

# The Education of Economists in Colombia: Quality Differences and its Determinants

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# Motivation

- Differences in the education of economists reflects the barriers for human capital acquisition at time when alumni are close to participate into labor force.
- Undergraduate student education is an important component of the educational and research mission for economics departments.
- Relatively little is known about the factors that define a successful economics faculty.
- Evidence is scarce between institutions at higher education and in developing countries.
- The study about quality education for more than one university has received relatively little attention.

# Research Question

Did Colombian undergraduate economics students have the same opportunities to achieve satisfactory academic performance?

We will distinguish between accredited and non-accredited economics programs, and analyze which factors can explain the difference between students by accreditation status on the standardized national exam 2007 SABER PRO (previously known as ECAES) that students present in last semesters of their undergrad courses.

# International Literature Review (1)

- A key measure in determining program quality is the quality of students (Perry, 1995).
- Literature has considered measures of students' quality such as: Grade Point Average – GPA (Betts and Darlene, 1999; Simonite, 2003; Spenner et al., 2004), grades in some particular courses (Ziegert, 2000; Krohn and O'Connor, 2005), number of approved subjects (Di Gresia, 2001; Porto et al., 2004), placement in the job market (Perry, 1995) and standardized tests among universities (Perry, 1995).

## International Literature Review (2)

- Quality factors of students' education (Vegas and Petrow, 2008; Banco Mundial, 2009).
  - What brings students to the economics programs such as the individual characteristics.
  - Social and family conditions of students.
  - Elements of program or campus such as effectiveness of teachers and infrastructure characteristics.
  - Institutional issues of the higher education system.

# Literature on Quality in Higher Education in Colombia

- Despite the implementation of new policies for continuous improvement of the quality of higher education programs in Colombia, few studies has devoted to assessing how these efforts of programs and institutions have been reflected in the learning and quality of education received by students.
- For measuring differences in academic performance specifically for economics students, Valens (2007) and Ortiz (2005) analyzed the ECAES in Economy for 2004.
- Descriptive analyzes: Sarmiento and Sandoval (2008) and Gomez (2012).

# Methodology (1)

- We use a decomposition technique developed by DiNardo, Fortin, and Lemieux (1996). This method permits us to see heterogeneous effects of individual, family, program and institution characteristics. The DFL method considers the whole distribution of exam results.
- This technique, based upon kernel estimates of the distributions of the exam results constructs counterfactual distributions that mimic how students with characteristics that are found in the non-accredited programs would have done if they would have studied in the environment of the accredited programs.

## Methodology (2)

- Through the construction of counterfactual with different sets of characteristics, we obtain information about the relevance of the characteristics to explain the differences between the distributions of the test results in the two program types.

$$\begin{aligned}
 f(x^{accr} | nonaccr; z_1) &= \int m(x^{accr} | z_1, z_2, accr) h(z_2 | z_1, accr) h(z_1 | nonaccr) dz \\
 &= \int m(x^{accr} | z_1, z_2, accr) h(z_2 | z_1, accr) h(z_1 | accr) \Psi(z_1) dz
 \end{aligned}$$

$$\text{with } \Psi(z_1) = \frac{h(z_1 | nonaccr)}{h(z_1 | accr)} = \frac{1 - P(accr | z_1)}{P(accr | z_1)} \frac{P(accr)}{1 - P(accr)}$$



# Data

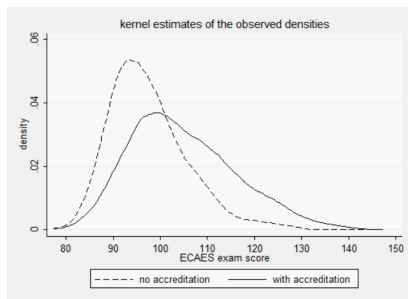
- Data of undergraduate economics students that presented the 2007 SABER PRO.
- Survey made by the Grupo de Estudios Macroeconómicos of the Universidad Militar Nueva Granada to higher education institutions that offered an undergraduate economics program and their students coursing last semesters in 2007.
- Data of undergraduate economics students scores achieved in standardized national exam (SABER-11).
- Sample:
  - We have data from 2,219 undergraduate economics students that presented the 2007 ECAES, achieving almost 100% of representativeness of the test takers.
  - Only 34.34% of economics' programs in 2007 counted with accreditation.

# Variables

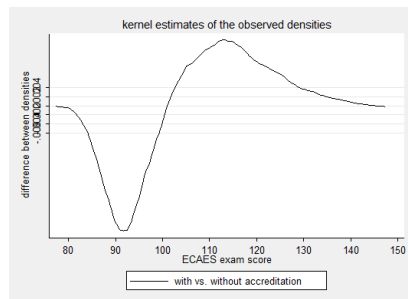
- **Dependent variable:** Score reached by students of economics in the standardized national exam (ECAES) that students present in last semesters of their undergrad courses.
- **Contrafactual:** The accreditation status is the variable that defines the groups that we want to compare.
- **Variable groups ( $z_j$ ):**
  - **Individual characteristics:** sex, age range, marital status, secondary degree, semester at survey, score reached by students at the end of secondary in the standardized national exam (SABER-11) on language, mathematics, natural science and social science subjects; and year that students take SABER-11 test.
  - **Family variables:** level of education and occupation of parents and stratum economic.
  - **Characteristics of program:** numbers of signatures required in microeconomics, macroeconomics, statistics and econometrics, and history of economic thought.
  - **Characteristics of institution:** public/private, accredited/non-accredited, department of location.

# Quality indicator, quality difference

## Kernel density estimate of Ecaes (2007)



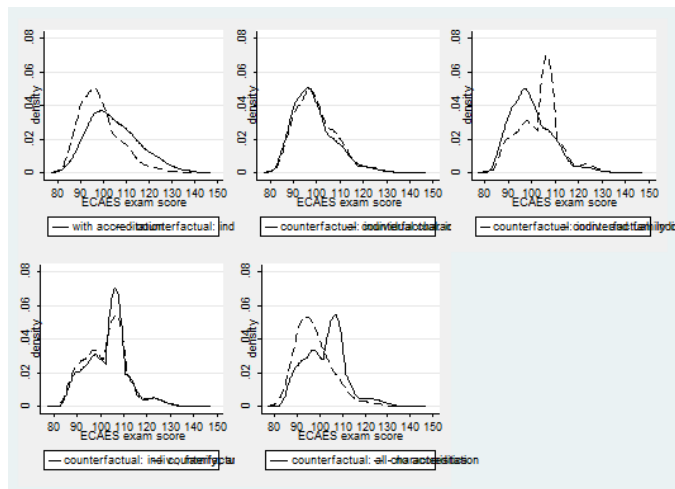
Density estimate by accreditation status



Difference between the accredited and non-accredited density functions

# Difference in returns between programs accredited and non-accredited

Estimated density function for the counterfactual



## Conclusions (1)

- The main contribution of this paper was disaggregate the gap along the distribution function of the scores in groups of variables considered relevant in economic literature such as individual, family, program and institution.
- Individual characteristics explained the gap along of almost the entire distribution of academic performance, while family features were the least likely explained this distribution. The university's features were influential in students who obtained around middle scores, while the characteristics of programs had influence on both students who had middle and lower scores.

## Conclusions (2)

- Better secondary education provides favorable conditions for the students.
- Economics programs with poor academic performance should focus on improving the intensity in subjects that are the core of education of economists; and for middle and low academic performance programs is necessary diminishing the disparity between regions, tuition costs and between public and private institutions.
- Programs with accreditation were more efficient in transforming the available inputs.