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Growth vs. level effect of population change on economic development: An inspection into human-capital-related mechanisms*

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Abstract

This paper studies the different mechanisms and the dynamics through which demography is channelled to the economy. We analyze the role of demographic changes in the economic development process by studying the transitional and the long-run impact of both the rate of population growth and the initial population size on the levels of per capita human capital and income. We do that in an enlarged Lucas-Uzawa model with intergenerational altruism. In contrast to the existing theoretical literature, the long-run level effects of demographic changes, *i.e.* their impact on the levels of the variables along the balanced growth path, are deeply characterized in addition to the more standard long-run growth effects. We prove that the level effect of the population rate of growth is non-negative (positive in the empirically most relevant case) for the average level of human capital, but *a priori* ambiguous for the level of per capita income due to the interaction of three transmission mechanisms of demographic shocks, a standard one (dilution) and two non-standard (altruism and human capital accumulation). Overall, the sign of the level effects of population growth depend on preference and technology parameters, but numerically we show that the joint negative effect of dilution and altruism is always stronger than the induced positive human capital effect. The growth effect of population growth depends basically on the attitude to intergenerational altruism and intertemporal substitution. Moreover, we also prove that the long-run level effects of population size on per capita human capital and income may be negative, nil, or positive, depending on the relationship between preferences and technology, while its growth effect is zero. Finally, we show that the model is able to replicate complicated time relationships between economic and demographic changes. In particular, it entails a negative effect of population growth on

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