The wider benefits of education

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OUTLINE

- Definitions benefits of educations

- Private returns: Meta analysis return to a year of education (Ashenfelter et al, 1999)

- Discussion/Break

- Wider benefits of education: Groot & Maassen van den Brink, 2003, 2005, 2006 (a,b) (health, social security, criminality)

- Monetary social benefits of education (OECD, 2009, Lange & Topel, 2006)

- External effects of Education

- Effects of Education on Social Capital (Huang, Groot & Maassen van den Brink, 2008)

- Conclusions

- Implications for educational policy

Adam Smith

- "A man educated at the expense of much labour and time to any of those employments which require extraordinary dexterity and skill, may be compared to [an] expensive machin[e]. The work which he learns to perform, it must be expected, over and above the usual wages of common labour, will replace to him the whole expense of his education, with at least the ordinary profits of an equal valuable capital." (from: *Inquiry into the Nature and Causes of the Wealth of Nation,* 1776, p. 118).

Benefits of education

- Total benefits of education:
  - Individual returns plus social returns
  - Monetary returns plus non-monetary returns

- Individual returns versus social returns

- Monetary versus non-monetary returns

Definitions

- Individual returns: the benefits for the individual who invests in education

- Social returns: the benefits for others in society (productivity, tax revenues, externalities)

- Monetary returns: the earnings effects of education

- Non-monetary returns: the non-earnings effects of education (health, citizenship, etc.)

- Welfare effect: the effect on happiness and life satisfaction

Non-monetary individual benefits of education

- Effect of education on:
  - Health and life expectancy
  - Unemployment and disability
  - Social capital (social participation, trust in others in society)
  - Happiness and life satisfaction

Non- monetary social benefits of education

- Social cohesion
- Cultural diversity and development

Monetary social benefits of education

- Additional tax revenues generated by higher educated
- Externalities: Spill-over effects of higher to lower educated
- Social savings (or costs) on publicly financed goods and services:
    - Health care
    - Policing, justice department, incarcenation
    - Social security expenditures
    - Cultural services
    - Tax subsidies

What do we know about the wider benefits of education?

- How robust is the evidence?

- Are the effects merely correlations or associations, are there common factors that cause both (f.e. genetic endowment) or is there a truly causal effect?

Individual monetary benefits of education

- Most is known about the individual monetary returns

    – Income or wage effects of education
    – Income or wage effects of training (years of schooling)

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Meta-analysis return to a year of education

- Orley Ashenfelter, Colm Harmon & Hessel Oosterbeek (1999), *'A review of estimates of the schooling/earnings relationship, with tests for publication bias'*, Labour Economics 6, p. 453-470

- Meta-analyse of 27 studies, 96 observation of rate of return for 9 countries

Study	Country
[Angrist and Krueger, 1991]	USA
[Angrist and Krueger, 1991]	USA
[Angrist and Krueger, 1995]	USA
[Angrist and Newey, 1991]	USA
[Ashenfelter and Rouse, 1998]	USA
[Bedi and Gaston, 1999]	Honduras
[Blanchflower and Elias, 1993]	UK
[Blackburn and Neumark, 1993]	USA
[Blackburn and Neumark, 1995]	USA
[Butcher and Case, 1994]	USA
[Card, 1993]	USA
[Card, 1998]	USA
[Conneely and Uusitalo, 1998]	Finland
[Dearden, 1995]	UK
[Dearden, 1997]	UK
[Duflo, 1998]	Indonesia
[Hanson and Wahlberg, 1998]	Sweden
[Harmon and Walker, 1995]	UK
[Harmon and Walker, 1999a]	UK
[Harmon and Walker, 1999b]	UK
[Isaacson, 1997]	Sweden
[Meghir and Palme, 1999]	Sweden
[Miller et al., 1994]	Australia
[Plug, 1997]	Netherlands
[Rouse, 1999]	USA
[Uusitalo, 1997]	Finland
[Viera, 1997]	Portugal

Average values and standard deviations of the rates of return in the 27 studies

Variable	All		OLS		IV		Twins	
	Mean	s.d.	Mean	s.d.	Mean	s.d.	Mean	s.d.
Year	88.71	5.93	88.38	5.90	88.14	6.46	92.00	3.00
Sample size/1000	32.70	86.65	35.67	96.50	38.54	84.74	0.631	0.470
Ability controls? (1=Yes)	0.198	0.401	0.180	0.388	0.257	0.443	0.091	0.302
Estimated rate	0.079	0.036	0.066	0.026	0.093	0.041	0.092	0.037
Standard error	0.015	0.017	0.006	0.007	0.026	0.022	0.021	0.010
Published?	0.365	0.484	0.420	0.500	0.286	0.458	0.364	0.505
Measurement Error?	0.063	0.243	0.020	0.141	0.057	0.236	0.273	0.467
N	96		50		35		11	

Conclusion from the meta-analysis on the rate of return to a year of education

- Rate of return of a year of education is 7-9%

- Rate of return in US is higher than in other countries

- Rate of return has increased during the past twenty years

The wider benefits of education

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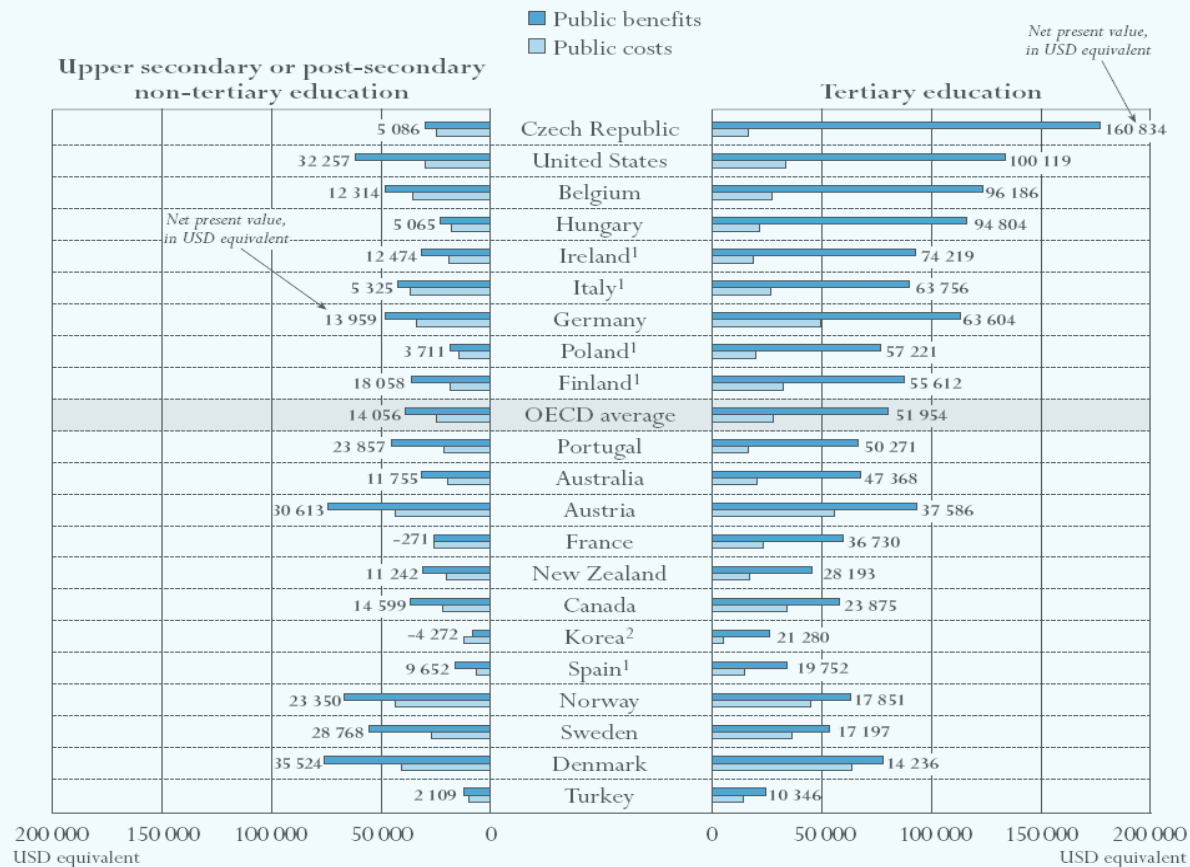
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Monetary social benefits of education

- Additional tax revenues
- OECD, Education at a Glance 2009
  - Netherlands not included
- Nett present value of the social costs and benefits (for men, OECD average)
  - Higher secondary education: $14.000
  - Tertiary education: $52.000
- Social benefits for tertiary education higher than for secondary education!

Chart A8.5. Public cost and benefits for a male obtaining upper secondary or post-secondary non-tertiary education and tertiary education (2005)

Legend:
- ■ Public benefits
- □ Public costs

Net present value, in USD equivalent

Upper secondary or post-secondary non-tertiary education | **Tertiary education**

	Upper secondary NPV	Country	Tertiary NPV
	5 086	Czech Republic	160 834
	32 257	United States	100 119
	12 314	Belgium	96 186
	5 065	Hungary	94 804
	12 474	Ireland[1]	74 219
	5 325	Italy[1]	63 756
	13 959	Germany	63 604
	3 711	Poland[1]	57 221
	18 058	Finland[1]	55 612
	14 056	OECD average	51 954
	23 857	Portugal	50 271
	11 755	Australia	47 368
	30 613	Austria	37 586
	−271	France	36 730
	11 242	New Zealand	28 193
	14 599	Canada	23 875
	−4 272	Korea[2]	21 280
	9 652	Spain[1]	19 752
	23 350	Norway	17 851
	28 768	Sweden	17 197
	35 524	Denmark	14 236
	2 109	Turkey	10 346

200 000 150 000 100 000 50 000 0   0 50 000 100 000 150 000 200 000
USD equivalent   USD equivalent

1. Year of reference 2004.
2. Year of reference 2003.
Cash flows (components) are discounted by 5% interest rate.
Countries are ranked by descending order of the public net present value obtaining tertiary education.
Source: OECD. Table A8.3 and Table A8.4. See Annex 3 for notes (*www.oecd.org/edu/eag2009*).
StatLink ⌗⌗⌗ http://dx.doi.org/10.1787/664146203473

Social rate of return education

- According to OECD higher than 5%

- Review study by Lange & Topel (2006): social return 6-9%

External effects of education

- Lower educated earn more in cities with more higher educated
  - Moretti (1998, 2002): increase in people with greater skills raises the productivity of whom they interact with (1% increase in share of higher educated workers increases 1-2% higher wages of lower educated workers)
- More higher educated workers lead to more technological progress and raises productivity (Krueger & Lindahl 1998)

Social savings on publicly financed goods and services

- Social Savings
  - Higher educated are less likely to be unemployed, have a higher change to find a job after unemployment and have a lower risk of disability
  - Higher educated are healthier and make less use of GP, medical specialist and hospital
  - If controlled for health status use of health care facilities is higher among higher educated
  - Higher educated use more ambulatory mental health care

Social savings on publicly financed goods and services

- Policing, law enforcement
  - Higher educated less likely to be convicted of violent crimes
  - Although tax fraud increases with schooling years

- Estimates on social savings as a result of 1 extra year of schooling (Groot & Maassen van den Brink 2003)

Individual non-monetary returns

- Health
- Higher educated:
  - Live longer (average life expectancy higher educated 5 years longer for men, 2.5 for women in the Netherlands)
  - Are healthier
  - Have a healthier life style (smoke less, have less overweight and obesity, but on average consume more alcohol)
- Available evidence on the causal effect of education on health supports the above mentioned conclusions

	Welfare effects of a year of education		Social savings of a year of education for society
	For the individual	**For society**	
Effect of years of education in:			
health	300-1380 euro	5,4-12,4 billion euro	660 million euro
criminal behaviour			578 million euro
social participation	3432 euro	41,2 billion euro	
social security			492 million euro
total social savings			1,7 billion euro
total welfare-effects of education	3732-4812 euro	46,6-53,6 billion euro	

The effect of education on social capital

- Meta-analysis

- J. Huang, H. Maassen van den Brink & W. Groot (2009), 'A meta-analysis of the effect of education on social capital', *Economics of Education Review 28*, p. 454-464

- Social capital
  - Trust in other people
  - Participation in social groups (clubs, unions, etc.)

- (Effect size: (ES) is a common currency in the meta analysis to evaluate the extimates across studies (simplest form: the standardized difference between the treatment and the control group)

Definitions of Social Capital

- Social capital is a heuristic concept with diverse and multidimensional definitions and operationalizations

- Most common and accepted definition (Putnam,1993, 1995, 2000): to describe elements of social life such as networks, norms and trust that facilitate coordination and cooperation for mutual benifit.

- At the individual level:
  - Trust in people those we know and we do not know
  - Social participation in social activities (clubs, unions, etc)

Assocation between social capital and years of schooling

- Not only important to look at own years of schooling but also important to look at years of schooling in neighboorhoods or cities: is there more social cohesion or social participation in neigboorhoods with a higher share of higher educated citizens?

- Level of education is of importance: Does social capital increase or decrease with increase of decrease of the level of education?

- Truly causal effect : Is there a joint relation between social capital and education (trust and social participation are mutually reinforcing) or just a of unilateral causal relation (trust is a direct outcome of social participation)?

Sources for meta-analysis					
Social trust study	*No of effect sizes in study*	*Survey period*	*Social participation study*	*No of effect sizes in study*	*Survey period*
Alesina & Ferrara (2000[a])	8	1990	Alesina & Ferrara (2000[b])	2	1990
Alesina & Ferrara (2002)	8	1974-1994	Brehm & Rahn (1997)	1	1972-1994
Brehm & Rahn (1997)	1	1972-1994	Choi (2003)	1	1993
Claibourn & Martin (2000)	4	1982	Claibourn & Martin (2000)	4	1982
Glaeser &Sacerdote (2001)	1	1972-1998	Cutler & Hendricks (2000)	2	1974-1994
Glaeser et al (1999)	46	1972-1994	Dee (2003)	14	1972-2000
Helliwell & Putnam (1999)	6	1972-1996	Denny (2003)	88	1990-1999
Huang et al (2008a)	9	1991	DiPasquale et al. (1999)	4	1986-1994
Ibáñez et al. (2002)	4	2000	Funk (1998)	1	1991
Johansson-Stenman et al (2005)	1	2003	Glaeser & Sacerdote (2000)	6	1973-1998
Lederman (2005)	4	2000	Glaeser & Sacerdote (2001)	22	1972-1998
Lee et al. (2003)	3	1996	Glaeser et al (1999)	9	1972-1994
Leigh (2006)	6	1997	Hauser	6	1974-1990
Levinsen (2004)	3	2002	Helliwell & Putnam (1999)	7	1972-1996
Marchall & Stolle (2004)	3	1975	Hooghe (2003)	1	1998
Milligan et al. (2003)	2	1948-2000	Huang et al (2008b)	6	2000
Newton (2001a)	7	1990	Kang & Kwak (2003)	2	1997
Rahn et al. (2003)	6	2002	La Ferrara (2002)	4	1994
Rothstein & Uslaner (2004)	2	1992	Lederman (2005)	4	2000
Rothstein (2001)	3	1998	Letki (2005)	1	2001
Scheufele & Shah (2000)	1	1997	Levinsen (2004)	9	2002
Shah et al. (2001)	4	1999	Li et al. (2003)	8	1988-1989
Uslaner (1997)	5	1992	Liu & Besser (2003)	7	1994
Uslaner (1998)	6	1972-1994	Milligan et al. (2003)	2	1948-2000
Uslaner (2003)	2	1990-1995	Norris (1996)	1	1990
Uslaner (2004a)	4	1972-1998	Patricia et al. (1999)	1	1997
Wilson 1997	3	1992	Pattie et al. (2003)	3	2000
Wollebæk & Selle (2003)	2	1998	Scheufele Shah (2000)	2	1997
			Shah (1998)	3	1995
			Shah et al. (2001)	4	1999
			Stoneman & Anderson (2006)	10	2006
			Tang	12	1986-1994
			Taniguchi	3	1995-1996
			Tiehen (2000)	24	1979-1980
			Uslaner (1997)	4	1990-1993
			Uslaner (1998)	6	1972-1994
			Wellman et al. (2001)	2	1998

Studies in the meta-analyses

- 65 empirical studies included in the meta-analyses

- 28 studies provide information on the return to education on social trust on trust and 37 studies provide estimates on social participation

- In total 154 observations on the return to education on trust and 286 observations on the effect of education on social participation

Table 2:
Summary statistics, estimates of pooled effect size and test statistics for fixed effect

	Social Trust		Social Participation	
A. Summary statistics	*Mean*	*SD*	*Mean*	*SD*
Effect size	**0.046**	**0.035**	**0.048**	**0.032**
Measure error (s. e of effect size)	**0.015**	**0.017**	**0.021**	**0.046**
B. Estimate of pooled effect size	*Estimate z-value*		*Estimate z-value*	
Fixed effects	**0.031**	**83.54**	**0.059**	**152.99**
Random effects	**0.045**	**18.44**	**0.050**	**21.67**
C. Test for fixed effects	*Social Trust*		*Social Participation*	
Q-statistics	**4557.98**		**8675.51**	
p-value	**<0.0001**		**<0.0001**	
	0.001		**0.001**	
N	**154**		**286**	

Results table 2

- One additional year of scholling increases one's trust in others by 4.6% of its standard deviation and increases social participation by 4.8% of its standard deviation.

- One standard deviation of schooling years, which is 2.5 – 3.3 years for most countries, accounts for the variation in social trust and social participation by 12% - 16% of their standard deviation (2.5 x 4,6%=12%, 3.3 x 4.8%=16%)

- Sizeable effect of education on trust and social participation

		Social trust				Social activity			
Table 3:		**Mean effect size by characteristics of the study and the population**							
Specific group	Obs	Mean	Dif*	Sig of dif**		Obs	Mean	Dif*	Sig of dif**
Female	4	0.020	0.027	0.01		22	0.017	-0.033	0.00
Older age group (over 60=1)	3	0.117	0.072	0.36		13	0.051	0.003	0.69
College graduate	52	0.048	0.002	0.70		24	0.043	-0.006	0.46
Survey after 1990	66	0.040	0.011	0.03		158	0.042	-0.014	0.00
Non US survey	74	0.031	-0.032	0.00		150	0.038	-0.020	0.00
Average education control	11	0.045	-0.002	0.84		10	0.116	0.071	0.00
Education endogeneity control	7	0.048	0.001	0.95		11	0.009	-0.041	0.00
Reciprocity control	47	0.044	-0.003	0.46		33	0.045	-0.004	0.55

* "Dif" refers to the mean difference between the effect sizes from the target group and the rest of the effect sizes;
** "Sig of dif" refers to the statistical significance of the group difference.

Mean effect size by characteristisc of the study and the population

- Effect of education on social capital is lower for:
    - Women compared to men (social participation)
    - Non US nations
    - Survey conducted after 1990

- For social participation the effect of education increases if controlled for the average education level in the region

- Accounting for the endogeneity of education reduces the effect of education dramatically

Table 4: Extended model for random effects meta-analysis					
	Social trust			**Social participation**	
Variable control in study	_Coef._	_z-value_		_Coef._	_z-value_
Gender control	0.007	1.30		0.010	1.08
Family control	0.015**	2.24		0.004	0.91
Reciprocity mechanism control	- 0.015**	- 2.53		- 0.013**	- 2.19
Environment control	- 0.010**	- 1.86		0.021***	4.76
Religion control	0.017***	2.95		- 0.001	0.11
Age/cohort control	- 0.006	- 0.53		0.006	0.85
Media control	- 0.013**	- 2.14		- 0.002	0.28
Education endogeneity control	- 0.008	0.54		- 0.042***	- 3.11
Average education control	- 0.004	0.32		0.037***	3.46
Literacy control	-	-		- 0.022***	- 5.68
Specific groups in study	_Coef._	_z-value_		_Coef._	_z-value_
Female	- 0.019	- 0.99		-0.059***	- 4.62
Survey after 1990	- 0.025	- 0.49		-0.022***	- 2.77
College graduate	0.010**	1.97		0.026***	3.94
Older age group (over 60=1)	- 0.010	- 0.36		0.020**	1.97
Non-US survey	- 0.020***	- 3.47		- 0.036***	- 8.03
Participation in voluntary activity	-	-		0.008	0.57
Constant	0.051***	3.65		0.071***	6.06
	0.0003			0.0002	
N	154			286	

* Significant at 10% level. **Significant at 5% level. ***Significant at 1% level.

Results table 4

- Some control variables have an impact on the association between education and social participation:
  - Controls for environment
  - Controls for reciprocity for both social trust and social participation
  - Literacy reduces the effect of schooling on ssocial participation by a considerable degree

- The association between education and trust is influenced by:
  - Religion
  - Family size and marital status
  - Media influence (radio, tv and internet)

Conclusions Social Capital

- Meta-analyse: 154 studies on trust, 286 studies social participation

- Accounted for publication bias and endogeneit of education

- Education has a strong and robust efffect on trust in others and social participation

- Sizeable effect: two to three years of education (= 1 standard deviation) accounts for 12% - 16% in the variation of social capital

Conclusions Social Capital

- Evidence for a robust effect of education on social capital: in neighborhoods and cities with a higher share of higher educated citizens education has a stronger effect on social participation compared to neighborhoods and cities with more lower educated citizens.

- Evidence for a 'virtuous cycle' in the accumulation of social capital, trust reinforces social capital vice versa

- Erosion of social capital has coincided with a decline in the marginal effect of education on social capital (= explanation of the paradox of increasing education levels and decline in social capital)

General Conclusions

- Rate of return to a year of education is 7-9%, and has increased during the past twenty years

- Social rate of return is also high, 5-9% (tax revenues, externalities, etcetera): Strong incentive to expand higher education

- Education contributes to better health and longer life expectancy

- Education reduces social costs of health, criminal justice and social security

- Education contributes to social participation and social cohesion (trust in other people)

Implications for educational policy

- Benefits are wider than just private income effects

- Positive externalities to education on health, crime, social security, civic behavior (social participation and trust)

- Re allocation of budgets between policy sectors (education, justice and health)

- New policy based on social savings and aggregated individual welfare

It's education, stupid!

THANK YOU FOR YOUR ATTENTION
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