



Student and worker mobility under university and government competition ☆☆☆



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ABSTRACT

We provide a normative analysis of endogenous student and worker mobility in the presence of diverging interests between universities and governments. Student mobility generates a university competition effect which induces them to overinvest in education, whereas worker mobility generates a free-rider effect for governments, who are not willing to subsidize the education of agents who will work abroad. At equilibrium, the free-rider effect always dominates the competition effect, resulting in underinvestment in human capital. This inefficiency can be corrected under exogenous university budgets if a transnational transfer for mobile students is implemented. With endogenous income taxation, under the non-cooperative equilibrium between governments, the combination of the free-rider effect and fiscal competition leads to underinvestment in both teaching and research. Furthermore, the transnational transfer no longer restores efficiency. Instead, it can reinforce fiscal competition and imposes a tradeoff between research and human capital.

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1. Introduction

Over the last decade, the international mobility of students has drastically increased. While for the year 2000, the world counted around 2.1 millions mobile students, this figure has increased up to 4.3 millions in 2011.¹ This phenomenon has increased the competition between institutions of higher education, and has brought new challenges for policy makers. Indeed, in the global economy, skilled labor has also become increasingly mobile, so that governments funding higher education do not necessarily reap its benefits at the national level. A crucial question in this context is that of the net impact of both student and worker mobility on university funding, higher education quality and research production.

This paper provides a normative analysis of endogenous student and worker mobility in the presence of diverging interests between universities and governments. Individuals differ in their ability to transform education into human capital, and in their preferences for living in a

specific country and for consumption. Universities compete internationally and seek to maximize their prestige, or excellence, which depends on the quality of their teaching and their research output. Governments set the funding schemes of their universities and the level of labor taxes so as to maximize national output, which is a function of the stock of human capital active in the country and of the research output of their university. The two types of mobility affect governments and universities in different ways. On the one hand, the international mobility of students expands the size of universities' markets, which gives them incentives to raise their teaching quality. This positive effect of student mobility on human capital production is called the competition effect. On the other hand, worker mobility affects governments, which care about the stock of human capital which contributes to the nation's economy. This other type of mobility affects the governments' incentives to finance human capital formation, yielding a negative free-rider effect. Also, there is a discrepancy between the interests of universities and governments which has not been considered in the literature so far. This is however an important point, since the impact of worker and student mobility on local and global economies is a hotly debated policy issue.

We present a two-country model in which we first identify the first best combination of human capital and research production under exogenous taxation and university budgets. We then compare this allocation to that obtained under various types of governance, namely (i) a supranational entity managing the funding of higher education of both countries, (ii) two governments non-cooperatively defining their respective university funding, (iii) government competition with the regulation of a supranational entity. In the first case, the coordination of government policies allows to control university competition, and

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¹ Organization for Economic Co-operation and Development (2013), Education at a Glance 2013. Paris: OECD.

leads to the first-best provision of human capital and research despite the free movements of students and workers. In the second case of government competition, governments do not fully internalize the positive externalities of funding human capital production. As a result, they incite universities to underprovide human capital compared to the socially desirable allocation. In other words, the free rider effect always dominates the competition effect, at the expense of education quality. This inefficiency can be mitigated in the third case, where a transnational entity enforces inter-government transfers for mobile students. This transfer must cover the costs induced by mobile students and the externality generated on the other country's stock of human capital.

We then reproduce this analysis while endogenizing the size of university budgets, which are financed by taxes on workers.² Compared to the first best with endogenous budgets, a supranational entity managing university funding and taxation for both countries – case (i) – is able to reach the first best allocation, i.e. an optimal budget size for universities, and an optimal combination of human capital and research production. In the case of non-cooperative governments, worker mobility generates fiscal competition, reducing available budgets for universities. This effect exacerbates the underproduction of human capital, but also leads to underprovision of research. Finally, the introduction of a transnational transfer always mitigates the free-rider effect, but fails to solve the underfunding of universities. Under some conditions, we show that the transfer, which increases the total stock of human capital produced by the two countries, strengthens fiscal competition and reduces university funding. Since funding decreases while the costs of human capital production increase, the transnational transfer has a dual negative impact on the production of research. In this case, the transnational transfer therefore imposes a strong tradeoff between human capital and research production.

1.1. Related literature

Two important and opposite effects of mobility on the incentives faced by higher education providers and governments are salient in the literature.

On the one hand, following the increase in student mobility, universities tend to engage in quality competition in order to attract mobile students. This effect is known as the competition effect and has been highlighted in a large variety of models in combination with admission standards (del Rey, 2001), tuition fees (Kemnitz, 2005; Demange et al., 2008; Lange, 2009) and multicultural skills (Mechtenberg and Strausz, 2008) among others.

On the other hand, worker mobility has two adverse effects on governments. The first one is that it may induce governments to set labor taxes to inefficiently low levels (Poutvaara, 2000, 2001) due to Tiebout competition. The second effect of worker mobility is that it reduces the incentives of governments to subsidize higher education. Free-riding is widely acknowledged in this context (Justman and Thisse, 1997, 2000; Poutvaara, 2004, 2008; Chevalier and Gerard, 2008).

Recent contributions have attempted to assess the combined impact of the opposite effects of free-riding and competition on higher education quality (Kemnitz, 2005; Demange et al., 2008; Mechtenberg and Strausz, 2008; Lange, 2009). Demange et al. (2008) highlight that, in a fiscal competition context, free-riding can be attributed to worker mobility while competition is driven by student mobility. In this sense, they argue that the Bologna process can help the latter effect to balance the former.

To the best of our knowledge, Lange (2009) was the first to develop a setting accounting for both student and labor mobility by extending the

model of Justman and Thisse (2000). In opposition to our results, he shows that overinvestment in higher education may result if mobile students are likely to settle in the host country as workers. Krieger and Lange (2010) also account for both types of mobility and focus on government competition with two instruments, namely labor taxes and student subsidies/tuition fees. The differences with our model are the following. The instrument used by governments at the higher education level is student amenities rather than education quality, which is considered here as exogenous. There is no research production and, as in all contributions to this field, governments and universities are the same agent. In line with our results, they show that student mobility reduces net revenues because of the intensification of tax competition.

Mechtenberg and Strausz (2008) is one of the closest contribution to ours. In their model, higher education is publicly provided, but unlike our model, the government directly makes the decision regarding the teaching quality offered. The extent of student mobility is defined in their paper by a threshold on the minimal ability of prospective students required to study abroad. Policies aimed at promoting student mobility such as the Bologna process are considered to lower this threshold. The government maximizes social welfare, taking account of externalities generated by foreign students who settle in the country as workers. The magnitude of this externality is the driving force determining the net effect in the trade-off between competition and free-riding effects. When externalities from mobility are low, teaching quality is decreasing with mobility. In this case, free-riding dominates the competition effect and quality is suboptimal. When externalities are large however, there is overinvestment in quality. In this model, as clearly appears from the results mentioned above, there is a partial effect by which a higher mobility weakens the competition effect, thereby reducing quality. This effect is somewhat counterintuitive since we would expect the competition effect between universities to be stronger under high mobility, as generally acknowledged in the literature. This effect is due to a composition effect, which stems from the assumption that increased mobility always comes at the cost of a lower average ability of students. This reduction in average ability in turn reduces the magnitude of the competition effect, leading to a decrease in quality. This assumption is not made in our model; instead we assume that all students are capable of studying abroad, but only those with sufficient multicultural skills will do so. Summing up, our model differs from that of Mechtenberg and Strausz (2008) in the following aspects. We consider governments and universities as distinct entities, governments face a budget constraint (further with endogenous taxes, which also leads to endogenous worker mobility), and universities produce both human capital and research. The first distinction between both models is already sufficient to produce a major difference in our results. Indeed, the fact that governments and universities are distinct entities, and that governments act as the principals of universities implies that governments distort the incentives of universities to provide teaching and incite them to favor research production. In other words, the free-rider effect faced by governments always dominates the competition effect faced by universities.

Let us discuss two additional topics raised by the literature which are related to the interaction between mobility and the provision of education quality.

First, the interaction between the provision of education quality and mobility calls for a clear definition of mobility. Indeed, quality provision is affected both by student and worker mobility. More precisely, it depends on the net flow between the two, that is, the flow of mobile students returning to their country to work, as well as the number of individuals who studied in their home country but went to work abroad (Justman and Thisse, 1997, 2000; Lange, 2009; Demange and Fenge, 2010). The sizes of these flows, which affect the magnitude of the free-riding effect, are captured in our model by the potential correlation between individual characteristics. For instance, if agents whose human capital formation strongly benefits from studying abroad (i.e. students

² This specification adds to the limited number of papers addressing government competition with multiple instruments, so far in the form of education subsidies and labor taxes (Wildasin, 2000; Andersson and Konrad, 2003; Haupt and Janeba, 2009; Krieger and Lange, 2010). In addition to these papers, we treat governments and universities as distinct institutions and represent their interaction by a principal agent relationship.

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