Upgrading Low Skilled Adults;
Is Public Provision of Formal Education a Sensible Policy?

Background

- SBTC - Adjustments in skills demanded favors high skilled (Katz & Murphy, 1992, Acemoglu 2002, Autor *et al*. 2008)

- Upgrading low skilled - potentially large gains to society (employment, growth, health, democratic effects).

Empirical data:

- Incidence of adult training in many countries between 25 and 50 per cent.
- Foremost high skilled receive training
- Training is of short duration (insufficient (?) for “upgrading”)

Documented “obstacles” to upgrade low skilled workers:

1 Employers prefer to train high skilled workers.

- Low skilled unwilling to participate Oosterbeek (1998), OECD (2003)
  2 a perception of low returns and/or low quality
  3 financial constraints

If there is a market imperfection, potential remedy:

(1) Public provision of
(2) formal education
(3) with financial support for participants.

- In most OECD countries, only marginal investments are made

Reasons for governments to be reluctant:

- Potentially overwhelming costs in terms of foregone production value.
- Literature evaluating ALMPs contains little support for large investments.

- However, scant literature on the returns to formal education for low skilled.

- The present paper seeks to address this gap.

Purpose

- Evaluate the earnings return of formal education for low skilled adults.
- Costs and benefits? Present necessary assumptions for benefits to cover the costs (efficiency).
- A clear result, in any direction, has potentially important implications for how governments should invest in low skilled.

- Sweden a suitable country for the analysis

  - Register data 1990-2004, including accomplished AE, compulsory, upper secondary and tertiary level.

  Institutional setting

  - mandatory for municipalities to supply AE (comp + upper secondary).
  - study allowances to cover modest living expenses (€800/month).
  - legal right to be on leave for studies and be reinstated.
  - public supply of AE attracts app. 2% of the labour force each year.

Earlier studies;
Does AE have positive effects on earnings?

Sweden (samples aged 25-55)

- Ekström (2003) — No
- Albrecht, van den Bergh, Vroman (2004) — Maybe.
- Stenberg and Westerlund (2008, Lab Ec) — Yes (LTU).

Drawback – implications(?), AE measured as 0/1.

US (aged 20-59)

- Jacobson, Lalonde, Sullivan (2005a, J of Econometrics, 2005b Ind & Lab Rel Rev).

Proportional returns (cfr returns to schooling literature), M: 9 % F: 13 %

Major difference; no financial support for participants.
50 % some college, more than 90 % a high school degree.

Present study

- Measuring AE directly allows estimates of the proportional returns. Comparable to the returns to schooling literature.

  1) sample ineligible for tertiary education at the outset.
  2) aged 24-43 in 1994 [data 1990-2004]

- Identification strategy; DDD and family fixed effects.

Main results

- Estimated average earnings return 4.4%

- Reconcile conflicting evidence from earlier studies (time horizon, sample)

- Cost benefit analysis:
  Direct costs (facilities, teachers, allowances) are covered within 9 years.
  Approximate calculations of FPV indicate: total costs ≈ total benefits.

  Reservation:
  - Unmeasured effects (democracy, health, growth etc) assumed zero

Educational system in Sweden

- 9 year compulsory school
- Upper secondary school; 2 or 3 years
  - 2 year programs mainly vocational
  - 3 year programs mainly theoretical
- Higher education

- Municipalities by law obliged to offer AE;
  - higher education available in roughly 30 cities (in a pop. of 9m)

  - All educ is free of charge,
    study allowances of app. €800/month
    (2/3 is a loan with favorable conditions).

Data

- Individuals aged 24-43 in 1994, with 2-year upper secondary school or less.
- Immigrated to Sweden aged 7 or above is excluded.
- Registered in AE 1979-1993 excluded (continuous decision; all treated and non-treated decided not to enroll AE prior to 1994).
- Sibling sample; participants who have siblings with identical parents.

  (population sample as reference)

Evaluation design

Treated: first time AE enrolees 1994-1995.

Comparison group: no AE before 1996.

Sibling sample:

13,021 treated

19,335 untreated siblings

(population sample of 29236 / 781885 individuals)

- Average years of AE among treated: 1.22.

Compulsory level	(9th)	.06 years	(28 % registered)
Upper secondary	(10-12)	.68 years	(81 % registered)
Tertiary level	(13-	.47 years	(24 % registered)

Figure 4. Distribution of completed AE 1994-2003, treated of the population sample.

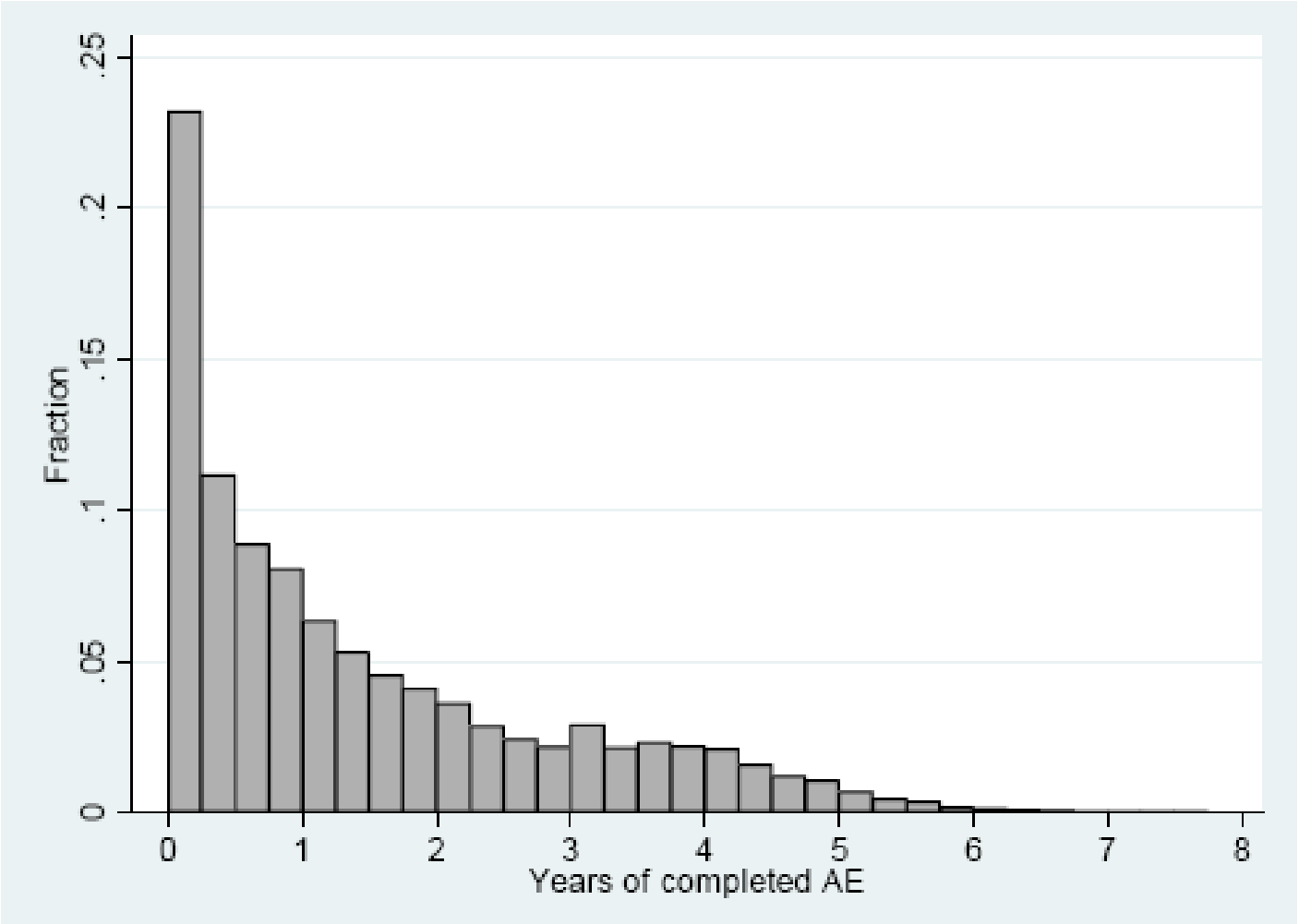
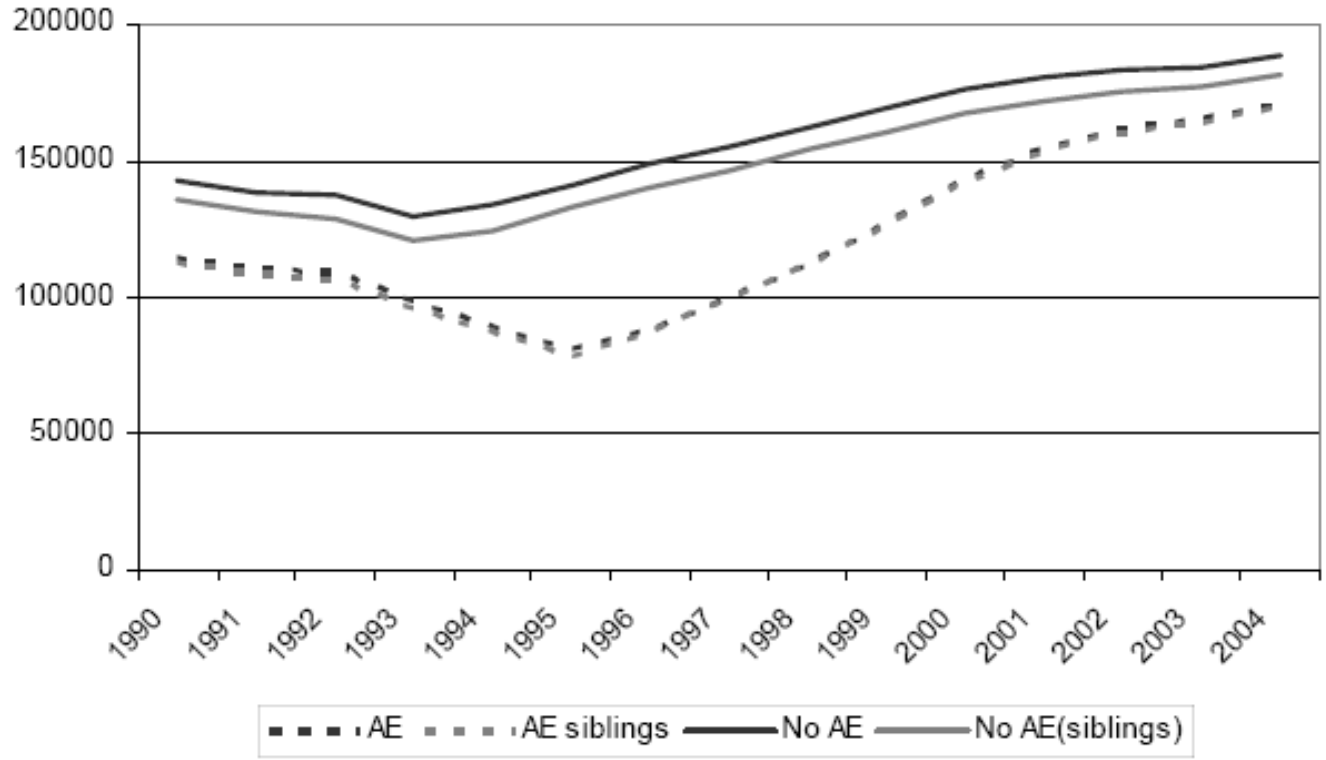


Figure 2. Annual earnings of the population sample and sibling sample; treated and control groups.



Note: SEK 2004 prices, € 1 is approximately SEK 9.70.

- 45% reg after 1998, 22% after 2001
- Fraction reg every year 2001-2004 only 2.8% (traffic in and out)

Table 2. Annual earnings of treated and control groups.

Annual earnings, SEK 2004 prices in thousands.
Percentage earnings change is measured with the average 1990-1992 as the base.

	Average 1990-1992	**1999**		**2001**		**2004**	
Population sample							
AE	111.2	126.6	13.8%	154.9	39.2%	171.2	53.9%
Controls	139.4	168.8	21.1%	180.7	29.6%	188.9	35.5%
Sibling sample							
AE	109.1	126.4	15.9%	153.2	40.5%	170.3	56.2%
Controls	132.3	159.9	20.9%	171.5	29.6%	181.4	37.1%

Regression model, individual *i,* family *j*:

$$\Delta Y_{ijt+} = \alpha + \beta' X_{ijt-} + f_j + \gamma(D_{ijt} * E_{ij}) + \varepsilon_{ij} .$$

1. Outcome is based on annual earnings *Y* and defined as: $(Y_{2004} - (Y_{1992}+Y_{1991}+Y_{1990})/3)$

2. Pre- and post-enrolment denoted *t*- and *t*+

3. X_{ijt-} includes e.g. earnings ∆earnings 1990-1992, various transfers f_{ij} captures permanent family background characteristics.

4. D_{ijt} = 1 if first enrolment in AE occured 1994-1995, otherwise $D_{ijt} = 0$, E_{ij} is continuous measure of AE.

Table 5. Estimates of earnings effects of AE (SEK 2004 prices).

Dependent variable: Earnings difference $\Delta Y_{ijt+} = (Y_{2004} - (Y_{1992}+Y_{1991}+Y_{1990})/3)$

	Population sample		**Sibling sample**		**Sibling sample**	
Proportional effect ($D_{ijt}*E_{ij}$)	6465***	3.7 %	8699***	5.0 %	7734***	4.4 %
	(329)		(574)		(717)	
Including f_j	No		No		Yes	
	Males		**Brother sample**		**Brother sample**	
Proportional effect ($D_{ijt}*E_{ij}$)	4507***	2.1 %	5423***	2.5 %	4810***	2.3 %
	(624)		(1427)		(1803)	
Including f_j	No		No		Yes	
	Females		**Sister sample**		**Sister sample**	
Proportional effect ($D_{ijt}*E_{ij}$)	7434***	4.7 %	8997***	5.8 %	7979***	5.1 %
	(342)		(855)		(1079)	
Including f_j	No		No		Yes	

Notes: *** significant at the 1 % level. ** at the 5 % level. * at the 10 % level.
All specifications include X_{ijt-}. Percentages express the coefficient value in relation to average earnings in 2004 of the respective treated samples with non-zero accomplished AE.

Lack of overlap with comp from pop sample ↓
Exclude singeltons↑

Costs and benefits – baseline assumptions

- Benefits assumed on average 2.3 % (m) and 5.1% (f).
- Individuals work until 65 years old
- A 3 % discount rate

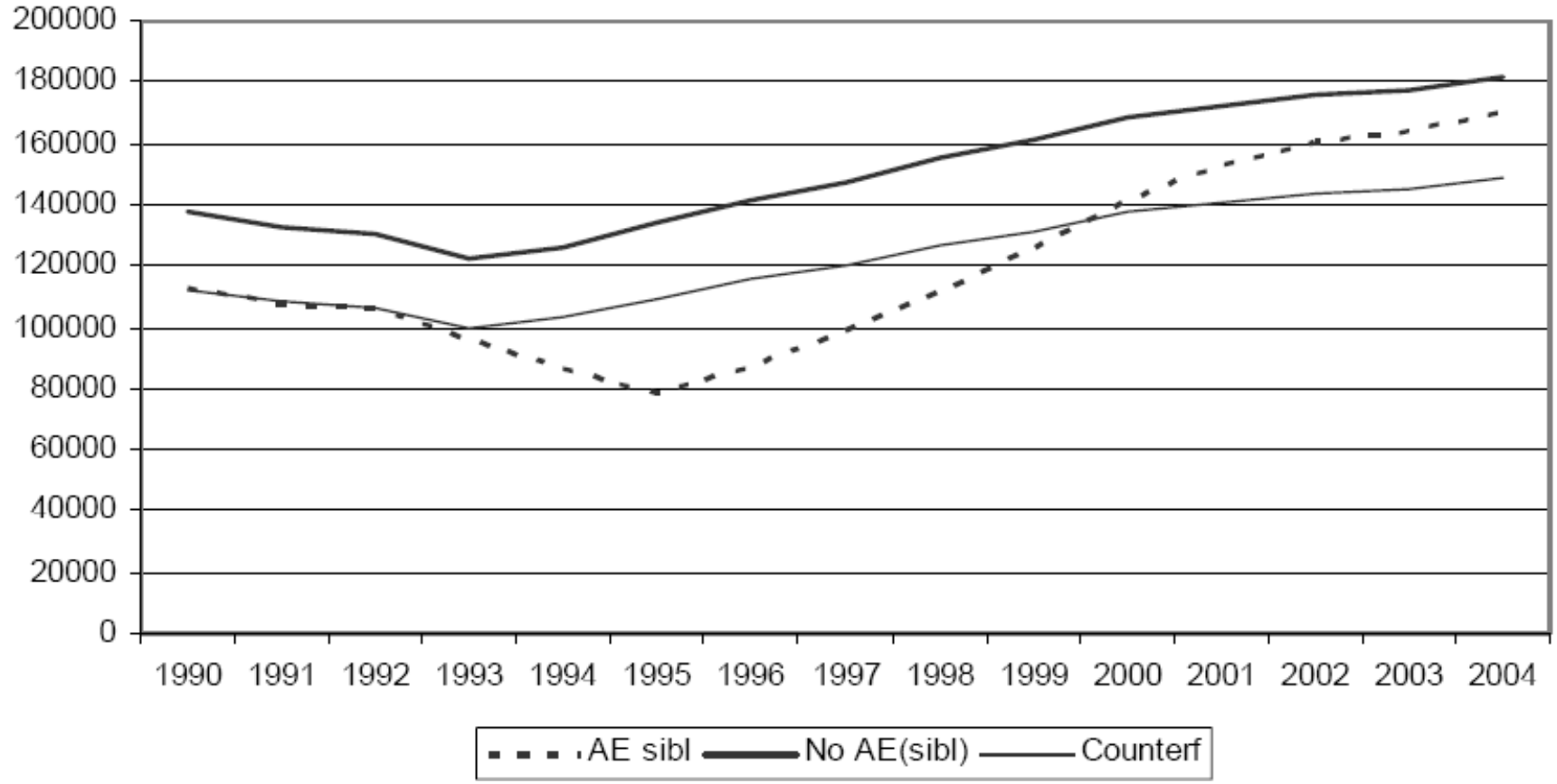
- Direct costs; given by public authorities, multiplied by average *registrations*.

- Indirect costs; foregone production value (FPV) = foregone earnings.
- Social returns = private returns, other effects of AE are assumed zero.

- The private returns cover the direct costs within 9 years.

- “Naïve” FPV (to be explained) increases the costs by 250 %. (incomplete records of registrations in higher education)

Figure A.3. Annual earnings of AE enrollees 1994-95, control group and hypothetical foregone earnings of participants had they not enrolled.



- Using the naïve FPV, the private benefits only cover **61%** of total costs by the time the youngest cohort retires.

- Calculations are stable (+/- 5%) to changes in:
  - the discount rate by +/- 1%.
  - length of working life +/- 2 years

Reservations: 1) naïve FPV overstates costs if AE enrollees are replaced

2) returns underestimated if social returns > private returns

1) Costs overestimated

- FPV is overestimated if absence caused by AE is followed by increased working hours among non-treated.

  Prob of replacement < 1, upper bound .70 (=empl rate)

- If **prob of replacement is .54**; benefits break even with the costs.

  Deadweight loss (.20 or .50) stretches necessary assumptions for private returns to cover total costs (**.62** or **.74**).

- Covering the costs is only a necessary condition – not sufficient

2) Returns underestimated

With the naïve FPV, costs and benefits break even if returns to society exceed private returns by a factor **1.63** (app. 6.3% instead of 4.4%).

Unmeasured effects – improved democracy, growth, health, externalities, labour market outcomes of off-springs, reduced tension between groups in society.

Albrecht et al. (2008): multiplier effect of AE in Sweden “1.5 - 2”.

Blomquist et al. (2009): social value of comm college 1.5 (stated pref.).

Cutler and Lleras Muney (2006): effect on health alone “1.15 - 1.55”.

What to make of this?

- Earnings effect of AE is positive (4.4 per cent).
- Total costs close to or in excess of the sum of private benefits
- Main point to emerge: To argue that the investments are efficient requires non-trivial social returns and replacement probabilities.

  These assumptions are difficult to assess – but can not be discarded

Summary

- For proponents of AE, positive effects are encouraging.
- However, additional assumptions necessary to motivate expenses.

Also

- On average, no significantly positive returns if AE < 1 year (about 45 %)
- Positive effects driven foremost by those who continue to higher education.