

Intellectual property rights

Law



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Studies have revealed that the social rate of return on R&D expenditures is usually very large, and frequently exceeds private returns by as much as three times (Jones and Williams, 1998). Moreover, these studies prove that the returns to R&D exceed by a big margin the returns from other types of investments, especially from investment in physical assets. Clearly there are wide margins to increase the resources dedicated to R&D at the economy-wide level, and that the government needs to play a role in doing so.

Spillovers can occur in numerous different ways, mobility of the R&D personnel being one of them. Employees acquire R&D skills and knowledge of the technologies and markets. This knowledge is partly general and goes beyond the knowledge embodied in any specific innovation that they developed. Now this cannot be fully protected by Intellectual Property Rights (IPRs). Employees who leave one firm and join another carry with them this human (or innovation) capital, which can benefit their new employers. If mobility is accompanied by migration, then the spillovers may be reaching the destination countries.

Hence the mobility of inventors is an important transfer mechanism for spillovers. Spillovers may also take place through economic transactions, such as trade: countries can improve their productivity by importing goods, particularly capital equipment with advanced technologies (Coe, Helpman and Hoffmaister, 1997), as well as through foreign direct investment, FDI (Blomstrom and Kokko, 1999). (Bottazzi,; Giovanni 1999 p. 3) Stephen Martin's stochastic innovation model differentiates and thinks about simultaneous input spillovers and output spillovers.

High R&D input spillovers and low appropriation of the rents that flow from successful innovation reduce the profit that flows from successful innovation, but for different reasons. High input spillovers mean that a firm's R&D effort contributes to its rivals' R&D programs. Low output appropriation means that a firm profits less from successful innovation if it is the first to innovate, all else equal. In the post-innovation market, a successful innovator's payoff increases if there is greater appropriation, all else equal.

But in industries where input spillovers are low, firm value is maximized at low appropriation levels: a greater chance to benefit from another firm's discovery after innovation compensates for a limited possibility of benefiting from another firm's R&D effort before innovation. (Martin S. 2000, p. 25)

Uncertainty There are three kinds of uncertainty, which differ according to what sort of thing the performer is uncertain about: truth uncertainty, semantic uncertainty and ontological uncertainty.

They may not be temporally or contextually mutually exclusive: multi-temporality and pluri-temporality imply that performers might confront all three in the same action context. The main point is that all three play fundamental, though different, functions in innovation process. (Lane, Maxfield; 2003, p. 4) In case of truth uncertainty, the uncertainty is whether well-defined propositions are true or not. This is the only uncertainty that Savage's decision theory admits, where the propositions in question are statements about future consequences.

Savage's decision theory (Savage, 1954) asserts that the truth uncertainty for all such propositions can be calculated in the probability scale. Others

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continue with Knight's distinction between risk and uncertainty: probability of propositions about risk can be calculated by reference to a sequence of fungible propositions with recognized truth-values: while others, "truly" uncertain, submit to events that have no such reference set and hence, according to Knight (1921), their truth uncertainty cannot be measured through probability.

For De Finetti (1930), the dissimilarity is different: propositions whose truth conditions are observable are based on probability, otherwise they are not. (Lane, Maxfield; 2003 p. 9) In semantic uncertainty, the uncertainty is about what a proposition means. There are many scenarios in which semantic uncertainty can arise, but by far the most important is when, in discursive interactions among the participants, one of them feels that the other participant interprets a different meaning to some term, phrase, or event than what he means.

In other words, it is ambiguities through interpretation of the context of use of words with multiple meanings. (Lane, Maxfield; 2003, p. 9) This type of discoveries are very important in innovation also because they may open up for analysis the ideas and acknowledgments that the participants had previously taken as aspects of reality rather than "just" their interpretations. With this, the participants can jointly construct new meanings. Generating new meanings is an important part of innovation. The definition of ontological uncertainty (Lane, Maxfield; 2003, p. 10) depends upon the concept of participants' ontology – their beliefs about

The types of entities inhabit their world The types of interactions these entities can have among themselves Change due to interactions in the entities and their interaction modes Since structure at all levels is dynamic, what counts to participants as an entity, is dependent on the time-scale of the processes through which they think their actions will produce results. Participants place the fallacy of time-independent ontology when these processes take place over different time-scales than those in which posited entities demonstrate the requisite stable structure to count as entities.