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Innovation, quality management and learning: Short-term and longer-term effects

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ABSTRACT

Quality-orientated management change and innovation are central strategies for firms. Implementing both quality improvement and innovation poses significant managerial, organisational and technical challenges, and may also involve significant lags before benefits are realised. Here, using data on a large group of Irish manufacturing plants and econometric analysis, we establish the short- and longer-term influence of plants' adoption of quality improvement methods (QIMs) on product innovation performance. Our study highlights the short-term disruptive and longer-term beneficial effects of QIM adoption on product innovation performance. In addition, we find evidence of complementarities and learning-by-using effects from QIM adoption. Our results suggest that maximising the returns to innovation and quality improvement requires consideration of the soft and/or hard nature of individual QIMs and the timing and sequencing of their adoption.

1. Introduction

With increased market competition, the successful management of change is crucial to firm survival and success (Todnem By, 2005). Quality improvement and innovation have therefore become established strategies as firms seek to create and defend their competitive position (Pekovic and Galia, 2009). Some authors have argued that quality improvement and innovation are the central concepts of new forms of economic theory of the firm and models of business behaviour (Anderson et al., 1994; Black and Porter, 1996; Rungtusanatham et al., 1998), viz. 'Quality is a vital component of the business strategy, and quality improvement is a strategic variable employed in the highly competitive international business world' (Adam et al., 2001, p. 43). And, on innovation Baumol (2002 p. ix) comments: 'firms cannot afford to leave innovation to chance. Rather, managements are forced by market pressures to support innovation activity systematically ... The result is a ferocious arms race among firms in the most rapidly evolving sectors of the economy, with innovation as the prime weapon'.

Within the management change literature, two paradigms of 'hard' and 'soft' management change emerge. Hard managerial changes typically emphasise rules, standardisation, conformity, discipline, stability, formality, whereas knowledge sharing/diffusion, reflection engagement, empowerment and intelligence gathering and are reflective of soft managerial changes. We use these contrasts to explore in more depth the relationship between product innovation performance and

quality improvement methods (QIMs). Quality improvement and innovation are clearly inter-related although there is little agreement on whether this is of a complementary or opposing nature. Nowak (1997), for example, envisages a complementary relationship, commenting that: 'quality and innovation processes are inter-linked and should not be treated separately. Technical change not enhancing quality is illusive because it does not contribute to a sustained and improved strategic competitive advantage, nor does it increase the value creation potential of available resources through quality creation'. Other writers have seen quality improvement processes – which may involve mechanistic routinisation and standardised business processes – as restricting creativity and innovation (Glynn, 1996; Kanter, 1983; Perdomo-Ortiz et al., 2009a,b; Prajogo and Sohal, 2004). Where the relationship between quality improvement methods (QIMs) and product innovation has been explored empirically relationships are generally positive (Martínez-Costa and Martínez-Lorente, 2008; Hung et al., 2011; Prajogo and Sohal, 2004; Hoang et al., 2006; Zeng et al., 2015). Other studies, however, have found either neutral or negative relationships between QIMs and product innovation (Terziovski and Guerrero, 2014). With a growing recognition of the complementary nature of hard and soft managerial processes, recent studies highlight the benefit of incorporating a combination of hard and soft quality management practices for product innovation (Hoang et al., 2006; Zeng et al., 2015) and firm performance (Gadenne and Sharma, 2009; Calvo-Mora et al., 2013).

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One other commonality between quality improvement and innovation processes noted in the literature is that both are often difficult to implement leading to significant lags in the realisation of any related benefits. [Pekovic and Galia \(2009\)](#) comment, for example, that ‘implementation of the ISO 9000 standard ... concerns the whole organisation and involves changes in the fundamental behaviour and applied routine of employees’ ([Pekovic and Galia, 2009](#), p. 831). Likewise, innovation may result in short-term disruption before any longer-term performance benefits are accrued by the firm ([Roper et al., 2008](#)). Understanding the performance benefits of innovation and quality improvement, and their interactions, is therefore likely to require longitudinal data covering a period of years in which causal mechanisms are clearly identifiable.

Here, using data on a large group of Irish manufacturing plants we focus on the relationship between product innovation performance and the adoption of quality orientated hard and soft management change. We ask whether, and over what period, the adoption of QIMs (specifically ISO9000, TQM and Quality Circles) impacts on plants’ innovation success (specifically sales generated from product innovation). Most, if not all, of the prior studies of the relationship between QIMs and innovation have been based on cross-sectional analysis making causality difficult to identify, and providing little information on the nature of the learning effects and lags involved in QIM adoption and its potential benefits for innovation. Our study makes several important contributions. First, our data allows us to identify the temporal profile of the performance benefits of individual QIMs, highlighting short-term disruption (negative) effects but longer-term (positive) benefits. Second, it seeks to explain the short-term and long-term aspects of the quality-innovation relationship within the context of the contrasting paradigms of hard and soft managerial change. Third, it highlights complementarities and learning by using effects for product innovation performance arising from the adoption of quality-orientated hard and soft managerial processes.

2. Concepts and hypotheses

2.1. Hard and soft management change

With increased market competition and developments in technology, the characteristics of business have changed drastically ([Pekovic and Galia, 2009](#)). The successful management of change is crucial to survive and succeed in the highly competitive and continuously evolving business environment ([Todnem By, 2005](#)). Organisational change management has been defined as ‘the process of continually renewing an organisation’s direction, structure, and capabilities to serve the ever-changing needs of external and internal customers’ ([Moran and Brightman, 2001](#)). It means entering new territory and “playing the game by new rules” and moving the organisation from its current state to a more desirable improved state ([Ragsdell, 2000](#)). Two paradigms of organisational change emerge from the literature. In general, objectivist, scientific approaches are hard, while subjectivist, social approaches are soft. The terms hard and soft are commonly used across a broad range of organisational change practices, such as HRM practices ([Storey, 1989](#)), quality improvement practices ([Zeng et al., 2015](#)), Information and Communications Technology (ICT) ([Arvanitis et al., 2013](#)) and project management ([Crawford et al., 2003](#)).

The hard, positivist, paradigm promotes an understanding of the world as an objective reality – systems are mechanistic processes, with stable or predictably varying, relationships between the relevant variables ([Crawford and Pollack, 2004](#)). In practice, the hard paradigm often takes a top-down approach, following a rational hierarchical model that emphasises control and is expressed through formal structures and systems. Its language acts to superimpose a logic, order, and structure on an otherwise irrational social process ([Crawford et al., 2003](#)). The soft paradigm stems from interpretivist and constructivist

schools of thought emphasising the inter-subjective creation of knowledge – people are continually developing and refining their views which informs their actions ([Crawford and Pollack, 2004](#)). These bottom-up models of organisational change recognise a non-linear, political and irrational process. Such models may be characterised as dynamic and fragmented, albeit interconnected, composed of competing perspectives and interested and supported by informal systems ([Crawford et al., 2003](#)).

While organisational practices can differ considerably, parallels exist in the demarcation of soft and hard practices across the spectrum. For instance, in project management, the hard paradigm assumes that goals and methods are already well defined, and the objective is to find the best solution to a particular problem, however ‘best’ is defined and measured. Contrastingly, the soft paradigm suggests that the aspects of a situation that cause it to be problematic are not easily defined or isolated. Therefore, it is necessary to engage with people at a qualitative level in the understanding that it is unlikely that there will be a unique ‘best’ solution ([Midgley, 2000](#)). Within the HR literature, similar differentiations apply. In general, soft management practices encourage knowledge sharing, engagement, empowerment and encourages intelligence gathering and reflection whereas hard management practices often are rule-based and require conformity, standardisation, discipline and stability ([Jenkins and Delbridge, 2013](#)). Furthermore, there is a growing realisation across the organisational change literature that hard and soft practices are more beneficial when introduced together. Within the project management literature, [Crawford et al. \(2003\)](#) report the need for both hard and soft perspectives when managing complex organisational change projects, particularly when changing aspects of organisations, such as working practices and culture. In addition, [Arvanitis et al. \(2013\)](#) report that the combination of hard and soft ICT capital has a positive effect on both process and product/services innovation

2.2. Quality orientated management change

Many firms have responded to the challenges they face by incorporating quality-based strategies into their change management approach ([Foley et al., 1997](#)). A commitment to quality can drive firms to make significant improvements in profitability, productivity and competitiveness ([Deming, 1986](#); [Morgan and Vorhies, 2001](#)). Hard quality management is mechanistic in nature and emphasises stability, conformity and discipline, and comprises processes such as work design and statistical process control. These hard components relate to the control of processes and products to maintain uniformity, comply with quality standards and satisfy manufacturing specifications ([López-Mielgo et al., 2009](#)). Soft quality management stresses employee engagement, partnerships, and comparison with the market leaders. These soft aspects of quality management are more organic in nature and focus on leadership, empowerment and training, and encourage employees to scan the environment for new trends, approaches and technologies ([Moura E Sá and Abrunhosa, 2007](#); [McAdam, 2000](#)). Soft quality management promotes the more human and developmental aspects of the quality system allowing the firm to adapt to its changing environment and promoting continuous improvement ([López-Mielgo et al., 2009](#)).

Three of the most widely recognised QIMs, which span the soft-hard range of management change practices, are Total Quality Management (TQM), Quality Certification (such as ISO9000) and Quality Circles. TQM has been described as a management philosophy that fosters an organisational culture committed to customer satisfaction through continuous improvement ([Kanji, 2002](#)). The TQM philosophy essentially comprises three key elements: customer focus, people involvement and continuous improvement ([Moura E Sá and Abrunhosa, 2007](#)). Quality Certification initiatives, e.g. ISO 9000, require detailed review and documentation of a firm’s production processes, in accordance with the quality system requirements specified by ISO.¹ The ISO 9000

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