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Research paper

Research performance and teaching quality in the Spanish higher education system: Evidence from a medium-sized university

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ABSTRACT

This paper studies the relationship between research performance and teaching quality in the context of the Spanish university system. We investigate whether there is a relationship between being an active researcher and teaching quality of college professors in Spain. We use a data set from the University of Extremadura, which contains information on teaching evaluations and research performance over a ten year period (from 2001–2002 to 2011–2012). Our results suggest that, on average, professors who are more involved in research obtain better results in their teaching evaluations. We also suggest that this positive link between research and teaching is non-linear, as we find a larger improvement in teaching quality from additional research at lower levels of research intensity. Additionally, we show that the relationship between teaching and research is not constant along the distribution of teaching scores, and that the teaching quality of professors in the lower quantiles is much more related to their research intensity than that of professors in the top quantiles.

1. Introduction

This study analyses the teaching-research nexus in the context of the Spanish university system. In most countries there is a shared view that universities should perform both research and teaching activities, which in the aggregate are seen as complements. Reasonable arguments for both positive and negative effects of research on teaching can be found in the literature. The complementary view is usually based on the idea that research may create positive spillovers on teaching by facilitating up-to-date courses and a deeper understanding of the relevant topics. On the contrary, these activities could also be thought of as being substitutes if one considers constraints of time, effort and funding allocation (Marsh and Hattie, 2002). We can therefore hypothesize different relationships between research and teaching rather than a single link, with these relationships depending on contextual factors such as the type and level of research, the academic discipline, or the level and the mode of delivering of teaching (Brew, 1999).

The debate on the relationship between teaching and research has a long tradition among academics and brings to the forefront some relevant issues for university authorities and public policy in regards to how these activities relate, the optimal mix between teaching and research and the incentives put in place to improve the quality of both teaching and research conducted by universities. Whether research and teaching are complements or substitutes may motivate increased funding for one or the other activity. If research contributes to improving the quality of teaching, this positive external effect of research would provide an argument for increasing the funding devoted to research activities. In a similar way, the net effect of research on teaching may also motivate the need for professors to integrate these activities or to specialize in one of them, thus having important implications at the organizational level of universities and departments. As noted by Hughes (2004), a positive relationship between research and teaching would motivate locating these activities closely together whereas a non-significant relationship (or a negative one) would support the idea of separating them into research-only and teaching-only institutions.[1] Finally, a crucial point to promote quality in both teaching and research refers to the incentive schemes, which could affect the allocation of time and effort to these activities. Although incentives to teaching are often established, most incen-

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[1] This discussion goes back to the nineties (see, for example, Elton, 1992), but there is still an open debate, at least in Europe, on the convenience (or not) of driving research and teaching further apart (see, for example, Dosi et al., 2006; or Karagiannis, 2009).

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tives schemes are based on research output and this may bias the optimal balance between teaching and research (Sylos Labini and Zinovyeva, 2008). If the emphasis to achieve career progression is mainly placed on the quality of research, many academics could regard teaching duties as a "necessary evil" (Karagiannis, 2009), thus neglecting their teaching activities or allocating less time and effort to them.[2]

Universities in Spain, as is common around the world, have the double mission of teaching and contributing to knowledge through research.[3] These two activities are generally seen as complementary and incentives schemes are set to enhance teaching and research quality, although greater emphasis for the academic career is placed on research. Most Spanish universities measure teaching quality using teaching evaluations based on students' perceptions. Although it is generally acknowledged that these subjective assessments do not directly measure learning outcomes and could be biased by students' expectations,[4] most universities rely on them to evaluate teaching, as there is no widely accepted alternative that is as easy to use on a regular basis (Alwood et al., 2015; Marsh, 2007). In the case of research performance, incentives are built mainly upon officially recognized research evaluations that are conducted by education authorities following an external review process. Academics in Spain can submit their research for evaluation every six years and a national committee evaluates the five most relevant contributions produced in that six-year period (*sexenio*) and decides to accord (or not) an official recognition of that research period. A positive evaluation of that research period implies salary increases, providing a research incentive.[5]

As in other countries, a potential concern in the Spanish system is that the focus on research may lead to a decrease in the teaching quality of Spanish universities. In this study, we use the measures of teaching quality (evaluations) and research performance (*sexenios*) typically used by the Spanish authorities to evaluate professors, and analyze whether there is a relationship between research and teaching during a ten year period (2001/2002 to 2011/2012) in the University of Extremadura, which is a medium-sized university located in the southwest of Spain.

Our detailed data and extended period of study allow us to contribute to the existing literature in several ways. First, although there is a large literature on the relationship between teaching and research (see, for example, Hattie and Marsh, 1996; Colbeck, 1998; or Marsh and Hattie, 2002) for Anglo-Saxon countries, the evidence is scarce for other countries, despite the fact that these countries have very different university systems.

Second, while most of the previous literature models the relationship between teaching and research as linear and find at most a small link, we allow for a flexible non-linear relationship and find a quantitatively relevant effect. This result is important because combined with the fact that most of the papers finding a small and mostly linear effect refer to Anglo-Saxon universities confirms that conclusions from those studies are not directly applicable to other university systems. According to our results the positive association between research and teaching is driven by the low teaching performance of professors of low research intensity in comparison with those of medium or high intensity, but we do not find a significant difference between the teaching scores of professors of medium and high research intensity.

Third, we provide evidence that the relationship between research and teaching is not constant across different quantiles of the distribution of teaching scores, being much stronger for lower quantiles. This is important because, by focusing on the mean effect, previous studies are unable to provide information on how research relates to teaching for professors of different levels of teaching quality. We have to be cautious in the interpretation of our results because our identification relies on all common variables that affect both being active in research and teaching effectiveness being controlled for in the regression. Nonetheless, unlike in previous studies, our focus across the distribution of teaching quality allows us to inform policy recommendations for the whole distribution of teachers. We find that, although the magnitude of the effect decreases along quantiles, research is positively associated with teaching at all levels of the distribution up to the 90th quantile. This implies that only for excellent teachers (those above the 90th threshold of the teaching quality distribution), research is not a significant explanatory factor of their teaching quality.

Fourth, our results are particularly relevant in the context of Spanish universities. Our study uses the same measures of research intensity and teaching quality that are currently being used by Spanish education authorities to evaluate research and teaching of all professors across Spain, which provide our results with immediate policy implications. We find that despite their limitations, these measures point to a significant non-linear association between research and teaching quality. Professors in our sample that have a medium or high level of research intensity over the period obtain, on average, better teaching evaluations than their less involved in research peers. To our knowledge there is only one published paper that has documented a similar relationship- García-Gallego et al. (2015), for the University Jaume I-.[6] We obtain our conclusions using an extended period of time, and data and measures of research and teaching that are more generalizable across universities. Therefore, an additional contribution of the study is to show that the positive link between research and teaching is not specific to a single university and data, and also that it appears when using more policy-ready measures of teaching and research.

Finally, we believe that the study of the link between teaching and research can contribute to the on-going debate regarding the reform of the university system in Spain. Since the passing of new regulations in 2001,[7] the system has moved towards a performance-based system,[8] a pillar of which was the creation of the National Agency for Quality Assessment and Accreditation (ANECA) in 2002. The new law changed the hiring and promotion process for faculty in public universities and a positive evaluation from this Agency (or similar regional agencies) is now required for individuals to be able to apply for a teaching position. The requirements for obtaining a positive evaluation are, however, subject to debate as experts disagree on the role that research should play in recruiting, salaries and promotions.[9] While research plays a cen-

[2] Mas-Colell (2003) offers a good discussion on the incentives schemes to teaching and research and compares two extremes situations to achieve a given teaching-research mix: "The institution can choose first a high teaching talent... and then rely on incentives to reach the desired research level. Or it can focus first on research talent and rely on the incentive part to guarantee the teaching objective". Although "the idea to choose the academic staff mainly by its research potential is controversial in Europe and it is less practiced than in the USA", the second alternative seems superior to him.

[3] See Sánchez-Barrioluengo (2014) for a discussion of Spanish Universities not only as centers of excellence in teaching and research but also on third mission.

[4] See McPherson (2006) on the determinants of students' assessments of teaching. Furthermore, the issue of whether student's evaluations really reflect effective learning or teaching quality has recently been questioned in several works (see, for example, Beleche et al., 2012; Galbraith et al., 2012; or Braga et al., 2014).

[5] See Jiménez-Contreras et al. (2003) or Osuna et al. (2011) for the role of this research indicator in the Spanish university context.

[6] There is also a recent working paper by Rodriguez and Rubio (2013) for the University Carlos III, in Madrid that reaches similar conclusions.

[7] The law that regulates the university system is called *Ley Organica de Universidades*, and was approved on December 6th, 2001.

[8] For a discussion on performance-based university systems, see the work by Hicks (2012).

[9] For example, a recent report written by a committee of independent experts appointed by the Spanish government to suggest policies to improve