INTRODUCTION
INDUSTRIAL DYNAMICS, PRODUCTIVITY AND GROWTH

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"Economics is like photography in this respect, that under-exposure is less desirable than no exposure at all" (Boulding, 1941, p. xv). This might be the case with the so-called new growth theory, which has benefited in the two last decades from a huge renewal mostly based on extensive developments in the modelling of imperfect competition, but which nevertheless is being affected by under exposure, making it necessary to explore more deeply the relation between innovation, competition and growth.

It is our belief that these relationships are still very weak. While it has been well established that growth performance depends on productivity growth in new or high tech industries, currently information and communication technologies and biotechnology, it cannot be said that performance is triggered only by improvements in science and technology as determined by appropriate institutions. The way that innovative technologies are pervasive across the whole economic system and how they affect industrial organisation are also central to the performance of the overall economy. Thus, it is important to consider growth proceeding hand in hand with structural change. Discovering the real nature of this change is a much larger issue than analysing changes in technological capabilities, that is, in public or private R&D activities.

Technological change most certainly has its losers as well as winners but it is in the main a process of creative destruction bound up with policies, institutions and behaviours that affect not only the incentives to invest in R&D, but also how co-ordination problems are managed. R&D incentives alone are not sufficient to enhance the growth process. Co-ordination failures and market disequilibria, which are inherent in a creative destruction process, need to be eliminated, which requires adapting behaviours. Any innovation process is characterised by the breaking-down of existing market structures and the modification of market conditions,

followed by a gradual reshaping that reflects the changes in cost conditions, profitability, relative prices, and changes in consumers' preference systems. It follows that the nature, the magnitude and the timing of the adapting process in large part explains the resulting performance. Innovative choices lead to distortions in the economic process both at the industry and at the global levels, which makes the capturing of the potential gains from new technologies uncertain for the economy and the industry. Productivity growth, far from being exogenous or only determined by R&D incentives associated with a given institutional framework, greatly depends on industrial dynamics.

In brief, technological change is, to a large extent, endogenous to the industrial organisation of the production process. Thus, economic performance depends not only on the technical properties of each production process, but also on the state and evolution of the industrial structures. These in turn are dependent on how co-ordination issues are dealt with.

Competition and market selection play a central role in the co-ordination process as they determine how market information relevant for co-ordination is made available. This coordination must be built up step by step to enable the necessary adjustments in the productive and market structures to be accomplished in order to realise the productivity gains.

However, neither theoretical investigations nor empirical studies have produced a definitive and generalisable answer to the question of which market structures stimulate innovation. We can conjecture that innovation requires both turbulence in and stabilisation of the market structure. On the one hand, integration, concentration or dismantlement, both at the industry and at the geographical level may appear to be necessary to promote innovation. On the other hand, stabilisation of the market structure and forms of geographical agglomeration are required to make innovation processes viable, that is, to allow firms to obtain the productivity gains associated with new technologies. In this context, competition is a process that is compatible with different market structures, and whose efficiency depends on its ability to reduce market disequilibria and eliminate abuses of market power.

In addition, firms that are in competition are heterogeneous, not only in terms of product differentiation, but also in terms of current performance, which evolves in relation to their positioning in the innovation life cycle. Their heterogeneity is the most important aspect of the dynamic process by which resource reallocation between firms, and internal reorganisation of firms, play a major role in promoting aggregate productivity growth. Failure of the market to select the best firms, or failure to stabilise the market structure will limit aggregate productivity growth.

Thus, the objective is not to impose rules that allow the economy or the industry to achieve a state of near perfect competition but to discover how the interaction between these heterogeneous innovative firms

produces an order, such that the firms' expectations will be confirmed and their actions will be consistent. The real problem is to know to what extent market connections or market imperfections will help to solve co-ordination problems and promote good interaction.

There can be no wealth creation without competition which pushes firms to search for and capture profits. However, this also requires the emergence of an order, which implies the stabilisation of industrial structures, and hence outcomes.

This special issue does not pretend to tackle such wide ranging issues in relation to industrial change. It does, however, aim to provide a better understanding of some aspects of industrial dynamics and productivity growth, by uncovering those elements of the innovation process that deserve more exposure.

Reference

BOULDING K. 1941: *Economic Analysis,* Harper and Brothers Publishers, New York and London.