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From creativity to innovation

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A B S T R A C T

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Talent is the bedrock of a creative society. Encouraging and developing talent involves mobilizing culture and tradition, building institutions to increase the stock of human capital, enhancing its quality, and instilling values that favor achievements and initiative. The productivity that emerges from this talent, in the form of ideas, can be increased by nurturing *wikicapital*—the capital arising from networks. Translating creativity into innovation is a function of multiple incentives, and sustaining innovation is inseparable from heavy investment in research. Ultimately, the transition from innovation to commercially viable products requires the midwifery of many service providers and the entrepreneurial skills of firms small and large. © 2007 Elsevier Ltd. All rights reserved.

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1. Introduction

Commercially viable innovations are becoming the linchpin of success in global markets by helping to raise total productivity, and they account for a major portion of the growth in advanced and industrializing economies.^{1,2} Innovation can take many forms, among which product innovation is but one. Design and incremental process innovations are more common, and in recent years myriad innovations have been introduced by providers of services.³ Innovation is changing the structure and enhancing the capabilities of organizations.⁴ Moreover, institutional innovations are sharpening market incentives for entrepreneurial activity and technology trading, which take new ideas, products, and practices into the commercial domain.

In areas such as genetics, climatology, and the social sciences, innovative uses of computing power are making research more productive by automating the framing of multiple hypotheses, and their testing, using advances in data processing and evaluative algorithms [5]. The importance of innovations that improve economic performance and living conditions cannot be over-emphasized in the face of the opportunities offered by globalization and the multiple challenges arising from scarce resources, dire predictions of accelerating climate change, and the threat of pandemics caused by new and resistant organisms.

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¹ Smil provides an enlightening tour of the innovations that transformed the twentieth century [1].

² See, for instance, Chapter 3 of OECD [2]; also Phelps [3], who suggests that the “root problem” among European economies is the low rate of commercially successful innovations. Japan has the highest ratio of patents per capita, but worries over waning creativity are spurring efforts to reform universities, invest in science, and induce researchers to be more adventurous and take risks. Likewise in China, great emphasis is placed on the need to move beyond imitation and for young people to develop innovations in industry and art.

³ Innovations in financial, retailing, wholesaling, and IT-based services have stimulated the growth of productivity in the U.S. over the past decade [4].

⁴ Since the mid-1980s, the crafting of new business models and organizational forms has become a flourishing industry that encourages firms to experiment with ways to pare costs, increase flexibility, and raise productivity.

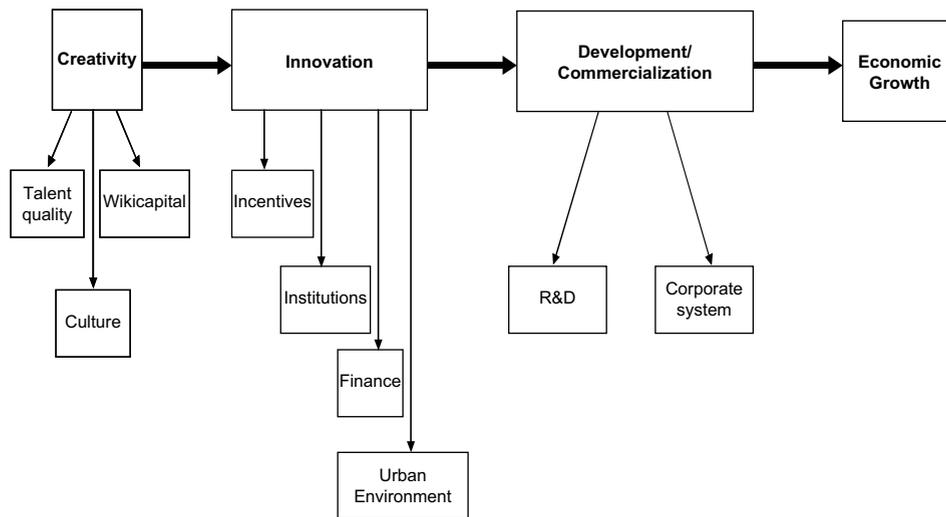


Fig. 1. Creativity and economic performance.

Innovation springs from the creative application of knowledge. Thus, it has two essential ingredients: creativity—artistic, scientific or other⁵—and a stock of knowledge. Knowledge and the functionalities it supplies are the essential raw materials, but it is the creative act that is the basis of an innovation. Often an initial invention or deep insight⁶ is the first of several stages before an innovation is fully realized, a process that often requires the accumulation of new knowledge.

Many innovations, however ingenious, have no market potential.⁷ Those that appear promising must be refined, tested, and modified before they are commercially ready. This can sometimes be a protracted process requiring additional innovations along the way, but it is almost as critical as the initial creative act itself. Repeated commercial success is a function of organizational capability and the coordinated use of multiple skills—managerial, financial, marketing, and legal—which themselves draw support from a variety of institutions.

What, then, makes a society creative? How does this translate from innovation to superior economic performance? A vast and multi-stranded literature, grounded in several disciplines, yields many clues. But the conditions that induce innovation are complex, many are not easily altered by policy, and some are the result of historical and cultural evolution that is beyond the influence of policy.

What follows (sketched in Fig. 1), opens an inevitably partial and highly synthetic window onto this literature. This paper is divided into three parts. The first presents some of the conditions that are correlated with creativity. The second part defines factors that can lead from creativity to innovation. The third part summarizes those conditions that contribute to the commercialization of innovations.

2. Achieving creativity

It almost goes without saying that culture and traditions strongly influence creative interest, the degree of creativity, and the forms it can take.⁸ Not all societies gravitate toward or sustain a culture of systematic scientific enquiry grounded in formal rules of logic, proof, and empirical validation of hypotheses. Creativity in some societies might be expressed through art, music, and crafts, for example, or through institutions that ensure survival in harsh environments. While many forms of creativity can be valuable, the economic measure encourages creativity that ultimately leads from innovations to commercial results. By and large, the scientific approach has proved to be overwhelmingly more fruitful in generating useable knowledge

⁵ Mokyr provides a historical perspective on creativity and how the competitive market for ideas that emerged in seventeenth-century Europe contributed to it [6].

⁶ According to Arthur [7], inventors start with a pressing need or a novel phenomenon and “think in terms of achievable actions and deliverable effects – functionalities – and they combine these in solving problems. Functionalities ... are also the currency of standard technological design. But what differentiates invention is that the overall problem has not been satisfactorily solved before, that the challenges may run several recursive levels deep, that the solutions of these may be far from standard, that novel phenomena and unusual effects may have to be used, and that the overall principle is new to the purpose in question... What are common to originators is not genius or special powers. Rather it is the possession of a very large quiver of functionalities” [p. 258].

⁷ This is reflected in the huge number of “dark patents” that lead to no useable outcomes.

⁸ Feinstein notes that “Our creative interests are a vital, central link connecting our creative endeavors with our culture including our cultural heritage” ([8], p. 470).

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