extensive~~intensifying ~~use of tem~~the use of ptemporary translocal clusters has ~~a~~ positive but insignificant effects; similarly the interaction between local and global linkages are complementary (albeit weakly) in their affect upon innovation. We offer implications of our findings ~~for the use of temporary translocal pipelines to enhance~~for innovation in local clusters.

JEL Codes

Keywords: Innovation, Clusters, international-linkages

1. Introduction

~~We demonstrate the role played by temporary translocal clusters such as international trade fairs (ITFs), international , business conferences seminars and international professional and meetingsconferences, on the innovative performance of 112 firms we surveyed within the traditional North Staffordshire ceramics district, UK.~~ Trade fairs have evolved from being pure market places, to knowledge spaces- (Maskell, 2014)~~(Maskell? Bathelt?)~~ where attendees can access significant information from multiple locations worldwide~~,~~ about emerging trends, future products, processes, techniques and technologies. Moreover, such trade fairs can be knowledge gathering, augmenting and production spaces simultaneously. They have a role to play in upstream knowledge formation. Similarly international ~~Trade fairs,~~ business ~~seminars and~~ conferences ~~are temporary spaces in which~~bring together experts from different organisations but similar roles, and hence often similar problems,~~across the value chain and across different markets come together~~ to exchange information and knowledge for a few days. In both instances, it has been proposed ~~(Maskell, et al., 2004, 2006)(Maskell et al 2004, 2006 papers)~~ (Maskell, et al., 2004, 2006) that these events~~They~~ act in similar (but nont~~-~~identical) ways to permanent~~geographically tied~~ clusters in the way they bring together knowledge communities in face-to-face exchanges of information and knowledge ~~in a localised setting~~thereby creating 'global buzz' and ~~, but by bringing agents in~~ in ~~from multiple locations for just a short time, they~~ become temporary translocal clusters. Knowledge identified in these temporary spaces in far off places may then be integrated by firms with the knowledge they access in their permanent industrial clusters, to generate future innovations; the local buzz in the permanent cluster becomes connected to the global buzz through these temporary spaces. ~~Such translocal clusters have a role to play in upstream knowledge formation processes. As such, they have a role to play in upstream knowledge formation which can then leveraged by firms in geographically tied industrial clusters and leveraged in future use(i.e. the knowledge is applied downstream from its point of formation).They are places where firms might start to identify remote but potentially complementary competences to their current activities and where potential sources of these competencies (suppliers, customers, competitors, technical institutes, etc.,) might be identified.~~ [tl1]~~Knowledge identified in these temporary spaces in far off places then needs to be integrated by firms with the current knowledge they access in their permanent industrial cluster, to generate future innovations in products and processes.~~ We demonstrate the role played by temporary translocal clusters such as international trade fairs (ITFs), international business conferences and meetings, on the innovative performance of 112 firms we surveyed within the traditional North Staffordshire ceramics district, UK.

Our work contributes to the discussion in economic geography on the role of clusters, local buzz, global pipelines ~~(~~(Bathelt, et al., 2004)~~Bathelt et al, 2004)~~ and global buzz (Bathelt and Schuldt, 2010, Schuldt and Bathelt, 2011)[1] ~~(Bathelt XXXX)~~.

The remainder of the paper is developed as follows. ~~However, global buzz in particular has resonance with the discussion in the institutional literature on the ability of trade fairs and conferences to be 'field configuring events' (FCEs) (Lampel and Meyer 2008) and with the open innovation literatures (Chesbrough, 2003).~~

~~Management scholars have considered ITFs and conferences to have the potential to be 'field configuring events'(Garud, 2008, Lampel and Meyer, 2008) which significantly alter the trajectory of their existing fields or the emergence of a nascent fields. In the FCE perspective of temporary gatherings, the impact or outcome of the 'global buzz' is more radical and it is unlikely that every trade fair and conference, even if conducted at a global level with large numbers of international participants, is a FCE. At least in the context of conferences (Henn and Bathelt, 2015) p.105 recognise that whilst certain conferences which are 'hierarchically-planned and oriented to specific goals' may be FCE, most do not meet such conditions. In the economic geography literatures, global buzz is implicitly characterised as leading predominantly to incremental knowledge exchanges although the possibility for FCE to occur exists but is likely only to be recognised as a FCE ex-post and is not discussed explicitly in any further detail. The nature of the trade fairs and conferences the firms in our sample engaged with are of this non-FCE type so we do not engage with the FCE literature further. Similarly, whilst the open innovation literature conceives 'openness' as the semi-permeability of the organisational boundary to inflows and outflows of knowledge, little attention has been paid to the role of transient sources of ideas and knowledge such as business conferences and trade fairs. Whilst our work will have empathy with the open innovation literatures, we do not seek to engage with it in depth in this paper.~~

~~W~~We proceed to outline our contextual setting in section two, before reviewing the literature to establish our hypotheses ~~in section 3~~and a refinement of the 'global pipelines' concept with respect to the access to global buzz in section 3. Section four describes the data and methodology, section five outlines the results and discussion. Section six provides ~~the discussion,~~ shortcomings and thoughts for future work before concluding.

[1] Global buzz in particular has resonance with the discussion in the institutional literature on the ability of trade fairs and conferences to be 'field configuring events' (FCEs) ~~Lampel, J. and Meyer, A.D., 2008. Guest editors' introduction. Journal of Management Studies. 45 (6), 1025–1035.~~(Lampel and Meyer, 2008) and with the open innovation literature (Chesbrough, 2003). In the FCE perspective, the impact or outcome of the 'global buzz' is quite radical, but at least in the context of business conferences (Henn and Bathelt, 2015~~,~~) p.105) recognise that whilst certain international conferences which are 'hierarchically-planned and oriented to specific goals' may be FCE, most do not meet such conditions. The nature of the trade fairs and conferences the firms in our sample engaged with are of this non-FCE type so we do not engage with the FCE literature further. Similarly, whilst the open innovation literature conceives 'openness' as the semi-permeability of the organisational boundary to purposeful inflows and outflows of knowledge, little attention has been paid to the role of transient sources of ideas and knowledge such as business conferences and trade fairs which might be sought out both purposefully or passively. Whilst our work has empathy with the open innovation literature, we do not seek to engage with it in depth here.

2. Contextual Background

Our work is set in the context of the North Staffordshire Ceramics Industry which is based in and around the British city of Stoke-on-Trent ~~(and its' immediate vicinity)~~. The district is 'mature', with ceramics manufacture dating back to the 17th century (Whipp, 1990)~~(Whipp, 1990)~~. It is the centre of UK ceramics production in table and giftware and to a lesser degree, tiles and flag manufacture, technical and refractory ceramics, brick and roof tile manufacture, and sanitary-ware. In addition, material and equipment suppliers (such as clays, glazes, ceramic decals, and in (reduced capacity) kiln and machinery manufacturers) also operate within the district. Finally, the British Ceramics Confederation (BCC), Lucid-eon (previously Ceram Research), the Ceramics Skills Academy, the International Clay Technology Association (ICTa) and Unity, the ceramics related labour union, are all located within the district.

During the late twentieth century, the district entered a 'long decline' (1979-2008) with the closure several high profile factories (and firms) and moves by some manufacturers to 'outsourc~~inge~~' production to the Far East to take advantage of labour costs and remain price competitive. However, in recent years, the district has begun to witness a renaissance as the remaining ceramics firms have increasingly focused upon serving higher end markets, with new innovative designs and exploiting the recognised cache for Staffordshire made wares. Simultaneously, ~~narrowed~~ cost differentials with the Far East have narrowed and led to some firms 're-shoring' their manufacturing operations back to the district. Whilst the industry has always benefitted from a strong supply chain, with close vertical relationships being particularly beneficial for innovation in the tableware and giftware sector (P.R. Tomlinson and Jackson, 2013)~~(see Tomlinson and Jackson, 2013)~~, local firms have been investing significantly in new plant and equipment and recent initiatives have focused upon promoting greater horizontal collaboration between district firms and there has been a notable increase in (district) co-operation and networking over technology and production operations ~~(P.R. Tomlinson and Branston, 2014)(for full details, see Tomlinson and Branston, 2014)~~(Philip Tomlinson, R. and Branston, 2014).

In terms of innovation, the ceramics industry has undergone significant technical change over the last fifty years. There have been notable improvements to clays and glazes, and in design techniques to enhance product development. Indeed, the industry itself has moved into new fields such as geo-polymerisation[R2], while ceramic technologies have been effectively utilised in a range of new spheres from bio-inserts and bone transplants, to drug delivery systems and mobile transmitters. On the process side there has been greater mechanization to control and improve the consistency of raw materials, the introduction of single-fire technology and new forms of organization within the workplace, including changed in management practices brought about by the employment of leaders from outside the industry. [R3]The combination of t~~T~~hese changes ha~~ves~~ ~~been seen as~~ deliver~~ed~~ed~~ing~~ faster throughput times, raise~~d~~ed~~ing~~ efficiency, ~~(and~~ reduc~~inged~~ waste~~)~~ and improve~~d~~ed~~ing~~ product quality throughout the industry (see Warren et.al, 2000[FF4]).

The district's main technological gatekeeper has been Lucid-eon, which provides consultancy, testing and technical support across the whole ceramics and related industries. Indeed, Lucideon has long been an instrumental conduit for innovative ideas, facilitating collaborative ties and knowledge transfer, and securing and managing external funding for R&D, and testing with within the industry (Philip Tomlinson, R. and Branston, 2014)~~(see Tomlinson and Branston, 2014)~~. On a lesser scale, district firms can also access the publicly funded Longton 'Hothouse', a ceramic shape and pattern design centre, which is equipped with the latest three-dimensional printing and prototype technology along with computer-aided design (CAD) and computer-aided manufacturing (CAM) tools. This centre of excellence aids firms in bringing new designs to markets more quickly, and serves firms across the whole sector, with firms being able to take advantage of the centre's facilities and expertise ~~(for a set fee)~~, without incurring the high sunk costs associated with investing in specific technologies (Sacchetti and Tomlinson, 2006, 2009)~~(Sacchetti and Tomlinson, 2006, 2009)~~.

Additionally, the district has begun to promote greater international networking. For instance, Stoke ~~through~~ hosting~~s~~ the British Ceramics Biannual (a 6 week international festival of ceramic art), while at the pan-European level, the City Council and industry representatives ~~(~~from the district~~)~~, were actively involved in the EU-funded (2008–2011) Urban Network for Innovation in Ceramic Cities, a network of nine European (ceramics focused) cities~~,~~ which brought together ceramics industrialists, policymakers, and other stakeholders from across Europe in a series of workshops and exchange visits to share ideas and discuss policy initiatives. While funding has ended, these links continue. Finally, the North Staffordshire Chamber of Commerce (NSCC) has become increasingly proactive in supporting district ceramics firms in attending international trade fairs.

~~Together they signal growing scholarly interest in temporary connections between firms and its influence on innovative performance.~~

~~We~~

3~~2~~. Literature Review

In line with ~~Together they signal growing scholarly interest in temporary connections between firms and its influence on innovative performance.~~~~In the open innovation era (Chesbrough, 2003) much attention has been paid to the sourcing of new ideas, technologies and knowledge, from sources external to the firm , but little attention has been paid to the role of trade fairs etc. as sources in this activity. The paper also draws upon recent calls in the economic geography literature to redress the balance from a focus solely on the role of industrial clusters and the benefits of local interaction and 'buzz' for innovation, to their linkages to other places via global 'pipelines'. However in this set of literatures most attention has been paid to the role of FDI, outsourcing or the transfers of personnel as~~

~~conduits of global knowledge transfer into clusters; trade fairs etc., have largely been neglected and only now are gaining interest .~~

~~Clusters and local buzz local regional innovation system (Cooke) Similar to~~ (Maskell, et al., 2004), we use the term 'cluster' in a generic sense so that it includ~~ing~~es related concepts such as geographical agglomeration, industrial district, regional knowledge network etc.

Clusters are a key instrument in regional policy initiatives and ~~U, -~~much empirical research on the economic benefits and performance of clusters and the co-location of firms has been written, ranging from the benefits of generalised positive spillover effects in the 'industrial atmosphere'(Marshall[FF5], 1890; Beccattini, 1990; Porter, 1990), through to more strategic access to specialised knowledge bases through ~~is~~ knowledge transfers in an 'innovative milieu' (Cooke and Morgan, 1994, 1998; Camagni, 1991; Maillat, 1995; Boekema et.al. 2000). However in the past decade or so, scholarly research on clusters has faced criticism ~~in~~from some quarters for having become very insular and locally focussed e.g. focus on interaction between local university-business relationships (Lissoni et al, Guena etc here +JEG, RS refs) and on the importance of co-location to access 'buzz ' (Storper and Venables, 2004)~~(Storper and Venables, 2004)~~. There have been recent calls in the economic geography literature to redress the balance towards the influence of knowledge sources outside of the cluster, ~~(Bunnell & Coe, 2001 (Currah and Wrigley, 2004)~~ as the injection of new knowledge from outside the cluster allows it to evolve in the manner suggested by the evolutionary economic geography approach ~~(M~~(Maskell and Malmberg, 2007)~~askell and Malmberg, 2007)~~. One popular perspective in this area has been advanced by (Bathelt, et al., 2004)~~Bathelt et al (2004)~~ in their conceptualisation of 'local buzz' and the complementary ~~and balancing~~ concept of 'global pipelines'.

> ~~*PHIL PLEASE FILL THIS SECTION OUTmanufacturers/producers, suppliers of material and equipment, technical training institutes and social institutions like labour union, role of local government – encourage local linkages and international ones by export promotion activities. "Nationally we are aiming to have an additional 100,000 businesses" trading overseas by the end of the decade." Robert Lawley, Head of International Trade, for UKTI Staffordshire. http://www.staffordshire.gov.uk/business/exporting/prior-events/Exporting-events-summary-report.pdf accessed 13/02/15*~~
>
> ~~***Dynamics of cluster** evolution (Lots of lit on this area to cite) – clusters may have lifecycles and die, others evolve to survive in a globally competitive environment – move towards niche, hi-end products, invest in new plant and equipment, renew leverage of local knowledge sharing, lower costs by outsourcingin the manner~~

suggested by the evolutionary economic geography approach (Maskell and Malmberg, 2007).

Although Outsourcing of production has potential for (deliberate or passive/incidental) incremental innovation, esp, in production processes.

3.12.3 FromLocal buzz , global pipelines toand global buzz

Scholarly research on clusters has faced m and on the importance of co-location to access 'buzz[2]' (Storper and Venables, 2004) ((Bunnell and Coe, 2001)Bunnell & Coe, 2001 (Currah and Wrigley, 2004) the complementary and balancing concept ofEssentially, the lLocal buzz provides the day to day knowledge ecology within a particular geographically located cluster, and is accessed . To access local buzz, outsiders need toby creatinge a physical presence in the cluster and engaginge face-to face with others in the location. It is characterised as by informal and spontaneous exchanges of knowledge that takes place in the locale or regional milieu as a result of social relations. These exchanges can lead to new ideas about product, techniques and markets which lead the firms within the cluster to thrive. It is recognised to be 'sticky' because of its strong tacit knowledge component which is shared between members within the cluster (Gertler, 2001, 2003, Markusen, 1996). Even with pressure from globalisation (Molina-Morales and Martinez-Fernandez, 2006) found that, despite pressures of globalisation, the relational structure within industrial districts and the strength onf relational capital between firms in that locality can lead to the retention of innovative capabilities within the district, even in traditional industries. need to create a physical presence in and engage face-to face with others in the locationADD COMMENTS FROM MOLINA 2006 ,al economic lock-in and here. This leads us to our first hypothesis:

H1. Creating local linkages between firms to access local buzz will have a positive effect on innovation among firms present in the cluster.

However, is also commonly acceptedacknowledged (CITATIONS?) th that if this local buzz becamewas isolated, forces of conversion [R6]in the cluster's knowledge base and social ties would eventually lead to a decline in 'buzz', regional economic lock-in, and eventual stagnation (Maillat, 1998, from (Bathelt, et al., 2004, Molina-Morales and Martinez-

[2] There are different definitions of 'buzz' and 'noise' – see Asheim et al (200,) p 658) for a summary outline of key ones.

Fernandez, 2009)~~.~~. (Uzzi, 1997) refers to the ~~phenonmenon~~phenomenon of 'overembeddedness' ~~T~~ ~~that is~~where~~,~~ there are eventually decreasing returns to innovation performance from continuing to access only local buzz. This leads to our second hypothesis:

> *H2: Deepening local linkages to access local buzz will have a curvilinear effect (inverse U-shape) on innovation among firms present in the cluster.*

3.2 Global Pipelines

'Global pipelines' (Bathelt, et al., 2004)~~(Bathelt et al, 2004)~~ link knowledge from~~–~~ distant locations to the permanent cluster through the use of key firms or other organisations in the cluster who act as knowledge filters and gatekeepers (Morrison, 2008, Rychen and Zimmermann, 2008) such as ~~e.g.~~ Lucid-eon and the Longton Hothouse in our case cluster. However, within Bathelt, et al. (2004)~~Bathelt et al 2004~~, there is not much consideration of where the knowledge that enters the global pipeline comes from. They suggest it comes from a deliberate scanning of the general external environment the firm operates within, or that it may arise from being present in other clusters and thus being exposed to their 'local' buzz.

Global pipelines are considered to be formal, structured, thoroughly planned linkages that have taken the deliberate investment of resources to cultivate. Global knowledge flows through these pipelines into the local cluster[3] and may ~~be pumped in to~~ re-energise local buzz and prolong the longevity of the cluster through its evolution (Maskell, et al., 2006). The form of these pipelines as discussed in the literature have typically been centred on the role of FDI and intra-firm knowledge transfers between subsidiaries of a parent MNE[R7], the transfers of personnel as conduits of global knowledge transfer into clusters (Rychen and Zimmermann, 2008), or global supply chains (Myers and Cheung, 2008) including the potential knowledge gained from partners to whom production might be outsourced. ~~Nevertheless~~Such pipelines are gradually built through the creation of formal (intra- or inter- organisational) relationships – they are planned and take time to establish. ~~As such,~~ W~~w~~e will call these 'embedded' global pipelines for our purposes as they reflect a deliberate embedded relationship ~~, once discovered, pipelines are gradually built through the creation of formal (intra- or inter- organisational) relationships – they are planned, rather formalised and take time to establish. As such, we will call these 'embedded' pipelines for our purposes~~between two parties or agents which have taken time to establish ~~in a knowledge transfer arrangement~~. Several of the ~~The~~ firms in the North Staffordshire ceramics industry located overseas production facilities in the Far East in the 1980's-2000's whilst other~~our cluster as~~~~re not multinational enterprises but a considerable number~~ outsourced production ~~of firms the North Staffordshire ceramics industry engage with outsourcing production to the Far East in the 1980's-2000's~~to the same thus, we ~~only~~ test the impact of th~~e~~~~i~~s~~e~~ type~~s~~ of embedded global pipeline here:

[3] The knowledge flows through global pipelines may also potentially flow in the opposite direction – out from localised clusters as one of the ways knowledge gets dispersed although this is not discussed much in the economic geography literatures.

H3: Does overseas manufacturing and the global outsourcing of production enhance innovation by firms in the cluster?[R8]

3.3 Global buzz

Within Bathelt et al 2004, there is not much consideration of where the knowledge in the global pipeline comes from. They suggest it comes from a deliberate scanning of the general external environment the firm operates within or it may arise from being present in other clusters and being exposed to their 'local' buzz. Bathelt et al, also did not comment on the nature of the knowledge that is accessed from the remote location. Implicitly it seems the knowledge within the global pipeline has lost its 'buzzy' nature and is rather more stable; it has been filtered for its potential relevance to the specific organisation by some sort of knowledge gatekeeper/gate keeping device clusters (Morrison, 2008, Rychen and Zimmermann, 2008). So whilst the foreign subsidiary itself may engage with "local buzz" in its overseas location, in the process of becoming internalised and entering the global pipeline, the knowledge appears to have become rather staid or at least stable in the stage of 'transfer' through the pipeline until it potentially becomes a catalyst for novel knowledge generation when it combines with knowledge that exists within the local cluster at the other end[FF9].

More recentlyRecently, sScholarsother economic geography scholars have recognised that there has been a conflation within studies between geographic and organizsational proximity (Torre and Rallet, 2005), and more recently in a contemporary discussion, seeking to clarify the distinctiveness of face-to-face interaction and buzz within the context of permanency or temporariness. These have clarified that. F face-to-face interactions need not be tied to permanent physical, or spatial proximity, but do require some sort of relational or cognitive proximity (Amin and Cohendet, 1999, Boschma, 2005)(Torre and Rallet, 2005). Asheim, et al. (2007) acknowledge that whilst much face-to-face communication is primarily aimed at transmitting complex tacit knowledge, mainly in formal collaborations, buzz refers to non-deliberate knowledge and information-exchange (Amin and Cohendet, 1999); it can be transmitted both electronically (Bathelt and Turi, 2011, Jones, et al., 2010) and face-to-face. Thus buzz is not exclusively 'local' and tied to local,to geographically based clusters nor does it only occur in permanent settings, but also in temporary ones (Bathelt and Turi, 2011, Rallet and Torre, 2009).

(Maskell, et al., 2004)(Amin and Cohendet, 1999)(Bathelt and Schuldt, 2008, 2010, Mendonca, 2003, Schuldt and Bathelt, 2011)(Bathelt and Schuldt, 2008, 2010, Maskell, et al., 2004, Schuldt and Bathelt, 2011) (Bathelt and Schuldt, 2008, 2010, Schuldt and Bathelt, 2011)offer the concept of "global buzz" – a thick web of specialised information in which participants or attendees are immersed; a rich communication and information ecology within a specific institutional setting. Global buzz is created in situations where expertise from across the globe is brought together for just a few days in a type of translocal cluster. The information and

knowledge gained from immersing in global buzz may have a role to play in stimulating or augmenting the knowledge available from~~by~~ immersion in local buzz.

3.3.1 Comparison of Local and Global buzz

Global buzz possesses similar characteristics to local buzz – in both cases, buzz consists of both deliberate~~,~~ planned and spontaneous ad hoc information exchange based on social relationships which can only be obtained by 'being present' (physically or virtually). However a number of differences exist. Whilst both forms of buzz are vision-oriented and seek broad or diffuse knowledge, local buzz occurring in permanent clusters facilitates this search with a quasi-permanent time horizon, whilst global buzz does so with a temporary time horizon. Access to local buzz in permanent clusters may be in part~~t~~, founded on the shared institutional setting of a local cluster; this generates a means by which knowledge is easily shared by cluster members but not outsiders, yet this institutional aspect is not present in the global buzz setting. In temporary translocal clusters, despite their different cultural, linguistic, and institutional interpretive frames, participants are still able to engage in meaningful knowledge gathering and exchange through their shared knowledge foundations and tacit knowledge based on their membership of both epistemic communities and communities of practice ~~(Seely Brown and Duguid, 1991) (Duguid and Brown XXXX;~~ (Seely Brown and Duguid, 1991, Wenger, 1998, Wenger, et al., 2002). This is shared perspective is sufficient for the relatively shallow, wide-ranging, and speculatively useful information and knowledge which is gathered in such temporary meetings which themselves may or may not be the precursor, to the establishment of more purposeful, strategic and quasi-permanent relationships between firms in the future (Maskell, et al., 2004). Moreover firm representatives accessing global buzz are able to spread knowledge back to their home cluster's local buzz because of both their membership of epistemic communities[R10], communities of practice, institutional norms, and/or personal knowledge networks (Cohendet, et al., 2014, Ramírez-Pasillas, 2008, 2010) ~~(Cohendet, et al., 2014, Ramírez-Pasillas, 2008, 2010)(Huber 2010?? Not in refs)~~. This leads us to our next hypothesis:

> *H4. Access to global buzz by attending temporary translocal cluster events has a positive impact on the innovative performance of firms in the cluster.*

3.4 Sources of global buzz

~~i.e. international trade fairs, professional gatherings and conferences.~~ Most of the empirical work on global buzz ~~in the economic geography literature~~ [R11]has been conducted primarily on international trade fairs (ITFs) (Bathelt and Schuldt, 2008, 2010, Bathelt and Zeng, 2014, Fitjar and Huber, 2014, Maskell, 2014, Maskell, et al., 2004, Schuldt and Bathelt, 2011) rather than business conferences, with exception of (Bathelt and Henn, 2014, Henn and Bathelt, 2015). However, emerging from these early works is a suggestion that the nature of the knowledge

exchanged in global buzz and their implication for stimulating local buzz is different between ITFs and conferences. We summarise each in turn.

3.~~3~~4.~~2~~1 ITFs

Work on international trade fairs has its foundations predominantly in the marketing literature (Bello, 1992, Bello and Barczak, 1990, Ling-yee, 2006)~~(Bello, 1992, Bello and Barczak, 1990, Ling-yee, 2006)~~ and has concentrated on how the creation of (social) relationships at such events can enhance sales and establish sales relationships. However, it is widely acknowledged that ITFs have evolved from being pure market places - where traders meet to set up contracts with existing customers and potentially find new customers, to knowledge spaces ~~((Li, 2014))~~(Li, 2014, Sarmento, et al., 2015) – where globally ambitious manufacturers, suppliers, and customers can come together face-~~-~~to -face to gather knowledge about future trends for their industry. For instance, ~~In vertical relationships in the supply chain~~ a producer can gather information from suppliers about emerging upstream technologies which may affect their production stage either as a potential threat or opportunity. Trade fairs have a role to play in 'upstream' knowledge formation (Maskell, 2014) (i.e. the knowledge sourced from these meetings may then be applied downstream from its point of introduction). Equally a producer can gather information from downstream about customers' preferences and requirements for future products in a user-led innovation type manner (Baldwin and von Hippel, 2011). Similarly in horizontal dimensions, firms can gather information and competitive intelligence about competing products, marketing strategies, pricing plans etc. This information exchange can be purposeful and planned with meetings scheduled in advance~~,~~ to take place during the trade fair, but much of it is opportunistic, ad hoc and spurious[R12] and obtained through casual observation walking around other exhibitor's stalls, or listening to conversations or informal exchanges during social occasions such as coffee breaks, or formal exhibitor dinners etc., (Cook and Brown, 1999)[4].

By these means global buzz is created in temporary translocal clusters like ITFs (Bathelt and Schuldt, 2008, 2010, Schuldt and Bathelt, 2011)~~(Bathelt & Schuldtz, 2008, 2010)~~ and can potentially be a place where firms might start to identify remote but potentially complementary competences to their current activities and where potential sources of these competencies might be identified (Maskell, 2014)~~(Maskell, 2014)~~. ~~(Bathelt and Schuldt, 2010, Schuldt and Bathelt, 2011)~~ Bathelt and Schuldt (2010) and Schuldt and Bathelt (2011) suggest that inter-industry differences arise in the type of knowledge that emerges from global buzz – with design dominant industries (e.g. paper designs) gaining different knowledge from technical equipment (e.g. meat processing equipment) based industries. Consequently the transformation of this knowledge into new designs or the foundations upon which to explore potential technological partnerships ~~emerged differently in the two~~differ between ~~different~~ industries.

[4] Rinallo and Golfetto (2011) counter-argue that the multidirectional, global buzz may in fact be socially and politically constructed at several levels rather than truly global. Rinallo, D. and Golfetto, F., 2011. Exploring the knowledge strategies of temporary cluster organizers: A longitudinal study of the eu fabric industry trade shows (1986–2006). Economic Geography. 87 (4), 453-476.

3.~~3.3~~4.2 Business Conferences

~~Bathelt and Henn 2014, (Bathelt and Henn, 2014, Henn and Bathelt, 2015)~~ Bathelt and Henn (2014) and Henn and Bathelt (2015) highlight that similarly to ITF's, business and professional conferences provide temporary settings for the intensive exchange of ideas and knowledge i.e. a form of global buzz[R13]. Whilst these often emerge from unplanned decentralis~~z~~ed knowledge flows as per ITF's, a differentiating characteristic of business conferences, is that conversations and knowledge exchanges occur around a common theme or business focus provided by plenary sessions or keynote speakers. The conference themes themselves reflect the dynamic changes in the underlying functional field [R14]and this is the basis for discussion, rather than specific products, technologies, or exhibits. Another difference they highlight is that the conference theme will tend to attract members of a knowledge community who hold similar jobs, roles and tasks from across different organisations, and as a result the exchange of knowledge in its horizontal dimension~~,~~ is much more significant than that in the vertical dimension. Moreover, whilst ITFs have an element of competitor intelligence gathering in the horizontal dimension of knowledge exchange, the absence of this in business conferences means that the exchange of knowledge across firms is possibly more open. Due to the combination of the similarity in the attendees in their job roles and functions, but from different and internationally dispersed organisations, the sharing of differentiated perspectives on the same issue works to promote knowledge circulation and knowledge reproduction in business conferences, as opposed to configuring the field in entirely new directions. Similar to ITF's the individuals attending the conferences may take knowledge gained from the business conference back to their facilities located in their 'permanent' local cluster. The individuals also create personal social networks which may form the basis of latent organisational networks that may be leveraged in future relationship building between organisations (Maskell, 2014) ~~(Maskell 2014)~~.

3.4 Refinement of a concept - ~~T~~the 'transient' global pipeline

~~Global buzz possesses similar characteristics to local buzz – in either case, buzz consists of both deliberate, planned and spontaneous ad hoc information exchange based on social relationships which can only be obtained by 'being present'. However a number of differences exist. Whilst both forms of buzz are vision oriented seeking broad or diffuse knowledge, local buzz occurring in permanent clusters facilitates this search in a quasi-permanent time horizon, whilst global buzz does so in a temporary time horizon. Access to local buzz in permanent clusters may be in part, founded on the shared institutional setting of a local cluster; this generates a means by which knowledge is easily shared by cluster members but not outsiders, yet this institutional aspect is not present in the global buzz setting. In temporary translocal clusters, despite their different cultural, linguistic and institutional interpretive frames, participants are still able to engage in meaningful~~

~~knowledge gathering and exchange through their shared knowledge foundations and tacit knowledge based on their membership of both epistemic communities and communities of practice (Duguid and Brown XXXX; (Wenger, 1998, Wenger, et al., 2002). This is shared perspective is sufficient for the relatively shallow, wide-ranging and speculatively useful information and knowledge which is gathered in such temporary meetings which themselves may or may not be the precursor, to the establishment of more purposeful, strategic and quasi-permanent relationships between firms in the future (Maskell, et al., 2004). Moreover firm representatives accessing global buzz are able to spread knowledge back to their home cluster's local buzz because of both their membership of epistemic communities, communities of practice, institutional norms and/or personal knowledge networks (Cohendet, et al., 2014, Ramírez-Pasillas, 2008, 2010)(Huber 2010?? Not in refs).~~

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~~substitutability of local and global aske lll et al 2004, 2006 thinks the knowledge gained is incremental and complentary/ implicitly path dependent and cumulative. However, the JMS authors see ITFs etc as FCE. I think that it's a bit like innovation – predominantly incremental change facilitated by ITFs etc, a slight outward pressure on the current production function. However, this is occasionally punctuated by more radical changes in the form of FCE's. I don't think FCE's are predicatable ex-ante. Plenty of hi-level international meetings take place with very little outcome e.g. G7 meetings, WTO Doha round negotiations. Whilst other meetings with lower ambitions actually provide more significant FCE outcomes e.g. medical devices, etc.~~

In contrast to the established local buzz--global pipelines literature – where the pipelines are formalised inter-organisational relationships~~,~~ - in the global buzz literature~~, however,~~ the form of the pipeline is hardly discussed. We suggest that such gatherings require global pipelines of a rather different nature to those specified in (Bathelt, et al., 2004). Maskell, et al. (2004)~~Maskell et al 2004- SPACEs paper,~~ introduce the term 'translocal pipelines' in addition to global pipelines, but it is not clear whether the two terms are referring to pipelines with different characteristics, if one is a sub-category of the other, or if the two terms are being employed as synonyms. We attempt to bring some clarity and refinement here.

-We postulate that connections from the permanent cluster's local buzz to global buzz are formed by~~These~~ pipelines which are temporary in nature (only lasting the duration of the gathering) and take the form of the organisation's representative(s) at the temporary gatherings. [R15]We call these conduits 'transient' (as opposed to embedded) global pipelines. The cost of creating the transient global pipeline itself is relatively low (at least only marginally more than the cost of attending the event anyway). The pipeline may be created through deliberate intent (e.g. the organisation sends delegates and representatives with the mission to gather certain

types of knowledge or connect with specified attendees) and pre-arranged meetings to be held during ~~in the duration of~~ the fair or conference, or its creation may be emergent, based on serendipitous meetings of individuals at informal social occasions who happen to find common ground. We also propose that these pipelines to temporary global buzz are initially formed by the individuals in attendance (as opposed to the inter-organisational level represented by embedded global pipelines). ~~and possibly recurrent (in situations like trade fairs, the major ones take place on a regular basis e.g. annually, biannually etc). We will call these conduits 'transient' global pipelines through which the initial knowledge will flow. Instead of requiring large investments of time and formal relationship building, we suggest these pipelines are founded at the level of the individual attendee(s) at the gathering and are based on social relationships formed in the temporary gathering by meeting and socialising with other delegates~~ These individuals gather potentially useful knowledge and information through their exposure to global buzz and transfer it ~~but they are then transferred by the individual in~~ through their participation ~~of~~in social networks (intra-firm and inter-organisational) and local buzz within the ~~home~~permanent cluster. The ~~individual~~ representatives at the temporary gathering are both~~themselves~~ ~~the~~ gatekeepers ~~(this differs to the nature of gatekeepers discussed in the cluster literature which sees the gatekeeper at an organisational level – a leading firm, or industry representative of the cluster)~~ of knowledge and the pipelines between global buzz and local buzz (again, this differs to the nature of gatekeepers discussed in the cluster literature which sees the gatekeeper at an organisational level – a leading firm, or industry representative of the cluster (Morrison, 2008)~~Morrison 2008)~~.

It is possible that these global pipelines whilst transient, are also recurrent (in situations like ITF~~trade fairs~~, the major ones take place on a regular basis e.g. annually, biannually etc) and it is also possible for either the same individual(s) to attend such events each year or for different representatives to attend in different years. Repeated attendance by representatives of the organisations could lead to the building of transient pipelines at the organisational level in a micro-foundational way (Felin, et al., 2012)~~(CITE SOMEONE FOSS?)~~. Furthermore~~, and~~ it may be that repeated or recurrent engagement with global buzz (by greater participation in ITFs and business conferences) leads to deeper relationship building in these temporary meetings which may, in turn, lead to better quality knowledge gathering and transfer. Thus, we propose:

> *H5: Greater engagement with global buzz has a ~~positive~~ positive effect* [FF16] *on innovation for cluster based firms.*

3.5 Local buzz and global buzz – complements or substitutes?

~~as well as potential contributors to the building of new global pipelines if the initial relationship develops and deepens over time (Maskell, et al., 2004).~~

Both embedded and transient global pipelines co-exist to stimulate the dynamic evolution of a~~n~~ permanent, geographically tied industrial cluster. Some of these may be "stronger" pipelines than others in terms of the depth and breadth of knowledge exchange, and influence on

innovation. (Faulconbridge, 2006) for example distinguishes between transfers of existing knowledge (best practice) which is more akin to the intra-firm transfers of knowledge across MNEs such as from parent HQs to subsidiaries, and the social production of new knowledge. The latter ~~which~~ brings global person~~a~~nel~~l~~ together through social experiences which enable the enrichment and shaping of an individual's own knowledge, understanding, and sense-making which better reflects the role of temporary translocal clusters and their influence on innovative activity. The forms of pipelines, and the varied global sources of knowledge they tap into, may also perform difference functions ~~(Maskell, 2014, Maskell, et al., 2006)~~(Bathelt, et al., 2004, Gertler, 2003, Maskell, 2014, Maskell, et al., 2006, Storper and Venables, 2004). They may also ~~and~~ be sequential in an evolutionary pathway such that ~~e.g.~~ transient socially based pipelines ~~(André Torre, 2008)~~~~between translocal temporary~~accessing global buzz ~~settings~~ may eventually lead to ~~knowledge transfers which eventually lead to~~ the formation of more embedded, formal global pipelines relationships for deeper knowledge exchange.[~~µ17~~]

~~In~~ The

~~The work on open~~ innovation literature [R18]at the firm level, assumes that that externally sourced knowledge is a complement to the firm's internal R&D activities largely because the latter creates absorptive capacity that allows the firm to filter and use the external knowledge. There is some work at the cluster level which suggests a similar story – a cluster or region that engages in knowledge creation activities between[R19] its actors builds up absorptive capacity that enables it to make use of knowledge that may be received through global pipelines. In other words, global buzz and local buzz are complements ~~(ITF as complements to local buzz in clusters~~ (Belso-Martinez, 2012, Maskell, et al., 2006)~~)~~. However others find support for a substitution effect ~~this may not be the case. For example,~~ (Moodysson, 2008, Torre, 2008) ~~has shown that in the Swedish part of the Medicon cluster, local buzz is actually weak/ hollow (although economies from pure agglomeration effects may still arise from clustering or other benefits such as tax breaks from locating in a particular trade zone may be accrued giving rise to clusters of firms), but is fed by strong global pipelines to other external sources of knowledge. Thus remote buzz may be a substitute for local buzz~~(André Torre, 2008)~~(A. Torre, 2008) (André Torre, 2008).~~, (Morrison, et al., 2013) find support for both relationships with the outcome being contingent on the characteristics of the local cluster's knowledge base: if strong and of high-quality, global pipelines enhance the diffusion of knowledge in clusters, if weak or absent then global pipelines are substitute sources of knowledge. We therefore examine:~~thus it is worth examining the relationship between global buzz and local buzz empirically.~~

~~Jerker Moodysson "Principles and Practices of Knowledge Creation: On the Organization of "Buzz" and "Pipelines" in Life Science Communities" Economic Geography Volume 84,~~

~~Issue 4, pages 449–469, October 2008 (Local buzz in Sweden part of Mdeican cluster is hollow, but fed by strong global pipelines).~~

H6a. Local buzz and global buzz are complements in their ~~positive~~ effect upon innovation in cluster based firms.

H6b. Local buzz and global buzz are substitutes in their effect upon innovation in cluster based firms.

~~Are they complements or subsitutes?~~ **~~Resonant & OI~~**

~~This work on access to pools of 'buzz' plays to the Open innovation literatures in innovation studies. In the open innovation era (Chesbrough, 2003) much attention has been paid to the sourcing of new ideas, technologies and knowledge, from sources external to the firm as a form of 'outside-in' open innovation. Open innovation sources span a spectrum from various forms of partnerships and alliances such as supply-chain relationships, user-led innovation, the use of strategic alliances and joint ventures, practices such as patent pooling in the establishment of industry and technological standards. Potential partners and ideas can be found through the leveraging of existing relationships, the sourcing of new ones through Open Innovation intermediaries (Innocentive?) and some well-documented firms have created open innovation platforms that crowd source ideas via social media networks and other Web2.0 based activities. There open innovation is concerned with the access, transfer and co-creation of knowledge across organisational boundaries as openness is conceived as semi permenable at the organisational boundary. Thus building global pipelines to other geographic locales of buzz can allow firms to access ideas and knowledge for innovation from other organisations. (Cooke) – has done work on OI and geography. However it is also possible to conceive of openness to occur other boundaries such as national ones in which case intra-organisational transfers of knowledge from one location to another might also be seen as a form of internal open innovation (Cite someone on internal open innovation). However, little attention has been paid in the open innovation literatures to the role of other more transient sources of ideas and knowledge such as business conferences and trade fairs[JL20].~~

ITF as learning and knowledge exchange ecology – creation of global buzz (Bathelt & Schuldtz papers)

Why is global buzz like local buzz? – substitutability of local and global

Why is global buzz different to local buzz? (Maskell – complementarity of local and global, but their degree of similarity actually facilitates KTs and learning. Epistemic communities and communities of practice.

Role of tacitness and stickiness of knowledge – Gertler, M. S. (2003). Tacit knowledge and the economic geography of context, or the undefinable tacitness of being (there). Journal of economic geography, 3(1), 75-99.

3. Case Background

The North Staffordshire ceramics industrial district is based in the British city of Stoke-on-Trent (and its' immediate vicinity). The district is 'mature', with ceramics manufacture dating to the 17th century and the industry shaping the region's industrial landscape and social fabric while providing long-standing employment (Whipp, 1990). The district is the centre of UK ceramics production in table and giftware and to a lesser degree, tiles and flag manufacture, technical and refractory ceramics, brick and roof tile manufacture and sanitary-ware. In addition, material and equipment suppliers (such as clays, glazes, ceramic decals, and in (reduced capacity) kiln and machinery manufacturers) also operate within the district. Finally, the British Ceramics Confederation (BCC), Lucid-con (previously Ceram Research), the Ceramics Skills Academy, the International Clay Technology Association (ICTa) and Unity, the ceramics related labour union are all located within the district.

During the late twentieth century, the district entered a 'long decline' (1979-2008) with the closure several high profile factories (and firms) and moves by some manufacturers to 'outsourcing' production to the Far East to take advantage of labour costs and remain price competitive. The decline in domestic capacity led to a subsequent deterioration in the UK ceramics trade balance (which fell into deficit for the first time in 2003, and has remained in deficit since, reaching reached £654 million in 2013), and a concomitant fall in employment from 52,700 to approximately 10,000 today (Office of National Statistics, 2013). However, in recent years, the district has begun to witness something of a renaissance as the district's remaining ceramics firms have increasingly focused upon serving higher end markets, with new innovative designs and exploiting the recognised cache for Staffordshire made wares. At the same time, rising labour and energy costs in the Far East have narrowed cost differentials and led to some firms 're-shoring' their manufacturing operations back to the district. To take advantage of these new opportunities, district firms have been investing significantly in new plant and equipment, while there has been a notable increase in (district) co-operation and

networking over technology and production operations (for full details, see Tomlinson and Branston, 2014)[5].

In addition, the district has in recent years begun to promote greater international networking through the British Ceramics Biannual (a 6 week international festival of ceramic art) held in the district, while at the pan-European level, the City Council and industry representatives (from the district), were actively involved in the EU-funded (2008–2011) Urban Network for Innovation in Ceramic Cities, a network of nine European (ceramics focused) cities, which brought together ceramics industrialists, policymakers and other stakeholders from across Europe in a series of workshops and exchange visits to share ideas and discuss policy initiatives. While funding has ended, these links continue. Finally, the North Staffordshire Chamber of Commerce (NSCC) has become increasingly proactive in supporting district ceramics firms in attending international trade fairs.

- In terms of innovation, the ceramics industry has undergone significant technical change over the last fifty years. There have been notable improvements to clays and glazes and in design techniques to enhance product development. Indeed, the industry itself has moved into new fields such as geo-polymerisation, while ceramic technologies have been effectively utilised in a range of new spheres from bio-inserts and bone transplants, to drug delivery systems and mobile transmitters. On the process side there has been greater mechanization to control and improve the consistency of raw materials, the introduction of single-fire technology and new forms of organization within the workplace. These changes have been seen as delivering faster throughput times, raising efficiency (and reducing waste) and improving product quality throughout the industry (see Warren et.al, 2000). The district's main technological gatekeeper has been Lucid-eon, which provides consultancy, testing and technical support across the whole ceramics and related industries. Indeed, Luci-deon has long been an instrumental conduit for innovative ideas, facilitating collaborative ties and knowledge transfer, and securing and managing external funding for R&D, and testing with within the industry (see Tomlinson and Branston, 2014). On a lesser scale, district firms can also access the publicly funded Longton 'Hothouse', a ceramic shape and pattern design centre, which is equipped with the latest three-dimensional printing and prototype technology along with computer-aided design (CAD) and computer-aided manufacturing (CAM) tools. This centre of excellence aids firms in bringing new designs to markets more quickly, and serves firms across the whole sector, with firms being able to take advantage of the centre's facilities and expertise (for a set fee), without incurring the high sunk costs associated with investing in specific technologies (Sacchetti and Tomlinson, 2006, 2009). [FF21]

44. Methodology

[5] The industry has always benefitted from a strong supply chain, with close vertical relationships being particularly beneficial for innovation in the tableware and giftware sector (see Tomlinson and Jackson, 2013). Recent initiatives have focused upon promoting greater horizontal collaboration between district firms.

44.1 Sample

Our aim was to survey all ceramics manufacturers registered as operating in the North Staffordshire industrial district and from across the whole industry spectrum: table and giftware (the most prominent sub-sector); tiles and flag manufacture; technical and refractory ceramics;, brick and roof tile manufacture; sanitary ware; and material and equipment supplies including clays, glazes and ceramic decals. In this regard, we obtained details of firms from the membership directory of the British Ceramics Confederation (BCC) and supplemented this list, with firms listed on Yell.com (a public directory). We also included firms that were not on either of these lists, but whose details had been provided to us by third parties such as the North Staffordshire Chamber of Commerce, Lucid-eonCeram, the Economic Development Office of Stoke-on-Trent Council and personal contacts within the district. In total, we surveyed 282 ceramics manufacturers, which was confirmed to us (by the Economic Development Office of Stoke-on-Trent City Council) as being a very good estimate of the total population of ceramics manufacturers within the district.

The questionnaire itself was part of a wider study exploring innovation, governance, institutions and networks within UK industrial districts, and as such included questions pertaining to these issues, along with acquiring details of the firm's background, its' size and ceramics activities. We took advice from the BCC on the framing of the questions to suit local industry nuances. The questions themselves related to the previous five years of business trading (2007/8-2012/13), with most utilising a 7 point structured Likert scale. The survey was addressed to the Managing Director of each firm[6] and was administered by post – with an option to complete online - between June and October 2013. To elicit higher response, respondents were offered the opportunity to enter a free prize draw[7], while non-respondents were chased by telephone and reminder letters during the survey period. In total, 121 responses (42.9% response rate) were received, with 112 (39.7%) providing complete information for the current study, which is a highly respectable response rate for survey research (Hair, et al., 2007). Tests for non-response bias were based upon comparing the mean responses of the variables under consideration of the early and late respondents, with ANOVA analysis revealing no significant differences (Armstrong and Overton, 1977, see Appendix A1).

44.2 Model Specification and Variable Construction

[6] When necessary, clarity over the status of the respondent was confirmed by a telephone and the responses verified.

[7] The use of a prize draw as an 'incentive' to participation in the survey raises issues as it could exert undue influence on potential participants' decisions about whether to take part in the research, which may distort the sample (Alderson & Morrow, (2004) Alderson, P. and Morrow, V., 2004. Ethics, social research and consulting with children and young people, Barnardo's, . However, such 'prize draws' are successful in generating higher response rates and thus reduces non-response bias, and increases the sample quality. This can help to achieve a sample that is more representative of the population being studied than could otherwise be achieved (Groves and Peytcheva, 2008) Groves, R.M. and Peytcheva, E., 2008. The impact of nonresponse rates on nonresponse bias a meta-analysis. Public opinion quarterly. 72 (2), 167-189..

Our model follows previous approaches modelling open innovation, and is based upon a standard knowledge production function (namely internal control variables), supplemented with independent predictors ~~(Geroski, 1990, Molina-Morales and Martinez-Fernandez, 2006, Molina-Morales and Martinez-Fernandez, 2009, P.R. Tomlinson and Jackson, 2013a, P. R. Tomlinson and Jackson, 2013b) (P. R. Tomlinson and Jackson, 2013b)~~(Geroski, 1990, Molina-Morales et.al, 2006, 2011, Tomlinson and Jackson, 2013) which, in our case capture both the extent of a firm's local and global linkages. To capture the effects of greater intensity in firms' local and global activities upon their innovative performance, we also included quadratic transformations of these predictor variables; this tests for curvilinear effects and follows Molina-Morales and Martinez-Fernandez (2009) and Love, et al. (2013). The formal model is

$$\text{Innovation} = \beta_0 + \beta_1 [X_{i..k}] + \beta_2 L + \beta_3 \sum_{i=1}^{n} G_{i\ldots k} + \varepsilon_i \qquad (1).$$

where X_i is a vector of control variables, L represents local knowledge linkages and G captures the extent of global linkages. The construction of the variables is described as follows (full details of survey questions in Appendix A1):

Innovation: Respondents were asked to report the number of new product and process innovations the firm had introduced over various activities during the previous five years. This measure is based upon Tsai and Ghoshal (1998) and has been utilised in previous research by Molina-Morales et.al (2006, 2009, 2011) and ~~Philip Tomlinson, R. (2010)~~(P. R. Tomlinson, 2010). It also corresponds closely to the Oslo Manual ~~OECD (2005)~~(OECD, 2005) guidelines on measuring innovation. In short, our measure seeks to capture the widest sphere of innovative activity within ceramics firms, which may/may not be directly observed through other recognised measures of innovation such as patents (which are typically not lodged by small and medium sized firms that comprise the majority of our sample)[8].[FF22]

Local Knowledge Links: Firms were asked questions (on a 7 point Likert scale) relating to the extent to which they utilised district research and development facilities and exploited local knowledge-related linkages. This is based upon Molina et.al (2006), and the variable was constructed using the mean scores across the survey items listed in Appendix A1. The aggregation was validated by Cronbach's alpha (α), with the calculated score (0.70) being acceptable to comply with requirements for both internally consistency and reliability (Hair et.al, 2007).

Global Links: Firms were asked questions (on a 7 point Likert scale) relating to the extent to which they participated in business seminars, workshops (including training and technology related events), conferences, trade fairs or undertaken a business visit (where such events take

[8] The use of self-reported data (of the number of innovations) as a valid indicator of innovation has long been accepted; for instance, in the EU Community Innovation Survey (see also Keeble, 1997).

place) in Continental Europe, North America, Asia, and the rest of the world. First, separate variables were constructed for each supra-national region. Secondly, the global links construct was compiled by using the mean scores across these regions (see also Appendix A1). The aggregation was again validated by Cronbach's alpha (α), with a score of 0.8 suggesting the measure was both internally consistent and reliable (Hair et.al, 2007).

Control variables: To control for firms' different 'absorptive capacities' to internally process and exploit external sources of knowledge (Cohen and Levinthal, 1990), we included measures capturing Firm Size and Research and Development expenditure (Symeonidas, 1996). In addition, we also include a dummy variable if a firm has an overseas manufacturing facility, since this might also be an external (global) source of knowledge (Reference ?).

4.3. Construct validation

In addition, to calculating Cronbach's alpha (α) for the construct variables, we also conducted tests for *discriminant validity* by comparing the variance-extracted estimates for pairs of constructs with the square of their respective correlation coefficient (Hair, et al., 2007); the test statistics confirmed that each construct was distinct (Campbell and Fiske, 1959). *Face validity* was satisfied by largely utilising similar multi-scale items, as used in previous studies. The *validity* of *subjective assessments* of single responses to the survey questions was verified by gathering similar independent data on the key variables from a random selected sample of 25 second participants (senior managers) from the surveyed firms, with possible second response bias being tested by a comparison of means (Krackhardt, 1996, Marsden, 1993); there were no significant differences, thus the validity of subjective assessments was considered acceptable

Finally, several measures were undertaken to reduce the possibility of common methods bias. In addition to establishing the validity of subjective assessments (and thus ensuring inter-rater reliability), we also reversed several items in the survey, while also placing questions on innovation and external linkages in separate sections of the survey to negate the possibility of respondents linking the categories (see Podsakoff et al., 2003). Anonymity of respondents was also assured to respondents to elicit truthful responses. As a final test, a Harman single-factor test was conducted in which all measures (in the study) were loaded into an exploratory factor analysis, with the result that the largest factor accounted for only 31.2% of the variance, which is within the bounds of acceptability (Hair.et.al, 2007). By undertaking these actions it is unlikely that common methods bias is a problem in our data set (Podsakoff, et al., 2003, Sharma, et al., 2009).

5.0 Results and Discussion

Following Molina et..al (2006), equation (1) was first estimated as a linear, hierarchical regression model, with innovation being regressed upon the control variables, with the model subsequently supplemented with the predictor (co-operation) variables. These results are presented in Table (1) and, in this set of models, the linkages with (global) regions are

considered separately. In Table (2), these supra-national linkages are consolidated within the construct Global linkages (see above), and here the model takes the form of a non-linear, inverted U-shaped, (quadratic) regression so as to test for curvilinear effects[9].

First, we consider the results in Table (1). The models here appear well specified with highly reasonable R-squared statistics for survey based studies ~~of open innovation,~~ and which improve with the addition of the predictor variables. The estimated *Beta* values indicate the magnitude and relative importance of the explanatory variables. As expected, the internal resource variables – firm size and R&D expenditure – are both positive and highly significant indicating that larger ceramics firms and those that invest in innovation activities achieve a higher level of innovation output. In addition, those ceramics firms that ~~– to a greater extent –~~ exploit local knowledge linkages, by heavily utilising the district's ceramics research related facilities and exploit local knowledge transfer are also more innovative. Thus the notion of 'local buzz' is an important facilitator for innovation within the North Staffordshire ceramics industrial district supporting H1. ~~maybe local linkages – the more you invest in these relationships the more you benefit (at an increasing rate). They are clearly deeper, shared knowledge, norms, institutional environments, ease and low costs of sharing because of geographical proximity.~~

The variable capturing the existence of an overseas manufacturing facility is insignificant for innovation (no support for H3). In light of our overall results, it maybe that overseas production (and/or outsourcing) is not an important pipeline of knowledge that would lead to innovative activity by firms in this cluster.

~~.~~ Finally in Table 1, the links with Europe, North America and Asia are ~~also~~ highly significant, suggesting that firms who engage and participate regularly in international trade fairs and business~~external workshops,~~ conferences ~~and trade fairs~~[F23] in these ~~supra-national~~ regions ~~also~~ benefit in terms of innovative performance, thus H4 is ~~thus~~ supported.~~.~~ In this regard, the Asia coefficient is by far the largest, which suggests the feedback loops from this region are the most important for North Staffordshire ceramics firms. Indeed~~Ov~~ over the last twenty years, significant trade related linkages have been formed between North Staffordshire and Asia~~,~~ ~~which may explain this~~ (reference?). ~~Finally, it is interesting that the variable capturing the overseas manufacturing facility is insignificant. In light of our overall results, it maybe that overseas production (and/or outsourcing) is not an important pipeline for innovation; rather it is the nature of the link that is important for innovation.~~ **~~REVISE in light of literature review~~**

North Staffordshire Chamber of Commerce (NSCC) has become increasingly proactive in supporting district ceramics firms in attending international trade fairs and with rising incomes in Asia, it has become a strong focal target market for increased sales.

Table 2 presents results from the quadratic specification, with the supra-national links consolidated within the construct 'Global Linkages[FF24]'. Again, this model performs very well, and in the first simulation (Column 1), both local and global linkages are highly significant in explaining innovation (H1 & H4 supported). In Column (2), the quadratic term on local links

[9] Unfortunately, using the separate supra-national regional variables to test for curvilinearity encounters problems with multi-collinearity. To negate this, the Global linkages construct is utilised.

is positive and ~~again~~ highly significant (H2 unsupported). ~~.~~ This suggests there are considerable increasing returns to exploiting local linkages. They are clearly deep relationships; shared knowledge, norms, institutional environments, ease and low costs of sharing because of geographical proximity would all serve to facilitate the creation and leveraging of local buzz through multiple strong local relationships. This is reflected by the case where~~In~~ in recent years, there have been a series of investments in new research facilities and knowledge transfer activities within the district largely conducted through ~~Ceram (now~~ Lucid-eon~~)~~, [R25]but also the Hothouse Project and wider collaborative activity (Tomlinson and Branston, 2014). It seems that at the moment the renaissance of this cluster can be prolonged through the building of strong local linkages and that diminishing returns from this activity have not set in yet.

~~However, t~~The quadratic term on global linkages, although positive, is insignificant~~. **REVISE in light of literature review**~~ (H5 not supported). We suggest that given the strength of the global linkages relationship, this outcome reflects the nascent nature of heightened participation in international trade fairs and business conferences of the firms in our cluster.

Finally, the interaction between global and local buzz is positive but also insignificant. Thus the relation is in the direction suggested by H6a i.e. they are complements, but not with any significance. This is possibly due to both the nature of the knowledge which it is possible to gather in the short timeframe provided by temporary translocal clusters and the type of knowledge which appropriate to the sub-sector of the industry to gather.

5.1 Knowledge gathered at translocal temporary clusters from global buzz and implications for interactions with local buzz

~~IFT –~~At such gatherings knowledge is ~~perhaps more~~ differentiated but still shareable because attendees belong to both epistemic communities and communities of practice. ~~This can lead to incremental innovation.~~ However of all the ~~the~~ information, knowledge and experiences gathered from global buzz, not all of it might be useful to the firm (hence it will be filtered out from entering the cluster more widely) and even that which has the potential to be useful, is~~in IFTs because they are temporary translocal clusters are~~ very likely to be ~~transient~~ shallow. Deep relationships (which require trust) and complex knowledge transfers are unable to be formed or take place in such a short time frame. Indeed, (Maskell, 2014) suggests temporary clusters to be most useful when there is low problem awareness and low awareness of the source to a solution for a problem~~(Maskell et al 2006). hence not creating deep relationships (hence positive but not leading to increasing returns). Also~~ So whilst the relationship can be initiated at IFTs and business conferences~~there~~ as a first point of contact~~,~~ and may give a great deal of knowledge breadth to an attendee, only some of this broad set of knowledge will be absorbed and used by the firm and it may never diffuse more widely across the cluster. Moreoever, ~~-~~if some of the broad, but shallow information and knowledge gathered from global buzz in temporary clusters has real potential to enhance innovative activity, ~~the relationship between 2 firms is successful and useful~~the initial contact will evolve such that ~~-~~the two will form a formal pipeline network (dyadic) relationship in which deeper, more specific knowledge

will be exchanged perhaps leading to more significant innovations (Maskell, 2014). The global pipeline will have evolved from a transient one in to an embedded one and the source of the knowledge may no longer be attributed to global~~.~~ buzz as its source, but others sources of knowledge like overseas clusters, or network partners. This may be one reason why the interaction term is positive but insignificant upon innovative activity.[R26]

~~Maskell 2014 – awareness of source x problem matrix). Hence to the role of IFT meeting for these two firms declines as they move towards more significant and possibly quasi-permanent forms of relationships.~~

5.2 Sub-sector specificity of knowledge

Another potential explanation for the ~~FF:~~positive but insignificant interaction effect between local and global buzz ~~I would expect to see a positive interaction effect – significance may be weak. This~~ maybe be ~~to do wit~~associated with~~h~~ the agglomeration of the subsectors within the ceramics ~~the~~ industry. I~~y~~n our case, this covers design focussed subsectors (tableware, giftware, sanitary ware, wall and floor tiles, bricks and roof tiles), technical products and equipment focussed subsectors (technical and refractory ceramics, material and ceramics related services). Whilst design focussed firms dominate our sample, among those who attend ITFs and business conferences, 53% were technical and equipment focussed whilst 31% were design focussed and 16% service focussed. (Bathelt and Schuldt, 2010, Maskell, et al., 2006, Schuldt and Bathelt, 2011) ~~as Bathelt et al (3 papers 2006, 2010 with Schuldt and 2011 Schuldt)~~ show that the ecology and practices of global buzz in IFTs differ~~s~~ according to the industry focus of the IFT as demonstrated by their research in a range of IFTs in the paper and meat processing industries.~~T.~~ Whilst the global buzz at IFTs will ~~Probably a lot of design type knowledge exchanged in ceramic from North Staffs given the profile of products listed above – china, earthenware, tiles, flags and sanitaryware. So influence of IFT will~~ lead to new designs (as signalled by requests from potential new customers, as well as scanning of other exhibitors' stalls for competitive intelligence) for design focussed firms, this might interact rather weakly with local buzz. Whereas, ~~rather than~~ the IFTs and conferences attended by technical ceramics and equipment focussed firms may be more likely to lead to ~~new techniques or~~ technical exchanges or the adoption of new techniques ~~.~~which have greater probability for diffusion in the local cluster through local buzz once the pipeline evolves into a more embedded form. The balance of the subsector categories may therefore also offer a partial explanation for the positive but insignificant result for the interaction between local and global buzz and its influence on innovation.

6.0 Limitations and Conclusions

We set out to investigate the role of local buzz in quasi-permanent clusters and global buzz in temporary translocal clusters and their impact upon innovation for firms based in the North Staffordshire ceramics cluster in the UK. We find that both local buzz and access to global

buzz have strong impacts upon innovative activity for these firms. Our results suggest that the risk of 'over-embeddedness' among local linkages is not yet on the horizon in this cluster. We would urge the local council to continue its efforts to build linkages between firms and institutions within the cluster as they have done in recent years. We would also suggest that they continue to support the attendance of local firms at international trade fairs and business conferences, across Europe and North America, but particularly Asia. The cache and marketability of the "Made in Staffordshire"~~FF: maybe local linkages – the more you invest in these relationships the more you benefit (at an increasing rate). They are clearly deeper, shared knowledge, norms, institutional environments, ease and low costs of sharing because of geographical proximity.~~ marque can be leveraged to access new markets, for the design focussed firms. Whereas raising the profile of Staffordshire's technical ceramics and equipment firms may enable the cluster to establish more stable and embedded pipelines to other locations with complementary knowledge bases, or to international firms who may become embedded within a stable network of partners.

We make these suggestions cautiously as whilst we made our best endeavours to capture the population of firms in this cluster, our useable response rate of 39.7%, whilst respectable still represents a minority. Given that the proportion of these that attend ITFs and international business conferences is smaller still, our comments in support of the potential benefits of attendance must be taken as suggestive at best. It might be that future work might consider these effects either in other ceramics based clusters e.g. Sassolo in Italy. Nevertheless, we suggest that the renaissance of the North Staffordshire Ceramics industry of recent years is likely to continue as local buzz connects to global buzz in these temporary cluster spaces.

~~IFT – knowledge is perhaps more differentiated but still shareable because attendees belong to both epistemic communities and communities of practice. This can lead to incremental innovation. However the experiences in IFTs because they are temporary translocal clusters are very likely to be transient (Maskell et al 2006) hence not creating deep relationships (hence positive but not leading to increasing returns). Also whilst the relationship can be initiated there as a first point of contact, if the relationship between 2 firms is successful and useful the two will form a formal pipeline network (dyadic) relationship in which deeper, more specific knowledge will be exchanged perhaps leading to more significant innovations. Maskell 2014 – awareness of source x problem matrix). Hence to the role of IFT meeting for these two firms declines as they move towards more significant and possibly quasi-permanent forms of relationships.~~

~~FF: I would expect to see a positive interaction effect – significance may be weak. This maybe to do with the industry as Bathelt et al (3 papers 2006, 2010 with Schuldt and 2011~~

~~Schuldt) show that ecology and pratices of global buzz in IFTs differs according to the industry focus of the IFT. Probably a lot of design type knowledge exchanged in ceramic from North Staffs given the profile of products listed above – china, earthenware, tiles, flags and sanitaryware. So influence of IFT will lead to new designs (as signalled by requests from potential new customers, as well as scanning of other exhibitors' stalls for competitive intelligence rather than new techniques or technical exchanges[rr27].~~

Table 1 ***Innovation in the North Staffordshire Ceramics Industrial District***

Variable	(1)	(2)	(3)
Constant	-1.615*** (0.243)	-1.433*** (0.241)	-1.585*** (0.231)
Firm Size	0.273*** (0.055)	0.265*** (0.053)	0.198*** (0.052)
R&D Expenditure	0.369*** (0.064)	0.312*** (0.064)	0.356*** (0.066)
Overseas manufacturing plant	0.160 (0.205)	0.128 0.197	0.091 (0.186)
Local Linkages		0.281*** (0.089)	0.181** (0.087)
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)
Adjusted R^2	0.30	0.352	0.446
F Statistic	16.675***	16.055***	12.185***
N = 112			

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

~~**Table 2** ***Innovation in the North Staffordshire Ceramics Industrial District: Testing for Curvilinearity***~~

~~Variable~~	~~(1)~~	~~(2)~~	~~(3)~~
~~Constant~~	~~-1.298***~~ ~~(0.241)~~	~~-1.429~~ ~~(0.252)~~	
~~Firm Size~~	~~0.209***~~ ~~(0.055)~~	~~0.214***~~ ~~(0.054)~~	~~.317~~
~~R&D Expenditure~~	~~0.311***~~ ~~(0.063)~~	~~0.294***~~ ~~(0.062)~~	~~.397~~
~~Overseas manufacturing plant~~	~~0.014~~ ~~(0.197)~~	~~0.104~~ ~~(0.198)~~	~~.008~~
~~Local Linkages~~	~~0.238***~~ ~~(0.088)~~	~~0.332***~~ ~~(0.092)~~	~~.244~~
~~Local Linkages ^2~~		~~0.161***~~ ~~(0.060)~~	
~~Global Linkages~~	~~0.264***~~ ~~(0.089)~~	~~0.233*~~ ~~(0.138)~~	~~.230~~
~~Global Linkages^2~~		~~0.030~~ ~~(0.073)~~	
~~IntGL~~			~~.070~~
~~Adjusted R^2~~	~~0.397~~	~~0.427~~	
~~F Statistic~~	~~15.238***~~	~~12.513***~~	
~~N = 112~~			

Table 2 ***Innovation in the North Staffordshire Ceramics Industrial District: Interaction Effects and Curvilinearity***

Variable	(1)	(2)	(3)
Constant	-1.303*** (0.238)	-1.298*** (0.241)	-1.429 (0.252)
Firm Size	0.206*** (0.055)	0.209*** (0.055)	0.214*** (0.054)
R&D Expenditure	0.310*** (0.062)	0.311*** (0.063)	0.294*** (0.062)
Overseas manufacturing plant	0.021 (0.194)	0.014 (0.197)	0.104 (0.198)
Local Linkages	0.271*** (0.095)	0.238*** (0.088)	0.332*** (0.092)
Local Linkages ^2			0.161*** (0.060)
Global Linkages	0.243*** (0.091)	0.264*** (0.089)	0.233* (0.138)
Global Linkages^2			0.030 (0.073)
Local*Global Links	0.111 (0.132)		
Adjusted R^2	0.394	0.397	0.427
F Statistic	13.04***	15.238***	12.513***
N = 112			

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

Table 3: Sample Composition

Key Focus	Ceramics Sub-Sector	Number of Firms in Sample	No of firms engaged in regular/high number of international visits	International participants as %tage of no. of sampled firms in category	%tage of firms engaged in international activity per focal category
Design	Table & Giftware	34	10 (26%)	29%	31%
	Sanitary-ware	6	2 (5%)	33%	
	Wall & Floor Tiles	2	0 (0%)	0%	
	Bricks and Roof Tiles	10	0 (0%)	0%	
Technical & supplies	Technical Ceramics	5	3 (8%)	60%	53%
	Refractory Ceramics	6	6 (16%)	100%	
	Materials supply	22	6 (16%)	27%	
	Machinery & Equipment	14	5 (13%)	36%	
Services	Ceramics Related Services	13	6 (16%)	46%	16%
	Total	112	38	34%	

References

Alderson, P. & Morrow, V. (2004) *Ethics, Social Research and consulting with children and young people* Ilford: Barnardos.

Armstrong, S. J. and T. S. Overton (1977). 'Estimating non-response bias in mail surveys', *Journal of Marketing Research,* XIV**,** pp. 396-402

Campbell, D. T. and D. W. Fiske (1959). 'Convergent and Discriminant Validation by Multitrait Multimethod Matrix', *Psychological Bulletin,* 56, pp. 81-105.

Cohen, W. M. and D. A. Levinthal (1990). 'Absorptive capacity: a new perspective on learning and innovation', *Administrative Science Quarterly,* 35, pp. 128-152.

De Propris, L. (2002). 'Types of innovation and inter-firm co-operation', *Entrepreneurship and Regional Development,* **14,** pp. 337-353

Freel, M. S. and R. T. Harrison (2006). 'Innovation and Cooperation in the Small Firm Sector: Evidence from Northern Britain', *Regional Studies,* **40,** pp. 289-305.

Geroski, P. (1990). 'Innovation, technological opportunity, and market structure', *Oxford Economic Papers,* **42,** pp. 586-602.

Groves, R.M & Peytcheva, E (2008) The Impact of Nonresponse Rates on Nonresponse Bias A Meta-Analysis, *Public Opinion Quarterly*,72 (2): 167-189.doi: 10.1093/poq/nfn011

Hair, J. F., W. C. Black, B. J. Babin, R. E. Anderson and R. L. Tatham (2007). *Multivariate Data Analysis,* Prentice Hall, New Jersey, USA.

Keeble, D (1997) 'Small firms, innovation and regional development in Britain in the 1990s', *Regional Studies* 31, 281-293 .

Krackhardt, D. (1996). 'Comment on Burt and Knez's third party effects on trust', *Rationality and Society,* **8,** pp. 111-120.

Love, J. H., S. Roper and P. Vahter (2013). 'Learning from openness: the dynamics of breadth in external innovation linkages', *Strategic Management Journal.*

Marsden, P. V. (1993). 'The reliability of network density and composition measures', *Social Networks,* **15,** pp. 145-161.

Molina-Morales, F. X. and T. M. Martinez-Fernandez (2006). 'Industrial Districts: something more than a neighbourhood', *Entrepreneurship and Regional Development,* **18,** pp. 503-524.

Molina-Morales, F. X. and T. M. Martinez-Fernandez (2009). 'Too much love in the

neighbourhood can hurt: how an excess of intensity and trust in relationships may product negative effects on firms.', *Strategic Management Journal,* **30,** pp. 1013-1023.

Molina-Morales, F.X., Martinez-Fernandez, M.T & Torlo, V.J (2011) The dark side of trust: the benefits, costs and optimal levels of trust for innovation performance, *Long Range Planning*, 44, 118-133

OECD (2005). Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data. 3rd ed. Paris: Organisation for Economic Co-operation and Development

Office of National Statistics, Annual Business Survey (2013) Available at: http://www.ons.gov.uk/ons/rel/abs/annual-business-survey/index.html [Accessed 6 April 2014].

Podsakoff, P. M., S. B. MacKenzie, J. Y. Lee and N. P. Podsakoff (2003). 'Common method biases in behavioral research: A critical review of the literature and recommended remedies', *Journal of Applied Psychology,* **88,** pp. 879-903.

Sacchetti, S. & Tomlinson, P.R. (2006) 'Globalisation, governance and clusters: the cases of the North Staffordshire ceramic and Prato textile industries', p.232-257, In Pitelis, C., Sugden, R., & Wilson, J.R. (Eds.) *Clusters and Globalisation: The Development of Economies*: Cheltenham: Edward Elgar

Sacchetti, S. and Tomlinson, P.R. (2009). 'Economic governance and the evolution of industrial districts under globalization: the case of two mature European industrial districts'. *European Planning Studies*, 17 (12), 1837-1851.

Sharma, R., J. Crawford and P. Yetton (2009). 'Estimating the effect of Common Method Variance: The Method-Method Pair Technique with an illustration from TAM research', *MIS Quarterly,* **33,** pp. A1-A13.

Tomlinson, P. R. (2010). 'Co-operative Ties and Innovation: Some new evidence for UK manufacturing', *Research Policy,* **39,** pp. 762-775.

Tomlinson, P.R. & Branston, J.R. (2014) 'Turning the Tide: Prospects for an Industrial Renaissance in the North Staffsordshire Ceramics industrial district', *Cambridge Journal of Regions, Economy and Society*, doi:10.1093/cjres/rsu016

Tomlinson, P.R. & Jackson, I (2013) 'Co-operative ties and the impact of external factors upon innovation in an industrial district: some insights from the North Staffordshire Table and Giftware sector', *Regional Studies*, Vol 47, Issue 4, 580-596

Tsai, W. and S. Ghoshal (1998). 'Social Capital and Value Creation: the role of intra-firm networks', *Academy of Management Journal*, **41,** pp. 464-478

Warren, M. P., Forrester, P. L., Hassard, J. S. and Cotton, J. W. (2000) 'Technological innovation antecedents in the UK ceramics industry', *International Journal of Production Economics* 65, 85–98.

(Whipp, 1990)

Appendix A1: ***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))

References~~Send to Schuldt and Iammarino for comment.~~

Alderson, P. and Morrow, V., 2004. Ethics, social research and consulting with children and young people, Barnardo's,

Amin, A. and Cohendet, P., 1999. Learning and adaptation in decentralised business networks. Environment and Planning D: Society and Space. 17 87-104.

Armstrong, S.J. and Overton, T.S., 1977. Estimating non-response bias in mail surveys. Journal of Marketing Research. XIV (August), 396-402

Asheim, B., Coenen, L. and Vang, J., 2007. Face-to-face, buzz, and knowledge bases: Sociospatial implications for learning, innovation, and innovation policy. Environment and Planning C. 25 (5), 655.

Baldwin, C. and von Hippel, E., 2011. Modeling a paradigm shift: From producer innovation to user and open collaborative innovation. Organization Science. 22 (6), 1399-1417.

Bathelt, H. and Henn, S., 2014. The geographies of knowledge transfers over distance: Toward a typology. Environment and Planning A. 46 (6), 1403-1424.

Bathelt, H., Malmberg, A. and Maskell, P., 2004. Clusters and knowledge: Local buzz, global pipelines and the process of knowledge creation. Progress in Human Geography. 28 (1), 31-56.

Bathelt, H. and Schuldt, N., 2008. Between luminaires and meat grinders: International trade fairs as temporary clusters. Regional Studies. 42 (6), 853-868.

Bathelt, H. and Schuldt, N., 2010. International trade fairs and global buzz, part i: Ecology of global buzz. European Planning Studies. 18 (12), 1957-1974.

Bathelt, H. and Turi, P., 2011. Local, global and virtual buzz: The importance of face-to-face contact in economic interaction and possibilities to go beyond. Geoforum. 42 (5), 520-529.

Bathelt, H. and Zeng, G., 2014. The development of trade fair ecologies in china: Case studies from chengdu and shanghai. Environment and Planning A. 46 (3), 511-530.

Bello, D.C., 1992. Industrial buyer behavior at trade shows: Implications for selling effectiveness. Journal of Business Research. 25 (1), 59-80.

Bello, D.C. and Barczak, G.J., 1990. Using industrial trade shows to improve new product development. Journal of Business & Industrial Marketing. 5 (2), 43-56.

Belso-Martinez, J., 2012.To what extent temporary collocation erodes the contribution of the permanent clustering to innovation in manufacturing industries?Regions in Motion. Breaking the Path, 52nd European Congress of the Regional Science Association International, Bratislava, Slovakia.

Boschma, R., 2005. Proximity and innovation: A critical assessment. Regional Studies. 39 61-74.

Campbell, D.T. and Fiske, D.W., 1959. Convergent and discriminant validation by multitrait multimethod matrix. Psychological Bulletin. 56 81-105.

Cohen, W.M. and Levinthal, D.A., 1990. Absorptive capacity: A new perspective on learning and innovation. Administrative Science Quarterly. 35 128-152.

Cohendet, P., Grandadam, D., Simon, L. and Capdevila, I., 2014. Epistemic communities, localization and the dynamics of knowledge creation. Journal of Economic Geography. 14 (5), 929-954.

Cook, S.D. and Brown, J.S., 1999. Bridging epistemologies: The generative dance between organizational knowledge and organizational knowing. Organization Science. 10 (4), 381-400.

Faulconbridge, J.R., 2006. Stretching tacit knowledge beyond a local fix? Global spaces of learning in advertising professional service firms. Journal of Economic Geography. 6 (4), 517-540.

Felin, T., Foss, N.J., Heimeriks, K.H. and Madsen, T.L., 2012. Microfoundations of routines and capabilities: Individuals, processes, and structure. Journal of Management Studies. 49 (8), 1351-1374.

Fitjar, R.D. and Huber, F., 2014. Global pipelines for innovation: Insights from the case of norway. Journal of Economic Geography. lbu017.

Gertler, M.S., 2001. Best practice? Geography, learning and the institutional limits to strong convergence. Journal of Economic Geography. 1 (1), 5-26.

Gertler, M.S., 2003. Tacit knowledge and the economic geography of context, or the undefinable tacitness of being (there). Journal of Economic Geography. 3 (1), 75-99.
Groves, R.M. and Peytcheva, E., 2008. The impact of nonresponse rates on nonresponse bias a meta-analysis. Public opinion quarterly. 72 (2), 167-189.
Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E. and Tatham, R.L., 2007. Multivariate data analysis, 6th. Prentice Hall, New Jersey, USA.
Henn, S. and Bathelt, H., 2015. Knowledge generation and field reproduction in temporary clusters and the role of business conferences. Geoforum. 58 104-113.
Jones, B.W., Spigel, B. and Malecki, E.J., 2010. Blog links as pipelines to buzz elsewhere: The case of new york theater blogs. Environment and Planning B-Planning & Design. 37 (1), 99-111.
Krackhardt, D., 1996. Comment on burt and knez's third party effects on trust. Rationality and Society. 8 111-120.
Li, P.-F., 2014. Global temporary networks of clusters: Structures and dynamics of trade fairs in asian economies. Journal of Economic Geography. lbu009.
Ling-yee, L., 2006. Relationship learning at trade shows: Its antecedents and consequences. Industrial Marketing Management. 35 (2), 166-177.
Love, J.H., Roper, S. and Vahter, P., 2013. Learning from openness: The dynamics of breadth in external innovation linkages. Strategic Management Journal.
Markusen, A., 1996. Sticky places in slippery space: A typology of industrial districts. Economic Geography. 72 (3), 293-313.
Marsden, P.V., 1993. The reliability of network density and composition measures. Social Networks. 15 145-161.
Maskell, P., 2014. Accessing remote knowledge—the roles of trade fairs, pipelines, crowdsourcing and listening posts. Journal of Economic Geography. 14 (5), 883-902.
Maskell, P., Bathelt, H. and Malmberg, A., 2004.Temporary clusters and knowledge creation: The effects of international trade fairs, conventions and other professional gatherings.SPACES online, Marburg, Germany.
Maskell, P., Bathelt, H. and Malmberg, A., 2006. Building global knowledge pipelines: The role of temporary clusters. European Planning Studies. 14 (8), 997-1013.
Maskell, P. and Malmberg, A., 2007. Myopia, knowledge development and cluster evolution. Journal of Economic Geography.
Molina-Morales, F.X. and Martinez-Fernandez, T.M., 2006. Industrial districts: Something more than a neighbourhood. Entrepreneurship and Regional Development. 18 503-524.
Molina-Morales, F.X. and Martinez-Fernandez, T.M., 2009. Too much love in the neighbourhood can hurt: How an excess of intensity and trust in relationships may product negative effects on firms. Strategic Management Journal. 30 1013-1023.
Moodysson, J., 2008. Principles and practices of knowledge creation: On the organization of "buzz" and "pipelines" in life science communities. Economic Geography. 84 (4), 449-469.
Morrison, A., 2008. Gatekeepers of knowledge within industrial districts: Who they are, how they interact. Regional Studies. 42 (6), 817-835.
Morrison, A., Rabellotti, R. and Zirulia, L., 2013. When do global pipelines enhance the diffusion of knowledge in clusters? Economic Geography. 89 (1), 77-96.
Myers, M.B. and Cheung, M.-S., 2008. Sharing global supply chain knowledge. Mit Sloan Management Review. 49 (4), 67-73.
OECD, 2005.Oslo manual: Guidelines for collecting and interpreting innovation data. Paris.
Podsakoff, P.M., MacKenzie, S.B., Lee, J.-Y. and Podsakoff, N.P., 2003. Common method biases in behavioral research: A critical review of the literature and recommended remedies. Journal of Applied Psychology. 88 879-903.
Rallet, A. and Torre, A., 2009. Temporary geographical proximity for business and work coordination: When, how and where? SPACES online. 2

Ramírez-Pasillas, M., 2008. Resituating proximity and knowledge cross-fertilization in clusters by means of international trade fairs. European Planning Studies. 16 (5), 643-663.
Ramírez-Pasillas, M., 2010. International trade fairs as amplifiers of permanent and temporary proximities in clusters. Entrepreneurship & Regional Development. 22 (2), 155-187.
Rinallo, D. and Golfetto, F., 2011. Exploring the knowledge strategies of temporary cluster organizers: A longitudinal study of the eu fabric industry trade shows (1986–2006). Economic Geography. 87 (4), 453-476.
Rychen, F. and Zimmermann, J.-B., 2008. Clusters in the global knowledge-based economy: Knowledge gatekeepers and temporary proximity. Regional Studies. 42 (6), 767-776.
Sacchetti, S. and Tomlinson, P.R., 2006. Globalisation, governance and clusters: The cases of the north staffordshire ceramic and prato textile industries, in: Pitelis, C., Sugden, R. and Wilson, J.R. (Eds,^Ed.), Clusters and globalisation: The development of economies. Edward Elgar, Cheltenham, p.^pp. 232-257.
Sacchetti, S. and Tomlinson, P.R., 2009. Economic governance and the evolution of industrial districts under globalization: The case of two mature european industrial districts. European Planning Studies. 17 (12), 1837-1851.
Sarmento, M., Simões, C. and Farhangmehr, M., 2015. Applying a relationship marketing perspective to b2b trade fairs: The role of socialization episodes. Industrial Marketing Management. 44 131-141.
Schuldt, N. and Bathelt, H., 2011. International trade fairs and global buzz. Part ii: Practices of global buzz. European Planning Studies. 19 (1), 1-22.
Seely Brown, J. and Duguid, P., 1991. Organizational learning and communities-of-practices: Toward a unified view of working, learning and innovation. Organization Science. 2 (1), 40-57.
Sharma, R., Crawford, J. and Yetton, P., 2009. Estimating the effect of common method variance: The method-method pair technique with an illustration from tam research. Mis Quarterly. 33 A1-A13.
Storper, M. and Venables, A.J., 2004. Buzz: Face-to-face contact and the urban economy. Journal of Economic Geography. 4 (4), 351-370.
Symeonidas, G., 1996. Innovation, firm size and market structure. OECD Economic Studies. (27), 36-70.
Tomlinson, P., R. and Branston, J.R., 2014. Turning the tide: Prospects for an industrial renaissance in the north staffordshire ceramics industrial district. Cambridge Journal of Regions, Economy and Society. 19.
Tomlinson, P.R., 2010. Co-operative ties and innovation: Some new evidence for uk manufacturing. Research Policy. 39 (6), 762-775.
Tomlinson, P.R. and Jackson, I., 2013. Co-operative ties and the impact of external factors upon innovation in an industrial district: Some insights from the north staffordshire table and giftware sector. Regional Studies. 47 (4), 580-596.
Torre, A., 2008. On the role played by temporary geographical proximity in knowledge transmission. Regional Studies. 42 (6), 869-889.
Torre, A. and Rallet, A., 2005. Proximity and localization. Regional Studies. 39 (1), 47-59.
Uzzi, B., 1997. The sources and consequences of embeddedness for the economic performance of organizations. The network effect. American Sociological Review. 61 (4), 674-698.
Wenger, E., 1998. Communities of practice: Learning meaning and identity, Cambridge University Press, Cambridge.
Wenger, E., McDermott, R. and Snyder, W.M., 2002. Cultivating communities of practice, Harvard Business School Press, Boston M.A.
Whipp, R., 1990. Patterns of labour. Work and social change in the pottery industry, Routledge, London
New York.

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Bellandi, M. De Propis, L. and Santini, E. (2015) 'Avoiding cognitive lock-in in a mature Marshallian Industrial District: the Potteries' mimeo, Birmingham Business School, University of Birmingham. UK.

Belussi F, Sedita S R, 2009, "Life cycle vs. multiple path dependency in industrial districts" European Planning Studies 17 505–528

Bergman E M, 2008, "Cluster life-cycles: an emerging synthesis", in Handbook of Research on Cluster Theory Ed. C Karlsson (Edward Elgar, Cheltenham, Glos) pp 114–132

Boschma R, Fornahl D, 2011, "Cluster evolution and a roadmap for future research" Regional Studies 45 1295–1298

Li P, Bathelt H, Wang J, 2012, "Network dynamics and cluster evolution: changing trajectories of the aluminium extrusion industry in Dali, China" Journal of Economic Geography 12 127–155

Martin R, Sunley P, 2011, "Conceptualizing cluster evolution: beyond the life cycle model?" Regional Studies 45 1299–1318

Menzel M P, Fornahl D, 2010, "Cluster life cycles—dimensions and rationales of cluster evolution" Industrial and Corporate Change 19 205–238

Staber U, Sautter B, 2011, "Who are we, and do we need to change? Cluster identity and life cycle" Regional Studies 45 1349–1361

Suire R, Vicente J, 2009, "Why do some places succeed when others decline? A social interaction model of cluster viability" Journal of Economic Geography 9 381–404