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Using longitudinal data to evaluate publicly provided formal education for low skilled

Anders Stenberg*

SOFI, Stockholm University, SE-106 91 Stockholm, Sweden

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ABSTRACT

Modern societies would potentially reap large benefits from upgrading low skilled's education. However, this is difficult to put into practice because employers are reluctant to train low skilled and because low skilled are unwilling to participate. To circumvent this potential market imperfection, a large supply of formal education in Sweden is complemented with the eligibility of enrollees for financial support. This study uses detailed data on Swedish siblings aged 24–43 in 1994 to evaluate the impact on annual earnings. The estimated average return was 4.4% in 2004. Calculations indicate that this is barely sufficient to cover society's total costs.

1. Introduction

Empirical data indicate that the incidence of training among the employed in many countries is between 25 and 50% per year (OECD, 2004, 2006), but it is also reported that such training is typically short in duration and mainly involves high skilled workers (e.g. Arulampalam, Booth, & Bryan, 2004; Brunello, 2003). This partly reflects employers' preferences to invest in already productive individuals, but also the unwillingness of low skilled individuals to participate because of financial constraints and/or a perception of low quality and low marginal returns to training (OECD, 2003, 2006; Oosterbeek, 1998). If this represents a market imperfection, a potential remedy is to publicly provide formal education, i.e. schooling that is integrated into well-known, structured and certified programs for which adult participants are eligible for financial support. This would alleviate financial constraints, improve the quality of training and (information on) the returns and circumvent employers' reluctance to provide low skilled workers with training.

The purpose of this paper is to provide an evaluation of the earnings impact of completed formal education among low skilled adults, defined as those ineligible for tertiary education and between the ages of 24 and 43 in 1994. The study is based on population register data from 1990 to 2004 for Sweden where there has been a considerable public supply of adult education (henceforth AE) at the compulsory, upper secondary and tertiary levels.[1] Other institutional features in Sweden also enhance the demand for AE. Enrolment in education is free of charge and participants are eligible for financial support

* Fax: +46 8154670.
E-mail address: anders.stenberg@sofi.su.se

[1] Although population data on AE registrations exist since 1979, this study focuses on enrollees from 1994 because this is the earliest year for which data on grades and credits completed are available.

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that is sufficient to cover modest living expenses. Workers are also legally entitled to take (unpaid) study-leave and to afterwards be reinstated with the same terms of employment. According to standard theory, enrolment in education depends on whether the expected present value of the benefits exceeds the costs of enrolment. Skill upgrading is therefore more likely if the expected returns to AE are relatively high and/or the expected opportunity cost is relatively low. In the case of AE, the decision to enroll (or not to enroll) is made repeatedly over time, and the expected benefits and costs may be sensitive to changes in various underlying factors such as relative wages, borrowing constraints, individuals' preferences, health, the individual's discount rate, new information, business cycle variations and structural changes.[2] Consequently, an individual's decision to enroll in AE is related to how the expected net present value varies over time. To take into account any systematic differences between participants and non-participants, a non-experimental empirical strategy is applied that relies on estimates from difference-in-difference-in-differences (DDD) models. Regressions include controls for pre-treatment earnings trajectories as well as for sick leave transfers, early retirement pensions and social welfare benefits to reflect health status and labor market marginalization. Within this framework, the variation between siblings is also explored to (*i*) generate a comparison group which to a greater extent overlap the treated in terms of both unobservable and observable characteristics, and to (*ii*) introduce family fixed effects that control for permanent family background characteristics.

Of earlier studies, the only peer-reviewed empirical analysis of the earnings effects of AE in Sweden is Stenberg and Westerlund (2008). They found large beneficial effects for a sample of long-term unemployed (365 days of full time unemployment in both 1996 and 1997), on average 14% for males and 23% for females, but with point estimates decreasing for those remaining in AE the longest. As will be shown later, these results were highly influenced by the sample of the study and, in fact, other evaluations with Swedish data have reported conflicting findings. Albrecht, Van den Bergh, and Vroman (2004) found, for very small samples, no statistically significant earnings effects while Ekström (2003) reported negative effects for males and no significant effects for females.[3] These studies were all based on difference-in-differences (DiD) estimates, involved participants aged 25–55 and used binary variables to indicate AE registration at the compulsory and upper secondary levels. None of the studies included information on completed course credits or further education at the tertiary level. This is in contrast with the present study and also with earlier studies from the US on community colleges, mainly involving education at the tertiary level. The US studies provide estimates of the proportional returns to AE, which are comparable to percentage estimates presented in the returns to schooling literature. However, these studies generally examine individuals returning to college after only a few years of work experience (Leigh & Gill, 1997; Light, 1995; Monks, 1997). The only peer-reviewed studies that consider prime aged adults in the US are those of Jacobson, LaLonde, and Sullivan (2005a, 2005b). They analyzed a sample of laid-off workers aged 20–59 in Washington State, including 16,000 participants in community college. With access to data on quarterly earnings for at least three years before and four years after displacement, they employed individual-specific fixed effects estimates. Jacobson et al. (2005a) reported that a year of studies was associated with a 9% earnings gain for men and a 13% gain for women, a payoff that they found covered the costs incurred by society. Jacobson et al. (2005b) focused on the part of the sample aged 35 or above and found similar returns; a 7% increase for males and a 10% increase for females. Compared to the present study, a major difference is that community college participants in their sample had no public financial support apart from subsidized tuition fees. Moreover, 90% had at least a high school degree and about 50% had completed some college earlier in life. Thus, their results are not necessarily applicable to low skilled or to a situation where study allowances decrease the opportunity costs. One may also expect that the returns to AE are lower in European labor markets which, compared with the US, are characterized by more compressed distributions of wages and skills (e.g. Harjes, 2007; IALS, 2000).[4]

The contribution of this study is to assess the economic consequences of the AE policy in Sweden. This is achieved by analyzing longitudinal data for 1990–2004 that include completed course credits, annual earnings and detailed controls for selection. The main finding is that a year of AE on average increases annual earnings. The preferred model specification yields an estimate of a 4.4% increase by 2004, which implies that skill upgrading improves the employability and/or the wages among low skilled. However, calculations indicate substantial costs to society such that the private benefits only roughly cover the total costs. The implication is that, to make a convincing case in favor of an extensive AE policy, there must be non-trivial social returns which exceed the private returns. While the required level of social returns is theoretically feasible, the existing empirical evidence of social returns to education through e.g. production externalities, democracy and health is only suggestive. Foremost, the results call for a balanced discussion of AE as they partly question the inherent optimism expressed by e.g. the OECD (OECD, 2004, 2006) and the European Union's Lisbon strategy for growth and jobs (EU, 2007, 2008).

The plan of the paper is the following; the next section briefly outlines the role of AE in Sweden. Section 3 contains a description of the data and Section 4 presents the

[2] Altonji (1993), Iwahashi (2007), Killingsworth (1982), Sjögren and Sällström (2002), Wallace and Ihnen (1975), Warner and Pleeter (2001) and Weiss (1971).

[3] A detailed reconciliation of the results is found in the working paper version of this article, Stenberg (2009).

[4] Other Scandinavian countries and Germany have AE-like policies that have not been evaluated. In continental Europe (except Germany), public provisions of formal education for adults seems practically non-existent. Studies in the UK have dealt with increases in competence level (NVQ) achieved by attending courses and/or through performing new tasks at one's current job. They typically report no increase in earnings (Jenkins, 2004; Jenkins, Vignoles, & Galindo-Rueda, 2003; Silles, 2007).