General Purpose Technologies as Emergent Properties, and the "Technological Multiplier" Hypothesis

First thoughts on an evolutionary approach to General Purpose Technologies

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Abstract

The paper suggests a novel theoretical framework to deal with the concept of General Purpose Technologies (GPT hereafter), attempting at understanding the economic as well technological conditions for the establishment of persistent and pervasive technologies. Framing this process as "emergent" from the network of inter-industry interdependencies, the paper proposes a micro-to-macro explanation for economy-wide inducements of innovative activities, hypothesizing that a mechanism comparable to a "technological multiplier" is at work. In addition to proposing a theoretical framework capable to adjust some of the flaws in the GPT theory and to place it on sound micro basis, the paper also suggests a potential empirical strategy to detect GPTs and the multiplier effect at work at industrial level.

Keywords: GPT; Industrial dynamics; Multiplier; R&D; Spillovers; Unbalanced Growth

JEL-codes: L10; O30; O32; O33

1. Introduction

The fertility of a theory may depend on a number of factors, its diffusion being the result of positive feedbacks or the fair reward for a superior effort in "the art of successful theorizing" (Solow, 1956), with the latter meaning the capability of a theoretical model to offer new insights on some phenomena independently of non-relevant details. Alternatively, the goodness of a theory – and therefore its likelihood to gain shares in the market for ideas – can be measured by its accuracy in providing correct predictions, despite the realism of its assumptions or premises[1]. In this paper, we are interested to assess the fertility and usefulness

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