Education and Economic Growth: A Meta-Regression Analysis

NIKOS BENOS and STEFANIA ZOTOU*

University of Ioannina, Greece

Summary. — This paper surveys the literature which examines the effect of education on economic growth. Specifically, we apply meta-regression analysis to 57 studies with 989 estimates and show that there is substantial publication selection bias toward a positive impact of education on growth. Once we account for this, the genuine growth effect of education is not homogeneous across studies, but varies according to several factors. Specifically, it is attributed to differences in education measurement and study characteristics, mainly model specification as well as type of data used, and the quality of research outlets where studies are published, e.g., academic journals vs. working papers.

* We thank especially the Editor and two anonymous referees for very constructive remarks and suggestions. The paper has also benefited greatly from comments received by A. Adam, P. Kammas, A. Lagou, D. Mavridis, and G. Salanti on earlier drafts. The usual disclaimer applies. Final revision accepted: June 30, 2014.

Key words — education, human capital, economic growth, meta-regression analysis, world sample

1. INTRODUCTION

The study of the role of human capital in economic growth has been a very fruitful line in economic research. Following Schultz (1961) and Becker (1964), we define human capital as the set of knowledge, skills, competencies, and abilities embodied in individuals and acquired, for example, through education, training, medical care, and migration. Education is considered as one of the most significant human capital investments. It plays a vital role in the process of economic growth and a significant amount of research has been devoted to the education–growth nexus.

From a theoretical point of view, there is an important distinction between neo-classical and endogenous growth theories regarding the linkage between human capital and economic growth. The former argue that a one-off permanent increase in the stock of human capital results in a one-off increase in the economy’s growth rate until the economy reaches the new higher steady-state. Moreover, there are two strands of new growth theories, which focus on the impact of (a) human capital accumulation and (b) human capital stock respectively. A one-off rise in human capital causes a one-off output increase in case (a) and a permanent increase in growth in case (b). Consequently, the social benefits of education are much greater in the latter case (Sianesi & Van Reenen, 2003).

Theoretical contributions emphasize different mechanisms through which education affects economic growth. First, education increases the human capital of the labor force, which increases labor productivity and transitional growth toward a higher equilibrium output level. Second, in endogenous growth theories, education increases the innovative capacity of the economy, knowledge of new technologies, products and processes, and thus promotes growth (Hanushek & Woessmann, 2008).

From an empirical point of view, the macroeconomic literature on the relationship between education and economic growth attempts to test empirically various model specifications. The early empirical approaches usually employ cross-section data. Most recent research combines cross-section data with time-series information using panel data sets. Finally, a few studies adopt time-series analysis for specific countries, where annual education data are available. However, the impact of education on economic growth remains controversial, due to a number of conceptual and methodological problems, such as the measurement of education and growth, as well as differences in education coefficients across countries or regions. In our opinion, the most important issue is education measurement. Ideally the best measures would be based on education output, but they are very difficult to obtain, so input measures are employed. These use information on formal education attainment, ignoring on-the-job training, experience and learning-by-doing, usually they do not account for education quality and focus on academic education, overlooking vocational education. Moreover, data quality varies widely across countries, implying measurement error, especially for changes in education, which may severely bias estimates.

This study surveys the empirical literature on the education–economic growth relationship. We distinguish between three categories of empirical approaches: cross-section, panel data, and time-series ones. The first category attempts to explain cross-section (country or region) differences in growth, while the second one examines both cross-section growth differences as well as the performance over time in each cross-section. The third group focuses on country-specific growth experiences. We account for differences in empirical findings due to the use of all available education (quantity and quality) variables and we are fully aware that, being imperfect proxies, they all suffer from weaknesses. However, this is the only way to conduct a quantitative review of the education–growth literature.

Given the diversity of findings on the link between education and growth, we conduct meta-regression analysis (MRA). MRA is a subset of meta-analysis. Meta-analysis combines and integrates the results of several studies that share a common aspect so as to be combinable in a statistical manner (Harmon, Oosterbeek, & Walker, 2003). MRA is a quantitative literature review of the estimates obtained from previous regression analyses and attempts to explain the...
variation in their results (Stanley & Jarrell, 1989). It aims at explaining the excess study-to-study variation typically found in empirical results and investigates the presence of publication selection bias (Stanley, 2005). Publication bias arises when editors, reviewers, and researchers prefer to report findings, which are statistically significant and/or satisfy certain theoretical expectations (Doucouliagos, 2005; Stanley, 2008). As a result, it biases the literature’s average reported effect away from zero. An additional advantage of MRA is that it allows the researcher to include aggregate data, e.g., data on aggregate labor supply that cannot be included in individual studies (Groot & Maassen van den Brink, 2000). MRA allows us to examine factors, which are likely to explain the heterogeneity of findings in the education–economic growth literature and the potential impact of study characteristics on the estimated relationship between education and growth.

We provide evidence in favor of substantial publication selection bias toward a positive impact of education on growth. Also, we do not find a representative genuine growth impact of education, since different education measures give rise to varying coefficients of the size effect of education on economic growth. The variation in empirical estimates can also be explained by the type of data, model specification, and quality of the research outlets, where studies are published.

The rest of the paper is organized as follows. Section 2 reviews the empirical studies on the role of education in economic growth used in our analysis. Section 3 presents the proxies employed to measure education and growth. Section 4 describes the construction methodology of our meta-data set, Section 5 discusses the meta-analysis estimation methodology, and Section 6 analyzes the meta-regression results. Finally, Section 7 summarizes our main findings and concludes.

2. REVIEW OF THE LITERATURE


دریافت فوری متن کامل مقاله

امکان دانلود نسخه تمام متن مقالات انگلیسی
امکان دانلود نسخه ترجمه شده مقالات
پذیرش سفارش ترجمه تخصصی
امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
امکان دانلود رایگان ۲ صفحه اول هر مقاله
امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
دانلود فوری مقاله پس از پرداخت آنلاین
پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات