

Assessing the Impact of Firm Contingencies on Sectoral System of Innovation Fit Based on Firm Age and Strategic Intent

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Summary

While the common national infrastructure sets the general context for innovation in an economy, it is ultimately firms, influenced by their microeconomic environment, that develop and commercialise innovation (Furman et al., 2002). Innovation outcomes in distinct sectoral environments are determined by a combination of opportunity, resources, firms and institutions. The thrust of this paper is that policy should take a more systemic approach to SSI by considering sector-level and key company-level indicators in concert. This would result in improved capacity to nurture firms with the highest potential to deliver sustainable economic development, supporting them with specific measures to promote growth and scale.

An innovation systems theory that accommodates firm dynamics offers both greater understanding and a more powerful policy approach. Firms are known to become more or less competitive according to the value derived from fit with their local contexts and systems.

While recognising the need for differentiated systems, the literature to date has failed to capture the relationship between Sectoral System of Innovation (SSI) dimensions, life-course and strategic aspiration. Our study begins to address this by testing bivariate interactions between firm age, firm strategy and SSI dimensions. The System of Innovation concept represents 'a way of describing and analysing the set of institutions that generate and mould economic growth, to the extent that there is a theory of growth in which technological innovation is the key driving force' (Nelson, 2000, p.11).

Research Overview

The SSI forms the basis of this research which employs interview and survey data of Irish software and manufacturing engineering companies to assess the 'fit' of the innovation system to managements' needs. Sectoral systems emphasise industry type and the resources, assets and co-operation they rely on for development and commercialisation of innovation. Enterprises depend on the people, resources and opportunities in their environment (Baum & Locke, 2004) including suppliers, customers, government, economic and educational institutions. The interaction between these constituents describes the firm's System of Innovation, which may be national, regional, technological or, sectoral.

Since the competitive advantage of countries is often concentrated in particular industry clusters and technologies, if sectoral theory holds, success will be supported by the SSI which best matches firms' requirements with system characteristics.

Research in the two distinct sectors, employed parallel dimensions and methods. Exploratory system analysis including data collection and inference based on in-depth interviews were followed by a dual sector survey. Comparative analysis of different systems across similar dimensions should help to uncover disparities such that policy and practice can be better informed (Lundvall et al., 2009).

The central interest is in how institutional and firm-level variables combine to enable or impede growth. Contingency models share the premise that context and structure must fit together if the organisation is to perform well, and further, that the structure and process of an organisation must fit its context if it is to survive or be effective (Drazin and Van de Ven, 1985).

Selected Findings

Software SSI

- With respect to age, mature software firms perceived the SSI as offering the least fit, compared to their young and adolescent counterparts who expressed lesser difficulty with access to funding and less contention for talent with foreign multinationals.
- With regard to strategic aspiration, firms aspiring to maximise technical superiority along with those seeking to maximise profitability perceive poorest fit with the sectoral system, with particular emphasis on the limited availability of technical talent, due in part to niche crowding in the sector. Notably, 95% of demand for technically qualified ICT employees in Ireland is currently met by foreign nationals (ICT Action Plan, 2012).

Engineering SSI fit

- With respect to age, young engineering firms perceived the SSI as offering the least best fit, compared to their adolescent and mature counterparts.
- With regard to strategic aspiration, those firms aspiring to technological superiority perceive least fit with the sectoral system.
- The research depicts a sector principally fuelled by retained earnings. This raises questions as to whether growth prospects are subject to retained earnings constraints.
- Exceptionally, engineering firms aspiring to technical superiority express the need for external funding. The working and risk capital constraints reported by young firms suggest significant system weaknesses in bank funding, compounded by state agency limitations. Adolescent and mature firms perceive no real alternative to self-funding and moreover, cite the dilution of autonomy as a barrier.

Implications

While recognising the need for differentiated systems, policy to date has failed to capture the relationship between SSI dimensions, firm age and strategic aspiration. The study begins to address this by testing bivariate interactions between firm age, firm strategy and SSI dimensions.

Greater focus on the multidimensional nature of the firm would support finer-grained evaluation of the effectiveness of system dimensions and the policy instruments that guide them. Variation in company context suggests the need for differentiation in policy design and evaluation to take firm context into account.

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For further information the Series editors are Dr Lorcán Ó hÓbáin of Skillnets (l.obain@skillnets.com) and Paul O'Reilly of the Dublin Institute of Technology (paul.oreilly@dit.ie).



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