

A MODEL OF PRIMARY AND SECONDARY WAVES IN BUSINESS CYCLES (*)

Guido Fioretti, Università di Firenze

fioretti @ facec.cce.unifi.it

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Abstract

Schumpeter maintained that oscillations of macroeconomic variables are only the “secondary wave” of business cycles, a reflex of more fundamental “primary waves” at the microeconomic level caused by the innovating activity of entrepreneurs.

Blending Schumpeter’s concern for innovation with Keynes’ concern for uncertainty and expectation formation, this article focuses on the behaviour of entrepreneurs in front of the uncertainty caused by innovation. Entrepreneurs’ behaviour is reconstructed modelling the functioning of their cognitive processes when technological novelties appear. The avalanche process that generates a macroeconomic wave out of the microeconomic behaviour of single entrepreneurs is described as a self-organisation phenomenon.

A rudimentary business cycle model is set forth, its qualitative behaviour is analysed by means of a potential function, and simulations are presented. While the basic model produces oscillations only because new technologies force entrepreneurs to change their confidence in the future, a more sophisticated version considers the effect of labour force, too.

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1. Introduction

Joseph A. Schumpeter maintained that business cycles cannot be understood looking at macroeconomic variables only, since they are ultimately determined by the behaviour of entrepreneurs at the microeconomic level. Schumpeter referred to the actions undertaken by single entrepreneurs as to the “primary wave” which, under favourable circumstances, could propagate to the whole economic system, generating the well-known “secondary wave” at the macroeconomic level (Schumpeter 1939). There is some empirical evidence supporting this view: the large degree of independence of regional and sectoral economic variables with respect to their macroeconomic aggregates suggests that macroeconomic fluctuations are a consequence of microeconomic disturbances, rather than the reverse (Quah 1994).

According to Schumpeter, the driving force of economic development is the introduction and diffusion of innovations that lower costs and restore profitability. However, while Schumpeter focused on the behaviour of single entrepreneurs and had to postulate the arrival of “innovation swarms” in order to explain business cycles (Schumpeter 1911), modern Schumpeterians rather stress the role of diffusion processes to transform a disordered innovating activity at the microeconomic level into a coherent macroeconomic wave (Silverberg and Lehnert 1993, 1994). It is the same idea known in physics as “self-organised criticality” (Bak, Tang and Wiesenfeld 1987, 1988), by which as diverse phenomena can be explained as earthquakes, or sand piles that suddenly collapse when a few grains are added: what is common to all of them is that little, but continuous perturbations have sudden macroscopic effects and end up to produce a kind of irregular wave.

Rather than on innovation diffusion, this article focuses on avalanche processes in the diffusion of modes of behaviour among entrepreneurs. Modes of behaviour are supposed to be triggered by the emergence of innovations in the qualitative features of goods, tastes and technologies: these innovations affect the confidence entrepreneurs attach to the courses of action they can undertake, since innovations suddenly open new fields of activity and often close old ones at the same time. Rather than by probabilistic uncertainty, such modes of behaviour are better described in terms of “animal spirits” (Keynes 1936, 1937a, 1937b).