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RESPONSE

Taking money and making ideas, or taking ideas and making money

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Until very recently, Graham Vickery worked for the Organisation for Economic Cooperation and Development in Paris as Principal Administrator of the Information, Computer and Communications Policy Division. He has long been interested in the innovation policies of the member countries, and has been instrumental in shaping many of them.

This comment focuses on three aspects of the Kastelle and Steen proposition paper that opens this innovation debate. The proposition paper begins well by clearly distinguishing between ideas (research and invention) and innovation. 'The most damaging myth concerning innovation is that it is all about ideas. Managers and researchers are both led into counter-productive behaviours as a result of this myth. This is not to discount the importance of ideas in innovation – every innovation starts with a great idea.' Nevertheless, the authors then go on to say that 'generating great ideas is actually the easiest part of innovation. Improving innovation comes not through generating more ideas, but through implementing existing ideas more effectively'.

The basic distinction that opens the proposition paper is thus somewhat watered down by emphasising the distinct nature of research and invention compared with innovation, but not discussing in enough depth the symbiotic and essential relations between ideas (more commonly summarised by the terms 'research' and 'invention') and innovation. In the never-ending debate on the inter-linkages between ideas (research and invention) and innovation, it has become increasingly clear that research and invention and innovation are quite different. In short, research and invention are about taking money and making ideas; innovation is about taking ideas and making money.

However, the two are interlinked, and always have been. Without ideas, there is no innovation, without innovation there is no reason to create new ideas, apart from individual curiosity. In addition, far from being the easiest part of innovation, generating great ideas is actually hard. Consider the need for great ideas at the moment to meet just a few of the global challenges we all face. Effectively dealing with climate change and global warming desperately needs both great ideas and a lot of innovation. Without the two, we will be stuck in a trap where alternative energy

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and social innovation are too expensive, or are seen as being too expensive, and the path from here to where we wish to go will be perceived as being too long and too arduous. Great ideas and continual innovation are also needed to deal with the challenges related to population growth, with world population projected to grow, possibly to 13 billion over the next 50 years, with attendant pressures on resources of all kinds.

On a different note, there are organisations that thrive on the linear paradigm research (invention) -> ideas -> innovation -> money -> research -> ideas, etc. These organisations are mainly, but not exclusively, in sectors that are intensive in science and advanced engineering. They include pharmaceuticals, semiconductors, aerospace, software and many new services. These sectors thrive on the generation of ideas. They could not exist without the constant flow of ideas generated from research and invention to maintain competitive advantage in a constantly changing market environment for their research-intensive products. The generation of ideas in these organisations and sectors is not necessarily captured in patenting activity. Patent counts and patenting behaviour are not robust measures of the richness and variation of inventive activity and idea generation, as both depend on the country, the sector, the firm, the period and other measures of reality.

Other industries are much more random in what they do and how they do it. Take mining. The books by Geoffrey Blainey (particularly Blainey (1963), *The Rush that Never Ended: A History of Australian Mining*) on growth and innovation in Australian mining and Australian mining companies are interesting for this reason, as well as others. The constant invention of new methods and techniques to extract, prepare and separate minerals from the crude ore in which they reside provides a fascinating view of how the imperatives of the market demanded new ways of extracting and purifying minerals. This resulted in a constant flow of ideas and inventions that directly enabled the innovations that turned rather simple exploration operations into mineral giants.

Finally, there seems to be a logical inconsistency in embracing a linear model for the innovation value chain when the linear and staged invention to innovation model for science commercialisation appears to be out of favour. The linear innovation value chain approach attempts to systematise complex processes to enable better management and provide the business community with valid models for managing innovation. However, this risks over-simplifying the complexity of the generation of ideas, and their transformation into innovations. The idea of the 'idea' is used to embrace a three-step value chain that begins with idea generation, and moves to idea selection and testing, and through to idea diffusion. There is considerable discussion of this three-step process and a five-step variant of the innovation value chain. This approach risks replacing one kind of mechanical system with an over-simplified linear innovation model that may not help management either to innovate or to provide ideas or tools for 'managing innovation', as it lacks the richness of the organisational and industrial context, and the wealth of drivers for the generation of ideas and development of innovations.

This complexity was nicely captured by Nathan Rosenberg (1982) in *Inside the Black Box: Technology and Economics* when he explored how the specific features of individual technologies have shaped crucial economic variables: the rate of productivity improvement, the nature of learning processes underlying technological change, the speed of technology transfer, and the effectiveness of government policies that are intended to influence technologies in particular ways. This book and

related work with David Mowery (1998) for the US, *Paths of Innovation*, and Eric Von Hippel (1988), *The Sources of Innovation*, clearly show this complexity and suggest the extent to which these processes can be managed and the extent to which public policy is relevant, and workable. Rosenberg, in particular, identifies the distinctive aspects of different industrial technologies, the increasing reliance upon science, and the subtlety and complexity of the dialogue and interactions between science and technology. In addition, he points to the costs of generating ideas and converting them into new technologies and the difficulty of predicting the eventual performance characteristics of newly emerging technologies and innovations.

One further comment. The role of innovation in the government sector needs more consideration. In many areas, there are systemic failures, going well beyond simple market failures, which inhibit the development of public sector service innovations, in part because of a shortage of ideas. For example, the development of interoperable cross-border platforms for the secure international exchange of individual health information is inhibited both by the lack of expressed demand for new software and by the difficulty of financing cross-border platforms from national public sector budgets. These and similar challenges in the development of public interest services deserve as much attention as innovation in the business sector.

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