

**Report on Economics Manuscript No. 495**  
**“University Funding Systems: Impact on Research and Teaching”**  
**by John Beath, Joanna Poyago-Theotoky and David Ulph**

The authors explore the effect that higher education funding has on the trade-off between research and teaching. The budget constraint the universities face plays a crucial role in determining the kind of “culture”, defined as the emphasis placed on research and/or teaching, that emerges. The authors consider changes in the parameters (namely, the premium for and the marginal cost of research quality, as well as the threshold level of teaching quality) and show how different “cultures” arise.

The authors deliberately ignore the role of competition between universities and focus on the effect of the budget constraint on the choice of teaching and/or research quality. Universities are funded for both teaching and research, there is a minimum teaching quality and universities differ in the exogenous relative weight that is placed on research.

The authors show that, depending of the parameters of the public funding system, three possible equilibria result, which they denominate “research elite”, “flat system” and “binary divide”. The “research elite” corresponds to a situation with universities below and above, but no university close to, the quality funding threshold. The efficiency frontier (in terms of research and teaching quality) that allows this outcome to arise is non-convex with a kink at the quality funding threshold.

The analysis appears to be correct and it deals with a topical issue. However, I am not convinced about the significance of the contribution: I think that previous approaches to the analysis of teaching versus research in universities are more powerful. There are also aspects of the paper that I think could be improved and I include some suggestions to this end below.

To sup up:

- Many assumptions the authors make in the present paper deserve to be further justified, either appealing to empirical evidence or otherwise acknowledging clearly that they are made for tractability.
- Even accepting that the assumption of homothetic preferences does not affect the qualitative results (for instance, the emergence of the “research elite” case), I believe that the specific functional form (in particular, the curvature of the indifference curve in the research and teaching quality space) might affect the quantitative relevance of some cases. I conjecture that the distance with respect to the research quality threshold might be relatively small in some cases. I think that the authors could and should elaborate more on this issue.
- My main concern with the significance of the present contribution is the reliance on the assumption of exogenous different relative weights assigned to research by different universities. The authors stress repeatedly that in this paper the “culture” of the university system becomes endogenous. I somehow struggle with this assertion when the different equilibria result from the combination of exogenous changes in public funding parameters and exogenous weights assigned to research.

### *Major comments*

- I understand that the authors deliberately ignore the role of competition between universities to focus on an alternative mechanism: the effect of public teaching and research quality funding on the budget constraint that universities face. However, the authors are forced to assume heterogeneous preferences, expressed in terms of an exogenous relative weight  $\omega$  assigned to research, to obtain results in which different universities make different choices of teaching and/or research quality. I find previous contributions in the competition between universities literature, such as Del Rey (2001), more powerful than the present paper.
- The authors assume homothetic preferences “in the interest of analytical tractability”, and they further restrict their attention to the case in which the universities indifference curves in the research and teaching quality space are represented by straight lines with the slope depending on the relative weight attached to each of these two activities.
  - If the results are indeed more general, and extend to other non-homothetic but well-behaved functional forms, I would suggest the authors to stress this clearly in the text in addition to or in lieu of the mention “in the interest of analytical tractability”.
  - In relation to the “research elite” case (Figure 2) the authors emphasize that “surprisingly there will be no universities close to the quality funding threshold”: universities locate either below  $\underline{q}^0$  or above  $\bar{q}^0$ . This is correct but the use of the linear specification to illustrate the results is to some extent misleading. I believe that other functional form specifications, still within the homothetic family, might yield a smaller distance between  $\underline{q}^0$  and  $\bar{q}^0$ , since the distance would then depend on the curvature of the indifference curve. I would like the authors to elaborate with some detail on this point. Note that this assertion is made repeatedly - the fact that “no university is very close to the critical research funding threshold” is highlighted again in footnote 16 - and although it is true that no university will choose that research quality threshold in this case it is likely that some universities will get closer to it if there is a certain degree of curvature in the indifference curve.
- The authors assume diminishing returns to time spent on research. I understand the technical reasons why this assumption is made, yet I believe the authors should better motivate this assumption, for instance by appealing to empirical evidence (if there is any) or otherwise acknowledging that the assumption is basically made for technical tractability.
- The authors also assume that academics are paid a fixed salary, which is independent of research quality. I understand that the authors wish to ignore the possibility of incentives schemes, which have been considered in the literature (e.g. Gautier and Wauthy (2007)), but I believe that they could be more explicit about this at this particular point and, once again, either motivate the assumption by appealing to empirical evidence (if there is any) or otherwise acknowledging that the assumption is made for technical reasons.

- In the conclusions the authors highlight that the paper “seems to offer a theoretical framework for cross-country comparisons and for policy advice”. I have some reservations about the direct applicability to the data of a model where the heterogeneous exogenous preferences for teaching and research play such a crucial role.

#### *Minor details*

- In the abstract the authors refer to the “parameters” being varied. I think that they should be clearer about the nature of these parameters. This is somehow clarified in the introduction but I think that the abstract would benefit from a more precise description of what is meant by “parameters”.
- In the introduction the authors mention that relatively little attention appears to have been paid to the question of the link between what universities actually do, in terms of teaching and research quality, and the way in which they are funded. I understand that there is some research on the issue of teaching funding in isolation (e.g. Johnes (2007)).
- P.7, point [7]: I think that the authors mean no other “expenses” (other than the salary), instead of “sources of income”.
- P.9, Figure 1: I had some trouble understanding Figure 1. In the end I came to the conclusion that perhaps the figure should appear later, when the two cases are discussed, to facilitate the understanding of the general reader.
- P.11, footnote 10: “include” instead of “included”?
- P.12, last sentence before Figure 2: missing full stop.
- P.12, Figure 2, although the comment applies to most figures, including those in the Appendix: I would suggest the authors to pay attention to the size of the fonts, which currently vary.

#### *References*

- Johnes, G. 2007. “Funding formulae where costs legitimately differ: The case of higher education in England”, *Education Economics*, vol. 15(4), pages 385-404.
- The references to Del Rey (2001) and Gautier and Wauthy (2007) appear in the paper.