Clustering and the Internationalisation of High Technology Small Firms in Film and Television.

Gary A.S. Cook¹ and Naresh R. Pandit²

Abstract

This paper draws together three strands of literature, that on clustering, entrepreneurship and international business, examining the relationship between these three in promoting firm formation and growth within clusters. The evidence drawn on includes econometric models based on the unique International Trade in Services Film and Television dataset, an in-depth interview survey and questionnaire survey. The key conclusions are firstly that strong clusters promote entrepreneurship, which in turn promotes cluster strength in a self-reinforcing dynamic. Secondly, some firms are better able than others to benefit from cluster location due to superior firm competencies and absorptive capacity. Thirdly, cluster strength and internationalization are mutually reinforcing. Cluster strength contributes to the ability of entrepreneurial firms to expand overseas via export sales, licensing and FDI. Evidence is presented which indicates firms have greater intensity of export and import activity if they have resource-strengths, some of which are derived from their membership of a strong cluster. Strong clusters also attract multinationals and in the case of the London media cluster, although those multinationals appear somewhat less embedded than non-MNEs, they are nevertheless quite strongly embedded. This means that there is a second important feedback loop as spillovers from MNEs to local firms enhances cluster strength which attracts further multinationals. The acquisition of high performing firms by overseas MNEs does not appear to have reduced either their performance or their embeddedness in the cluster. Fourthly, the nature of internationalization strategies are conditioned by firm and industry characteristics. In particular, the extent to which tacit knowledge is embodied in a product emerges as being influential in terms of the decision of which internationalisation mode to use. Finally, the resource-based view of the firm emerges as a useful integrative framework for understanding the interplay between clusters, entrepreneurship and internationalisation strategies.

Keywords: clusters, broadcasting, entrepreneurship, internationalization strategies

JEL classification codes: F29, L26, L82, O18, R11

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1. Introduction.

Geographical clustering is a major characteristic of industrial growth and has recently become the subject of intense interest in academic (Fujita, Krugman and Venables, 1999; Porter, 1998; Saxenian, 1994; Swann et al., 1998) business practitioner (The Economist, 1999; Owen, 1999) and government policy (DTI White Paper, 1998) circles. Porter (1990, 2000), in common with much of the literature in economic geography, has identified two key trends which are powerfully shaping the context for corporate strategy in the 21st century: on the one hand the manifest rise in importance of local concentrations of economic activity and excellence; and on the other a fast-paced increase in the globalization of business. There has been a burgeoning of literature within the field of Economic Geography which has centred on the nature of dynamic local concentrations of economic activity. The intense interest among geographers, including relevance for corporate strategy (Clark et al., 2000; Scott, 2000), stands in contrast to the relatively more muted impact within the management, strategy and international business fields (Buckley & Ghauri, 2004). Akin to the recent awakening of interest among International Business scholars in clusters, so too Entrepreneurship scholars are increasingly bringing cluster-based analysis more centre stage. This paper provides evidence in support of the analysis of the relationship between clusters and both international business and entrepreneurship and further makes some connections between the latter two fields.

The UK media industry provides an important case study for examining these interlinkages. Firstly, the emergence of a cluster of entrepreneurial SMEs is of comparatively recent origin, as a result of two events which transformed the broadcasting industry. The first was the establishment of Channel 4 in 1982 as a broadcaster without its own in-house production capability. Almost immediately a comparatively large number of independent production companies emerged, many locating in the vicinity of Channel 4’s headquarters in central London. The second major change was the Broadcasting Act 1990 which brought in competitive tendering for Independent Television (ITV) network contracts and obliged the BBC and ITV companies to commission 25% of most types of new programmes externally. A small number of the hundreds of independent firms which have sprung up over the past 25 years have grown and internationalized rapidly. What this paper will demonstrate is that the region in which the firm is located is one of the fundamental influences on both the prospects for firm formation and growth and for internationalization. It will further demonstrate that the mode of internationalization differs according to the economic and technological characteristics of the particular line of activity the firm is engaged in.
2. Literature Review

2.1. Clusters and Competitive Advantage

The majority of the literature acknowledges and builds on the classic insights of Marshall (1927) into the sources of superior performance in clusters (industrial districts in Marshall's terms): labour market pooling; the emergence of specialised input suppliers; and technological spillovers. A distinction has long been made in the literature (Hoover, 1948) between two potential sources of (urban) dynamism: urbanization economies, which refer to the benefits of size and diversity within a city; and localization economies which refer to the benefits of large scale in a particular industry in a particular location, essentially related to the classic Marshallian externalities.

Cultural industries are highly concentrated in urban locations (Hall, 2000; Power, 2002). Scott & Storper (2003) suggest that the superior economic dynamism of cities rests on the coexistence of four key factors: economies of scale in capital intensive infrastructure; dynamic forward and backward linkages among firms, which promote information flows regarding business opportunities, resource availability and labour market conditions, among other things; dense local labour markets; and localised relational assets or social capital promoting learning, efficient coordination in production and innovation (Scott, 1996; Storper & Scott, 1995). Scott and Storper’s list is not exhaustive. Rivalry may be important to stimulate innovation and productive efficiency (Jacobs 1972, 1985; Malmberg & Maskell, 2002; Porter, 1990). The volume and sophistication of demand within the city may be critical (Kitson et al., 2004; Porter, 1990), especially in driving quality standards and innovation (von Hippel, 1988). The existence of concentrated demand for specialized services also provides an incentive for workers to invest in specialized skills and competencies (Scott & Storper, 2003), which is another dynamic of cumulative causation.

A challenge to cluster theory is to account for why some firms appear to benefit more than others from membership of a particular cluster. In recent articles (Pinch et al., 2003; Tallman et al., 2004) an important and bold attempt has been made to meld insights from strategic management and economic geography to argue how membership of key clusters can be the foundation for sustained competitive advantage, which appeals in part to the Resource-Based View (RBV) (Barney 1991; Wernerfelt 1984, 1995). While not gainsaying the importance of other types of resource, these authors place particular emphasis on knowledge-based resources. They lay importance on the firm’s absorptive capacity to assimilate and make use of new knowledge (Cohen & Levinthal, 1989). The link with spatial clusters is made by arguing that there exist cluster-level knowledge systems, which some firms are better able to exploit than others. This account of the differential ability of firms to benefit from cluster membership is in principle applicable to entrepreneurial SMEs.

2.2. Clusters and Entrepreneurship

Entrepreneurship is important to regional prosperity (Camagni, 2002; Chinitz, 1961; Coe & Townsend, 1998; Scott, 2006). Small firms have long been viewed as an integral part
of dynamic industrial districts or clusters (Best, 1990; Piore and Sabel, 1984; Scott, 1988), yet entrepreneurs have been conspicuous by their absence in much of the literature on clusters (Acs & Varga, 2005). A growing literature is examining the ways in which dynamic clusters themselves may promote entrepreneurship (Capello, 2002; Folta et al., 2006; Rocha & Sternberg, 2005; Scott, 2006). Scott explicitly argues that as a cluster develops, so increasing agglomeration economies will emerge as more firms are formed and in turn form denser networks which will anchor firms to a particular location, thus there is a dynamic positive feedback between clusters and entrepreneurship. Scott also emphasizes that entrepreneurship is a social phenomenon, hence rich social institutions in clusters may be particularly supportive of entrepreneurship (DeMartino et al., 2006; Elfring & Hulsink, 2003). In a more broadly related way, seeing examples of successful entrepreneurship may in turn encourage others to try and follow suit, possibly learning from the mistakes of others. Would-be entrepreneurs may also derive much practical support from the social capital within the cluster. As demand grows, so there may emerge a finer division of labour, allowing niches which entrepreneurs can exploit. More generally, dense urban agglomerations offer a wider array of resources such as money, premises and business services, which facilitate the survival of new firms (Scott, 2006).

2.3. Clusters and International Linkages

Whilst several authors have championed the region as the most important spatial scale over which clustering processes operate (Cooke & Morgan, 1998; Florida, 1996; Scott, 1996; Storper, 1997), processes operating at wider spatial scales are important. Jacobs’ (1972, 1985) analysis lays considerable importance on the nature of external linkages a city has, especially import and export activity, a point also emphasised by Hall (2000) as a powerful contributor to periods of creative flourishing in cities. The significance of external connectivity for remaining at the forefront of innovation has been widely acknowledged in the literature (Boggs & Rantisi, 2003; Cumbers & McKinnon, 2004; Pred, 1977; Rocha & Sternberg, 2005), important as it provides a constant stream of fresh ideas and helps prevent insularity and homogenization.

Bathelt et al. (2004) suggest that multinationals (MNEs) provide important “pipelines” within which tacit knowledge (among other types) can flow between locations in a way which would be less easy between third parties at equivalent distance. Whilst it is clear that there is a considerable amount of MNE Foreign Direct Investment (FDI) in clusters (Kozul-Wright & Rowthorn, 1998), and that this activity is increasing (Nachum, 2003a, 2003b), the body of research on this interface is small (Birkinshaw & Solvell, 2000). There is a large literature that attempts to generally explain MNE FDI in terms of the benefits that certain locations provide for investing MNEs (Dunning, 1993). More recently, he has drawn from economic geography (Dunning, 1998) to elaborate the location element of his ‘OLI’ framework by incorporating clusters thinking. Although this literature encourages us to think of MNEs ‘taking’ from clusters, we should guard against such a conclusion. Studies by Head et al., (1995), Nachum (2000) and Wheeler & Moody (1992) show that MNEs can play a major role in cluster development and evolution.
There has been debate in the literature regarding the implications of takeovers of small firms by overseas multinationals. The fastest growing and most innovative firms are the most likely to attract bids and such acquisitions have been common in the UK among high technology firms (Mason & Harrison, 2006). It is plausible that these acquisitions may benefit the SME by providing the resources needed to exploit its innovations more fully, as well as benefiting the acquirer by providing access to a stream of new innovations. Mason & Harrison report the consensus in the literature that the short-run effect on the target firm is generally positive. On the other hand there is evidence that longer term the influence may not be so benign with a loss of autonomy, lower levels of engagement with local networks and not infrequently the closure of the acquired firm ensuing.

Thus the literature of economic geography sees international linkages of firms in the cluster as being important influences on cluster success and dynamism. Moreover, there is an important dynamic feedback loop in so far as strong clusters promote international linkages, exemplified by their attraction to MNEs, which in turn yield positive spillovers reinforcing cluster strength.

2.4. Internationalization Strategies of Small Firms

The literature on internationalization of SMEs has evolved with three distinct strands. In brief, these are the stages model of the Uppsala School (hereafter referred to as UM) (Johanson & Vahlne, 1977, 1990), the International New Venture (INV) school (Oviatt & McDougall, 1994) and the business network approach (Coviello, 2006; Johanson & Vahlne, 2003). Each of these approaches will now be reviewed to distill the key features which they suggest will influence the prospect, mode and extent of internationalization. Some reflections will also be made on how each of these approaches might interface with insights derived from the clustering literature.

The UM is a behavioural model predicated on fundamental assumptions that risk-averse agents pursue profit under bounded rationality and imperfect information. This leads to the central proposition that firms, especially SMEs, internationalise in an incremental fashion, acquiring learning in an experiential fashion, albeit that large firms may have the resources to internationalise in a non-incremental way. The UM thus predicts both age and size will be influences on internationalization. From a clusters perspective, rapid learning can take place within rich circuits of information within highly networked and dense agglomerations, which may support internationalization.

The Uppsala model has long been prone to the basic objection that not all firms internationalize in small steps and that the sequential model is too mechanistic (Melin, 1992). This basic thought has been effectively crystallized in the theory of international new ventures (INV) set out by Oviatt & McDougall (1994), motivated in part by evidence that firms are increasingly establishing international relationships and operation from a very early stage. One of the four key elements which constitute the necessary conditions for the emergence of international new ventures is that the firm must have unique resources as a basis for being competitive in international markets. The ability to exploit previous experience in international business has been one of the reasons advanced in the INV approach to explain how rapid internationalization is possible.
What clusters theory contributes is the idea that such experience is more abundantly available in some locations than others both because in stronger clusters there will be more firms which have international experience and also because the labour markets, particularly in major global nodes, are highly international in scope.

All firms are embedded to a greater or lesser degree in networks comprising suppliers, customers and peers. To the extent that firms are embedded in networks which are international in scope, this may smooth the path of internationalization (Coviello & Munro, 1997). From a clustering perspective, networking skills, which are important in international business, may be effectively developed in a dense cluster typified by high levels of networking, and a global node in Amin & Thrift’s (1992) sense will provide important connections to highly internationalized networks.

One important piece of received wisdom in the literature is that small firms are at a relative disadvantage to large firms in terms of any form of internationalization, but above all foreign direct investment (FDI) (Buckley, 1997; Hollenstein, 2005). Nevertheless, there is evidence that the amount of FDI attributable to small firms has been growing rapidly in recent years, albeit from a small base, such that the share of small firms in FDI has been rising (Acs & Preston, 1997). Buckley, drawing on Dunning’s (1993) OLI framework, suggests reasons why the extent of small firm FDI might be industry specific. In some industries efficient scale is large relative to market size and in such cases small firms will struggle to survive unless they can find a defensible niche. By contrast, he argues small firms will be better placed where scale is less important and local skills and rapid information processing are more to the fore.

In summary, the extant literature on SME internationalization is consistent with clusters providing a conducive environment for the accumulation of knowledge, resources and access to networks which the leading theories indicate will be important influences on successful engagement with international business. What is more, the important OLI framework provides analytical insights into the firm and industry-specific factors which may influence choice of internationalization mode.

2.5. Conclusion.

Four propositions emerge from the above discussion that will be explored in the evidence to be presented below.

Proposition 1. There is a symbiotic relationship between dynamic clusters and entrepreneurship

Proposition 2. International connectivity is both a symptom of and cause of cluster dynamism

Proposition 3. Internationalization strategies depend on the economic characteristics of the industry a firm belongs to and the strength and nature of the firm’s distinctive competencies (ownership advantages).

Proposition 4. Firms which internationalise or are acquired by overseas MNEs will become less embedded in the cluster.
3. Formation and Growth of Entrepreneurial SMEs.

3.1. Clusters and the Formation and Growth of Firms

This section will provide an overview of the programme production, post-production and equipment supply sectors and place them in the context of the contribution which they make to broader clustering dynamics in the British broadcasting industry. These three sectors provide the bulk of the entrepreneurial and internationalizing small firms.

The British broadcasting industry is highly clustered, with an estimated 70% of employment in film and television concentrated in London. Within this, there is a very strong concentration on an area of approximately one square mile in Soho. The post-production sector has around 70% of its firms located in London which account for 91% of total revenues (Film Council 2003). Post-production companies are generally very small, with a median size of 15 employees. The exception to the generally atomistic structure of post-production is the BBC which is far larger than any other post production facility. Programme production is also dominated by the BBC which is responsible for around 36% of programme production. The independent television broadcasters account for around another 25%. Another 25-30% of the market is accounted for by about 50 medium-sized, mainly London-based independent production companies (many of which are owned by larger media concerns) and the remaining 10% is accounted for by around 500 very small companies. Independent production companies are very small, with a median size of 5 employees.

Equipment supply firms manufacture and/or supply the hardware and software which is not only used by the post-production companies but also the broadcasters and production companies, some of whom also have in-house post-production sections. The median size of the equipment manufacturers is 39, but there are some firms which are much larger. Some important multinational companies such as Sony, Panasonic and Philips have UK subsidiaries. These companies are based mainly to the South and East of London, particularly in the Thames Valley area and down into Hampshire.

Recent econometric research conducted on the British broadcasting industry (Cook et al. 2001) has yielded results which indicate that the dynamics of industrial clustering are subject to positive externalities of colocation. Two types of model were estimated. The first, a growth model, estimated the extent to which cluster strength, measured in terms of employment in both the firm’s own line of activity (own employment) and in related lines of activity (other employment), either impeded or enhanced the growth rate of firms located within the cluster. In almost every case, cluster strength in the firm’s own line of activity enhanced the firm’s growth rate, whereas strength in related lines of activity diminished firm growth, suggesting a congestion effect. The second type of model was based on firm entry and investigated the extent to which cluster strength in sub-sectors within each industry either appeared to attract or repel entry of firms into each sub-sector. Entry into a given sub-sector is almost always deterred by existing cluster strength in that sub-sector and entry attraction typically emanates from other sub-sectors.

In terms of growth dynamics, the strongest positive effects of cluster strength in a firm’s own line of activity appear in programme production, manufacture of broadcasting systems and post production. The centrality of programme production and post
production in cluster dynamics is reinforced by entry dynamics. Programme production is the only sub-sector in broadcasting where cluster strength within the sub-sector attracts entry of like firms. Programme production and post production also exert strong positive entry attraction on each other. Thus there is a powerful virtuous circle where cluster strength in each of these sub-sectors not only attracts entry but also leads to faster growth. Both of these sub-sectors attract entry from firms in other sub-sectors within the industry. Both attract entry from specialist equipment suppliers, natural given the extent to which each relies on specialist equipment which they are likely to want to update, develop and keep in good repair.

3.2. Entrepreneurial Growth Processes within the Clusters.

The crude econometrics point to the fact that clusters promote entrepreneurship in terms of the formation and growth of new businesses. Some brief remarks will now be addressed to the nature of the cluster processes which underpin these relationships. The main evidence supporting these comments was gathered from a semi-structured interview survey encompassing 75 forms and industry experts in London, Bristol and Glasgow between 2000 and 2005 and a questionnaire survey of 204 companies in London conducted in 2004.

The importance of social capital is very manifest in the post production and production sectors. The interview evidence and reading of the trade literature does reveal that substantial support can be forthcoming for entrepreneurs starting new businesses. Spin-offs with backgrounds in the major broadcasters are imbued with knowledge about their organizational routines and so are easier for the major broadcasters to work with. Many have also received considerable support and advice from their former parent. In post production it is not unusual for new firms to be given space in an existing facility in return for an agreement to pay in kind by doing work as requested for the host company. In some cases funds are advanced to help the new firm become established. The full extent and nature of support in cash, kind and by way of advice is beyond the scope of this paper to answer. Nevertheless, there are sufficient straws in the wind to indicate that collectively they are an important support to entrepreneurship.

An important section of the questionnaire asked about why it was important to have close proximity to other firms in London. These factors achieved the highest ratings, with prime importance being placed on face-to-face contact, ability to foster trust and interpersonal relationships, providing three of the top ten benefits of a London location. These are important for three reasons. Firstly, the high semiotic content of television programmes, films and advertisements requires rich communication for a team to arrive at the desired end product. Secondly, any weakness in the finished product can badly undermine the desired effect, therefore a high degree of assurance is required of the ability of individuals. Thirdly, projects are typically undertaken to very tight deadlines with considerable sums of money at stake, therefore it is essential that the team brought together for the project can gel quickly and that consummate effort can be relied upon. In the event of problems, it is essential that they be resolved quickly in a frank and constructive manner.
Allied to the above points regarding social capital, aspects of the labour market emerge as being especially important, especially the ability to recruit high quality labour and the ability of highly skilled labour to contribute to innovation. Social institutions are highly important in the labour market, where socialization into the norms of both a particular craft and the industry more generally are important in the rites of passage to becoming a credible professional. They are also essential in supporting short-term project work where disparate skills must be combined under severe time pressure. The density of demand means that people are willing to specialize to a high degree and invest in highly idiosyncratic human capital. What is more, the labour market in London has global reach, acting as a magnet to the best talent. This is an important self-reinforcing dynamic of cluster success.

Finally, relationships with other firms emerged as being a highly important advantage of proximity within the dominant London cluster. Above all, both suppliers and customers were identified as providing important support for innovation. Customers may demand innovation, a spur for both broadcast production and post production companies competing for business against strong rivals. Moreover, customers may themselves be important innovators who are able to guide their suppliers to innovative solutions. London is also the focus of a high volume of national and international demand. Both questionnaire and interviews established that people talk to peers in other firms and that there is a substantial degree of mutual support and advice.

In summary, the London cluster, above all, provides a very fertile environment in which entrepreneurs can thrive. There is both highly concentrated demand and a rich and specialized supply infrastructure into which they can embed their businesses, exploiting rich personal and business networks. Resources of all kinds, especially skilled labour, are abundant. The econometric evidence indicates that there are powerful feedback effects whereby cluster strength promotes business formation and growth, which further strengthens the cluster.

4. Clusters and International Linkages: Evidence

4.1. Influences on Import and Export Activity.
The basic dataset on which this analysis was conducted is the UK’s Annual Survey of International Trade in Film and Television Services (FTV). The survey examines sources of export and import revenues by country. The data analyzed in this paper is from the 2003 Survey, the most recent for which complete data are available for both positive and nil returns. In order to produce meaningful analysis of the pattern and extent of export and import activity, the FTV data was merged with a variety of additional databases maintained by the UK’s Office for National Statistics, the Annual Respondents’ Database and the Business Data Library.

Analysis in the regression models was based on those firms with fewer than 600 employees, which was a natural break in the firm size distribution and broadly consistent with a conventional cut-off for SMEs of 500 employees. The models estimated were logistic regressions based on a 1,0 dependent variable depending on whether or not the firm was engaged in international activity, exporting or importing, or not. The basic model had the form:
\[ L_i = \beta_1 \text{Size}_i + \beta_2 \text{Overseas}_i + \beta_3 \text{Age}_i + \beta_4 \text{MP}_i + \beta_5 \text{OthMP}_i + \beta_6 \text{TV}_i + \beta_7 \text{Locquo}_i + \beta_8 \text{Totemp}_i \]

where \( L_i \) is the log of the odds ratio \( \ln \left( \frac{P_i}{1-P_i} \right) \) and \( P_i \) is the probability that the firm either exports or imports respectively. The coefficients reported for the logistic regression show the change in the log-odds ratio for a one unit change in the independent variable, therefore a coefficient less than 1 indicates an increase in the independent variable made, respectively, importing or exporting less likely and vice versa where the coefficient exceeded one.

- Size was measured by numbers of employees, measured in natural logs due to the strong positive skew. In both the import and export equations this is \textit{a priori} expected to be positive as it crudely proxies resource strength.
- Overseas was a 1, 0 dummy variable taking the value 1 where the firm had a code indicating it was ultimately owned by an overseas corporation. This is \textit{a priori} expected to have a positive sign.
- Age is the age in years of the firm since first registration, sign expected positive.
- MP is a 1, 0 dummy indicating that the firm was classified to SIC92111, motion picture production, which is expected to take a negative coefficient due to the lower propensity to engage in trade relative to the default category SIC 92120, motion picture and video distribution.
- OthMP is a 1, 0 dummy variable indicating that the firm was classified to SIC 92119, other motion picture and video production. As for MP, the sign is expected to be negative.
- TV is a 1, 0 dummy indicating the firm belongs to SIC 92202, television activities. The expected sign is negative as the majority of independent programme production companies are very small and serve the domestic market.
- Locquo is the location quotient of the region in which the firm is located. The location quotient is constructed as the ratio of total media employment in the region to that of all media employment in Britain divided by the ratio of total employment in the region to all employment in Britain. The location quotient thus represents the extent of clustering in the region. A quotient above 1 indicates that the region has a disproportionate share of media employment relative to its total employment. The prior expectation is that the coefficient will be positive representing the positive effect of stronger clusters which will manifest itself, in part, in stronger export performance.
- Totemp is total employment in the region. This crudely represents the extent of urbanization economies in the region. Again the prior expectation is that this variable will have a positive sign.

The strongest influence on propensity to engage in either export or import activity is firm size, which may be given a crude interpretation as indicating the importance of resource strength. Firms with resource strength would be expected to grow larger, controlling for age, and also to accumulate resources through the process of growth. Age has a negative influence, although not significant and virtually indistinguishable from 0 in the export equation. This is consistent with the INV literature, which argues that it is
resource strength rather than age which is the principal influence on whether or not a firm will engage in international activity. A somewhat speculative interpretation of the larger (negative) coefficient on age in the import equation may be that as firms mature, they become better able to produce internally goods and services they previously imported. Penetrating export markets is more demanding of resources, and also experience and contacts accumulated over time, therefore one would not expect export activity to diminish with age in the same way. The location quotient has a positive coefficient and is highly significant in both equations implying that firms located in stronger clusters are more likely to be engaged in importing and exporting. This is capturing the centrality of London, which has by far the largest location quotient and around 75% of all firms involved in international trade (compared to around 60% of all firms in the sample). Total regional employment has a barely positive effect and is quite far from conventional significance, indicating that it is regional strength in media employment which is the principal source of the positive influences. As would be expected, being a subsidiary of an overseas firm is positively associated with the likelihood of being engaged in import or export activity. The generally negative coefficients on the industry dummies are consistent with expectation.

Table 1 Logistic regression for probability of engaging in importing and exporting

<table>
<thead>
<tr>
<th>Variable</th>
<th>Import model</th>
<th>Export model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>coefficient</td>
<td>z</td>
</tr>
<tr>
<td>Size</td>
<td>1.7201</td>
<td>6.27</td>
</tr>
<tr>
<td>Age</td>
<td>0.9739</td>
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</tr>
<tr>
<td>Overseas</td>
<td>1.4094</td>
<td>1.01</td>
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<tr>
<td>MP</td>
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<td>OthMP</td>
<td>0.5845</td>
<td>-1.34</td>
</tr>
<tr>
<td>TV</td>
<td>0.8121</td>
<td>-0.56</td>
</tr>
<tr>
<td>Location quotient</td>
<td>1.2666</td>
<td>2.36</td>
</tr>
<tr>
<td>Total regional</td>
<td>1.0001</td>
<td>0.29</td>
</tr>
<tr>
<td>employment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N observations</td>
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<td></td>
</tr>
<tr>
<td>Wald $\chi^2$</td>
<td>103.16***</td>
<td></td>
</tr>
<tr>
<td>Pseudo-R$^2$</td>
<td>0.22</td>
<td></td>
</tr>
</tbody>
</table>

A set of models were run to examine the principal influences on export/import intensity. This was measured as exports/imports per employee due to the fact that only a small number (64) of firms had turnover data available, therefore using employment lead to a much larger number of uncensored observations. The Heckman (1979) two-step procedure is required as we have censored observations of export and import activity. Failing to take into account the fact that firms have made a prior choice to either import or export through the selection equation would lead to biased estimates in the
export/import intensity equations. The export/import intensity equations were as follows, with a full and a restricted model being separately estimated. The selection equation in each case (not reported for brevity as it is highly similar to the logistic regressions reported above) was as follows:

\[ Y_i = \beta_1 \text{Size}_i + \beta_2 \text{Overseas}_i + \beta_3 \text{Age}_i + \beta_4 \text{MP}_i + \beta_5 \text{OthMP}_i + \beta_6 \text{TV}_i + \beta_7 \text{Memp}_i \]

Where Memp is total media employment in the sector

**Restricted model**

\[ Y_i = \beta_1 \text{Size}_i + \beta_2 \text{Overseas}_i + \beta_3 \text{Age}_i + \beta_4 \text{MP}_i + \beta_5 \text{OthMP}_i + \beta_6 \text{TV}_i + \beta_7 \text{Locquo}_i + \beta_8 \text{Totemp}_i \]

**Full model**

A more extensive model was estimated in cases where additional financial information for a sub-set of firms was available, in order to capture more firm-specific effects.

\[ Y_i = \beta_1 \text{Size}_i + \beta_2 \text{Overseas}_i + \beta_3 \text{Age}_i + \beta_4 \text{MP}_i + \beta_5 \text{OthMP}_i + \beta_6 \text{TV}_i + \beta_7 \text{Locquo}_i + \beta_8 \text{Totemp}_i + \beta_9 \text{Productivity}_i + \beta_{10} \text{Advertising/sales}_i + \beta_{11} \text{R&D/sales}_i + \beta_{12} \text{Meanwage}_i + \beta_{13} \text{Investment intensity}_i \]

- Productivity is measured as gross value-added per head. The expected sign is positive as greater productivity implies greater cost competitiveness.
- Advertising/sales is a standard proxy for a resource strength in product differentiation. The expected sign is positive.
- R&D/sales is a standard proxy for resource strength in innovation. The expected sign is positive.
- Mean salary. The expected sign here is ambiguous. A high value might imply a resource strength in terms of a labour force skewed towards more highly skilled employees. Alternatively it may represent a disadvantage of relatively high costs.
- Investment intensity is measured as net capital expenditure/sales. The expected sign is positive as a high investment intensity implies a progressive company.

Considering first the restricted export and import models, size and being under foreign ownership take positive signs as expected, although the coefficients are far from conventional significance. Age is positive in the export equation but negative in the import equation. The negative sign on age in the import equation is consistent with the logistic regressions of the probability of being engaged in exporting or importing. Again, importing may be easier for younger firms compared to exporting and younger firms may be more reliant on importing, lacking resources. There is an interesting contrast in the behaviour of the regional variables in the export and import models. The coefficient on the location quotient becomes barely distinguishable from 0. The coefficient on total employment remains positive and is close to significance in both equations, implying that
as far as export and import intensity go, urbanization economies may be more important than localization economies. Sectoral dummies behave much as expected, the positive coefficient on TV in the export model probably reflecting the small core staff in television production companies which inflates the ratio.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Restricted model</th>
<th>Full model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size</td>
<td>248.5235</td>
<td>0.5943</td>
</tr>
<tr>
<td>Age</td>
<td>0.4494</td>
<td>6.1479</td>
</tr>
<tr>
<td>Overseas</td>
<td>289.0943</td>
<td>203.1317</td>
</tr>
<tr>
<td>MP</td>
<td>-115.2359</td>
<td>350.1079</td>
</tr>
<tr>
<td>OthMP</td>
<td>-1.2121</td>
<td>206.3557</td>
</tr>
<tr>
<td>TV</td>
<td>56.8050</td>
<td>394.4886</td>
</tr>
<tr>
<td>Location quotient</td>
<td>97.8228</td>
<td>4.2176</td>
</tr>
<tr>
<td>Total regional employment</td>
<td>0.2870</td>
<td>0.0548</td>
</tr>
<tr>
<td>Productivity</td>
<td>0.8236</td>
<td>1.50</td>
</tr>
<tr>
<td>Advertising/sales</td>
<td>1636.98</td>
<td>1.26</td>
</tr>
<tr>
<td>R&amp;D/sales</td>
<td>6858.712</td>
<td>0.21</td>
</tr>
<tr>
<td>Mean wage</td>
<td>0.4275</td>
<td>0.12</td>
</tr>
<tr>
<td>Investment intensity</td>
<td>27.3772</td>
<td>0.07</td>
</tr>
<tr>
<td>Rho</td>
<td>1.0000</td>
<td>0.5630</td>
</tr>
<tr>
<td>Sigma</td>
<td>1559.6933</td>
<td>273.7773</td>
</tr>
<tr>
<td>Lambda</td>
<td>1559.6933</td>
<td>154.1408</td>
</tr>
<tr>
<td>N observations</td>
<td>597</td>
<td>493</td>
</tr>
<tr>
<td>Censored obs.</td>
<td>464</td>
<td>464</td>
</tr>
<tr>
<td>Uncensored obs.</td>
<td>133</td>
<td>29</td>
</tr>
<tr>
<td>Wald $\chi^2$</td>
<td>83.06***</td>
<td>58.06***</td>
</tr>
</tbody>
</table>

The results from the full model clearly need to be treated with caution as they have a very small number of uncensored observations. Nevertheless, there are a few pertinent observations. As expected, the inclusion of a greater array of firm specific variables generally moderates the influence of the variables included in the restricted model. The impact of the regional variables, in particular total regional employment, is clearly weakened, and the coefficient on the location quotient becomes negative in the import equation, implying that for the larger firms remaining in the restricted model, for whom a greater array of financial data is available, firm resources play a greater role in supporting international activity relative to regional externalities. In both equations productivity, advertising intensity and investment intensity have the expected positive
sign, with advertising intensity being significant in the import model. The negative coefficient on R&D intensity in the import equation is hard to rationalize. The negative and highly insignificant coefficient on mean wage reflects the ambiguous a priori influence of this variable.

Table 3 Heckman two-step model of import intensity second step results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Restricted model</th>
<th>Full model</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>coefficient</td>
<td>Z</td>
</tr>
<tr>
<td>Size</td>
<td>47.750</td>
<td>0.15</td>
</tr>
<tr>
<td>Age</td>
<td>-8.5736</td>
<td>-0.49</td>
</tr>
<tr>
<td>Overseas</td>
<td>264.604</td>
<td>1.00</td>
</tr>
<tr>
<td>MP</td>
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</tr>
<tr>
<td>OthMP</td>
<td>-431.0996</td>
<td>-1.23</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TV</td>
<td>-175.8165</td>
<td>-0.86</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Location quotient</td>
<td>27.8352</td>
<td>0.19</td>
</tr>
<tr>
<td>Total regional employment</td>
<td>0.1558</td>
<td>1.53</td>
</tr>
<tr>
<td>Productivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advertising/sales</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R&amp;D/sales</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean wage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment intensity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rho</td>
<td>0.8792</td>
<td></td>
</tr>
<tr>
<td>Sigma</td>
<td>666.8622</td>
<td></td>
</tr>
<tr>
<td>Lambda</td>
<td>586.2995</td>
<td></td>
</tr>
<tr>
<td>N observations</td>
<td>587</td>
<td></td>
</tr>
<tr>
<td>Censored obs.</td>
<td>498</td>
<td></td>
</tr>
<tr>
<td>Uncensored obs.</td>
<td>99</td>
<td></td>
</tr>
<tr>
<td>Wald $\chi^2$</td>
<td>96.11***</td>
<td></td>
</tr>
</tbody>
</table>

*** significant at 1%  ** significant at 5%  * significant at 10%

Around 30% of post production revenues are derived from overseas (Film Council, 2003). International sales in film, advertising and broadcast television post production are for high value-added work. This is above all the case for high-end special effects on Hollywood blockbuster movies. This export-based activity is an important part of the dynamics of the London cluster, since work on these projects both develops skills and allows the latest technology to be invested in. It also adds to the reputation of the cluster and specific firms within it. Only a limited number of companies in London have the scale and capability to compete for high-end film work, the most significant being CFC Framestore, the Mill, MPC, Double Negative and Cinesite (non-UK). There is evidence that there is a “trickle down” effect to other local companies of the techniques and
technology used in the most cutting edge work (Oxford Economic Forecasting, 2005). Programme production companies tendering for original productions overseas also benefit from meeting demanding requirements. What is more, the incremental revenues which export activity brings is an important source of financial resources. This is particularly significant for export revenues in programme production, where the incremental cost is extremely low for sales of programmes which have already been made, and export revenues are a highly important source of cash flows. Those firms able to generate such revenue streams also find it easier to raise additional finance, supporting their growth strategies.

In summary, there is evidence that strong clusters promote internationalization and that there is a positive feedback loop through both accumulation of experience and financial resources which strengthens both individual firms and the cluster. In terms of cluster-based advantages.

4.2. The Role of Multinational Enterprises

This section reports analysis based on the questionnaire survey, which asked about a broad range of possible advantages and disadvantages of having a location in central London, rated on a five-point Lickert scale. There were 187 usable replies from companies, of which 150 were non-MNEs and 37 were MNEs.

The evidence on the degree of embeddedness of the multinationals in the local cluster indicates that there is quite a high level of embeddedness in terms of dependence on local interaction, but that this generally has lower importance to MNEs than to non-MNEs. In the main, there were no substantial differences between MNEs and non-MNEs in terms of the perceived advantages of being located in the London cluster. This is consistent with MNEs being attracted by a range of positive externalities in strong clusters. The greater importance of complementary expertise as an advantage of proximity to other firms in the cluster to non-MNEs ($\chi^2(4) = 6.79, p=0.147$) does indicate that MNEs have internal capabilities which make them less reliant on such spillovers. It is, however, important to point out that MNEs do often rate this factor as important and are not more likely to rate it as unimportant compared to non-MNEs. This is underscored by the slightly greater importance to MNEs of the ability to have face to face contact due to close proximity ($\chi^2(1) = 1.34, p=0.246$). The evidence on the importance of contact with other firms is also similar.

The symbiotic relationship between MNEs and the local cluster is exemplified by the relationship between the post production and equipment supply sectors. Both have a significant presence of MNEs, both indigenous and overseas. Not only do they benefit from cluster spillovers within their respective lines of activity, but there is also significant interaction between them in the development of new equipment. Post production companies in London are important lead users (von Hippel, 1988) who are demanding and directly contribute to the development of technological solutions. This contributes both to the South East being a foremost research node in the equipment industry but also to London maintaining it global pre-eminence in post production as the availability of the latest equipment attracts the best talent.
What have been the effects of the takeover of domestic firms by overseas multinationals? The most spectacular entry has been that of US-based Ascent Media which in the space of roughly two years in the early 2000s acquired a significant proportion of London’s highest quality post production capacity, causing considerable consternation in the post production community. The important companies acquired over this period were Rushes, the Soho Group, Todd-AO (itself a US-based company), Telecine, SVC, TVI, St. Anne’s and One Post. A common view prevailing at the time was that it would not be successful as top creative labour would not want to work for a large multinational and that a more bureaucratic firm would not be capable of providing sufficiently flexible and bespoke service to clients. The evidence to date is that these early predictions of failure have not been born out. It appears that the subsidiaries have been given reasonable autonomy. It is also the case that Ascent has brought considerable financial and management resources to the service of the acquired companies. The most recent beneficiary has been Rushes which has seen a substantial expansion backed by significant investment in recent months. Equally, in the programme production sector, the acquisition of Bazal and Brighter Pictures by Endemol and of Talkback, Alomo, Thames Television and Witzend by Bertelsmann appears to have had beneficial effects as these multinationals have had the resources to exploit more fully the intellectual property of it acquisitions more fully than they might have done themselves.

5. Internationalization Strategies

Internationalization strategies in post production are essentially export based. There are a small number of notable examples of companies which have made FDI moves, three leading examples being the creation of New York offices by CFC Framestore, The Mill and Smoke and Mirrors in advertising post production. The experience of internationalization in post production bears out some, but not all, of Buckley’s hypotheses. Post production does exhibit the technological characteristics which are identified by Buckley as being favourable to FDI by small firms. Although quite capital intensive, and more capital intensive than programme production, technology is small scale in post production compared to typical manufacturing industries. An average-sized post house would require a capital investment of a few million pounds, rather than hundreds of millions of pounds. Labour is a key resource and access to the right type of labour is critical. Finally, it is a highly knowledge intensive business where creativity, ability to use advanced technology and the ability to interpret the clients’ creative vision and requirements is all.

In film post production, scale is more important as the magnitude of the work required for the effects on a “blockbuster” movie is significant. Compared to setting up an advertising post house, the attendant risk is greater given the higher costs and how “lumpy” demand is, with just a few high budget projects becoming available each year. These factors help explain why major film post production companies such as Moving Picture Company and indeed the Mill and CFC Framestore have not made FDI moves into Hollywood. Hollywood studios are willing to come to London to source this high value-added work because the knowledge and human capital which is sought is embedded in the cluster. Moreover, it is sufficiently valuable relative to the alternatives
to warrant the time and money costs of periodic trips between Los Angeles and London to manage projects. Again in line with Buckley, there are some examples of small, niche firms, such as Uli Meyer Animation, which have found it worthwhile to set up overseas operations in Hollywood. Here the balance of highly idiosyncratic tacit knowledge and small scale combine to tilt the balance in favour of FDI.

FDI has not been a major feature of the independent programme production. Some of the major production companies have established sales offices overseas, mainly in the USA, however this is a comparatively limited form of FDI. Firms may earn export revenues through direct programme sales to a broadcaster, where the UK is the world’s second largest exporter of TV programmes, albeit a distant second to the USA, or from sales of videos or DVDs of programmes. Format sales, where the basic programme idea is sold with the programme itself being reworked and remade to suit it to a different national audience, are an increasingly important source of revenues. Programme production does not lend itself as easily to FDI and also has a range of means of exploiting its intellectual property which mean that overseas location is not as important. These factors can be related to Dunning’s OLI framework. Post production is a service which it is typically advantageous to deliver in close proximity to the customer to ensure the end product meets the creative vision. In terms of exploiting intellectual property overseas in programme production, then such a market seeking advantage for overseas location is less important. The product is easy to export. Transport costs are negligible in the case of direct programme sales and very low for videos and DVDs, the production of which can in any event be easily subcontracted. Format sales are now a reasonably well established and successful contractual mode of exploiting the intellectual property in programme ideas and there are no internalization advantages which warrant overseas production. The key tacit knowledge required to make a programme acceptable to an overseas audience resides in local firms and the intellectual property in the idea itself is reasonably easily transferred under the licensing agreement.

6. Conclusions

This paper has presented a few strands of evidence relating to the question of the interconnections between clusters, entrepreneurship, and international expansion. Regarding proposition 1, the econometric evidence revealed that strong clusters do promote higher rates of surviving new firm start-ups and firm growth rates, providing evidence of a self-reinforcing dynamic between clusters and entrepreneurship. Underpinning these crude statistical relationships are classic processes identified in the literature. There is close cooperation and exchange of tacit knowledge underpinned by rich social capital, flexible specialization and dynamic linkages between firms. Labour markets are deep, flexible, specialized and a draw on the best talent. Moreover, socialization of labour, for which physical propinquity is necessary, is highly important. These processes and the abundance of resources, especially in London, support entrepreneurship and entrepreneurship drives innovation and cluster strength.

Proposition 2 is also supported. The logistic regression showed that both export and import activity are more likely in stronger clusters. Those firms which have seen the greatest success in terms of international expansion have been almost all London based.
This accords with Requena-Silvente (2005)’s finding that geographic spillovers promote SME exports. Moreover, London’s status as a major global node in the media industries attracts powerful multinationals which interact with and benefit local firms, not least via the innovation system in equipment supply. One exception to the supremacy of London is Bristol, which has a unique position as the world’s most important centre in a genre of programme making highly suited to international sales, natural history. The ability to compete for export revenues overseas and to serve demanding customers there draws knowledge, labour and financial resources into the cluster in a further positive feedback loop. The regressions, however, also indicate that firm-specific factors may be more important than locational factors in promoting internationalization.

There is general support for proposition 3. Industry characteristics were shown to explain in part the pattern of internationalization across different segments of the industry. Advertising post production and niche elements of film post production lend themselves to FDI being generally small scale and highly (tacit) knowledge intensive. Programme production is product rather than service based and there is a less compelling reason for an overseas location, therefore as Dunning’s OLI framework would suggest, exports are the most common strategy. Only limited evidence has been presented in respect of proposition 4. Whilst in general MNEs appear slightly less embedded than domestic firms, there evidence to date is that the benefits to the cluster of the presence of overseas MNEs and the expansion overseas by both exports and FDI of domestic firms has had a net positive influence on cluster dynamics.

References

Film Council (2003). *Post-production in the UK*. (London: DTI.)


