A Microeconomic Approach of the Dynamics of the Production of New Knowledge

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There is growing evidence that the process of production of new knowledge is generally a collective effort that necessitates the interaction and coordination of a multitude of economic actors. Increasingly, the literature on the role of cooperative agreements in R&D emphasises is that the period of research that goes from the emergence of the first innovative idea to the moment when a patent can be written and claimed for, is in fact rarely assimilable to a patent race of isolated inventors.

This period of research is rather characterised by the building of R&D consortia, by the formation of pools of inventors, or by collective ventures in local clusters specialised in high tech. The inventive idea needs to come equipped with shared codes, tests, and "grammar of usage" before being considered as having an economic potential. Without the building of this public or semi-public "codebook", most of the inventive ideas are not economically viable.

However, if it is widely and increasingly acknowledged that invention has a collective dimension, the dominant economic approach of invention is still focused on the representation of a solitary inventor as set forth in the seminal contribution of Arrow (1962) dealing with knowledge creation in the firm, and by the image of the opportunistic patent race of isolated investors that logically derives from it.

The aim of this contribution is to depart from this traditional Arrovian representation by "opening the black box of the phase of invention" and analysing the complex microeconomics phenomena that take place during the period of research, and which favour a collective approach to the process of creation. Our objective is to grasp the processes and procedures through which communities are formed, collective goods produced and the social benefits of the activity enhanced. In the first part, we present a model of collective production of knowledge during the period of research which is based on recent results from sociology of innovation. This model revisits Arrow's contribution and leads to the conclusion that the traditional vision of weak appropriability in the process of development of new technologies is only valid for an extreme phase of the period, when the characteristics of the technology are clearly and universally understood. In the second part of the article, we derive the main consequences from this model in two domains: first we suggest an interpretation in the

domain of practical regimes of appropriability, and second we suggest some application of this approach in the domain of creative clusters.