

Abstract

The role of human capital in economic growth has been thoroughly discussed and emphasised in a variety of modern growth theories, especially since the 1960s. At the same time, indisputable empirical proof on the positive impacts of schooling on growth has been difficult to achieve. Some studies have reported positive, some insignificant, some even negative results on the impact of schooling on growth. The reason for the controversy could be that direct measuring of human capital is not an easy task. The typical measures for human capital in empirical studies have been literacy rate, school enrolment ratio, and, as the most prominent one, average years of schooling in the working age population.

This paper explores empirically what the feedback is to theory when human capital is assessed in the National Accounts framework. While GDP and physical capital have grown exponentially in the long run, average years of schooling, and the other proxies mentioned, grow linearly. This is not necessarily the case with an estimate for human capital in the National Accounts frame. The first feedback to growth theory concerns this.

The linear growth of average years of schooling is likely at least one of the reasons why the human capital variable often enters with an exponential structure in various growth models. In empirical studies, especially in the longitudinal ones, an exponential transformation for the average years of schooling in the working ages, in accordance with Mincerian equations, has been carried out for receiving an estimate for human capital. However, without a similar transformation in the other core variables, GDP and physical capital stock, this implicitly refers to increasing returns to schooling itself. With an estimate in the National Accounts frame this type of transformation does not seem to be needed. For instance, Kendrick's estimate through accumulated costs for the stock of education and training grows exponentially, and does not refer to increasing returns to schooling. Therefore, human capital assessed in the National Accounts can probably be entered straight-forwardly in the production function, without any assumptions.

The main objective to be studied is whether human capital assessed in the National Accounts changes the view on whether physical and human capital accumulation would be the main factors of growth or whether it has been the exogenous technical change. In empirical studies, with the proxy variables for human capital, the answer has usually favoured the latter. Instead, in accordance with the lifetime labour incomes system for human capital, Jorgenson and Fraumeni have demonstrated that the accumulation of human and non-human capital accounts for a predominant share of economic growth.

The mentioned systems of Kendrick and Jorgenson & Fraumeni have broadened the National Accounts far beyond the standard GDP. Their imputed values for non-market activities have been included in the new GDP. Instead, the studies with the proxy variables have explored the connection of schooling with the standard GDP. For reaching a fair comparison for feedback a strict long run econometric analysis is done with intangible human capital by schooling from a system of national accounts in which GDP does not have to change. In this system the education expenditures have been used as investments in human capital in Finland in 1877–2000. The stock of human capital by schooling has been accumulated by the PIM method, taking into account the long graduation times, for the years 1910–2000. The role of human capital by schooling is studied together with GDP, K and hours worked by the Vector Equilibrium Correction Model.