Does subsidized adult apprenticeship improve the aggregate level of education?

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Why education?

CLAIM: Due to increased globalization and international competition, developed countries compete by upgrading the skills of their labor force (OECD 2006)

FACT: Denmark has initiated MANY programs inside and outside workplaces to increase the education level and the occupation possibilities in the population

One of many initiatives is the adult apprenticeship subsidy (AAS) introduced in 1997. It is given to adults over 25 years of age who take an vocational education in a potential bottleneck industry.

First study on the effect of AAS !!! (no other country has AAS)

The Danish setting

Education

unskilled (max 13 years)

vocational educ. (2-6 years **apprenticeship**)

further educ. (2+ years)

Training

Job related training (JRT)

No courses but experience

Formal education is generously subsidized and JRT receives more and more subsidies.

The Danish educational system is generous

Vocational education: Trainees receives a wage (<minimum wage) from the workplace. The employer obtains reimbursement when the trainees attend school.

Subsidized adult apprenticeship: similar to vocational education, BUT trainees receive a minimum wage and the employer receives a wage subsidy and a high level of reimbursement when the trainee is in school.

Further education: Students are entitled to a public support, and it is possible to take a loan under favorable conditions

AAS

Since 1997 about 2500 persons have started vocational education with an AAS every year. Thus about 10 pct of all people over 25 starting an apprenticeship position receive AAS
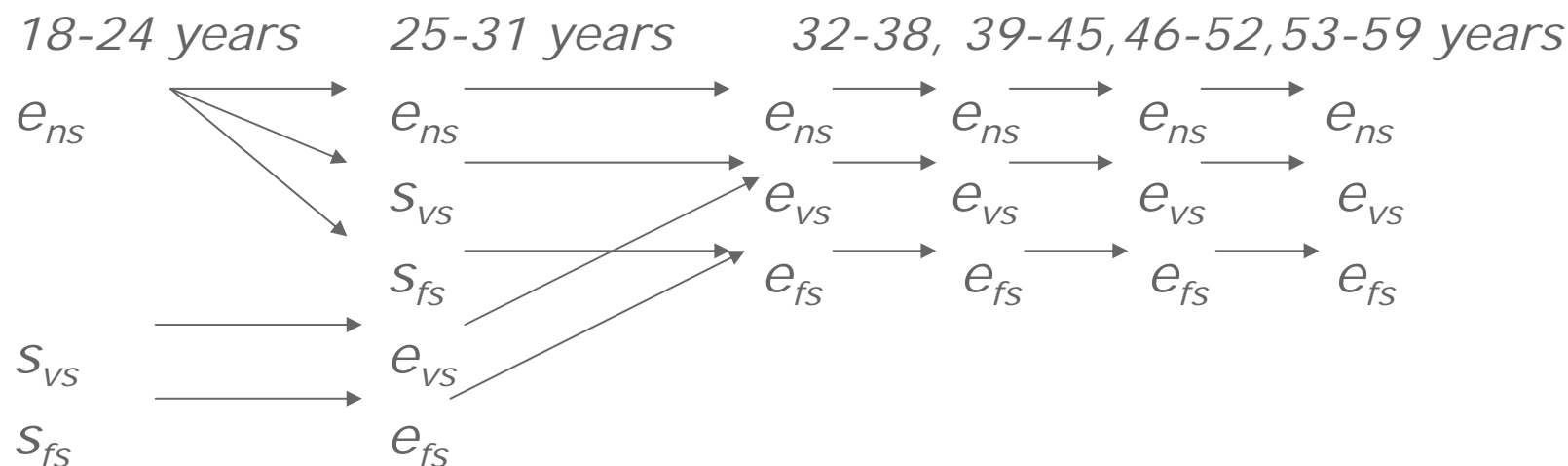
AAS increase on average an apprentice's income by more than 30 pct

Female dominated vocational fields rarely make the bottleneck list

Theoretical human capital model

The individual choose an education that maximize his lifetime utility
max U=f(education, cost of education, earnings, discount factor)

5 possible occupations: vocational education s_{vs}, further education s_{fs}
Workers: no education e_{ns}, vocational education e_{vs}, further education e_{fs}

18-24 years   *25-31 years*   *32-38, 39-45, 46-52, 53-59 years*

e_{ns} e_{ns} e_{ns} e_{ns} e_{ns} e_{ns}

                  s_{vs} e_{vs} e_{vs} e_{vs} e_{vs}

                  s_{fs} e_{fs} e_{fs} e_{fs} e_{fs}

s_{vs} e_{vs}

s_{fs} e_{fs}

The effect of AAS in the simulated model

More people enters a subsidized apprenticeship

All people reevaluate their educational path when an adult vocational subsidy is introduced

Income effect: adult vocational education prefered to no education

**Substituion effect**: vocational education is prefered to further education

Postpone effect: adult vocational education is prefered to vocational education at an early stage

Cohort 1973-75 vocational attendance rates for men from 1996-2004
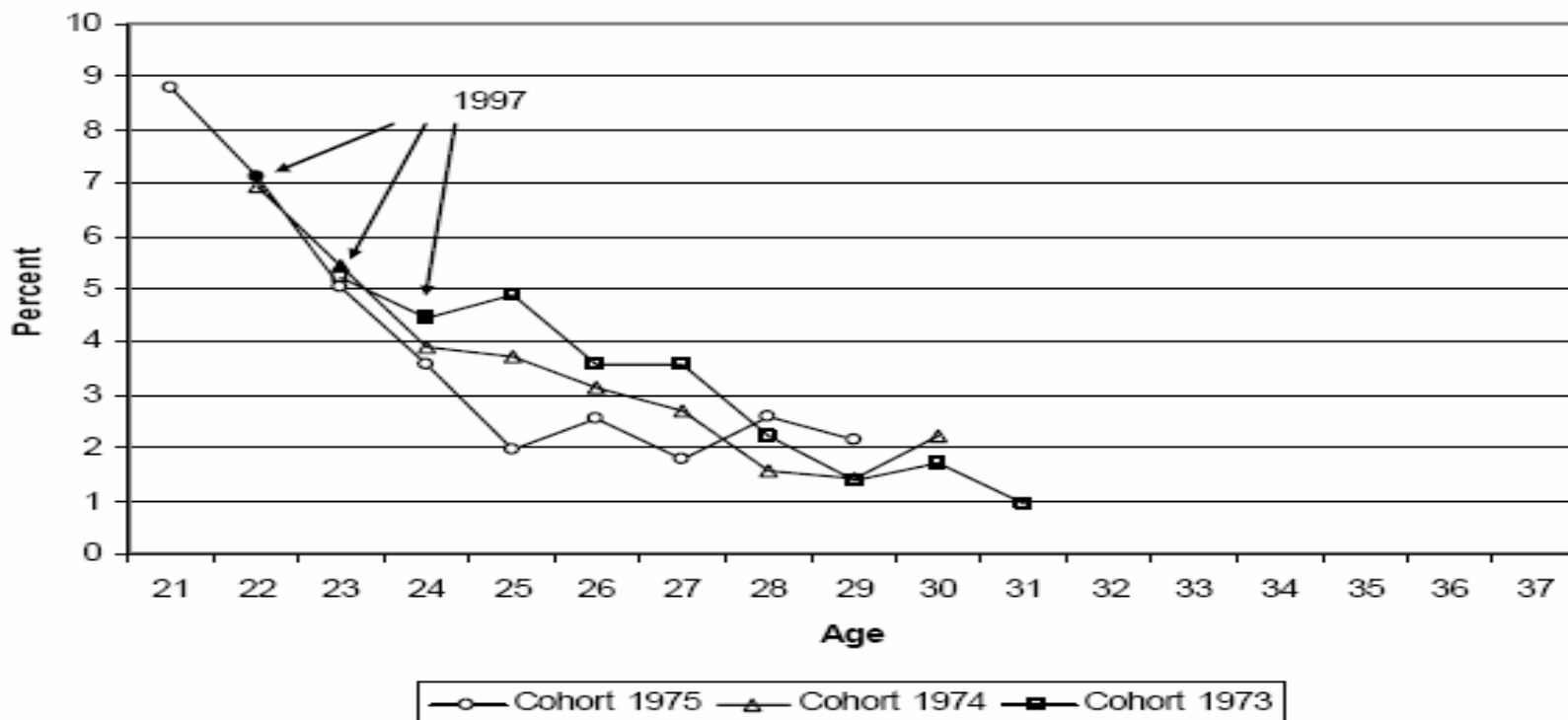
Source: Statistics Denmark register panel data from 1995 to 2004 & Dream register on AAS 1997-2005

Cohort 1969-72 vocational attendance rates for men from 1996-2004
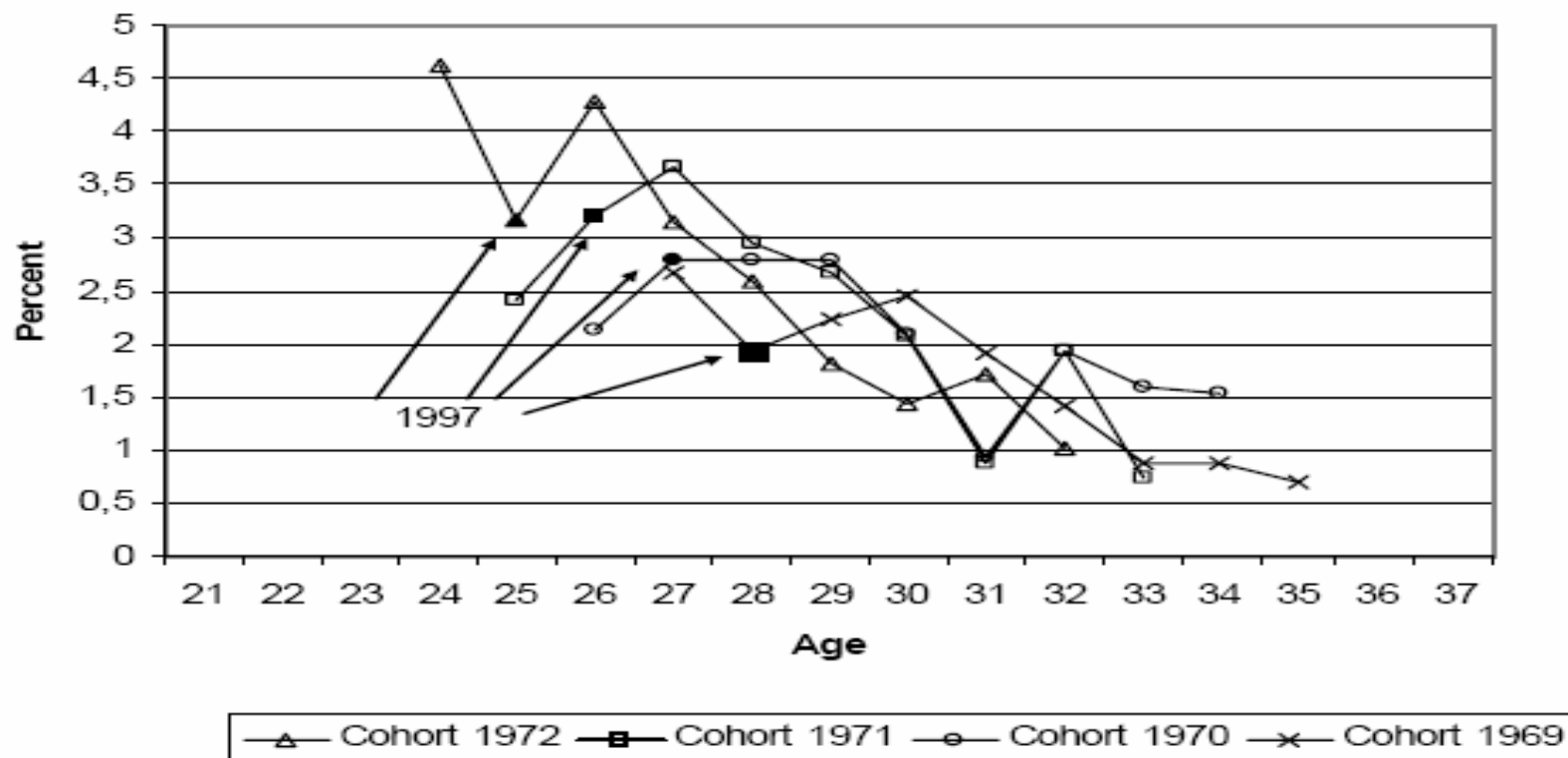
Source: Statistics Denmark register panel data from 1995 to 2004

Empirical problem

The simulated human capital model illustrates the difficulties in finding an empirical strategy capable of evaluating the effect of AAS in the absence of an obvious control group

Solution:

Partial analysis thus comparing 24 years old with 25 years old around 1997 where the AAS was introduced

Attendance rate for men between 24-25 years of age 1991-2003
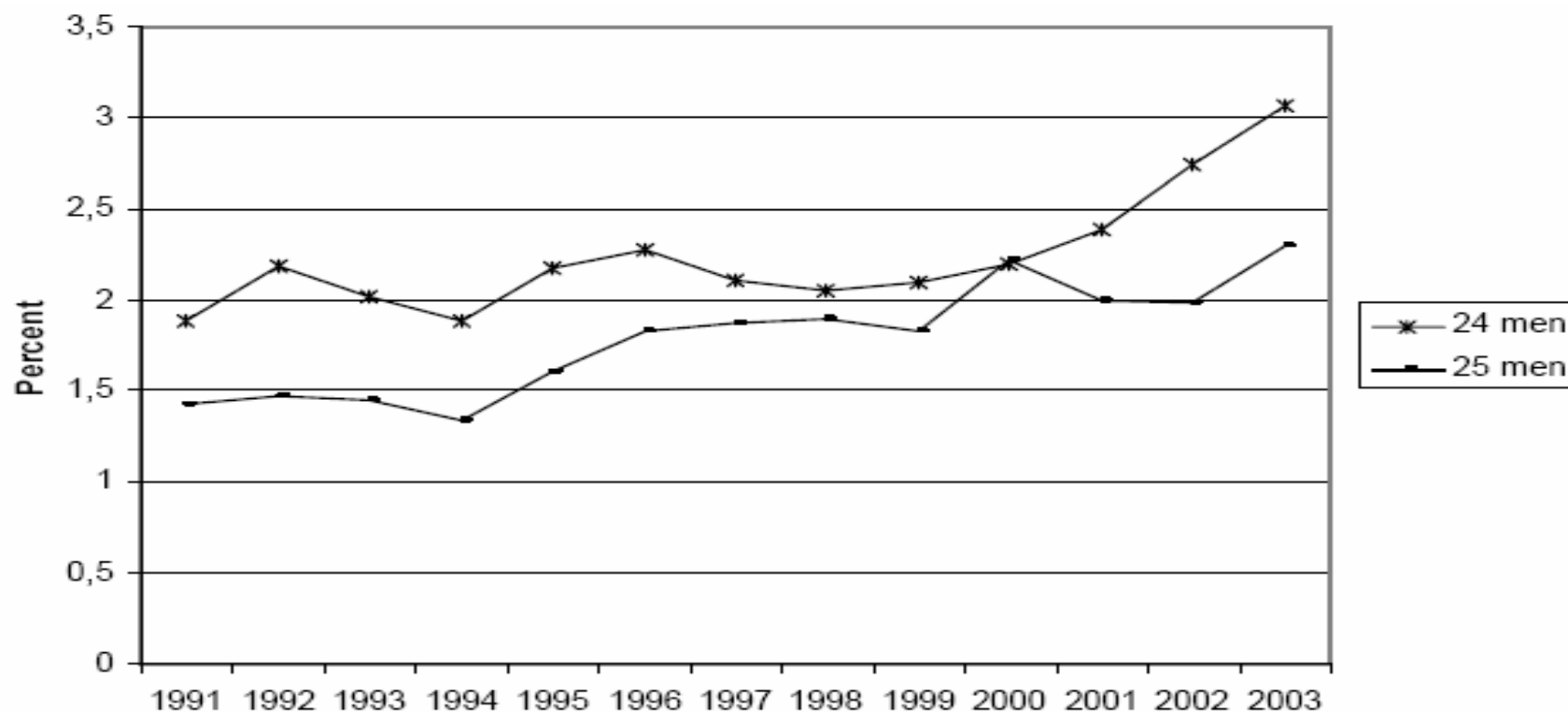
Source: Statistics Denmark Data Bank (1991-2003)

Data

All subsidized adult vocational trainee 1997-2004 (National Labor Market Authority)

10 pct random sample of the population 1995-2004 (Statistics Denmark)

Detailed information on socioeconomic characteristics: age, family status, educational skills, unemployment history etc.

Cost of education and ability is missing !!

Empirical model

Two comparable age groups and an "exogenous" shock
(the introduction of AAS in 1997)

Diference-in-Difference

$$attendvs_i = \alpha + \beta(age25_i * year98_i) + \delta age25_i + \lambda year98_i + X_i\gamma + \varepsilon_i$$

Results for men

Attending apprenticeship

•An immediate effect of the AAS among men =>The attendance rate is highly elastic to AAS, but the AAS is also very extensive

•Small and insignificant effect of AAS after 1998 among men and women

Marginal effects	Dif-Dif OLS	Dif-Dif cov OLS	Dif-Dif time cov OLS	Dif-Dif time cov Probit
25 years (ref 24 years)	-0,015 ***	-0,016***	-0,015***	-0,015***
1998 (ref 1997)	0,0001	0,002	-0,022	-0,003
25*1998	0,025***	0,026***	0,024***	0,027***

Conclusion on AAS

In theory introducing an AAS influences all populations groups education decisions. Thus the increase in vocational skills among adults is to some extent caused by a decrease of skills in other population groups (income, postponement, substitution)

The empirical analysis shows that AAS increases the vocational education attendance rate among non-educated 25-year-old men in 1998. However the effect is small and insignificant for women and for all other years

The postponment and income effect is expected to occur among 24 and 25 years old

Discussion

- Does the state pay for something that companies would be willing to pay for?

- Wage earners with a lot of work experience in certain regions have a high risk of starting an apprenticeship with an AAS

- Maybe AAS changes the apprenticeship group (geographically, industry)

- Major gender differences with respect to AAS

- The postpone effect and income effect is relevant among the 24 and 25 year olds

AAS in the simulated model (dependent costs)

	No AAS	AAS 10%	AAS 40%
No education	31,77	31,68	31,36
Voc. Edu. Period1	35,72	35,17	32,90
Voc. Edu. Period 2	4,44	5,13	7,85
Fur. edu. Period 1	25,94	25,92	25,84
Fur. Edu. Period 2	2,14	2,10	2,05