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Where evaluation theory collides with policy practice

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In search of indicators to support the 'perfect cluster':
Where evaluation theory collides with policy practice

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1. Introduction

The concept of geographically concentrated 'clusters' of firms, research institutions and other organisations became popular in economic development policy circles during the 1990s, following the publication of Michael Porter's (1990) *Competitive Advantage of Nations*. Porter defined a cluster as a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by commonalities and complementarities, and his neat exposition of the potential benefits of cooperative relationships alongside competitive relationships was quickly embraced by policy-makers around the world. A large number of authorities at supra-national, national, regional and even local level began to integrate the cluster concept into their policy discourse and to design and implement policy initiatives explicitly geared towards identifying and supporting clusters. Moreover, in the European context the uptake of clusters – a 'soft' policy focused on fostering proximity-based relationships – has been reinforced by the devolution/regionalisation processes being experienced in many countries alongside the increase in public-private collaboration in projects derived from EU structural funds (Lagendijk and Cornford, 2000; Rodríguez-Pose and Gill, 2003).

Today there is widespread acceptance, certainly within Europe, of the need to design policies that nurture and support cooperative relationships among groups of firms and other agents. The extent of the uptake of cluster policies and initiatives can be seen in Oxford Research's (2008) identification of national and regional cluster policy programmes in 17 European countries, in the TACTICS (2012) report on cluster policy trends, and in the around 1200 cluster organisations that signed up voluntarily to the European Cluster Collaboration Platform. Policies to support clusters therefore form an integral part of the regional policy mix employed to boost competitiveness and innovation (Flanagan *et al.*, 2011; Magro and Wilson, 2012), and there is strong demand to better measure and understand the impacts of these policies. Yet this has proved to be a challenge in practice. With standard evaluation approaches focused on

the firm as a single point of measurement, this risks missing the added value of collaboration core to the cluster approach. In addition further challenges include unique contextual issues around the types of impacts to be measured and the possibilities of collecting adequate data, which necessitate the coming together of academic expertise and analysis with the real-time and evolving experience of policy makers and practitioners. This paper makes a contribution in addressing this shared challenge and moving the cluster evaluation state-of-art forwards. Specifically it reflects on a four-year process of bringing together academics, policy-makers and practitioners from around the world to address the challenges of cluster evaluation. This process, and our reflections on it, has resulted in a concrete evaluation framework and set of cluster evaluation principles.

2. Cluster evaluation: Some context

Following the initial explosion of interest in clusters, criticism started to emerge concerning the theoretical and empirical basis of the cluster concept and the dangers that clusters be seen as a policy panacea (Benneworth and Charles, 2001; Martin and Sunley, 2003; Lorenzen, 2005; Belussi, 2006; Pitelis et al., 2006). This critique was driven in part by the fuzziness of the concept, which makes it difficult to rigorously show whether or not clusters in fact have positive effects on economic development processes. Perry (2005: 833) has argued, for example, that "it has been possible to pick and mix research evidence too freely". Indeed, despite the widespread use of cluster policies as cornerstones of regional and national competitiveness policy, there remains a shortage of evaluation research and practice that enable us to understand the impacts of these policies. This is due to the inherent methodological difficulties in evaluating cluster policies, whose direct outcomes are usually intangible. It is also due to the sheer variety of specific policies that fit within this broad policy family, rendering generalisation of results and implications extremely difficult. This continues to leave cluster policies (and other policies based around cooperative relationships) open to questions around their justification, and even more significantly it prevents learning that could improve the functioning of these policies.

There is a large empirical literature that has analysed various aspects of the pure agglomeration impacts associated with clusters (Glaeser et al., 1992; Audretsch and Feldman 1996; Paci and Usai 2000; Duranton and Puga 2001; Greunz 2004; Martin et al. 2011a; Spencer et al., 2009). Clusters are not simply an agglomeration concept, however. Their hypothesized benefits rely on cooperation between agents to acquire competitive advantages; for example, sharing the costs of input purchases or risky innovation projects, or joint access to finance or international markets. In this sense cluster policies represent a classic example of a 'soft policy'. Rather than dealing in subsidies for specific production- or innovation- related activities, they typically focus support on initiatives that foster a general atmosphere conducive to co-operative relationships between agents. It is precisely this 'soft' characteristic that makes the evaluation of cluster policies challenging; the outputs and outcomes of the policy are often intangible, and the systemic nature of the policy itself render cause-effect relationships difficult to isolate and demonstrate.

Current evaluation practice among policy-makers in this field therefore tends to be focused on the management of the cluster initiative, and tends to be conducted on an *ad hoc* basis that renders comparison difficult. These evaluations typically seek to measure activity (number of agents involved, or number of projects conducted) and review effectiveness (what was done) and efficiency (use of resources). This approach is more akin to audit, and merely measures, often quantitatively, against the programme of work originally planned. This fails to adequately capture the more qualitative elements, such as the essential role of trust-building and leadership, and the relevance of the collaborative approach – which are so essential for successful clusters. It also gives limited insights as regards the impacts of the policy programme as a whole or in terms of learning how to better design policy interventions.

Academic analysis has also struggled to overcome the challenges of cluster policy evaluation and has been able to have little influence on practice among policy-makers. Until very recently most academic analysis evaluating clusters and cluster policies tended to fall into two camps: qualitative case studies highlighting the relevance of contextual elements (see for example: Parrilli, 2004; Pitelis et al., 2006; Aranguren et al., 2008; Borras and Tsagdis, 2008) or evaluations seeking to quantify direct effects in terms of a specific 'hard' outcomes (see for example: Choi *et al.*, 2013; Huggins, 2001; McDonald et al., 2007; Nishimura and Okamuro, 2011; Martin et al., 2011b; DASTI 2011). Schiemedeberg (2010) provides an overview of the methodological state-of-art, but concludes that "using only a single evaluation method will provide a very limited view on the cluster policy programme". In addition, Wolfe and Gertler in their review of cluster analysis methodologies highlight that many analysts see the purely statistical methodologies to be too limited and that the "growth and innovation dynamics of clusters can only be properly captured using qualitative research techniques" including "accounts of the cluster's evolution" (2004, p. 1081). Indeed, there has recently been recognition of the importance of using mixed methods (Aranguren et al, 2014), and a series of studies are starting to emerge that seek to employ new approaches such as social network analysis (Guiliani and Pietrobelli, 2014) and participatory evaluation approaches (Aragón et al., 2014) that are capable of integrating qualitative and quantitative approaches.

In particular, there is increasing recognition of the need to further explore the "human element" of cluster analysis: the social behaviours, cooperation and collective learning hypothesized to be central for successful cluster. Studies have tried to model the growth of social networks to allow an analysis of the development of clusters (Smith and Brown, 2009) or use social network analysis to provide information on the nature, extent and quality of ties and interactions between actors in the cluster (Cassidy et al., 2005). Indeed, in seeking to gain further insight into measurement of the operation and interactions within clusters, Wegner and Padula (2010), Slotte-Kock and Covellio (2007) and Demirkan (2007) suggest that social network constructs combined with those of open innovation can advance understanding through the examining of how network operation and management leads to innovation outputs (Hidalgo and Albors, 2008). However these models and frameworks are at an early experimental stage of development, and more consistent testing and comparisons are needed to identify a

robust and easily repeatable approach to capture both the hard and soft indicators of cluster competitiveness.

3. Five elements to the cluster evaluation challenge

The emergence of these new approaches offers exciting possibilities, but they remain fragmented and are often ignorant of the data-collection possibilities that exist in practice and indeed the specific needs of cluster policy-makers and practitioners. As such there remain significant gaps between theory and practice around cluster policy evaluation. At least five elements to the cluster evaluation challenge can be identified, all of which require dialogue between academic experts, cluster policy-makers and cluster practitioners if they are to be appropriately addressed. Firstly, it is important to improve how we capture the more qualitative "human element" (or cooperative dynamic) that is essential for understanding the processes and linkages between actor groups that help build a successful cluster. Secondly, there is a need to convert emerging academic analyses into the development of pragmatic indicators/approaches that have feasible data requirements in practice. Thirdly, we need a better understanding of the selection and combination of techniques and tools as appropriate to different circumstances. Fourthly, there is a knowledge gap around approaches capable of dealing with complexity from the interactions that exist across policy levels, instruments and initiatives. Finally, all of these areas need to be addressed in the context of a stronger emphasis on the contribution of indicators and evaluation to policy learning, rather than the more common narrow focus on audit.

A quarter of a century on from initial interest in Porterian clusters as a policy construct, and at a moment in which many regional and national administrations are scrutinising their competitiveness policy mix in the face of pressures from austerity, these are timely challenges. Meeting them has the potential to both help demonstrate the returns on investments in clusters and to inform a learning process, the outputs of which should feed back into better future approaches to clusters and collaborative networking, and more effective regional competitiveness policy.

4. Methodology: Fusing academic and practitioner knowledge

The specific contribution of this paper is to report on and reflect on a unique experience over four years that has brought together academics, policy-makers and cluster practitioners from around the world to collectively address the challenge of cluster evaluation through a working group of TCI (the global network for clusters and innovation). TCI network is a global network of policy-makers, practitioners and academics working in the fields of competitiveness and clusters. After many years of discussing the challenges of cluster evaluation on a more *ad hoc* basis, a decision was taken in 2012 to establish a Cluster Evaluation Working Group. Since then four dedicated participatory workshops have been organized (in Scotland, Northern Ireland, Poland and Spain), each bringing together 20-40 participants from academia and policy from across Europe. Over 70 different contributors have been involved of the series of events, and the ongoing sharing of discussions and developments are shared on the online platform through a specific microsite area on the TCI network website. Specific

sessions have also been held at three annual global conferences of the TCI network, the most recent of which attracted around 60 participants at a 'cluster evaluation lab' in Daegu, South Korea. The regular nature of these activities and the continuity of a proportion of the people involved have facilitated a progressive process of identification and exploration of cluster evaluation challenges that has integrated theoretical and practical considerations. This has enabled the development of a common understanding of challenges and progress towards an approach for addressing some of these issues.

5. Results

This process has resulted in the development and validation of an evaluation framework based on the notion of what would expect to be found in the 'perfect cluster'.

"Perfect Cluster" Part I: How we would evidence its emergence and growth?

	Emergence of the Cluster	Growth of the Cluster
Activities: What is happening?	- (Regular) networking and interactive meetings/workshops across cluster actors - Capability and market mapping - Matchmaking - Understanding target markets - Defining area of specialization/value chain that draws initial perimeters of the cluster - Establishing basis for a common vision/strategy - Developing cluster brand - Forming institutions (unique organisations/funds) to coordinate action - Cluster intelligence - Communication strategy and action plan (internal and external)	- Strategic planning - Understanding and addressing barriers - Identifying (longer-term) opportunities - Development projects between different players (latest research being put into play) - Skills' training, workforce development - Proactively strengthening industry-academic partnerships - Building capability for the region
Actors: Who is involved?	A broad/diverse group: critical mass of interested actors engaged in related activities - SMEs (drivers) and large companies (enablers/accelerators) - Researchers (thinkers) - Practitioners (do'ers) - Supportive government actors (but not too "directive")	- Professional cluster manager/facilitator and core leadership group - Entrepreneurs - New cluster actors (expanding network) - Government involvement aligned with cluster strategy - Civil society
Resources: What money and physical assets are being used?	- Internal support; volunteers, in particular committed industry leaders - Meeting space - External (maybe public sector) support/seed financing - Potential qualified management (resource-dependent)	- Membership fees - Project resources - Private sector R&D investments - VC/entrepreneurship investments - Public investment (within policy/programme) - New joint facilities (test/demo, incubators) - Knowledge resources (e.g. training) - Cluster brand
Human Elements: What are the characteristics and	- Willingness to engage - Regular basis - Strong social element and trust among regional actors - Information sharing - Positive atmosphere and behaviours	- Mobility between actors within the cluster - More complex projects - Knowledge-sharing and spillovers - Commitment to solving common (wicked) problems

behaviours of people involved?*	- Open minded	- Developing ways of operating - Trust, confidence in the added value of the cluster members - Strong and frequent internal communication
Results: What is being generated?	- New collaborative projects between small and larger companies in collaboration - Foundations for value creation	- Spin-off businesses - New companies; new actors - Successful projects; value creation - Local to regional spread (company, cluster + regional impacts) - Media coverage - Widening of cluster ecosystem & potential changes in cluster perimeters - Opening up of specific development paths based on internationalization &/or diversification (see second table)

*Cluster equation: Will + Trust = Engagement, which leads to joint action = achieving the vision

"Perfect Cluster" Part II: How we would evidence different development paths?

	Internationalising the Cluster	Diversifying the Cluster
Activities: What is happening?	- Filling capability gaps - Exploiting opportunities - Identifying international partners; linkages with hubs internationally - Development projects with new partners (outside cluster)	- More (and more ambitious) projects - Different types of projects - Cross-cluster platforms - Other regional clusters - Clusters of clusters - International clusters/ partnerships
Actors: Who is involved?	- Participants in regional strategy; cluster actors in other activities - Other clusters and research actors outside region (including internationally) - Venture capital (including international) - Public support important (changing scope) - Lawyers	- Participants in regional strategy; cluster actors in other activities - Financial organisations - Lawyers - Venture capital (including international) - Public support important (changing scope)
Resources: What money and physical assets are being used?	- More private sector investments - Transnational programme funding (e.g. EU) - Project resources - Intangibles (e.g. databases) and structured ways of working	- Transnational programme funding (e.g. EU) - Project resources - Intangibles and structured ways of working
Social Capital: What are the characteristics and behaviours of people involved?*	- International partners - More expansive and inclusive - Intercultural skills - Creative skills - Education links - Finding commonality with other clusters	- New sector partners - Partner clusters - Education links - Creative skills - Boundary spanners
Results: What is being generated?	- Better knowledge; new insights - New business models - Shared value - Company growth (exports) - Integration in global value chains	- New knowledge - Spin-off businesses in new areas - New markets - Shared value

*Cluster equation: Will + Trust = Engagement, which leads to joint action = achieving the vision

The development of framework has been accompanied by the articulation of a series of cluster evaluation guidelines, which are summarized below in their headline form.

1. *Evaluation for change - Evaluation is about learning – not just audit*
2. *Different audiences need different outputs*
3. *Evaluation needs to reflect real world context*
4. *Capture evidence against Why (regional competitiveness), what (projects and programmes) and how (collaborative dynamics)*
5. *Timing of evaluation - reflect the maturity*
6. *Social capital and trust are fundamental so find ways to evidence softer issues*
7. *Causality of challenging so gather basket of evidence*

The combination of these outputs can help those involved in cluster evaluation to correctly frame their study design, and appreciate the elements that need to be considered and included. In addition, these two outputs are also currently guiding the development of a specific question bank for cluster members to promote future comparative analysis among those engaged in the process, in particular focusing on how to capture the softer elements of collaborative processes and impact so often missed in traditional cluster evaluation approaches. This draft survey will be tested by numerous cluster practitioners (e.g. cluster programme managers or researchers) around the globe over the next six months.

6. Conclusions

We identify two primary conclusions from this ongoing process of collision between evaluation theory and policy practice. Firstly the process itself demonstrates the need for forums and spaces where academics working on clusters and cluster evaluation issues can meet with those practitioners who are implementing and attempting to evaluate cluster programmes on the ground. There is a large gap between the data and indicators that might be desired in theory to evaluate cluster activities and the practical possibilities, and such spaces can play an important role in bridging that gap and adjusting expectations and behaviours on both sides in ways that open interesting new possibilities for realistic implementation. This links into a second main conclusion regarding the opportunities that are emerging for developing new indicators and data collection methods that respond to the challenges of measuring not only the results of collaborative activity, but also the process of collaboration. Indeed, to use an illustration that emerged in one of the workshop discussions, clusters have a certain parallel with meringues; there are a lot of soft elements in the process of collaboration that take time to solidify into real effects from collaboration. The interface between academic analysis and policy practice is especially important for opening up opportunities to better measure these soft processes and understand when (and when not) they are developing in ways that will ultimately solidify into hard impacts. Collaboration as an approach is not isolated to cluster programmes, but increasingly underpins many innovation and other policy approaches. Thus, these advances in

indicators and data collection methods will be relevant not only for cluster policies and programmes, but also for many other policies focused on strengthening collaboration.

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