

COMMENT

'Innovator Protection and the Rate of Technical Progress' by Thomas von Ungern-Sternberg

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The paper by Von Ungern-Sternberg on 'Innovator protection and the rate of technical progress' is both high-lighting and thought-provoking, but perhaps in a way unintended by the author. The paper deals with the consequences of certain changes in the economic incentive system for the rate of technical progress. This direction of causality is just as interesting and important to deal with as the consequences of technological changes for the rate of economic progress. More specifically, the consequences of changes in patent protection time and rate of imitation for the rate of technical progress are analyzed and situations are found in which increases in patent protection lead to decreases in the rate of technical progress.

The framework (or paradigm) used is that of comparative statics and profit maximization. In this framework the findings are arrived at through a (non-simple) sequence of simplifying assumptions and the claim is finally made that much can be learned about the economics of R&D by analyzing such simple models.

Viewed with intra-paradigmatic eyes the paper is probably good. The presentation is systematic and clear and simple mathematics is used to arrive at interesting implications. Naturally, several assumptions and dichotomies could be commented individually here. However, my main concern is how one could justify the author's choice of paradigm, i.e., his basic set of unchallenged assumptions, and his choice to leave out a confrontation of his (partly counter-intuitive) findings with empirical data, which would go beyond scattered empirical illustrations.

Regarding the choice of paradigm, any deterministic, essentially time-less, optimization model of technological change must be viewed with great suspicion, although less so if the purpose is to generate hypotheses, which are actually empirically tested. The intrinsically uncertain and evolutionary nature of technological change makes too simple modeling misleading. It is not always possible to proceed step-wise from simple to complex modeling in such a way that better and better approximations are achieved. The essentially continuous time problem of what determines R&D inputs and

outputs and the rate of technical progress cannot be approximated by a sequence of comparative static problems in the sense that solutions of the latter will converge to a solution of the former. This is regardless of whether the firms are assumed to be perfect profit maximizers or not. Likewise the results of a deterministic model are vulnerable to the introduction of certain types of uncertainty. For example, if the conditional probability, that imitational R&D of the (rather artificial) sort studied in the paper will be successful, given that innovational R&D is successful, is introduced in the analysis, the result may be reversed.

Thus, certain simple models may be misleading rather than guiding future learning. This is likely to be the case if the basic simplifying framework becomes accepted as a tradition, which justifies omissions to thoroughly challenge it, analytically and/or empirically. The paper indirectly highlights this circumstance and would have benefited from a critical discussion of the chosen framework.

Lack of realism in assumptions may be compensated by empirical testing of implications. In fact, the impact of changes in patent protection time (or more general but less operationalizable — changes in rate of imitation) upon the size and composition of R&D budgets in firms is quite possible to study empirically, both regarding hypothetical and real changes. (Patent protection time has in recent years increased from 17 to 20 years in Sweden.)

Similar studies have been done on the impact of R&D tax deduction schemes on the size and composition of R&D budgets. The interesting issue raised by Von Ungern-Sternberg is whether an increase in patent protection time would effect the amount of R&D spent on entirely new products and processes versus the amount of R&D spent on improved products and processes. The paper deals only with cost-reducing innovations, which is a strong limitation, and an empirical study also ought to focus on possible shifts between product and process R&D, since process R&D is usually more protected by secrecy than by patents, unless licensing is of importance. (Licensing possibilities are tacitly ignored in the paper.)

An empirical study of the sort outlined above would of course have added much value to the paper. It is not unlikely that the main implications of the models in the paper would have remained unrefuted. However, as the implications now stand they are not very convincing since they are derived in a questionable overall framework, in which simplifying assumptions have left the reader with a small set of highly stylized decision situations with little resemblance to the many different complex situations facing R&D decision-makers.

It is finally to be hoped that research on the economics of R&D will not be protected by tradition in such a way that it is becoming relatively more profitable for researchers to move into imitational R&D.