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Title and Abstract

Title Innovation-Led Entrepreneurship and Inter-Organizational Knowledge Flow:
The Formation of Network Capital

Firms utilise inter-organizational networks to manage flows and access knowledge to enhance expected economic returns. In particular, inter-organizational networks are an important aspect of the innovation process, with network scholars stressing that innovation is a complex process often requiring knowledge flow between organizations. Increasingly, this process is viewed as a systemic undertaking, i.e. firms no longer innovate in isolation but through a complex set of interactions with other organizations.

Emerging theories of the firm such as the knowledge-based view and extensions of the resource-based view recognize that knowledge accessing, acquisition, exchange and creation are a key reason why firms build or enter networks with other organizations. These networks concern the interactions, relationships and ties existing between firms, and may arise through the need to access new assets and skills, and keep pace with competitors. In general, although significant attention has been given to understanding the nature and role of firm resources in providing competitive advantage, less attention has been given to network resources resulting from membership or participation in inter-organizational networks. The ‘network’ focus is pertinent given the evidence suggesting that with the exception of knowledge protected by property rights, such as patents and copyrights, knowledge is not generally accessible or appropriable by means of market transactions. Inter-organizational networks in this context are defined as consisting of the interactions and relationships organizations utilise to access knowledge.

The aim of this paper is to analyse the formation and role of inter-organizational networks in facilitating the flow of, and access to, knowledge from the perspective of innovation-led entrepreneurial firms. The paper

utilises and builds upon the concept of network capital, which seeks to recognise that investments in inter-organizational network facilitating access to knowledge are a capital asset in their own right for firms, and differs significantly from the type of social capital held by firms. The paper is structured, therefore, around understanding the processes of network capital formation. Drawing on a series of in-depth case studies of entrepreneurial firms, the paper attempts to theorise the relationship between network capital and inter-organizational network formation and innovation-led growth, particularly in the entrepreneurial context and environment. The key questions the paper seeks to address are: (1) what is the rationale and motivation for engagement in inter-organizational networks by innovation-led entrepreneurial firms? (2) how do firms search for and select organizations with which to form networked relationships? (3) what are the characteristics and underpinning interaction mechanisms of these networks? and (4) what is the nature of the knowledge accessed and applied in order to facilitate innovation?

In general, the case studies aim to capture the following core themes: the rationale and motivation underlying network capital formation; the process of searching and selecting organizations with which to form knowledge-based inter-organizational networks; the types of inter-organizational networks formed and the interaction mechanisms underpinning them; the type of knowledge accessed through the networks and the applications stemming from its sourcing. In summary, it is found:

Network Rationale - network capital formation is related to the objectives of innovation-led growth, although this does take different forms. For the majority of firms, the rationale for network capital formation is embedded within the strategic requirements of firms, in particular the requirement to the access knowledge from beyond the boundaries in order to meet the innovation objectives.

Organization Search and Selection - overall, it is found that there two distinct mechanisms at play: first, the utilisation of prior and current interpersonal and inter-organizational ties held by the firm; and second the formation and utilisation of new ties outside of a firm existing network. In general, the majority of firms utilise a balance between these two forms.

Network Type and Interaction Mechanisms - these largely consist of a mix of networks that can be classed as alliances – largely manifested in the form of collaborative project – and contacts networks, whereby knowledge is accessed through contact with customers, suppliers, universities, etc.

Accessed Knowledge and Applications - for the majority of firms the form of knowledge accessed through their inter-organizational networks relates primarily to scientific and technical knowledge, with a smaller number of firms focusing on accessing knowledge related to the development of their market. In general, the scientific and technical knowledge accessed consists of know-how and tacitly held knowledge rather than more codified forms. However, this knowledge is often combined with codified knowledge that the firms access through searches of the relevant literature and publications, as well as sources of codified knowledge.

Overall, the paper establishes both a theoretical and practical framework to better understand how strategically formed networks act as an asset

underpinning knowledge flow and innovation-led growth across entrepreneurial firms. Network capital clearly requires significant levels of management and investment if it is to be effective. The growth of new knowledge formation across the globe suggests an enhanced requirement to manage network capital, since it is often becoming increasingly difficult to establish relationships with appropriate knowledge sources. The push toward the strategic management of networks, and the potential financial rewards associated with effective management, almost paradoxically suggests the establishment of markets for network capital. This strategic view may further infer the outright commodification of networks whereby information on key contacts may be stored, exchanged or even stolen.

Finally, from a public policy perspective, there may be a role for government intervention in educating firms in the art of network management. There is a growing applied and professional discipline related to the management of networks and knowledge flows, which should be supported through public policy. Our key recommendations for consideration by policymakers consists of providing entrepreneurial firms with appropriate support to establish a high performing network structure that allows them access to the knowledge they require. Policy should help identify and map key communities of practice, and then make firms better aware of these communities.

In recent years we have witnessed the predominance of cluster policies as key mode of government intervention in this arena. In a network sense, cluster policy has concerned the promotion of social capital - through network initiatives seeking to promote long-term stable relationships, but often lacking clear objectives - and the formulation of spatially bounded inter-organizational networks. Our findings suggest that in the case of knowledge-based network environments, investments in network capital and the formulation of relatively dynamic network configurations are also of importance. Therefore, distinguishing between social and network capital development may have implications for policy-makers, particularly in the field of economic development, who have tended to focus on facilitating firms and organizations in building and utilizing social capital. These efforts need to be complemented with facilitating the generation of network capital.

This is not to suggest that policy-makers should seek to disinvest from business development programmes with a high focus on social activities, but that network capital development programmes focused on the business community must also be supported. Policy-makers often appear to expect that innovation and economic benefits will spillover from these networks as a by-product of the development of socialized interaction. Business network programmes must also encourage the development of networks with a clear strategic, and often task-specific, focus to their activities. More generally, there needs to be far more intelligence concerning exactly how effective and successful inter-organizational knowledge networks are formed, and to what extent these can be supported or orchestrated, through policy. This should consist of facilitating the development of both the type of enduring knowledge networks required for effective collaborative innovation and the dynamic networks required to access the most relevant and up-to-date knowledge. There is need to build upon existing policy strengths, and in Europe, for example, the European Commission's initiatives represent a growing opportunity for entrepreneurial firms to access knowledge through

inter-organizational networks.