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The effectiveness of access restriction to higher education in decreasing overeducation

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ABSTRACT

This paper presents a theoretical analysis of the effectiveness of restricting access to higher education in order to decrease overeducation. Agent-based simulation is used as the modelling method. Agents represent secondary school graduates who may choose to get tertiary education. Their willingness to continue studies depends on the share of their friends with tertiary education. There are high-qualified and low-qualified jobs in the labour market; the former require higher education. Tertiary-educated agents employed in low-qualified jobs are overeducated. There are also two types of agents, one of which will not be hired for a high-qualified job even if they graduate from university because they lack personal characteristics important for success in high-qualified jobs. The simulation is used to analyse the impact of government's decision to restrict the number of university entrants. This is compared to an alternative of accepting all students who want to study. Restricting access to university successfully decreases the overeducation rate. Social-network effects distort the theoretical equality between the relative drop in overeducation and the restriction size. In some scenarios, restricting access is efficient: it decreases overeducation more than expected. The study stresses the importance of admission tests as an alternative to a general admission ceiling.

1. Introduction

Overeducation, the state in which an individual has more education than required to do his or her job, is a growing concern among labour economists. This is corroborated by recent interest from the OECD (Quintini, 2011) and ILO (International Labour Office, 2013). Empirical findings show that, compared to the individuals working in positions that match their education level, the overeducated face negative consequences from being in this state. They earn less than the matched (Groeneveld and Hartog, 2004; Rubb, 2003b; Hartog, 2000), and their wages grow slower (Groeneveld and Hartog, 2004; Korpi and Tåhlin, 2009). They also can become uncommitted to their workplace without enough career opportunities (Blenkinsopp and Scurry, 2007), are more likely to look for other jobs (Wald, 2005), and never are more satisfied with their jobs than the matched (Tarvid, 2012).

It is tempting to assume that overeducation plays a positive role for individuals who compensate their lack of experience by achieving a higher level of schooling and, while temporarily overeducated, they would progress through the career ladder faster. While there is some support for that (Dekker et al., 2002; Groeneveld and Hartog, 2004), other studies show that

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overeducation is not a "stepping stone" but a problem which persists over time (Baert et al., 2013; Frei and Sousa-Poza, 2012; Kiersztyn, 2013; Rubb, 2003a).

Various solutions to the problem of overeducation have been suggested in the literature. Some researchers propose to restructure the economy to take advantage of the large supply of university graduates (Murillo et al., 2012), thus, reshaping the labour market to fit whatever the education market outputs. Others propose reshaping the education system to fit whatever the labour market demands (Guironnet and Peypoch, 2007) by, e.g., increasing the selectivity of access to universities or motivating students to choose educational tracks that fit with employers' demands (Cainarca and Sgobbi, 2012). Still others propose improving the link between the education system and the labour market (Budría, 2011), thus, changing both systems to fit each other.

The fastest and simplest, and thus, most appealing, solution could be restricting access to higher education. The reasoning might be that because there is an obvious excess supply of tertiary graduates, the government should bring that supply in line with demand. It is, however, not obvious that this is the best solution, and whether it is a good solution at all.

In this paper, I study the effectiveness of this policy in decreasing overeducation and consider the potential side effects of the policy. I simulate the choice of studying at university and subsequent employment chances. The decision to continue to tertiary-level studies depends on the composition of an individual's social network. Because analytical methods are not applicable to the analysis of models where the dynamics depend on social networks, I use agent-based modelling as the study method. I then study how system behaviour changes if the government creates a ceiling to the number of admissions to university and compare its behaviour to the situation where all applicants continue to be admitted.

In the next section, I briefly describe the theoretical view of overeducation. After that, in Section 3, I specify the agent-based model. Section 4 presents the mathematical analysis of a simplified version of the model without social network influence. Section 5 then discusses the parameter values chosen for simulations and Section 6 presents the results. Section 7 analyses the sensitivity of the model results to alternative parameter specifications. The final section concludes.

2. Theoretical aspects of overeducation

Mismatches between job requirements and an individual's education, qualifications and/or skills represent an inefficiency of the labour-education market system. By employing overeducated workers, firms are not fully utilising their productivity, while, by employing undereducated workers, firms are employing less productive workers than they should do and, hence, are operating below their productive frontier.

There are two groups of theories that explain the presence of overeducation (and other related types of mismatch). They mainly differ in their assumptions regarding the functioning of the labour market.

Theories belonging to the first group assume that the labour market is a perfect market, and that it is able to quickly correct any imperfections itself. The human capital theory (Becker, 1993) assumes that firms assign the job and wage to the worker in accordance with the worker's marginal product, which depends on the education and training received by the worker. If the firm has overeducated workers, it may change its production processes to reap the full benefits of their skills and provide training to other workers. Otherwise, the overeducated are paid below their potential marginal product and move to more appropriate jobs. If the worker remains at the current job, it is argued that there is a perfect match between the worker and the job, but the apparent mismatch is a result of imperfect measurement of the extent of match between the worker and the job, or *unobserved heterogeneity* of seemingly similar jobs and workers. A similar argument is behind the *job (career) mobility theory* (Sicherman and Galor, 1990; Sicherman, 1991), which postulates that overeducation is a short-term phenomenon, arising because workers agree to spend some time in mismatched positions in order to accumulate the right amount of skills to become matched. As already discussed in the introduction, however, often, overeducation persists for longer than assumed by this theory.

Theories from the second group assume that the labour market is imperfect and that mismatch is a persistent market failure. These theories then differ in their explanation of the reason for this failure. The *job competition theory* (Thurow, 1975) argues that because formal education is a good proxy for the amount of training needed for the job candidate to reach required productivity, firms are more likely to employ individuals with higher levels of education in order to minimise investment in training. Hence, all individuals are motivated to attain higher levels of schooling, because it increases their chances of obtaining employment. The *signalling theory* (Spence, 1973), however, posits that simply attaining a higher level of education might not give as strong a signal about the worker's potential productivity if it is easy for everyone to attain similar, high levels of education. If this is the case then individuals will search for education that signals their high productivity in the best possible way. This is only possible when the costs of this education (both monetary and non-monetary) are negatively correlated with their productive capabilities. According to the *assignment theory* (Tinbergen, 1956; Sattinger, 1993), the actual productivity is the maximum of the worker's productivity and the productivity of the job (depending on its complexity, technology etc.). In this view, mismatch may arise due to (1) errors in the complex assignment process (Büchel, 2001), (2) an imbalance between the supply of and demand for individuals with different skills (Quintini, 2011), but also (3) because there are some factors that compensate for the negative effect that mismatch has on the individual (Ortiz and Kucel, 2008)—an argument with the unobserved heterogeneity logic. The *technological change theory* (Mendes de Oliveira et al., 2000) explains the long persistence of workers with different qualifications in similar positions by the willingness of firms to hire new workers with better qualifications due to technological change combined with the inability of firms to change the whole workforce immediately.