

Report for the paper “University Funding System: Impact on Research and Teaching”

The paper “University Funding System: Impact on Research and Teaching” tackles the interesting issue of *teaching vs. research quality* in the university system. Literature has been studying this topic basically since the seminal paper Del Rey (2001). The paper studies how an external funding scheme influences the choice of teaching and research quality. Such a scheme implies that the university receives two type of funds, the first targeted to its teaching activity (received according to students enrollment), the second received according to the quality of its research. Several optimal combinations teaching/research arise. One of these is a *research elite system*, which is when two types of universities, either teaching or research intensive, coexist. The analysis is correct, however I am concerned about the significant contribution the current version of paper can add to the existing literature.

In what follows I separately discuss some crucial points.

Major comments

- My main concern is that, although “research activity” seems the core of the paper, there is no interaction among universities (no competition) driving the choice of the research quality. In reality, funds are distributed according to a measure (i.e. REA in the UK) that depends on the ability of attracting good researchers. For instance, some English universities compete by opening also teaching vacancies to offer applicants with high impact factor less teaching load. In this model, instead, the existence of an *elite research system* doesn’t arise from an equilibrium analysis involving all the universities. In order to see a main contribution to this literature (clearly correlated to the funding policy) I would expect an endogenous strategic behavior for the universities. I would therefore expect that an *elite system* would arise from an equilibrium analysis when more universities compete on teaching and research quality (as the literature has done so far). In particular, Del Rey (2001) treats the issue in a model in which two universities compete in research and teaching and several types of equilibria arise, i) full-time teaching, ii) full-time research, iii) selective teaching plus research, and iv) mass teaching plus research. Moreover, Del Rey (2001) already shows how the government could affect the equilibrium level of research

and teaching by setting the parameters of the funding scheme. The same approach is used in De Fraja & Iossa (2002) where an *elite system* arises as equilibrium in a model in which two universities compete in setting the minimum ability level. In this paper, instead, the existence of an *elite system* simply comes from a budget analysis. (See also a recent working paper Grazzini et al. (2010)¹). When discussing the *research elite* scenario at page 12, the authors already admit the limit of their analysis by writing “*The explanation for the existence/sorting of the two groups lies entirely in differences in preferences over ω* ”). They therefore bypass the endogenous creation of the research quality (through competition) by differentiating the universities according to a weight each one exogenously assigns to its research. When the strategic interaction is ruled out, in order to have a main contribution, I would expect a deeper analysis *within* the university about how teaching and research quality are induced through incentives (more in line with the approach in Gautier and Wauthy (2007)) and therefore how the internal structure would change according to the funding policy. However, to have a potentially significant contribution in this second approach, the authors should compare the effects from different funding schemes.

- The results basically depend on two assumptions: *i*) the homothetic objective function with a constant slope (with its particular additive specification-see the last equation at page 8), and *ii*) decreasing returns to time spent on research. With a more general objective function it is likely that the *elite* wouldn't be obtained. The authors should clearly discuss these assumptions and provide some insights about what happens to their results if these assumptions were relaxed. The assumption *ii*) is necessary to make the LHS of the budget (4) convex. Although reasonable for easing the tractability, this makes the model less general. The authors should better motivate this choice and how it is in line with the reality. The results (especially in the Case A2 with the FLAT SCHEME) would change if increasing returns in the time spent for research were introduced (the budget curve would be concave). In particular, solutions q_2 and q_3 might not exist. When, in fact, γ is higher than 1, then β is lower than 1 and the curved budget line in the LHS of (4) is concave. Moreover, Case B could definitely collapse (no equilibria are found, because no reasonable range of q might exist-see Fig. A4 page 22). Instead of immediately ruling the Case B out from the analysis by writing “*this is not very realistic*” (note at page 11), the

¹ Università degli Studi di Firenze, Economic Department, working papers series n. wp2010_02

authors should stress that this Case could make the model not robust when the assumption of decreasing returns to time spent on research is relaxed. However, if they still think that this case is not realistic, they should at least spend a short discussion on why.

- However, even accepting all the assumptions the paper is based on, empirical evidence supporting of that should be provided (i.e. the assumptions in (1)). The paper, instead, is silent on that. Empirical evidence could better motivate the ex-ante exclusion of the Case B.
- There is no technical relation between research and teaching quality. Research affects teaching just in a quantitative way via the time allocation. A significant contribution could derive from the introduction of some relationship between these two factors. In this scenario, Case B might become interesting by providing an interesting counterintuitive result. For example, if funds for teaching didn't cover the gap between salary and the transfer for the research, the university could set a so high investment in research to enforce teaching quality (indirectly affecting the funds) regardless the level time spent on it. Post graduate courses (PhDs or masters) are an example. It is almost commonly accepted that most of the funds (i.e. for the business schools) are raised by post graduate degrees (like master's programs attended by international students) whose quality is strictly related to the characteristics of the research staff in charge for teaching. In such a new Case B an *elite* could be even stronger.
- In page 11, the authors should motivate why the university should chose ii) instead of i), since this choice leads to the core of the paper. Does the existence of at least one university preferring i) eliminate the *elite* case? The paper should have discussed this part to enforce its result.

Minor comments

- Abstract does not stress the contribution. I suggest a revision.

- The concept of “*research elite*” should be highlighted already in the introduction and not left in the note.
- I need to get the last part of the introduction to realize the contribution; this discussion should be moved in the first part. Also, the central part of the introduction should try to be a bit more precise on how the model technically works (at least give an idea of what “parameters” mean)
- Fig 1 seems wrongly drawn, I don’t see in the graph that the LHS of (4) is equal to w when $q=1$, it seems higher instead.