PROMOTING INNOVATION ON THE SEED MARKET AND BIODIVERSITY: THE ROLE OF IPRS AND COMMERCIALISATION RULES

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Abstract:

Promoting biodiversity is an important facet of public policies targeting sustainable development, both for developed, developing and less developed countries. More specifically, since the early twentieth century, public authorities are very active to set instruments that aim at preserving and enhancing diversity of plants and seeds used in the agricultural sector. Such diversity is seen as a public good subject to underinvestment due to the non-cooperative behaviour of private agents. Two complementary types of instruments have been set.

Intellectual property rights (IPRs) are the first type of instruments. The rationale for defining IPRs on plant varieties is that entropic interventions is essential for obtaining new varieties, thanks to seed selection for instance. Such interventions are costly and may thus be rewarded to occur. Whether sui generis IPRs or patents have to be used is controversial. Partisans of a sui generis IPR argue that inventions in the sector of seeds are essentially incremental and that a breeders' exemption enabling breeders to freely develop new varieties from protected varieties is essential. The European Union shares this point of view and has set up specific Plant Variety Rights (PVRs). Partisans of patents, and among them the United States, contest this point of view. So far, the economic literature has mainly focused on the empirical assessment of the effectiveness of incentives to innovate in the seed sector. No definitive conclusions arise from this literature. Whether the different conclusions are due to differences in the characteristics of IPRs does not seem to have been examined. More generally, the literature lacks discussions of the respective merits of patents and PVRs. This article is an attempt to fill the gap.

Commercialisation rules, the second type of instruments, are designed to address the adverse selection problem that arises on the market for seeds. They generally consist in a regulatory approval based on the fulfilment of minimum standards by commercialised seeds. How stringent are these standards depends on the country. In European Union, the marketing authorization procedure relies on the Distinctness Uniformity and Stability (DUS) tests carried out by the authority competent for granting PVRs. Commercialisation approval is thus tightly linked to PVRs. By contrast, commercialisation rules in the United States rely on less stringent criteria and are not tight to the grant of a patent. As a result, a "free seed" movement has developed in Europe to stress that the way PVRs are coupled with commercialisation rules is counterproductive to promote biodiversity. The idea is that ancient varieties can not be commercialised because they do not fulfil one of the DUS criteria. This article tries to highlight the debate from an academic perspective.

The article proposes a theoretical model to analyse the optimal combination of commercialisation rules and intellectual property rights for the seed market. It adapts a standard model of vertical differentiation to a dynamic approach of market equilibrium. The type of IPRs set up by public authorities is assumed to affect market structure and thus influences the decision to proceed or not with an incremental invention at each period. Biodiversity is introduced as a public good, the level of which modifies the

productivity parameter of agricultural land. Numerical simulations based on calibration of the model are finally examined. As regards commercialisation rules, we consider three situations. In the first situation, no commercialisation rules apply and the seed market is subject to adverse selection. In the second situation, each breeder may subscribe on a voluntary basis to a system of commercialisation rules that is assumed to convey a credible signal on the quality of seeds. Finally, in the third situation, commercialisation rules are compulsory and rely on DUS tests so that they imply the eviction of ancient varieties. As regards intellectual property rights, we compare patents and PVRs. Patents are assimilated to an exclusivity right on all uses of a plant variety for perpetuity whereas PVRs are assumed to provide an exclusivity right on commercialisation of a plant variety but not on its use as a raw material to generate new varieties. As a result, PVR are assimilated to an oligopolistic market structure of the seeds market whereas patents are assimilated to a monopolistic structure. Combinations of commercialisation rules and intellectual property rights are compared both in terms of surplus and in terms of biodiversity for different level of the R&D cost for obtaining a new variety.