Universities and regional economic development: The entrepreneurial University of Waterloo

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Abstract

This paper argues that the contribution of some universities to local and regional economic dynamism is much richer than overly mechanistic depictions suggest. Beyond generating commercializable knowledge and qualified research scientists, universities produce other mechanisms of knowledge transfer, such as generating and attracting talent to the local economy, and collaborating with local industry by providing formal and informal technical support. A detailed case study of the University of Waterloo, in Waterloo, Ontario, Canada, with its progressive Coop and Entrepreneurial education programs, and innovative Intellectual Property policy, illustrates the way in which the university has contributed to growth and innovation in the local and regional economy.

1. Introduction

Universities have emerged as central actors in the knowledge-based economy, expected to play an active role in promoting technological change and innovation. However, the nature of their role in regional economic development is less well understood than is often presumed. While the presence of a leading research university is a critical asset for urban and regional economies, it is not sufficient in itself to stimulate strong regional economic growth because universities tend to be ‘catalysts’ of technological innovation rather than ‘drivers’ (Doutriaux, 2003; Wolfe, 2005a). Yet many policymakers still view research universities as potential ‘knowledge factories’ for the new economy (David, 1997), with untapped reservoirs of commercializable knowledge waiting to be taken up by firms and applied. This mechanistic view of the way in which basic scientific research is transformed into commercial products demonstrates a misconception of the commercialization process itself, as well as the role that universities can and should be expected to play in that process. The flow of knowledge does drive innovation, but knowledge transfer from universities to industry is a fluid, complex and iterative process involving many different actors. As a consequence, the role of universities in technology transfer and commercialization is much more nuanced than traditional linear conceptions of the innovation process assume (Stokes, 1997; Branscomb, 1997).

From a theoretical perspective, the linear approach to technology transfer is being replaced by approaches that emphasize the interactive and social nature of the knowledge transfer process and the importance of tacit dimensions of knowledge. The goal of this paper is to suggest a more robust conception of the ways in which university-generated knowledge is transferred into the local economy. We argue that universities are not just generators of commercializable knowledge or even highly qualified research scientists; they provide other equally critical mechanisms of knowledge transfer. First, they generate and attract talent, which contributes both to the stock of tacit knowledge in the local economy, as well as to the ‘thickness’ of the local labour market
innovations and a lot other things, you are not going to go very far.1

The transformation of the post-war research system in the leading industrial countries followed from the demonstrated success of wartime R&D efforts that produced significant research breakthroughs in radar, atomic weapons and other critical technologies. In this new system, universities were privileged as a principal site for the conduct of scientific research and their autonomy in this endeavour was left intact. Underlying the post-war ‘social contract for science’ (Martin, 2003) was the ‘linear model’ of innovation based on the assumption that “a rather straightforward conversion takes place from investments in basic science to economic growth, passing through applied science, technological development, and marketing” (Lundvall, 2002, p. 3).2 In recent years, however, universities have come under increasing pressure to move farther along the innovation continuum and supplement their traditional role in the conduct of basic research with more applied research activities, reflecting a shift in government expectations that public investments in basic research should produce a measurable economic return (Etzkowitz and Webster, 1998; Geiger, 2004; Wolfe, 2005b). As a result, universities have shifted their emphasis to include more applied research of greater relevance to industry, and to diffuse technical knowledge and provide technical support to industry.

This shift in the balance between primary and more applied research in the universities has not always been matched by a corresponding shift in understanding of the nature of the innovation process. This shift depends on the recognition that the adoption and diffusion of new knowledge by firms involves the transfer of both codified and tacit knowledge through a process of interactive and social learning (Lundvall, 1992, 2004; Maskell, 2001; Gertler, 2004). The capacity for firm-based learning in a region depends on their ability to exploit both external, codified and reproducible knowledge, which is often university-generated, as well as the ability to develop and assess person-embodied, tacit knowledge. The density of a firm’s interaction with suppliers, customers, and knowledge institutions is critical to the constant learning and adaptation that underpins the innovation process. Successful learning through interaction involves a capacity for localized learning within firms, and between firms and supporting institutions. The regional level is conducive to this form of learning because firms within a region share common networks that facilitate learning among them, and are supported by a common set of regional institutions, including universities (Wolfe, 2005a).

2 In a stylized linear model, the innovation process begins with basic research that leads to new discoveries without consideration of potential future applications, but which can launch potential applications that are pursued and taken-up by firms through further applied research, development, design, production, and marketing. The later stages of this process lead to the successful commercialization of new products and processes (Brooks, 1996; Stokes, 1997).
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