BanRep Blog: The Role of SENA and the Technical and Technological Education Sector in the Adjustment of Supply and Demand of Skills in the Colombian Labor Market

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The mismatch between the skills of workers and the needs of companies is a problem that affects the efficiency of labor markets in developing countries. The vocational education sector as well as technical and technological education and skills certification are mechanisms for adjusting this imbalance. Two recent research papers published in *Banco de la República*'s (the Central Bank of Colombia, Banrep) *Borradores de Economía* series shed light on its functioning.

The first document, published in *Borradores de Economía* (Only Available in Spanish), is also included in the most recent Labor Market Report (Only Available in Spanish) and was prepared with participation of Leonardo Morales, a researcher of Banrep's Labor Market Analysis Group (GAMLA in Spanish). It assesses the most extensive occupation-specific certification program in Colombia, implemented by the National Training Service (SENA in Spanish). This program assigns certifications in four levels according to the worker's performance in a practical and theoretical exam. The study uses administrative data from SENA's certification program and records of contributions to the social security system to evaluate the effects of certifications on participants' income and employment status.

The study shows that SENA's certification of advanced skills impacts labor income positively and significantly. The advanced level of certification is an achievement by approximately half of the participants and leads to a significant increase of 9.7% in their income during the two years following certification. These benefits are more pronounced for more educated workers with more work experience and in larger companies. The study further finds that basic or intermediate (as opposed to advanced) skills certifications do not significantly influence labor income. In addition, the advanced skills certificate does not substantially affect the labor income of workers who were unemployed at the time of certification. In the case of self-employed workers, certification at the advanced level affects their labor income, especially after one year of the certification process, with increases of up to 20%. This effect on labor income coincides with an increased probability of obtaining a formal dependent job.

A second paper, also published in the *Borradores de Economía* series (Only Available in Spanish) and co-authored by Juan Esteban Carranza, researcher and Chief Officer for Economic Studies at Banrep, studies the evolution of the supply of technical and technological education programs in Colombia and the factors that determine it. These programs are known in the literature as short-cycle higher education programs, in contrast to professional programs that last four or more years. They also differ from the job training programs traditionally offered by SENA, which are shorter and focused on more specific skills. Among other aspects of the market, the research analyzes the capacity of these short programs to adjust to the needs of the production apparatus in a faster and more flexible way than that of long-cycle university programs.

The study is based on detailed data on all short-cycle programs offered by Colombian educational institutions other than SENA over time, according to their geographic location and field of study. A statistical analysis of the entry of new programs by field of study and department of the country is carried out to explore the relationship

between productive activity and the supply of programs according to the economic activity related to each field and other relevant variables. The estimates indicate precisely that the supply of short-cycle programs responds positively and significantly to variations in the economic activity associated with each field of study in each department of Colombia.

The study also includes similar estimates of the elasticity of entry of new long-cycle university students. According to the results, this elasticity is significantly lower than that of the short-cycle programs. This result implies that university programs are less responsive to changes in demand and reflect higher adjustment costs related to the characteristics of longer programs. The results of the study corroborate the importance of short-cycle programs to accommodate shocks of the production apparatus through the training of relevant labor force.

The two studies reviewed highlight the importance of educational institutions in developing job skills, which are critical for bringing labor supply and demand closer together. In addition, the certification by SENA plays a significant role, particularly verified in the case of advanced skills. Thus, together, the educational institutions and SENA benefit workers and economic growth.

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