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Human capital distribution, growth and convergence

DANILO GUAITOLI†‡

Department of Economics, Universitat Pompeu Fabra, Trias Fargas 25–27, 08005 Barcelona, Spain

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Summary

This paper studies the dynamic relationship between distribution and endogenous growth in an overlapping generations model with accumulation of human and physical capital. It is shown how human capital can determine a relationship between per capita growth rates and inequality in the distribution of income. Family background effects and spillovers in the transmission of human capital generate dynamics in which aggregate variables depend not only on the stock, but also on the distribution of human capital. The evolution of this distribution over time is then characterized under different assumptions on private returns and the form of the externality in the technology for human capital. Conditions for existence, uniqueness and stability of a constant growth equilibrium with a stationary distribution are derived. Increasing returns, idiosyncratic abilities and the possibility of poverty traps are explicitely characterized in a closed form solution of the equilibrium dynamics, showing the role played by technology and preferences parameters.

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1. Introduction

The aim of this paper is to characterize the dynamic relationship between distribution and growth in an overlapping generations model with human capital accumulation as the engine of growth. In particular the focus is on the role of family background and

† This is a revised version of part of my PhD dissertation (Guaitoli, 1994).
‡ E-mail: guaitoli@upf.es

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aggregate spillovers, how through these channels inequality in the distribution of human capital affects per capital growth rates and levels, and how this distribution evolves over time.

Although the nature of the exercise is theoretical, its motivations are both theoretical and empirical. The use of representative agent endogenous growth models is supposedly a fair approximation if distributional effects have no relevant effect on aggregate variables. It is shown in this paper that this is true only in particular cases. In order to account for the diversity of growth experiences in economies with similar preferences and technology, our analysis suggests that inequality in the distribution of human capital is relevant to explain how economies with similar initial per capita income may end up on very different equilibrium paths.

There has been recently increasing empirical evidence suggesting a negative relationship between growth rates and inequality. Persson and Tabellini (1991) find negative coefficients for some measure of inequality in growth regressions for a subset of countries. World Bank data also show (with few exceptions) a neat contrast between Asia's miracle economies (like South Korea, Singapore, Taiwan, Hong Kong, Japan), which have experienced in the past 30 years high growth associated with low and declining inequality, as compared to African and Latin American countries (like Zambia, Ghana, Sudan, Peru, Argentina) where high inequality has been associated with very poor growth performance. Our model is an attempt to explain these stylized facts pointing to human capital as the crucial variable in the link between distribution and growth. It also provides an explicit analytic characterization of this dynamic relationship.

For a class of functional forms it is possible to characterize the dynamics of a model with human and physical capital, deriving conditions for existence, uniqueness and stability of a constant growth equilibrium with no inequality. A link between inequality and stochastic dominance is used to define a relationship between growth rates and inequality, and to check how robust the results are to the form of the externality. The negative sign of the relationship between inequality and growth depends on two forms of concavity in the technology for human capital: concavity in parental levels of human capital and concavity of the aggregator function which defines the external effects. The first type of concavity is also required for convergence to a stationary distribution. Only when individual returns are constant, inequality is irrelevant for aggregate growth rates and levels.

Closed form solutions for the equilibrium dynamics are obtained, checking the role of different preferences and technology specifications, and incorporating additional features like idiosyncratic abilities and increasing returns. The conditions (in terms of the initial distribution) for persistent growth and the possibility of