Chapter 14

Economic Growth, Technical Progress and Labor Productivity:
Knowledge Economics and New Forms of Technical Progress

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ABSTRACT

The debate on deindustrialization assumes that domestic industry is a leading sector and produces positive externalities for the whole economy. This paper will partially refute this. Since the early 1990's, most developed and emerging economies have been subjected to two paradoxes: the paradox of Solow, which calls into question the relationship between ICT investment and productivity gains, and the paradox of Gordon, showing that productivity gains in the ICT sector do not propagate to all other sectors. These paradoxes lead one to question the linear nature of the kaldorian cumulative mechanisms. Following both a theoretical and an empirical approach, such relationships are analyzed from the viewpoint of the various models of unbalanced growth built by Baumol. The author will highlight the limits of such models and provide elements for an alternative explanation. Ultimately, the real problem is to investigate the economic nature and the role that services and forms of intangible capital play in the new dynamic of growth.

INTRODUCTION

This study aims at examining the problem of deindustrialization from the development of different forms of intangible capital, i.e. the so-called new economy. – mainly characterized by the activities related to knowledge and information. This paper will analyze relationship between technical progress, gains in labor productivity and economic growth, which most of the macroeconomic analyses posit. This involves studying the explanatory value of Kaldorian cumulative logics used to explain economic growth, and questioning the linearity of this relationship.

For this purpose, I will use different models of unbalanced growth built by Baumol (1967, 1992). These models express, from a simple formalization, the linear relationships that exist between technical progress, productivity gains, and economic growth, i.e., they emphasize the crucial role of industry in the process of long-term growth. *I will thus study the macroeconomic implications caused by meso and microeconomic changes related to the production of intangible assets*[1].

I will show why and to what extent these different models can explain the stylized facts that characterize the Post-Fordist phases of capitalism, especially the Solow and the Gordon's paradoxes (Nordhaus, 2002). The first one emphasizes the fact that the increase of investments in Information Technology (ICT) does not correspond to an increase in labor productivity, the second one claims that about half of productivity gains is performed in the producing ICT.

We can talk about deindustrialization when we observe a relative decrease of the industrial sector in terms of aggregated value created and in terms of source of employment (Oreiro, 2009, p. 1). From a theoretical point of view, the deindustrialization allows identifying two problems: one concerns the methods of value added creation, and the other regards the level of employment and income distribution that matches it:

1. The development of services and different forms of intangible assets (especially knowledge and information) is such that, currently, the construction of aggregates to measure this type of activity is particularly difficult and incomplete (Griliches, 1994). These measurement problems are directly related to *historical changes in the systems of production and of appropriation of value in contemporary capitalism.*
2. There are fundamental differences between the sectors linked to the production of intangibles, and those related to industrial production. These differences are explained

by the economic characteristics of the objects produced and the adopted system of Property Rights, the specificity of production processes, and the nature of labor and its modalities of remuneration.

This study aims at discussing the validity of the hypothesis regarding the crucial role of industry in the process of long-term growth. As I will show, the economic specificities of knowledge and information allow refuting the linearity of the kaldorian relations between labor growth productivity, GDP growth and industry.

In the first part, I will analyze the feedback model built by Baumol and Bowen (1992), which explains the mechanisms from which technical progress is endogeneized, and confront the theoretical results derived from this model with the stylized facts that characterize the current phase of capitalism. In the second part, I will highlight the limits of such explanation and propose an alternative analysis, based on a reformulation of these macroeconomic relations.

BAUMOL'S ANALYSIS: THE DIFFERENT MODELS OF UNBALANCED GROWTH

The Endogenization of Labor Productivity Gains

The Extension of the 1967 Model

Baumol uses the results of the 1967 model, and writes the following equations:

$$y1 = cL1e^{rt}, \; y2 = bL2 \qquad (1)$$

$$AC1 = wL1/y1 = w/c.e^{rt} \text{ and } AC2 = wL2/y2 = w/b \qquad (2)$$

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