Title: Measuring the Efficiency of teaching activities in Italian Universities: An Information Theoretic Approach

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Measuring the Efficiency of teaching activities in Italian Universities: an Information Theoretic Approach

Abstract. The measurement of teaching efficiency of Italian universities has become a topic of much interest and debate in recent years. The aim of this study is to fully explore the potential of panel data in the analysis of teaching efficiency both by modelling human capital formation in the university as a series of sub-processes and by using various models to account for observed and unobserved factors which generate heterogeneity. The new approach for estimating a stochastic frontier model based on the Generalized Maximum Entropy method provides further insights into the measurement of teaching efficiency. The evolution of technical efficiency throughout the entire study period was also analysed.

Keywords: university teaching efficiency; heterogeneity; stochastic frontier approach; generalized maximum entropy method; panel data.

JEL Classification: I21; C23

1. Introduction

The Bologna Process led Italy, like many other European countries, to reform the university system with the specific aim of overcoming some negative aspects, such as high university dropout rates, long duration of studies, low graduation rates and difficulty in finding a suitable job for graduates in accordance with the level of education achieved.

The purpose of the reform, introduced with the Law 509 in 1999 and implemented in the academic year 2001/02, was to increase the efficiency of universities in providing teaching services by changing the duration, structure and content of university programmes. The reform focused on bringing the Italian higher educational system in line with the European two-tier university model by adopting a 3+2 scheme composed of a First Level Degree (first cycle, undergraduate) which theoretically has a three-year duration, followed by a two-year Second Level Degree (secondary cycle, master level). This reform introduced more flexibility in the degree programme structure together with a number of provisions aimed at creating a university system which provides students with more support.

Empirical studies show that the 1999 reform had a positive effect as it lowered the dropout rate and enhanced students' motivation to complete a university degree (Di Pietro & Cutillo, 2008). However, the drop-out rate is still very high especially between the first and second year of first level degree courses, where the dropout rate was 18.4% in 2009 (MIUR, 2011).

Moreover, on average, Italian students who graduate tend to take longer than the institutional time to complete their degree courses. In fact, in 2009 only 23.3% of Italian graduates obtained their degree within the institutional duration of the course, while 45.6% took 6 years or longer to graduate (NUEC, 2011).

It is clear that the students' delay in obtaining their degrees is due to a delay in achieving the credits required. Indeed, although it is necessary to accumulate about 60 credits each year[1]

[1]The university educational credit system was introduced to facilitate the mobility of students at both national and international level. Credits (CFU) - which are units used to measure the total amount of coursework required by a student, in terms of hours of study and tuition - are obtained by passing examinations or by means of other forms of assessment established by each university. They do not count towards the overall mark and are therefore independent of the grade obtained with examinations or assessments of other kinds.