

Stay or Leave? Optimal Career Strategies in Academia

November 13, 2013

In some areas of sciences there are significant differences in wages paid in academia and in the private sector. However, for the private sector competencies acquirable in academia, in particular research and teaching skills, are of high value, directly, when a firm works in a related field, and indirectly, when these competencies are seen as a signal for talent and/or the ability to work hard. The present paper extends El Ouardighi et al. (2013), who studies how professors should optimally invest into research and teaching skills over the course of their career, by including the option to leave academia for the private sector. Thus, there are essentially three career scenarios for a scientist, which we consider: he or she could leave academia immediately, after some optimally determined time or never. In the resulting optimal control problem we approximate the gains of entering the private sector by a salvage value function. Applying numerical methods, by varying the parameters of this salvage value function, we are able to analyze the effect of complementary, substitutable and non-academic salvageable competencies on a professor's decision to leave academia.

It is not surprising that when gains of leaving academia significantly outweigh the advantages of staying, a professor will quit the job sooner or later. Also, when the private sector does not offer sufficient rewards, a professor will stay. For intermediate rewards of leaving, the decision on whether to leave or stay in academia as well as the efforts put into work, crucially depends on the initial competencies. Particularly, we can show that if wages in the private sector do not depend on academic skills, it is the less competent people who will leave academia. As it does not pay off to invest much into competencies, in such a scenario people with mediocre skills are strongly tempted to neglect work and simply exploit advantages of an academic job before leaving. People with low skills will quit immediately.

If the gains of leaving academia significantly increase with the competencies, the most competent people have the highest incentives to quit. Depending on whether the salvageable competencies are substitutable or complementary, a professor will either invest into his or her weaker skill before leaving or not at all. Figure 1 depicts a scenario where professors with low and high skills have the highest incentives to leave academia, and mediocre people will stay. Depending on the initial skills, a professor who will leave academia puts more efforts into his or her weaker competency. A professor planning to stay will invest the same efforts into research and teaching if these skills are equally valued at his institution.

In order to prevent the most competent people from leaving, universities might try to stronger reward skills. We show, however, that while improving the incentives to stay in academia might affect a professor's decision on whether to leave or not, if the poor working conditions at the institution do not support knowledge acquisition or preservation, competencies will inevitably fall and people will be mediocre at best in the long run.

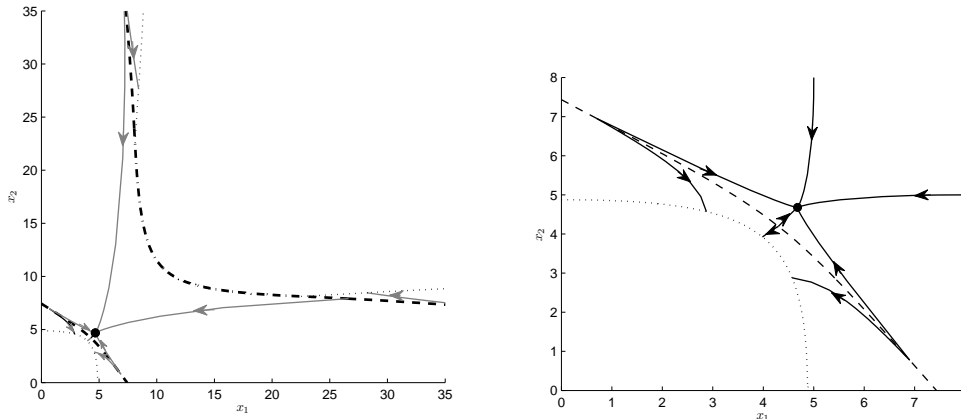


Figure 1: Phase portrait; the right panel is a zooming of the left; on the dashed line, the professor has the choice between leaving academia after some finite optimally determined time (at the dotted line) and never and approaching a steady state, on the dash-dotted line the professor is indifferent between leaving immediately or never.

Furthermore, we analyze the impact of spillovers between research and teaching on the decision to leave. We are able to show that if the academic job allows such spillovers, people are more likely to stay in academia. The reason for this is that high spillovers make it much easier for incompetent people to acquire and for highly skilled people to keep rewarding academic skills.

The results we gain are not only interesting from an application point of view, but also methodologically. By comparing finite and infinite time horizon solutions, see also Caulkins et al. (2010) for more information on this approach, we are able to derive indifference curves in a linear-quadratic two-state model, in some cases even analytically. We apply numerical methods to find curves, where for certain initial state values one has the choice between quitting academia immediately or never, and between leaving after some optimally determined time and never.

There are several possibilities for extensions: Within a multi-stage framework, one could formulate and study the optimization problem of the professor after leaving academia. Furthermore, many academicians are confronted with rigorous evaluations of their work. Thus, it would be interesting how the timing and frequency of review processes affect the efforts put into one's work particularly under the threat of having to face severe consequences by negative evaluations. Another important extension would be to consider a dynamic game between the professor and the dean, who might have different preferences with respect to teaching and research efforts. Furthermore it would be interesting to study how annoying but necessary administrative obligations affect academic careers. One could also explicitly model effects of aging and thereby gain insights about its impact on academic achievements and the decision to pursue a career in the private sector.

References

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