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The cumulative growth model as an alternative approach to the convergence process: Some theoretical and empirical considerations

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Resumo

O objectivo principal deste artigo é explicar as diferenças entre três teorias principais que pretendem interpretar o fenómeno de convergência ou divergência do rendimento per capita ou da produtividade entre economias diferentes. A primeira parte descreve três processos diferentes que tentam explicar o fenómeno da convergência real: a teoria neoclássica e a teoria do crescimento endógeno da convergência incondicional e condicional, e a teoria keynesiana baseada no processo de crescimento cumulativo que prevê a divergência como o resultado mais provável. A segunda parte do artigo explica as fontes da convergência incondicional examinando os estudos empíricos que evidenciam este resultado. A secção 3 analisa as fontes da convergência condicional apresentando estudos empíricos que identificam quais os factores condicionais que explicam esta convergência. A secção 4 comenta a relevância e as limitações das teorias convencionais que explicam a convergência real. A secção 5 apresenta o processo do crescimento cumulativo que explica o fenómeno da convergência ou divergência, como método alternativo para compreender as diferenças de crescimento entre economias diferentes. A última secção enumera as razões que tornam o processo de crescimento cumulativo como o mais relevante para explicar as diferenças dos níveis da vida entre regiões ou países diferentes.

Cet article a pour objectif principal d’expliquer les différences entre trois théories principales qui prétendent interpréter le phénomène de convergence ou de divergence du revenu per capita ou de la productivité entre des économies différentes. La première partie décrit trois processus différents qui tentent d’expliquer le phénomène de la convergence réelle: la théorie néoclassique et la théorie de la croissance endogène de la convergence inconditionnelle et conditionnelle, et la théorie keynésienne basée sur le processus de croissance cumulative qui prévoit la divergence comme le résultat le plus probable. La seconde partie de l’article explique les sources de la convergence inconditionnelle par l’examen des études empiriques qui mettent en évidence ce résultat. La troisième section analyse les sources de la convergence conditionnelle présentant des études empiriques qui identifient les facteurs conditionnels expliquant cette convergence. La quatrième section commente l’importance et les limitations des théories conventionnelles qui expliquent la convergence réelle. La cinquième section présente le processus de la croissance cumulative qui explique le phénomène de la convergence ou de la divergence, comme méthode alternative pour comprendre les différences de croissance entre des économies différentes. La dernière section présente les conclusions, énumérant les raisons qui font du processus de croissance cumulative celui qui est le plus important pour expliquer les différences des niveaux de vie entre des régions ou des pays différents.

The main scope of this study is to analyse the differences between three main approaches which attempt to explain the convergence or divergence pattern in per capita income or productivity level, among different economies. In section 1 three main theoretical approaches are brought together to explain the convergence phenomenon: the neo-classical and endogenous growth analyses of unconditional and conditional convergence, and the demand orientated approach of cumulative growth, which predicts divergence as the most probable outcome. Section 2 explains the sources of unconditional convergence in the light of the empirical evidence that gives support to this result. Section 3 analyses the sources of conditional convergence making reference to the empirical studies which identify the main conditioning factors which lead to convergence. Section 4 evaluates the relevance and explains the limitations of the conventional approaches to convergence. Section 5 describes the cumulative approach to convergence or divergence as an alternative method for understanding the differences in growth rates between economies. Section 6 concludes, pointing out the reasons which make the cumulative approach to growth the most relevant approach in explaining differences in the living standards of regions and countries.
1. Introduction: The main theories of convergence

Recently, a large literature on economic growth tries to explain the crucial issue of whether different countries or regions become similar over time. A large number of empirical studies use cross-section or time series methods to analyse whether different economies have converged or not. Convergence between economies is defined as the tendency for the levels of per capita income, or levels of per worker product (productivity), to equalise over time which will happen only if a continuous catching-up process takes place. There are three main theories which predict this convergence pattern of economies.

First, there is the "neo-classical theory" of convergence which argues that due to diminishing returns to reproducible capital, poor countries or regions with low capital/labour ratios have a higher marginal productivity of capital, and therefore, will grow faster than richer ones, given the same saving and investment rates. The conditions of free factor mobility and free trade are essential and contribute to the acceleration of the convergence process through the equalisation of prices of goods and factors of production. The role of the government in such a process is limited to the promotion of market forces and the provision of macroeconomic stability. In this context, the tendency for disparities to decline over time is explained by the fact that factor costs are lower and profit opportunities are higher in poor regions compared to rich regions. Therefore, low income regions will tend to grow faster and will catch-up the leading ones. In the long run, income differences and growth rates will be equalised across regions. In the neo-classical convergence framework technical progress is a public good; therefore, all economies will benefit from the exogenously given technical progress. At the empirical level the neo-classical approach to convergence uses and tests the so called hypothesis of "sigma" (α) convergence which predicts a narrowing dispersion of real per capita income across regions with the passage of time, or the alternative hypothesis of "beta" (β) convergence which identifies a negative relationship between the growth of per capita incomes over a given period and the initial level of income per head across different regions. Some empirical studies based mainly on the concept of "beta" convergence find evidence of unconditional convergence, which is interpreted by the neo-classicists, as a convergence to the same steady-state growth of per capita income or productivity for all regions (Barro and Sala-i-Martin, 1991). The convergence hypothesis of the neo-classical approach is consistent with Solow's (1956) growth theory where growth is determined by the supply of the exogenously given factor inputs, inputs exhibit diminishing returns to scale and technological progress is exogenous. In particular, the simple Solow model assumes that technology is a public good; therefore, all economies have access to the same technology and this eventually leads to convergence. The model predicts that in the long run there will be an inverse relationship between a country's per capita growth of income or productivity and its initial level of income per head or productivity. In the steady state point, all countries will have identical rates of per capita income growth. In the short run an adjustment process will take place towards the steady state path where the poorer countries will exhibit faster growth of their per capita income than the richer ones, since poor countries will have a higher marginal productivity of capital due to a lower capital-output ratio. Convergence is thus the rule in the Solovian growth model and there is no room for a divergent process of per capita output to take place, (Barro and Sala-i-Martin, 1992, Targetti and Foti, 1997).

The story of the neo-classical approach to convergence owing to diminishing returns to capital and the exogeneity of technical progress has been challenged by the theory of endogenous growth.

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Economies can be regions or countries.

This concept was introduced by Barro and Sala-i-Martin (1992) to distinguish it from "sigma" convergence.