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REGIONAL COLLABORATION INFRASTRUCTURE

Effects in the Hunter Valley of NSW

Abstract

Regional innovation has been incorporated into planning debates broadening the view of the crucial role that networks play in regional development as vehicles of knowledge and innovation. Research in this area has focused on the effects of the ‘innovative milieu’ (Maillat 1991; Kogut et al. 1993; Capello 1999; Camagni 1999) and recently into systems of innovation as a way to explain innovation at the regional level (Storper 1995; Landabaso 1997; de La Mothe & Paquet 1998; Cooke 2001). However, less research has been done into the meaning of regional collaboration structures, its measure and effects on regional development.

This paper discusses collaboration systems such as clusters and development networks as they enable innovation in regions. The paper argues that collaboration infrastructure has tangible and intangible effects in regional development that makes it a critical infrastructure to be developed in regions, especially those suffering economic decline. The paper will present the case of the Hunter region of NSW as an example of tangible and intangible effects of a collaboration network.

Introduction

Innovation at the national level has been identified as driven by networks of public-private sector organisations whose activities and interactions initiate, import, modify, and diffuse new technologies and practices (OECD 2001). In the case of regions, these public-private networks can be clearly identified as a system of interactions sometimes called ‘innovative milieu’ which advocates that the flexibility of the space stimulates innovation cycles that benefit the region (Capello 1999). Authors of this approach (Maillat 1991; Kogut et al. 1993; Camagni 1999) advocate the importance of the formation of tacit knowledge and the close interaction needed among firms to facilitate learning. Cooperation is then seen as a decisive factor in collective learning and innovation.

Recent research has moved into Regional Innovation Systems (RIS) arguing that firms are increasingly dependent on the direct involvement of institutions to stimulate innovation and thus competition (Landabaso 1997; de La Mothe & Paquet 1998; Cooke 2001). A strong, regionalised innovation system is one with systemic linkages between the sources of knowledge production (universities and research organisations),

1 This paper is based on my PhD thesis, my gratitude to my thesis supervisors: Prof. Tong Wu of UWS and Prof. Peter Murphy of UNSW.
intermediaries (government and private innovation services) and firms (Cooke 1995). However, research into RIS is still not systematic, regional comparison is difficult and remains dependent on the framework of National Innovation Systems (NIS). This, in part, is because analysts have been too focused on the geographic boundaries of cities or regions and less on the regional innovation capabilities and their effects.

RIS research is difficult to replicate elsewhere for comparative purposes and this has the effect that we are still not clear about what processes underpin regional innovation. The discussion in this paper focuses on the innovation capabilities that collaboration infrastructure develops, its measure, and its tangible and intangible effects as significant assets of regions.

The paper is divided in three sections: the first section discusses clusters and development networks as collaboration systems co-existing in a region; the second section focuses on the measure and analysis of collaboration infrastructure; and the third section discusses the effects of collaboration infrastructure on regional development. The case of the Hunter Valley of NSW is used as an example.

**Regional Collaboration Systems**

Can regions present collaboration systems that enable innovation for the region as a whole? This section argues that regional networks such as clusters and development networks are systems that foster regional innovation.

Clusters may be understood to be an informal association of firms, which are usually in geographical proximity and which pursue deliberate practices of collaboration in order to heighten their competitive edge in regional, national and international markets. Clusters offer a structure that articulates strategies to foster knowledge, technology applications and innovation at the firm level (Martinez 1998). The characteristics of clusters are that they attract needed specialised services to a region, generate demand for more firms with similar and related capabilities, they have an open membership with shared social values and they involve both cooperation and competition (OECD 2001).

The concept of clusters developed by Michael Porter in his paradigm for understanding company competitiveness, national implications and new global strategies (Porter 1990) has moved towards a more inclusive definition embracing one critical aspect of innovation: the generation and transfer of knowledge. In 1990 Porter provided a definition of what he called ‘vertical and horizontal clusters’. Vertical clusters are made up of industries that are linked through buyer-seller relationships. Horizontal clusters include industries that might share a common market for the end products, use a common technology or labour force skills, or require similar natural resources (Porter 1990). Eight years later in 1998 he expanded his definition:

Clusters are geographic concentrations of inter-connected companies and institutions in a particular field. Clusters encompass an array of linked industries and other entities important to competition. They include, for example, suppliers of specialized inputs such as components, machinery, and services, and providers of specialized infrastructure. Clusters also often extend downstream to channels and customers and laterally to manufacturers of complementary products and to companies in industries related by skills, technologies or common inputs. Finally, many clusters include governmental and other institutions - such as universities,
standard-setting agencies, think tanks, vocational training providers, and trade associations - that provide specialized training, education, information, research, and technical support (Porter 1998).

Finally, in a paper he wrote in 2000 he defined clusters as concentrations of highly specialized skills and knowledge, institutions, rivals, related businesses, and sophisticated customers in a particular nation or region (Porter 2000). This is a more sophisticated view of the extension of a cluster and the reach of cluster boundaries into political, administrative and regional education institutions.

The other type of network that can be found at the regional level is the Development Network. These are strategic alliances of firms/organisations from the private sector, the public sector and the non-profit or civic sector with the objective of the socio-economic development of a certain territory, usually where they live and work. This type of network acts like a non-profit organisation and may adopt legal forms such as ‘consortium’ (Sabety & Griffin 1996; Martinez-Fernandez 1999). The focus of development networks is on collaboration among the different actors in a certain territory, a metropolitan area, a local council or a region which includes several local and metropolitan areas in order to enhance the development of the region.

Development networks are led by the public sector and have the triple bottom line of addressing social, economic and environmental issues. The identification and target of industry clusters is thus one of the strategies of development networks and it might well include a very similar membership of firms and organisations but clusters have usually a more restricted membership of actors in their specific product-service system focus. Development networks also have a focus on institutional collaboration so that planning strategies and policy agreements can be put into place thus minimising coordination risks. The trend of the last ten years towards loosening the boundaries between ‘clusters’ and ‘development networks’ may mean that clusters are more likely to emerge in those regions having a rich and active development network rather than in those which are non-networked. As cluster development depends on public funds for the initial analysis, the organisation of meetings and the design of strategic plans, the articulation of the cluster into development networks is critical to the success of the cluster, and this is not difficult when the collaboration structure is already in place.

Clusters and development networks are two different regional networks that can coexist in the same planning space but whether these networks have innovation capabilities and how we can identify these capabilities has received little attention in the literature. In one way, discussions have been placed around the economic effects that clusters might have and the competitive advantage that the cluster could bring to its territory (Porter 1990, 1998, 2000). In another way clusters’ developers soon understood the importance of involving powerful players in the cluster management and clusters and development networks began to blur, probably because the cluster emerges from strong development networks. Discussions on the role and effects of development networks are limited to the important work of Cooke and Morgan (1993), Cooke (2002) and other authors such as Martinez-Fernandez (2001) and Hagen et al. (1997). The two innovation capabilities that stand out from this literature are collaboration and competition.

Strong collaboration between firms or organisations is no doubt the domain of development networks. They thrive in collaboration and they need it to be sustained
The benefits of collaboration on capability-building and innovation seems to be clear but often the literature does not include ‘competition’ as a critical factor of the innovation process and coexisting with the collaborative efforts of clusters and networks. Competition has been strongly fostered by Porter (1990, 1998, 2000) as a key factor in companies and nations’ competitiveness and innovation.

Clusters promote both competition and cooperation. Rivals compete intensely to win and retain customers. Without vigorous competition, a cluster will fail (Porter 1998).

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2 The Hunter region is restructuring its economic base, moving away from depending excessively on steel production.
In more advanced economies and increasingly elsewhere, however, the more decisive aspects of the business environment for competitiveness often are cluster specific (e.g., the presence of particular types of suppliers, skills, or university departments) (Porter 2000).

Porter also claims that proximity amplifies rivalry while simultaneously stimulating cooperation:

It should be clear that clusters represent a combination of competition and cooperation. Vigorous competition occurs in winning customers and retaining them. Because of the presence of multiple rivals and strong incentives, the intensity of competition among clusters often is accentuated ... Competition and cooperation can coexist because they are on different dimensions or because cooperation at some levels is part of winning the competition at other levels (Porter 2000).

Competition is a strong human dynamic that cannot be neglected. Firms co-located geographically have many opportunities for observing each other. Instruments for understanding or guessing which innovations are going on in the business environment are developed and creative solutions stimulated by strong competition so that ‘knowledge’ becomes an important component of the cluster learning environment. Isolated firms may be able to keep secrecy but in an environment of strong formal and informal interactions enough information often leaks to give competitors the knowledge they need to mix with their own capabilities (Maskel & Lorenzen 2003). In this way, clusters facilitate a continuous product and process improvement that is activated mainly by the fact that competing firms are present and that each firm needs to develop its own ‘competition watch’ to remain in the game. Competition is therefore another factor that enables companies to be more innovative and it can be encouraged through a collaboration network.

The rest of the paper will focus on an example of how to analyse regional collaboration structure and the effects it has on regional development.

**Collaboration Infrastructure: the case of the Hunter Valley**

The economic changes affecting the Hunter region of NSW (100 km north of Sydney) set part of the development circumstances influencing the rise of an active network of public and private organizations influencing the development of this region. The Hunter has lost full-time high-income employment in favour of part-time low-paid jobs, mostly in the hospitality industry. The highest reduction of employment has occurred in the steel industry, a sector that has suffered most from global competition. Unemployment is also consistently greater than the state and country average. These conditions have produced a transitional economy mainly creating casual low-paid jobs (Hunter Valley Research Foundation 1996).

The unemployment rate in the Hunter region (NSW) has been around 11 per cent since 1996. Primary industry accounts for coal mining and agriculture, but it is the coal sector where the jobless are more numerous. Employment in coalmines has been rationalised and has fallen 20 per cent during the 1990s. Since 1990 about 2,000 miners have lost their jobs, and more declines are expected due to productivity improvements.
and mine closures (Parliament of New South Wales Legislative Council 1998). Secondary industry in the Hunter was the second largest employment sector, although it has declined markedly since the 1970s, with approximately 16 per cent fewer employees. Traditionally the sector has been dominated by the manufacturing of heavy metals such as iron, steel, aluminium, zinc and lead. A special mention is required for steelmaking, which commenced in 1915 by Broken Hill Products (BHP) in Newcastle. Thousands of jobs were created since then, with a peak level of 11,139 persons in 1981, and decreasing to 2,900 workers in 1997 (Hunter Valley Research Foundation 1996). The industrial dislocation of the Hunter region was epitomised by the closure of the steelworks which led to 5000 jobless in direct and indirect positions; 2.18 percent of the total employment in the Hunter (Martinez-Fernandez 2001).

The social and economic impact of the BHP plant closure and redundancy was investigated by the HVRF for the Prime Ministerial Task Force in 1999. The report found that certain internal and external factors impede the transition to other jobs, and that anxiety, confusion and stress will rise.

The consequences include relationship breakdown, domestic violence, alcoholism, depression and suicide. They appear to be most manifest in middle age males - those between 40 and 55 years, in good health, and for whom retirement is not an option. It is this group, in particular, which has most trouble in battling the vagaries of the economy, and is most likely to show up in the troubling social statistics for the region, or at the doors of the Hunter’s welfare agencies (Hunter Valley Research Foundation 1999).

This environment of economic crisis urged organizations to join together in the analysis of how to overcome the difficulties faced by the region. It was at this point that the collaboration network of organisations became more visible, promoting regional strategies and coordination of actions. This crisis is not an isolated factor limited to this particular region. It is a consequence of global trends such as the internationalisation of mineral markets and technological changes affecting the production and procedures of extractive and manufacturing industries. It can be argued that the emergence of regional networks for economic development is predictable in industrial countries where knowledge and learning contribute much to business competitiveness and where institutions are also adopting the collaborative ‘attitude’ of networks. That way these regional networks catalyse the effects of globalisation at the regional level as a way to prepare for and absorb the region’s much-needed structural changes. In spite of the obvious effect of global movements, regions such as the Hunter remain dependent on national and local factors and it can be argued that the regional economic crisis, and public-private partnerships under government-funded programs are ultimately promoting network activity – much more than the effects of globalisation.

In the case of the Hunter, evidences of a strong collaboration system have their roots both in the heavy manufacturing and trade-unionist history of the region associated with steel making, and the strong sense of community after critical events such as the earthquake of 1989 (Hunter Valley Research Foundation 1999). Specifically the Hunter collaboration network is composed of twenty-five organisations including eleven organisations from the public sector, five private enterprises, eight non-governmental organisations (NGOs) and one informal group (Martinez-Fernandez 2001). The relationships between these organizations are show in Figure 1 which maps
the collaboration links of the Hunter organisations in projects of economic development. Three components are present: nodes, lines and arrows. Each node represents one of the organisations collaborating in projects of economic development. Lines between nodes represent a specific collaboration link in a project between those organisations. Arrows represent the direction of the link, as reported by the informants, and thus who initiated the collaboration in that particular project. Organisations close to the centre of the figure have a higher frequency of arrows. These organisations are those more central to the network, that is, the ones participating in the highest number of projects. Those organisations on the periphery indicate a minor number of collaborations in projects.

Figure 1: Hunter Valley collaboration system

Source: Martinez-Fernandez (2001)
Interview data also shows the presence of a well-organised collaboration infrastructure. Quotations from interviews have the ID number shown in Figure 1. For example the following quote is for a NGO, commenting about why the organisations of the network collaborate:

There are obviously elements of altruism, and there are probably elements of self-interest in any cooperation...but the bottom line I think is essentially that...when the region is able to put aside any part of self-interest to focus in a particular task and do so in partnership with a range of other organisations, you got a better chance of achieving success [NG4: 24/7/98].

Private organisations also acknowledge the strong collaboration system in the Hunter:

If I see an opportunity that is not an opportunity for [my organisation] I’ll tell the others about [it] immediately…and that’s the type of culture that is keeping us going.
It’s not really a person driven thing, [it] is a lot of people becoming a good positive unit [PR2: 12/5/98]

One of the fundamental principles on which we operate is that a team work approach will always be more effective that any individual trying to undertake work of this scale on their own. So part of our planning process is always to identify those individuals and organisations that should be potential members of the team [PR1, 12/5/98]

The emergence of the network is linked to a process of collaboration that has proliferated in the region. That process of collaboration is likely to be nurtured by consistent communication at the formal and informal levels:

When I started about three years ago I think there were just a range of small initiatives that were taken by a group of new people in some key positions, those people seems to have more of a team focus in their work and there was some information sessions there were started on, just simple effects of gradually building a better understanding and creating a willingness to try to identify ways in which we could cooperate and also to try to eliminate any duplication, so [it] has been a thing that’s evolved, I think particularly over the last three years, I think prior to that time there was probably a sense that people were operating more in isolation [PR1, 24/7/98]

The pressure of a growing economic crisis has also contributed to the emergence of the Hunter network:

One factor is a stable population, people with their roots in the area...and this gives them the commitment to the development of the area...another factor that undoubtedly has stimulated the local region is a sense of crisis...and this sense of crisis was catalysed in the BHP announcement...that spawned a few more network groups, they’re not formal organisations...don’t have a structure, they are a group of people, of leaders, they are prepared to come together to try to do something for the region [NG23: 24/7/98]
The existence of collaboration infrastructure itself is a critical step for innovation to occur but the focus and direction (if any) of that collaboration infrastructure requires sophisticated planning skills. Implementing the collaboration usually takes precedence over such planning activity.

Effects of collaboration infrastructure on regional development

The section above shows the presence of robust collaboration infrastructure in the Hunter region of NSW. This section focuses on the tangible and intangible effects of the Hunter network on regional development. Tangible effects can be measured by the number of development projects generated by the network. Intangible effects are shown in the role of knowledge creation, transmission and transfer in the region. This section discusses both effects in the Hunter region of NSW.

Tangible effects: production of projects of regional development

The collaboration network in the Hunter Valley was involved in 186 projects of economic development during 1997 and 1998 (Martinez-Fernandez 2001). The main types of projects were industry sector and SME projects (28 per cent) and planning projects such as studies, research, and the development of future strategies (22 per cent) as can be seen in Figure 2. The figure also shows that public organisations are largely involved in projects targeting industry growth or SMEs’ competitiveness and planning and feasibility studies. Private organisations are also involved in these types of projects while NGOs show a bigger focus on employment and network support activities.

Figure 2: Hunter collaboration network - type of projects
The projects account for approximately A$3.29 billion\(^3\) (October 1999), and 68 per cent of the member organisations reported that these projects would not exist without their collaboration. The claim is valid because all these projects depend on collaboration between several organisations and it is difficult to believe that they could have been undertaken by a single organisation, even with funding available.\(^4\)

The roles played by organisations part of the network in the projects indicates that strategic planning, generation of proposals and coordination are the main functions of the collaboration network (see Figure 3). Again it can be seen the critical role of public organisations in funding projects but also in preparing proposals and coordinating activities.

The outcomes of the projects are difficult to know due to the cost of the evaluation task, the extended time frame of projects and the difficulties in isolating projects' effects from other external effects. However the expected outcomes give an indication of why the network organisations get involved in projects (see Figure 4). The focus of both public and private organisations on jobs and business outcomes is well ahead of their focus on training programs (which are often associated with industry competitiveness, job creation, and so on).

Figure 3: Hunter collaboration network: roles of member organisations

![Figure 3: Hunter collaboration network](image)

Source: Martinez-Fernandez (2001)

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\(^3\) Source: Questionnaire and field survey.

\(^4\) Interview data shows that up to 68 per cent of the organisations assert that regional development projects would not exist (or not with the same degree of success) without the collaboration infrastructure of the network.
The results show that the network invests in businesses as a strategy running parallel with the creation of jobs. This network has a well-integrated private sector that puts pressure on improving the region’s entrepreneurial culture and investments in existing firms. Figure 4 shows also a strong focus on exports and the competitiveness of firms, both categories linked to business development. As an example, one of the characteristics of the Hunter network is a solid strategy to support industry clusters and most organisations in the Hunter believe that business development will generate employment (Parliament of New South Wales Legislative Council, 1998; Martinez 1998).

The contribution of the network to regional development is evident, both in the planning process and in the project delivery, as this private Hunter organisation estate:

It’s about sharing strategy in the first place, it makes sense in terms of current regional strength and opportunities, it is about sharing information and establishing key projects through the strategy and about working collaboratively to actually complete projects... Now we can do a better job on the projects we identify and we can have a better sense about what are the most important projects through the network, and through better sharing information and cooperation on planning and project implementation [PR1, 12/5/98]

**Intangible Effects: Network and Knowledge Capital**
The effectiveness of the network is considered difficult to assess because there are no ways to measure intangible effects such as motivation:

The effect of the energy [of interacting] on motivation of firms, I think it’s very difficult to quantify but I’m sure it is there, the informal contacts that arrive from

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5 In the category of ‘others’, Hunter’ organisations report the following: to promote the region; to protect the environment; to generate regional strategies; to create awareness and educate population; to coordinate government action; to have a better use of resources; to establish a consultative group; and to set up agreements for Aboriginal people.
networking also operate, …I think that as a result of that there is a benefit also on the economic activity for this region…the ability to export…[NG23: 24/7/98]

The effects of the collaboration system are also seen in the network capital that is generated in the region. Networks have been included in the concept of social capital together with norms and trust (Putnam 1992; Sabel 1993) but a recent stream is working on the concept separately (Sik 1994; Wong & Salaff 1998). The Hunter network organisations consistently report that networks are vehicles of innovation and the transfer of knowledge and learning, and that these factors are transforming the social and economic environment of the region. Network capital is regarded here as the capacity of a region to activate all socio-economic actors in a way that processes of collaboration between them are developing continuously, fostering learning and generating new ways to solve problems. The network capital adds value to the region, for example, by making it more attractive and interesting to investors and new settlements. Somehow these intangible factors are acknowledged as important for the region by most organisations:

I think the network has impacted…it is able to marshal the resources of the region, to identify opportunities and issues and to respond to them in a constructive way, I think without that existing network of organisations our capacity to respond to opportunities and issues that affect our development we’re very poor indeed. If you look at the network itself, each of the organisations that are there have evolved through their own processes and many of them political in their nature…so government created organisations and they don’t uncreated…they still there. So what are we working then is a diverse range of groups but they are all focus in trying to address these opportunities and issues. If you took all that capability out, it will be very difficult for the region to survive in the current economic climate, very difficult indeed. We might all of us feel we’re not achieving our potential but at least with a network there we’re making a good honest effect and trying to move forward [PRI, 12/5/98]

I think it might drive you mad if you go to repeated meetings and you keep seeing the same faces or almost the same faces…so what are you getting is intersecting circles nor necessarily overlapping ones…and I think it is in fact a very efficient way of getting good communication and ensure we know each other what we’re doing…and getting this source of energies you can get from an interaction [NG23: 24/7/98]

Regarding knowledge capital, there is little discussion today that participation in networks, clusters and alliances proves a powerful learning mechanism, especially if the relationships are in geographical proximity so that extensive sharing can take place informally (Little 2001). Regional innovation systems thus should maximise the value of their knowledge-generation institutions through linkages with the different actors in their systems (OECD n.d.; Maskell 2001). These actors belong to the public, private and/or the non-profit sectors. Although the transfer of knowledge between knowledge providers and industry has been discussed in the literature (Kline & Rosenberg 1986; Teece 1987; Faulkner & Senker 1995), the generation and transfer of knowledge between public institutions and the role of the non-profit sector has received less attention.
The role that universities and other knowledge institutions play today in the generation and transmission of knowledge is looked upon by regional stakeholders with much more sophisticated eyes than it was in the past. Training of new talent is no longer the main role of these institutions, now the engagement with industry and the community is driving strategic agendas for regional universities. The role of collaborative research and development with firms also goes beyond the particular project-alliance as firms learn through interaction to improve both their collaborative capabilities and their likelihood of successful partnerships in the future (Dogson & Bessant 1996).

An analysis of the role of the knowledge providers in the Hunter network show that universities hold key strategic power positions because they generate multiple interactions with other players and they generate trust and prestige through these contacts or collaborations. Using methods of social networks analysis it was found that these organisations act as ‘gatekeepers’ of information and knowledge within the development network in their regions (see Figure 5 below where 2 public education institutions–R10 & R17-hold the highest positions in the network). This strategic position was not shared with private research institutions (R13) indicating the important role of ‘public knowledge’ among other stakeholders. Although this result cannot be generalized, it points to knowledge institutions as key players of current debates on knowledge-hubs and territoriality where ‘knowledge’ is discussed as a crucial asset of any territory (AEGIS 2003; Marceau & Martinez-Fernandez 2003). In the case of the Hunter region, both the University of Newcastle and TAFE are institutions very well linked to both public institutions and industry organizations. The exploration of the specific role of public institutions in knowledge generation and transfer is a subject of recent interest and only recently these knowledge institutions have been aware of the key role they might be holding in generating knowledge capital for the region where they are embedded. One of the practical implications, for example, has been discussed by Acs (2002) in a recent analysis of US counties where he isolated specific positive effects of university research on industry innovation. The effects are shown directly on SMEs innovation and indirectly on big corporations within the same industry sector. These spillovers of university research are found even when collaboration with industry in the region is not particularly strong, pointing to the importance of geographical proximity of knowledge providers and generators.
The experiences and economic impact of knowledge hubs such as the Silicon Valley and the North Carolina Research Triangle emphasise the integrated role of human capital, public agencies and firms in generating and applying both local knowledge and knowledge produced elsewhere (Saxenian 1985, 1990, 1991, 1994). Such a model is more often the exception and it is a solution that cannot be reproduced elsewhere because it will require the replication of the whole socio-economic ecosystem.

The role of knowledge-hubs is specified in the generation, transmission and transfer of knowledge in order to continually increase initial firm capabilities but also cluster and development network capabilities. The potential of clusters and networks in stimulating knowledge-hubs remains in the capability of these innovation systems to capture and diffuse knowledge generated within the region and externally to their geographic location. This way knowledge created elsewhere can be applied very quickly to local industry needs, policy and community needs. The rich public-private-civic structural platform of clusters and development networks can act both as magnets and diffusers of new knowledge. The role of universities and other knowledge institutions is vital here because their day-to-day business is the transmission of knowledge and, as such, they act as concentrated pools of talent in a visible and defined space.
Very little work has been done in terms of the analysis of the relationships between a university and other knowledge organisations with firms in its immediate geographical area. Methods for doing this analysis in regions are needed so that the measure of ‘knowledge capital’ can be achieved. A few studies are being developed at the moment but the understanding of these knowledge intensive interactions is far from being completed (Martinez-Fernandez & Davison 2003).

Conclusions

Consideration of the success or otherwise of regional development innovations has informed stimulated the debate about the drivers influencing such development. The literature has focused on regional innovation systems (RIS) but less has been done in providing methods that allow for replication of studies and for measuring regional collaboration systems and their effects on regional development. Despite numerous studies on regional analysis, it is still difficult to isolate the most critical elements influencing regional development. The work discussed in this paper proposes that regional collaboration systems are innovation-enabled-infrastructure that can be identified, analysed and evaluated in terms of their effects on the region’s development. The Hunter region is an example of a region presenting a robust collaboration structure. The Hunter’s development network was identified using social network analysis methods and interview content analysis, indicating the strong role of interactions among organizations to transfer knowledge, enable learning, and produce new projects of interest for the region’s development.

The specific innovation of producing projects of economic development allows for an analysis of tangible effects of the collaboration network where the number of projects, capital investment, and expected outcomes can be identified. The analysis of intangible effects such as network capital and knowledge capital are much more difficult, but again, necessary to understanding the articulation of the region as a knowledge system.

In summary, the paper argues that regional innovation analysis should include an analysis of the collaboration infrastructure of the region and should be performed so that tangible and intangible effects can be evaluated and contrasted with other successful regions. The high relevance of collaboration infrastructure for the design of policies and programs to promote sustained development in Australian regions makes the topic critical for regional researchers, economic development practitioners and urban and regional planners. The particular findings reported in the paper matter because regional analysis and planning has focused on comparative per capita investment, locational and investment growth and other economic outcomes as indicators of regional development but very little is known about knowledge assets or collaboration assets and their influence on regional development. Future research on comparative analysis of regions presenting different types of regional networks and their effects will add further light on the added value of regional collaboration infrastructure.
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