

PHD THESIS SUMMARY:
Essays in the economics of knowledge.

SAMULI LEPPÄLÄ

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University of Turku

“The economics of knowledge”, as outlined by Kenneth Boulding (1966, 1), “studies the role of knowledge in social systems, both as a product of the past and as a determinant of the future”. Within this extensive and challenging field, there have been numerous contributions since the early pioneers such as Kenneth Arrow, Friedrich Hayek, Fritz Machlup, and Joseph Schumpeter. The field experienced a rapid growth with the development of the knowledge industries, and Foray (2004) argues that the economics of knowledge has now been firmly established as a distinct discipline.

In conjunction with the expansion also came fragmentation. Different but interrelated terms—such as knowledge, information, belief, expectations, uncertainty, technology, innovation, invention, skills and human capital—appeared in the literature. Many papers, studying specific questions regarding the role of knowledge, seemed to have little in common. In particular, research on market knowledge (i.e., knowledge in the general decision-making sense) was largely separated from the research on technological knowledge (i.e., the causes and consequences of technological development).

This evident fragmentation is also the basis of Mirowski’s (2009) thesis, contra Foray, that there is (as yet) no such thing as an economics of knowledge. While fragmentation along different research questions and schools of thought is regrettable, it is unsurprising considering the wide relevance that the economics of knowledge is claimed to have for every sub-field of economics (Lamberton 1971; Stiglitz 1985).

The introductory chapter of my thesis surveys the literature in this field, identifying the main themes and contributions. Besides the apparent fragmentation, it is perhaps also a sign of immaturity that we have nothing close to general economic theories of knowledge as yet. Nevertheless, it cannot be denied that there is a continuing and growing

tradition of research on how incentives and institutions affect the generation, dissemination, and use of knowledge in the economy.

While the importance of knowledge issues for economics was recognized early on, the assumption of perfect knowledge held the field. The reason for this, argues Stiglitz (2002), was that while knowledge can be perfect in only one way, it can be imperfect in infinitely many ways. As such, it was unclear how this assumption could or should be relaxed. Technological development finally prompted economists to analyze the incentives and institutions behind it. A prevalent feature in R&D, at least as much as for any other economic decision, is uncertainty, which implies lack of knowledge. This prompted economists to consider decision-making in situations where knowledge was imperfect or incomplete.

Uncertainty implies not only a lack of knowledge or available information, but also the issue of truth-worthiness regarding our beliefs and communicated information. While economists have noted that knowledge, being nonrival and (partially) nonexcludable, is a very special kind of an economic good, the issues related to the quality of beliefs and information require more work. After all, the concept of knowledge proper implies justified true beliefs, not merely any beliefs, be they true or false. If veracity is not trivially verifiable then it becomes an important issue, and we require a theory of justification explaining a tendency towards acquiring true beliefs and discarding false ones.

At first, this may seem something largely beyond the domain of economics. However, knowledge acquisition and communication depend on incentives as well, creating a niche for economists to study the role of incentives and institutions in truth-seeking and truth-telling activities. The demand for studies on epistemic efficiency, i.e., how closely beliefs and information approximate truth in various situations, seems extensive.

The subsequent essays in my thesis address more specific issues. Essay 1 takes an epistemological view on knowledge transfers, now in focus in many areas of economics and related sciences. While tacit knowledge is widely used to explain the main difficulties in knowledge transfers, besides the unarticulable nature of some knowledge, equally important are the incentives in knowledge acquisition and communication. Successful transfer of codifiable knowledge requires that the sender's belief is true (capability) and that she sincerely reports

that (reliability). The analysis of incentives can explain the success or failure of knowledge transfers in different contexts.

In Essay 2, I set out to find the level of excludability that creates the optimal allocation of research investments in nonrival knowledge. Taking into account the tradeoff involved in greater or less excludability the optimal level can be found; though, being a function of the research costs and benefits, this would typically vary between different knowledge industries and types of knowledge. While this result can explain the continuing controversy regarding the desirability intellectual property rights, it also illuminates a major challenge for IPR law.

Essay 3 (Leppälä 2010) re-examines Hayek's thesis on the informational role of the price system. Drawing an analogy from his psychological theory, I argue that the informative role of a price is not to communicate the same knowledge to everyone, as is generally thought in the subsequent literature, but to provide a reference point to which each can compare their local knowledge. This idea is further applied in addressing some common interpretations of the informational role of prices.

At a general level, Essay 4 (Leppälä and Desrochers 2010) argues that if one takes a methodologically individualistic perspective (seldom applied in regional economic analysis) the basis for publicly promoted regional specialization largely disappears. Furthermore, by ignoring the actual spillovers between individuals, the research on localized knowledge spillovers has been unable to prove or document the existence of these spillovers. An attempt to correct this shortcoming is made in Essay 5 (Desrochers and Leppälä 2011), where, based on a qualitative survey of individual Canadian inventors, three broad mechanisms conducive to inter-industrial knowledge spillovers and subsequent inventions are identified.

These essays are hardly the last word on the topic but hopefully illustrate the importance of these questions and provide examples of how they can be addressed from an economic point of view.

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Samuli Leppälä obtained his PhD from the School of Economics at the University of Turku, Finland. He was supervised by Hannu Vartiainen (Helsinki Center of Economic Research), and the official opponent at his defense was Suzanne Scotchmer (University of California, Berkeley). Samuli is currently a postdoctoral researcher at the Department of Economics in the University of Turku. In August 2012, he will be joining Cardiff Business School as a lecturer in economics.

Contact e-mail: <samuli.leppala@utu.fi>

Website: <<http://sites.google.com/site/samulileppala/>>

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