Creating the competitive edge: A new relationship between operations management and industrial policy

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1. Introduction

The offshoring of manufacturing has been a serious concern in developed economies in the past decade (Blinder, 2006; OECD, 2007; Harrison and McMillan, 2010) As a result, there has been growing support for policy interventions to reverse this trend, particularly since the 2007–8 global financial crisis. In the US, the Obama administration established the Advanced Manufacturing National Program Office (AMPSC, 2012). In the UK, the 2010–2015 Government developed an ‘industrial strategy’ to help rebalance the economy, away from financial services and back toward manufacturing: in the words of Peter Mandelson, the UK Secretary of State for Business from 2008 to 2010, “less financial engineering and a lot more real engineering”1. In 2016, the US Presidential Election and the UK’s referendum on membership of the European Union have both made the global location of manufacturing and the idea of industrial strategy even more important in the political sphere.

Competitive threats from developing economies are, of course, nothing new. The rise of Japanese manufacturing during the 1970s was a particular cause for concern in the US and UK, and gave rise to a great deal of activity in operations management (OM) research on topics such as JIT, lean, quality management and supply management. Various forms of industrial policy responses were also developed. In this regard, senior operations managers and policy-makers have been concerned with many of the same phenomena: the changing nature of manufacturing processes, organizations, markets and supply networks, and the evolution of our understanding of them. Whereas thirty or forty years ago the primary unit of analysis for both policy and OM would have been firms and domestic sectors, both communities are now faced with understanding how to capture value from product and process innovation in complex, globally-dispersed manufacturing value chains (Hughes, 2012). Despite these many common concerns,

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however, there has been precious little dialogue between industrial policy and the OM discipline. This paper seeks to establish such a dialogue, in order to understand how industrial policy and OM can be combined to enhance the competitiveness of manufacturing in high-cost economies, given the nature of contemporary manufacturing and the theoretical developments in both the OM and industrial policy spheres.

The paper is structured as follows. Since some of the concepts discussed are more typically encountered in economics and development studies, we begin by clarifying these. We define industrial policy and consider the relationship between the competitiveness of firms, which is the more typical concern of the management and OM literature, and the aggregate picture at the level of national economies. Three connected arguments are then developed. First, we examine the changing conceptualization of manufacturing in OM and manufacturing strategy since the 1980s, when manufacturing firms were trying to make sense of and develop strategic responses to the threat from Japanese manufacturing firms in particular. Second, over the same period, we summarize the main trends in the industrial policy implemented by successive governments in one particular developed economy, the UK. Third, we complement this account of actual industrial policy in a particular country by explaining the development of the more general underlying theoretical ideas on industrial policy, which have increasingly been informed by the approach known as ‘systems-of-innovation’ (Edquist, 1997). All three of these arguments reflect similar themes, notably the importance of considering more extended, fragmented and geographically-dispersed supply networks, and the central importance of innovation. The systems-of-innovation approach is thus an appropriate basis for a new understanding of industrial policy — in theory and practice — and for the new relationship between industrial policy and OM for which we argue. This broad shift in industrial policy thinking is then examined in concrete form by studying recent initiatives in the UK, including the establishment of intermediate research organizations known as ‘Catapults’. Based on this examination, we identify new issues for OM, as well as arguing for a more OM-infused approach to policy.

Since we go on to examine some exemplar policy initiatives in the UK, it is also useful briefly to outline some of the specific economic context against which this policy is being considered, so that its relevance to other economies can be better understood. (More details on these aspects of the UK economy are presented in Appendix 1.) In summary, compared to other major developed economies, the UK manufacturing sector has been characterized by low growth and productivity, a lack of investment in capital equipment, and declining employment. Despite the world-leading performance of UK universities in basic sciences, UK manufacturing shows weak innovation performance, and an unusually high proportion of UK R&D is funded and conducted by foreign-owned firms. Given this background, a prominent concern of UK industrial policy is to enable the academic excellence of the science and technology base to be translated into improved innovation and productivity performance in UK firms. This focus is another reason for the relevance of the systems-of-innovation approach.

2. Key concepts: industrial policy and competitiveness

It is important to clarify some of the concepts that are central to what follows. First, we outline key definitions of industrial policy, then we discuss the concept of competitiveness and its relationship to industrial policy and manufacturing.

2.1. Industrial policy

Industrial policy can be defined as follows:

“Industrial policy is any type of intervention or government policy that attempts to improve the business environment or to alter the structure of economic activity towards sectors, technologies or tasks that are expected to offer better prospects for economic growth or societal welfare than would occur in the absence of any such intervention ...” (Warwick, 2013: 16–17)

In a business and management context, notably at Harvard Business School, the term ‘policy’ has referred to business strategy (Bower, 1982; Bower et al., 1991). In operations management, Skinner (1969) is now known for developing the notion of manufacturing strategy, but typically referred to it as ‘manufacturing policy’, both in his 1969 HBR paper and in a series of industry casebooks (e.g. Skinner and Rogers, 1968). It is important to be clear that industrial policy is not business policy or manufacturing strategy: industrial policy is, as the definition states, an intervention by, or policy of, government.

A distinction is typically drawn between horizontal and sectoral (or vertical) industrial policy (Crafts and Hughes, 2013). Horizontal policy is intended to provide public goods that the market would otherwise under-provide, such as education, R&D and training (Chang et al., 2013: 7) and not to target any firm, sector or locality more than any other. Sectoral industrial policy, in contrast, is deliberately targeted at some sectors and/or firms. A government might, for example, provide special support to firms in aerospace. Targeting has been criticized on the grounds that governments are incapable of ‘picking winners’, for example by providing financial support to firms selected as ‘national champions’ in strategic sectors, an approach largely discredited since the 1970s. Critics also argue that targeted policies may be captured by firms, sectors and lobbyists to further their own ends or the ends of those they represent, rather than the wider economic constituency originally intended to benefit - so-called ‘regulatory capture’ (Chang et al., 2013: 8). Targeting is, however, difficult to avoid, since all but the most general horizontal policies (e.g. primary education) have implicit targeting (Chang et al., 2013). For example, policies to improve rail and seaport transportation infrastructure will favor manufacturers of relatively bulky goods; the provision of tax-breaks for R&D will favor research-intensive industries. As Michael Porter puts it: ‘Every nation practices implicit targeting of some kind, whether it will admit to it or not. The issue, then, is less whether targeting is taking place than how a nation is going about it’ (Porter, 1990: 673). Part of the concern of this paper is to understand how, despite these difficulties, industrial policy can be actively targeted.

2.2. Industrial policy objectives and firm competitiveness

We are concerned to understand how industrial policy can help manufacturing firms to be competitively located in developed economies, where costs, especially labor costs, are high. This is seen as an attractive policy objective, especially post-2008, because manufacturing has higher levels of innovation, productivity growth and export intensity than other sectors, which improves the balance of trade and provides economic resilience in the face of macro-

\footnote{In practice, however, the idea of sectoral policies is under increasing strain, as the boundaries of traditional sectors become blurred, manufacturing and services are combined, and information technology becomes increasingly pervasive and disruptive.}
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