Foreword

The first essay in Volker Simmering's study in *The Evolution of Standards*, undertaken while at the *Graduate Programme in Law and Economics* in cooperation with the *Institute of SocioEconomics* at the University of Hamburg, examines the effects of "globalization" on the evolution of global standards. The central result of this essay is that there may be too few global standards and those which do evolve are not necessarily efficient; a result that is at odds with standard economic reasoning. Simmering derives his result from the application evolutionary theory – which is becoming increasingly popular in economics, the social sciences, and philosophy. This branch of theory focuses on the convergence and selection of equilibria and its attendant reduction of variety.

Simmering's study, very interestingly, indicates a major difference in the results of evolutionary reasoning when applied to the coordination of human interaction to that at the species level. Simmering shows how variety is reduced to produce homogeneity or compatibility; while in biology it has been to show how variety emerges. For example, in his *The Origin of Species* (1859), Charles Darwin tried to give an interpretation of the characteristics, diversity, and distribution of the various forms of animal and plant life as the result of a historical process involving descent with modification. This process includes the origin of two or more distinct species, or other groups, from a single ancestral group, and also the natural modification of a line of ancestors and their descendents to such a degree that the later forms may be markedly different from the earlier. The question in economics is different. It is not to explain why so much variety exists but whether an equilibrium that is selected by a process of evolution is efficient; or whether the intervention of benevolent dictator can improve the outcome from a social point of view.

The message of Herbert Spencer's Social Darwinism and its trivialization as "survival of the fittest" suggests that society progresses to efficiency. However, fitness is defined relative to the surrounding conditions, *i.e.* the property of relevant populations. But, even nature is not always "successful" in selecting a single best alternative. For instance, a large variety of species of antelopes graze side by side in the Serengeti. Their horns are evidently useful and yet may be of different forms in different species. It seems impossible that the characteristic form in each species is precisely that best fitted for the survival of that particular species.

Among other concepts of evolutionary game theory, Volker Simmering builds upon an approach of Ralf Peters (1998)[1], also developed at the Institute of SocioEconomics, and applies the size of the basin of attraction to discuss stability and convergence properties of his industry model. Through this, he derives interesting conclusions for the optimal decision on the legal status of formal standards.

Simmering's second essay analyzes conditions of technological progress in networks under the assumption of switching costs and a limited life span for goods. Users have to decide whether they exhaust this life span or prematurely switch to a technologically advanced version of the good. The rational solution to this problem depends clearly on what others do. Simmering demonstrates that, counter-intuitively, the presence of switching costs tends to support transition to new technologies under these conditions. The third essay derives from joint work on harmonization within the European Union by means of majority voting in

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[1] Peters, R. (1998): Evolutionäre Stabilität in sozialen Modellen. (Diss.) München.

committees such as CEN and CENELEC (Holler and Simmering, 2001)[2]. Voting outcomes depend on whether the components of a system good are standardized so that they are compatible and, *e.g.*, the amplifier of system A can be used in combination with the loudspeakers of system B. In case of standardization, harmonization on a mix of components of systems A and B is possible and a majority voting on various combinations to single out a unique mix of components is appropriate. However, anticipation of the voting outcome, Simmering shows, may cause producers to keep their systems incompatible. This implies that the optimal system may not be available for harmonization through voting.

Simmering's book will be of interest to scholars of standardization and network economics. The results of his last essay contribute to the understanding of European Standardization. The results of the second essay are potentially relevant for decision making on the supply and demand of technologically advanced goods and thus they contribute to the explanation of technical progress. The evolutionary model in the first essay should motivate a more profound understanding of socio-economic processes and solutions to coordinating social interaction. Simmering's message is key to critically assess the more standard perspective of rational choice.

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[2] Holler M.J. and Simmering, V. (2001): "Voting on Harmonization." Paper presented at the Annual Meeting of the European Public Choice Society, Paris, 2001.

Abstract

The thesis comprises three essays on the evolution of standards in networks. Networks exhibit positive adoption externalities, so-called "network effects". The essays investigate various aspects of how such effects influence the performance of markets and other institutional arrangements.

In the first essay, an evolutionary game theoretic model is introduced in order to study how increasing integration among nations ("globalization") influences the evolution of global standards. It is found that integrated markets tend to produce too few global standards. Even if global standards do evolve, agents do not necessarily end up with the best available one. In addition, strategies for policy intervention are discussed. The role of laws that render adoption of technical standards mandatory are compared with voluntary standards issued by recognized standardization bodies.

The second essay is devoted to the problem of technological progress in networks. It focuses on industries where the goods that are associated with each technology have a limited life and users, due to sunk costs involved, are either more or less committed to their chosen technology. The study suggests that the risk of too much technological change is low in such industries. In contrast, users tend to suffer from too little technological change. The lower the users' commitments the higher the risk that established technologies are too sticky. A fruitful strategy of governmental technology policy, the analysis suggests, is to fasten the transition process if an already ongoing transition is observed.

The third essay studies the resolution of conflicts within international standardization bodies. We discuss whether voting is an eligible mechanism for collective decision making in such bodies. It is demonstrated that outcomes of votes on harmonization of international standards are likely to be stable and not path dependent, even if goods are specified in more than one dimension. In addition, pitfalls that might arise with harmonization policy are identified. In case the harmonization body cannot commit to abstain from harmonization – even if it has observed that the industry performs badly – the outcome with harmonization policy might be inferior to the outcome that would be achieved without harmonization policy. Thus, *ex post* desirable harmonization policy might be undesirable *ex ante*.