11 Networking of Small Firms: Is the Region a Knowledge Source for Innovation?

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11.1 Large and Small Firms in the Innovation Process

The debate about whether small or large firms are more innovative, and whether size is a useful criterion for distinguishing the differences in the intensity and kind of innovative activity is not a recent phenomenon. It can be traced back to the pioneering work of Schumpeter, who in his early work emphasised the risk-taking behaviour of pioneer entrepreneurs in enhancing the supply of innovative solutions (Schumpeter 1911). He later argued that large firms can devote more resources to systematic research and development (R&D) and are therefore more innovative than small firms due to scale advantages (Schumpeter 1942). These two hypotheses were summarised by Freeman in the models of entrepreneurial innovation (Mark I) and of large-firm managed innovation (Mark II) (Freeman 1982).

An important aspect of studies analysing innovation processes in firms (e.g. Nelson and Winter 1982) is therefore the relationship between firm size and innovative activity. One common result of the studies carried out during the 1970s and 1980s was the conclusion that innovation intensity increases with firm size up to a certain point and then decreases again, forming an inverted U-shaped curve. Although these studies produced variations concerning the trend and exact turning point of the inverted U-curve, depending on the data used for the analysis, the innovation indicators and the business units observed, the general pattern was believed to be stable (see Frisch 1993 for a summary of various input and output-oriented studies).

Small firms and the role they play in job creation and economic development came into the limelight during the 1980s, following empirical evidence emerging from several North American and European regions. In the United States, between 1969 and 1976 two-thirds of all new jobs were created by start-ups and firms with under 20 employees (Birch 1987). Also in many other countries and regions, small firms were shown to contribute to regional and employment growth (Aydalot 1986; Camagni 1991; Keeble 1997; Piore and Sabel 1984; Pyke et al. 1990; Sengenberger and Pyke 1992). The decentralisation of entrepreneurial functions and the creation of smaller production units, as well as outsourcing and other
strategies for improving the core competencies of companies, led to an increase in
the number of smaller firms during the 1980s and to the assumption that small
firms adjust more efficiently to market volatilities. Evidence for the importance
of small firms was provided by the SPRU innovations database, according to which
small firms were not only responsible for more innovation than their share of
R&D expenditure would imply, but also for a larger share of innovations than
would be expected from their share of employment (Pavitt et al. 1987; Tether et
al. 1997).

Not surprisingly, in the late 1980s and early 1990s the contribution of small
firms to innovation was the subject of several publications (e.g. Acs and
Audretsch 1990). Although these studies found some evidence that small firms are
more innovative than large firms, one of the major conclusions was that the degree
of innovativeness mainly depends on the industry. The innovation rates of both
small and large firms depend on the level of capital intensity. In capital-intensive,
advertising-intensive, concentrated and highly unionised industries, larger firms
are more innovative than smaller ones, although the innovative activity tends to
decrease as the level of concentration in an industry increases. On the other hand,
in highly innovative industries composed predominantly of large firms, the
innovative advantage is held by the smaller firms (Acs and Audretsch 1990).

By reclassifying the firms originally listed, the SPRU database now suggests
that "...the relationship between innovative intensity and enterprise size in the
manufacturing sector (tends) to be not U-shaped but J-shaped, with only the
largest enterprises introducing a disproportionately large share of the innovations" (Tether et al. 1997, p. 31). While pointing to the limitations of his analysis, Tether
came to the conclusion in another study using the SPRU database that by taking
the average value of an innovation, measured in terms of revenue, "... the
interpretation that small firms are more innovative (or more efficient innovators)
than large firms because they have introduced a larger number of innovations
relative to their employment is unsound" (Tether 1998, p. 742). There is also no
evidence for particularly rapid growth among the small firms included in the
database between 1975 and 1983.

All the results presented so far lead to the conclusion that size alone is not
sufficient for distinguishing innovative firms, but that a number of internal
features, as well as the nature of the innovation process itself are also relevant. As
Frisch (1993) concludes in his study, there is no optimal firm size for innovation.
The innovative potential of a firm depends, among other factors, on its risk-taking
propensity, which itself depends on the structure and behaviour of the
management (Barkham et al. 1996). It is also linked to the firm's absorptive
capacity, which concerns its ability to exploit, evaluate and utilise external
knowledge for innovation (Cohen and Levinthal 1990). Whether a firm is large or
small, the bigger its knowledge base and the greater its capacity to absorb this
knowledge into the organisation, the better its ability to innovate (Le Bars et al.
1998). Among the elements contributing to the knowledge base are the internal
and external communication structures, R&D, production experience and the
learning capacity of the staff. In this respect, the so-called 'gatekeeper' undertakes
an important interface function. Firms which tend to centralise access to external