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## Does lecture attendance affect academic performance? Panel data evidence for introductory macroeconomics<sup>☆</sup>

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### ABSTRACT

I analyze data from students enrolled in an introductory macroeconomics course taught at a public university in Italy to assess the impact of lecture attendance on academic performance. Using proxy variables regressions to capture the effect of unobservable student traits possibly correlated with attendance, I still find a positive and significant effect of attendance. However, when using panel data fixed effect estimators to eliminate time-invariant individual-specific unobservables, the effect disappears. The robustness of my results to supplementary data from a major public university in Spain suggests that the positive effect of attendance commonly reported in the literature may still incorporate an impact of unobservable student traits.

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## 1. Introduction

Estimating the impact of instructional time on student performance in higher education has potentially important policy implications. Educational institutions could more efficiently allocate their scarce resources among different possible modes of teaching delivery and/or among courses requiring different amounts of instructional time. Furthermore, students could use this knowledge to improve the efficiency of their time allocation and to maximize their academic performance.

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In light of the high policy relevance of the issue, one strand of the wide literature on the determinants of student performance in university economics courses has recently focused on the role of lecture attendance in student learning outcomes. Since the seminal article of Romer (1993), a number of studies have found positive effects of attendance on performance, leading some authors to call for policies to increase or even mandate attendance.<sup>1</sup> The extent to which these results are robust and generalizable is not, however, entirely clear, since most studies leave the two main problems usually affecting the attendance variable unresolved. First, self-reported attendance is likely to contain measurement error, inducing attenuation bias into the estimated coefficient. Second, attendance is potentially endogenous, given that students' choice of whether or not to attend lectures is positively affected by unobservable student traits, such as ability, effort, and motivation, which are also likely to have a positive effect on performance. If the latter were the case, the estimated coefficient would suffer from endogeneity (upward) bias.

I address both of these issues through the collection of data that match survey data with administrative student records. My approach has four key components. First, careful attendance monitoring in each lecture session is used to ensure accurate measurement of attendance rates. Second, the richness of my data allows me to use proxy variables in a preliminary attempt to confront the attendance endogeneity issue. Third, I exploit the longitudinal nature of the data by using panel data estimators to account for endogeneity related to time-invariant student-specific unobservables. Finally, I assess the robustness of my results by re-estimating the most relevant model specifications on comparable supplementary data collected from a higher education institution operating in a different EU country.

My findings are consistent with the hypothesis that the inclusion of proxy variables is not sufficient to capture all the correlation between the regressor of interest and unobservable student traits. The bias correction obtained using OLS proxy regressions goes in the expected direction, although the effect of attendance remains positive and significant. However, when I account for time-invariant unobservables possibly correlated with attendance by means of panel data estimators, I find that lecture attendance does not have a significant impact on performance. While I acknowledge that time-variant unobservables could still be introducing bias into my results, their robustness to the use of comparable supplementary data from a higher education institution operating in a different context lends them further credibility. Overall, my results seem to confirm what most instructors recognize: better or more motivated students attend lectures more frequently and receive on average higher grades. In this context, the implementation of incentive schemes at universities aimed at fostering student attendance may have neutral or even undesirable effects on student learning outcomes.

The remainder of this work is organized as follows: Section 2 reviews the literature. Section 3 describes the data. Section 4 illustrates the empirical strategy. Section 5 presents and discusses the results. Section 6 concludes.

## 2. Literature

In his widely cited paper "Do students go to class? Should they?", Romer (1993) provides the first analysis of the relationship between lecture attendance and exam performance.<sup>2</sup> Using attendance records collected in six sessions of his large ( $n=195$ ) intermediate macroeconomics course, he finds that attendance has a positive and significant impact on academic performance. On the basis of this finding, Romer recommends experimenting with mandatory attendance policies to enhance student performance.

Following Romer's seminal paper, several studies have attempted to measure the impact of attendance on learning outcomes. Durden and Ellis (1995) use students' self-reported number of absences to explore the relationship between absenteeism and academic achievement in several sections ( $n=346$ ) of a Principles of Economics course. Controlling for student differences in

<sup>1</sup> See the Brauer et al. (1995) debate in the summer 1994 issue of the *Journal of Economic Perspective* and Lai and Chan (2000).

<sup>2</sup> Earlier studies, including McConnell and Lamphear (1969), Paden and Moyer (1969), Buckles and McMahon (1971), Schmidt (1983), Park and Kerr (1990), and Browne et al. (1991), had provided conflicting evidence on the effect of time spent attending lectures as one among other possible determinants of academic performance.

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