

**Children's education and
parents' socio-economic status:
distinguishing the impact of
fathers and mothers**

(a cross-national comparison)

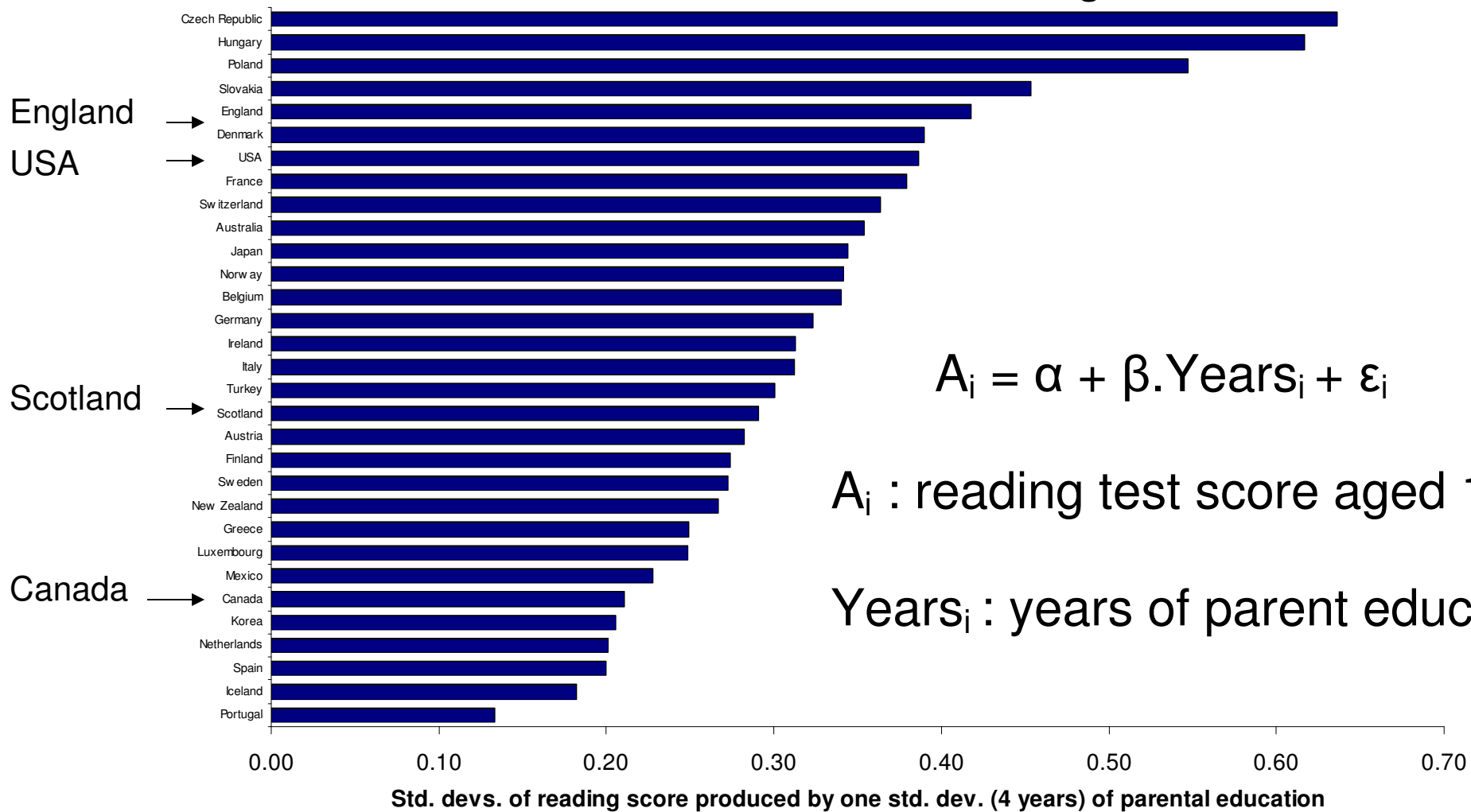
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(with an acknowledgement to Bernard Masterson)

Motivation (1)

Parental education and children's reading scores



$$A_i = \alpha + \beta \cdot \text{Years}_i + \varepsilon_i$$

A_i : reading test score aged 15

Years_i : years of parent education

Motivation (2)

Country correlations between Father and Mother measures:

Years of education: 0.37 to 0.75, average 0.63

Occupation: 0.27 to 0.57, average 0.38
(Ganzeboom et al index)

NB average correlations between education and occupation:

Mothers: 0.42

Fathers: 0.45

Framework (context)

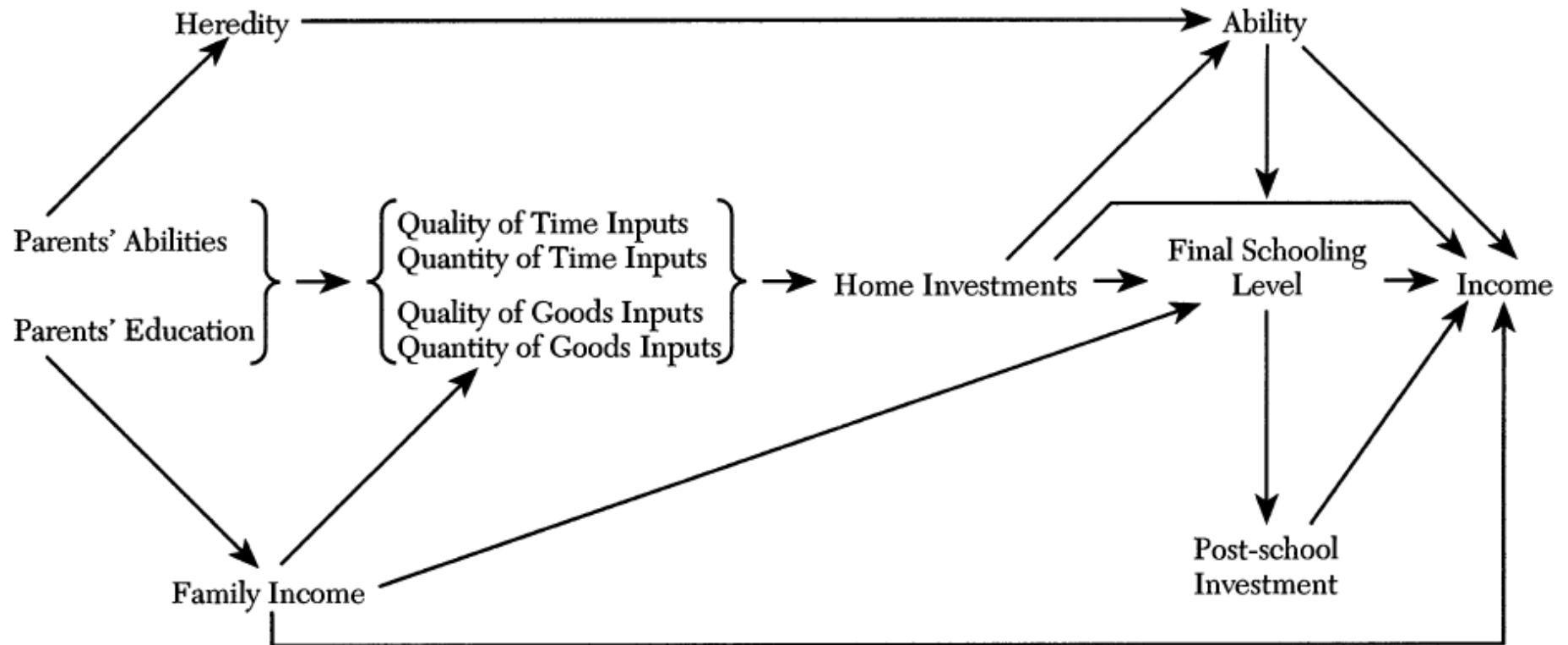


Figure 1. Home Investments in Children^a

^aAdapted from Leibowitz (1974).

R Haveman and B Wolfe, 'The Determinants of Children's Attainments: A Review of Methods and Findings' *Journal of Economic Literature*, 1995

Theory

Economics – focus on education and income

“Children in affluent homes are bathed in financial and cognitive resources.....More educated women marry later, have more resources, fewer children, and provide much richer child rearing environments that produce dramatic differences in child vocabulary and intellectual performance.”
(Heckman 2008)

Sociology – focus on education and occupation

Models of dominance, power, and role-models
(e.g. Korupp et al 2002, Beller 2008)

Existing Evidence

- more on parent education than occo. (or earnings)
- tends to be on attainment, not cognitive achievement

$$\text{Years of education}_{\text{Child}} = f(\text{Years}_{\text{Pa}}, \text{Years}_{\text{Ma}}, \text{controls})$$

ideally:

1. models estimated separately for boys and girls
2. awareness of *natural- vs. step- vs. no-parent* differences
3. results shown also with no controls
4. results shown also with levels of education, not years
5. large samples used

Verdict: MA > PA (tends), but hard to identify boy/girl diffs

Our Data

PISA – Programme for International Student Assessment

- tests of reading, maths, and science for 15 year olds
- all OECD countries, plus various middle income countries
- three data rounds so far, 2000, 2003, 2006
- samples of schools and then pupils within schools,
 - about 4,500 children per country per round

At present we:

1. focus on reading only
2. analyse OECD countries only
3. pool data from 2003 and 2006 (USA 2003 only)

READING UNIT 3: GRAFFITI

I'm simmering with anger as the school wall is cleaned and repainted for the fourth time to get rid of graffiti. Creativity is admirable but people should find ways to express themselves that do not inflict extra costs upon society.

Why do you spoil the reputation of young people by painting graffiti where it's forbidden? Professional artists do not hang their paintings in the streets, do they? Instead they seek funding and gain fame through legal exhibitions.

In my opinion buildings, fences and park benches are works of art in themselves. It's really pathetic to spoil this architecture with graffiti and what's more, the method destroys the ozone layer. Really, I can't understand why these criminal artists bother as their "artistic works" are just removed from sight over and over again.

Helga

There is no accounting for taste. Society is full of communication and advertising. Company logos, shop names. Large intrusive posters on the streets. Are they acceptable? Yes, mostly. Is graffiti acceptable? Some people say yes, some no.

Who pays the price for graffiti? Who is ultimately paying the price for advertisements? Correct. The consumer.

Have the people who put up billboards asked your permission? No. Should graffiti painters do so then? Isn't it all just a question of communication – your own name, the names of gangs and large works of art in the street?

Think about the striped and chequered clothes that appeared in the stores a few years ago. And ski wear. The patterns and colours were stolen directly from the flowery concrete walls. It's quite amusing that these patterns and colours are accepted and admired but that graffiti in the same style is considered dreadful.

Times are hard for art.

Sophia

QUESTION 3.1

The purpose of each of these letters is to

- A. explain what graffiti is.
- B. present an opinion about graffiti.
- C. demonstrate the popularity of graffiti.
- D. tell people how much is spent removing graffiti.

QUESTION 3.4

We can talk about *what* a letter says (its content).

We can talk about *the way* a letter is written (its style).

Regardless of which letter you agree with, in your opinion, which do you think is the better letter?
Explain your answer by referring to *the way* one or both letters are written.

.....

.....

.....

Measurement issues

education – information sought on *highest level completed*

- primary, lower secondary, upper secondary (two types), university, other tertiary
- formulae to transform into years of education

occupation – information sought on job (or last job)

continuous measure: Ganzeboom et al ISEI (aims to capture the indirect effect of education on income)

information – provided by *the child* for both parents (or parent-figures)

Regressions with parents' years of education only

$$\begin{aligned} A_i = & \alpha_0 + \alpha_1 \cdot \text{Boy}_i \\ & + \beta_1 \cdot \text{Pa-Years}_i + \beta_2 \cdot \text{Ma-Years}_i \\ & + \beta_3 \cdot \text{Boy}_i \cdot \text{Pa-Years}_i + \beta_4 \cdot \text{Boy}_i \cdot \text{Ma-Years}_i \\ & + \text{missing value dummies} + \varepsilon_i \end{aligned}$$

Test hypotheses:

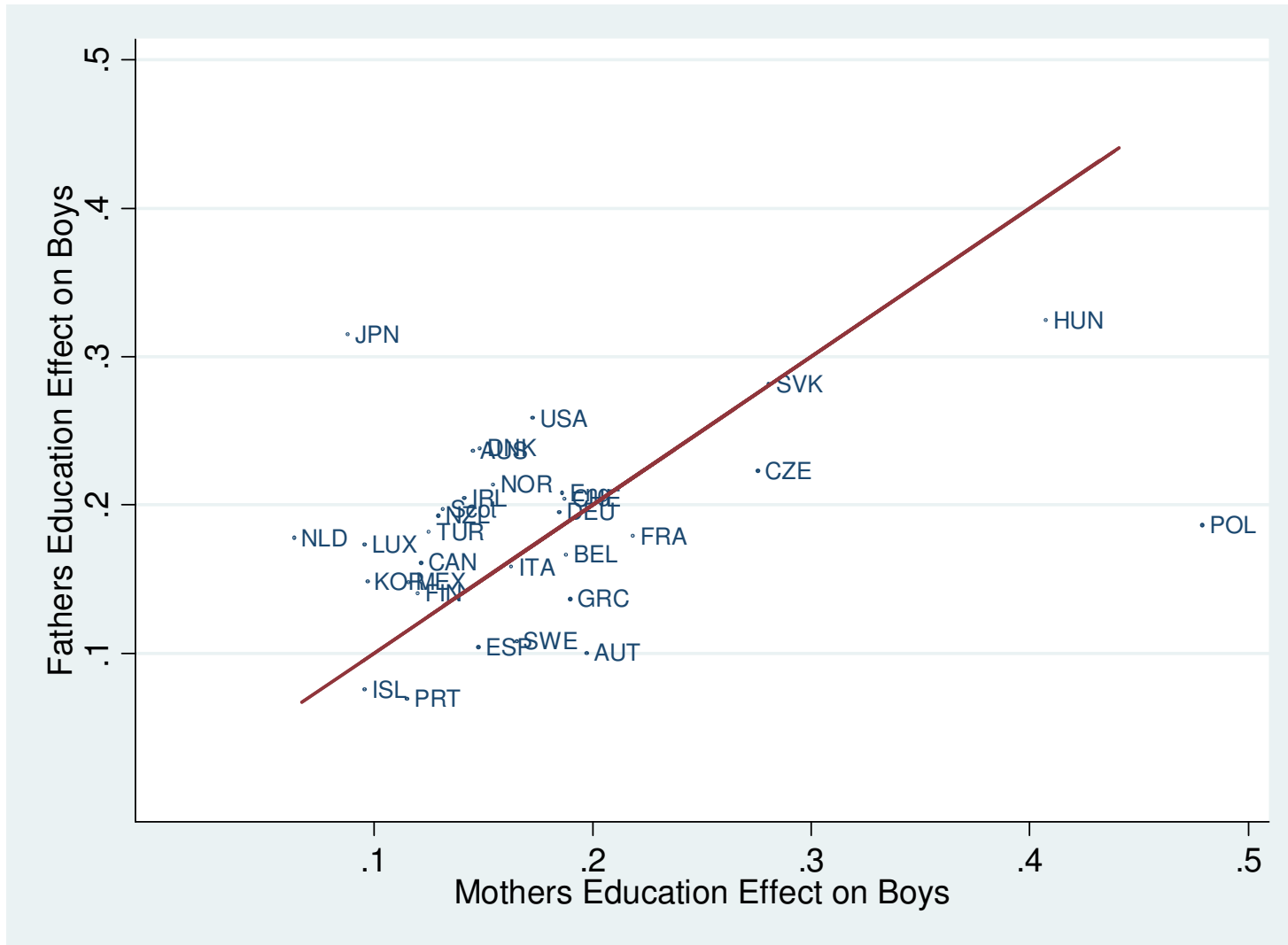
$\beta_1 = \beta_2$: Fathers \rightarrow Girls = Mothers \rightarrow Girls

$\beta_3 = 0$: Fathers \rightarrow Boys = Fathers \rightarrow Girls

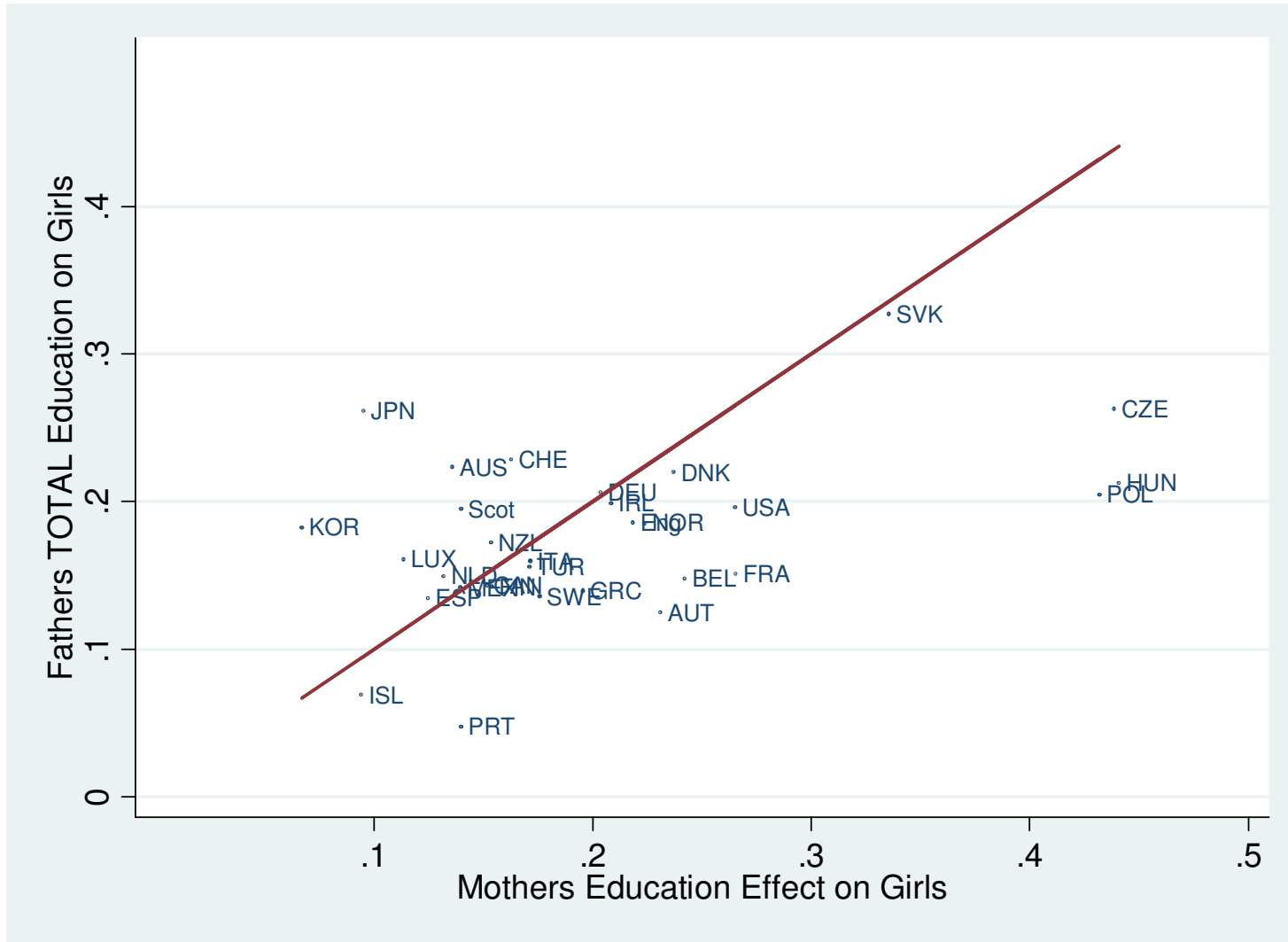
$\beta_4 = 0$: Mothers \rightarrow Boys = Mothers \rightarrow Girls

$\beta_1 + \beta_3 = \beta_2 + \beta_4$: Fathers \rightarrow Boys = Mothers \rightarrow Boys

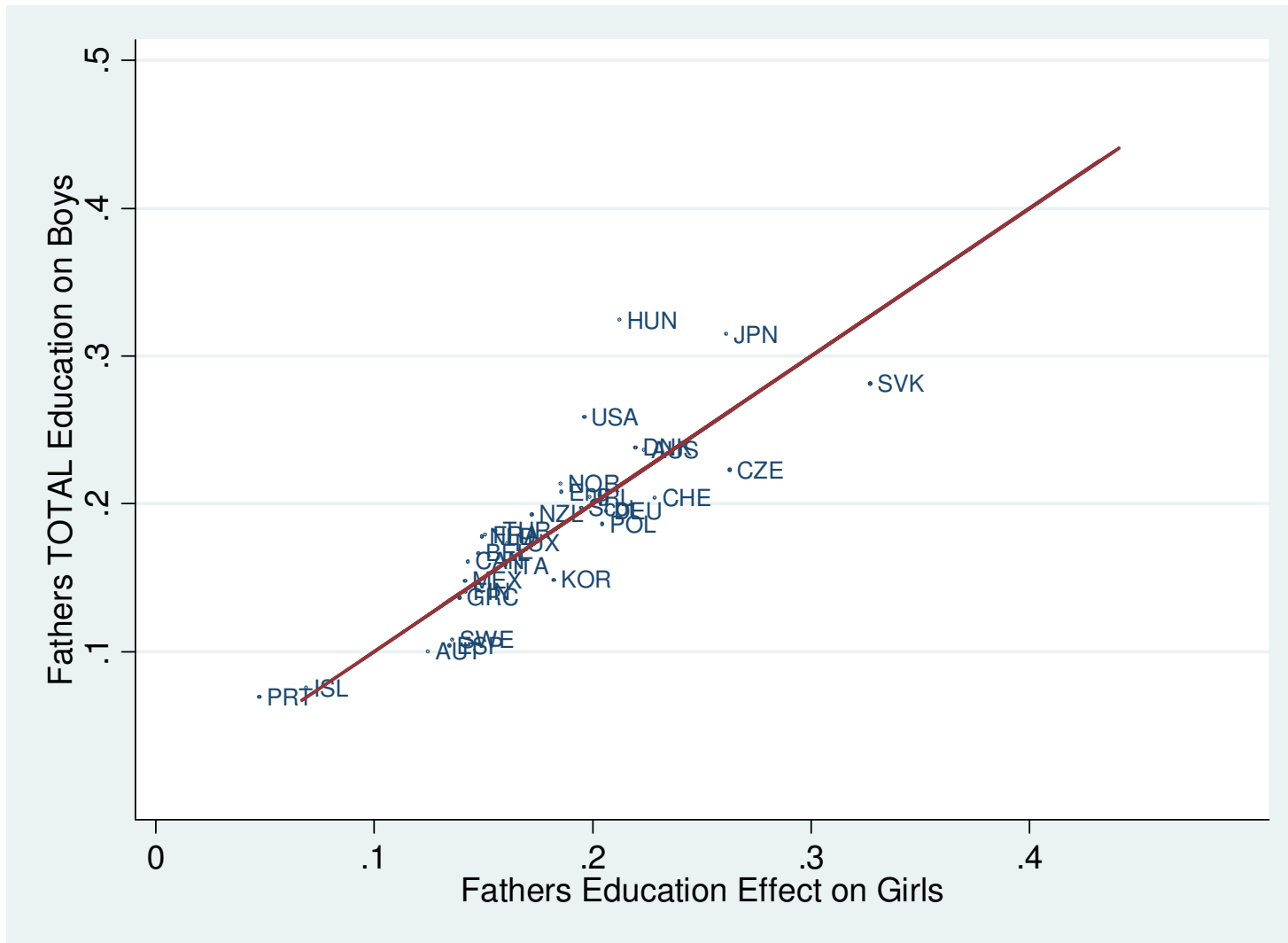
Fathers → Boys = Mothers → Boys $[\beta_1 + \beta_3 = \beta_2 + \beta_4]$



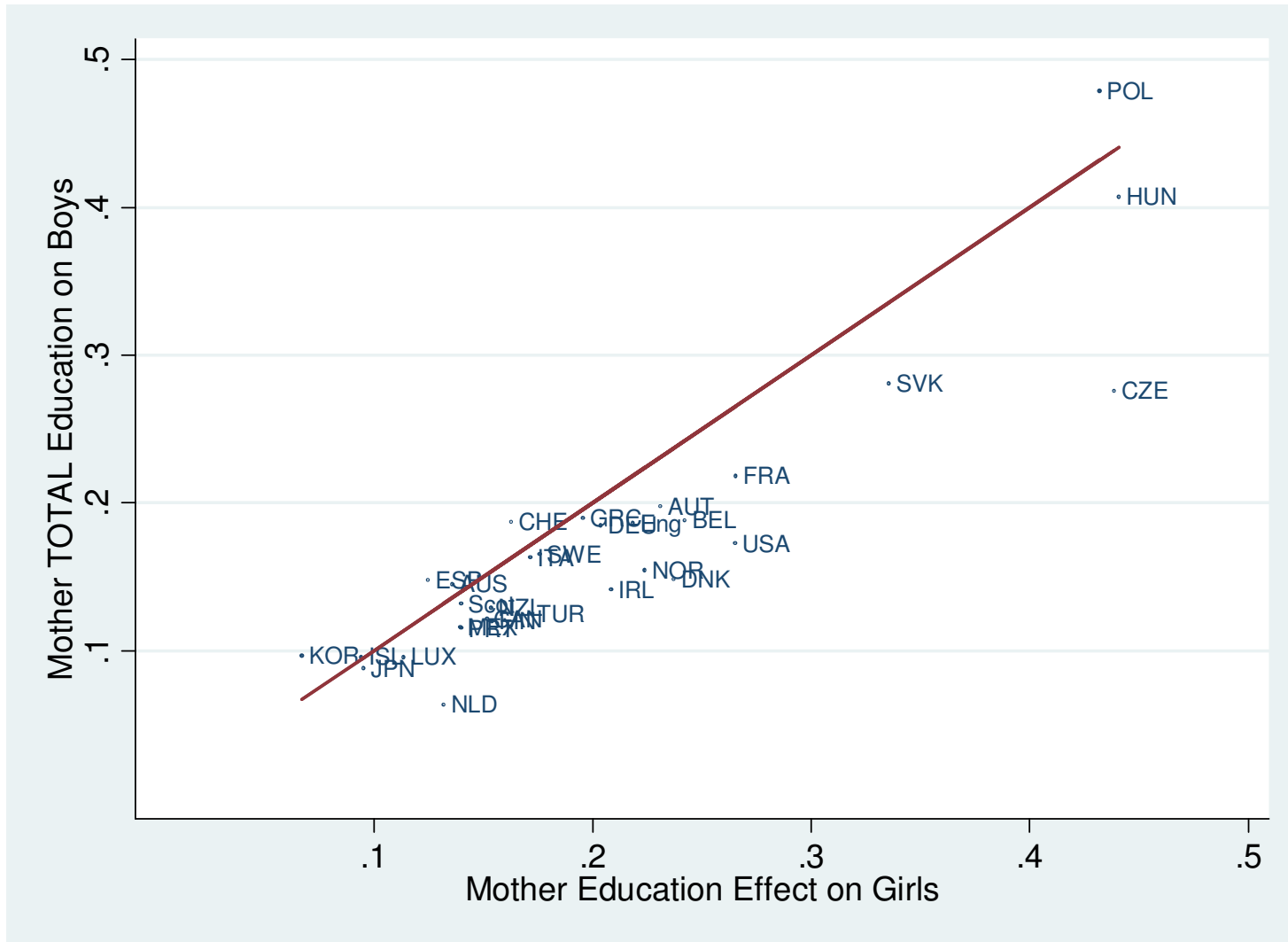
Fathers → Girls = Mothers → Girls $[\beta_1 = \beta_2]$



Fathers → Boys = Fathers → Girls $[\beta_3 = 0]$



Mothers → Boys = Mothers → Girls [$\beta_4 = 0$]



Pooled Country Regression

Scaled coefficients: show the number of SDs of reading score resulting from a change in education of 4 years

$n = 468,972$ (country dummies are included in the model)

Variable	Coefficient (std.)	Standard error (std.)	t-statistic
Pa-Years	0.171	0.006	29.6
Ma-Years	0.166	0.006	26.7
Boy.Pa-Years	0.015	0.008	1.9
Boy.Ma-Years	-0.018	0.008	-2.4

$\beta_1 = \beta_2$: Fathers \rightarrow Girls = Mothers \rightarrow Girls

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$\beta_1 + \beta_3 = \beta_2 + \beta_4$: Fathers \rightarrow Boys = Mothers \rightarrow Boys

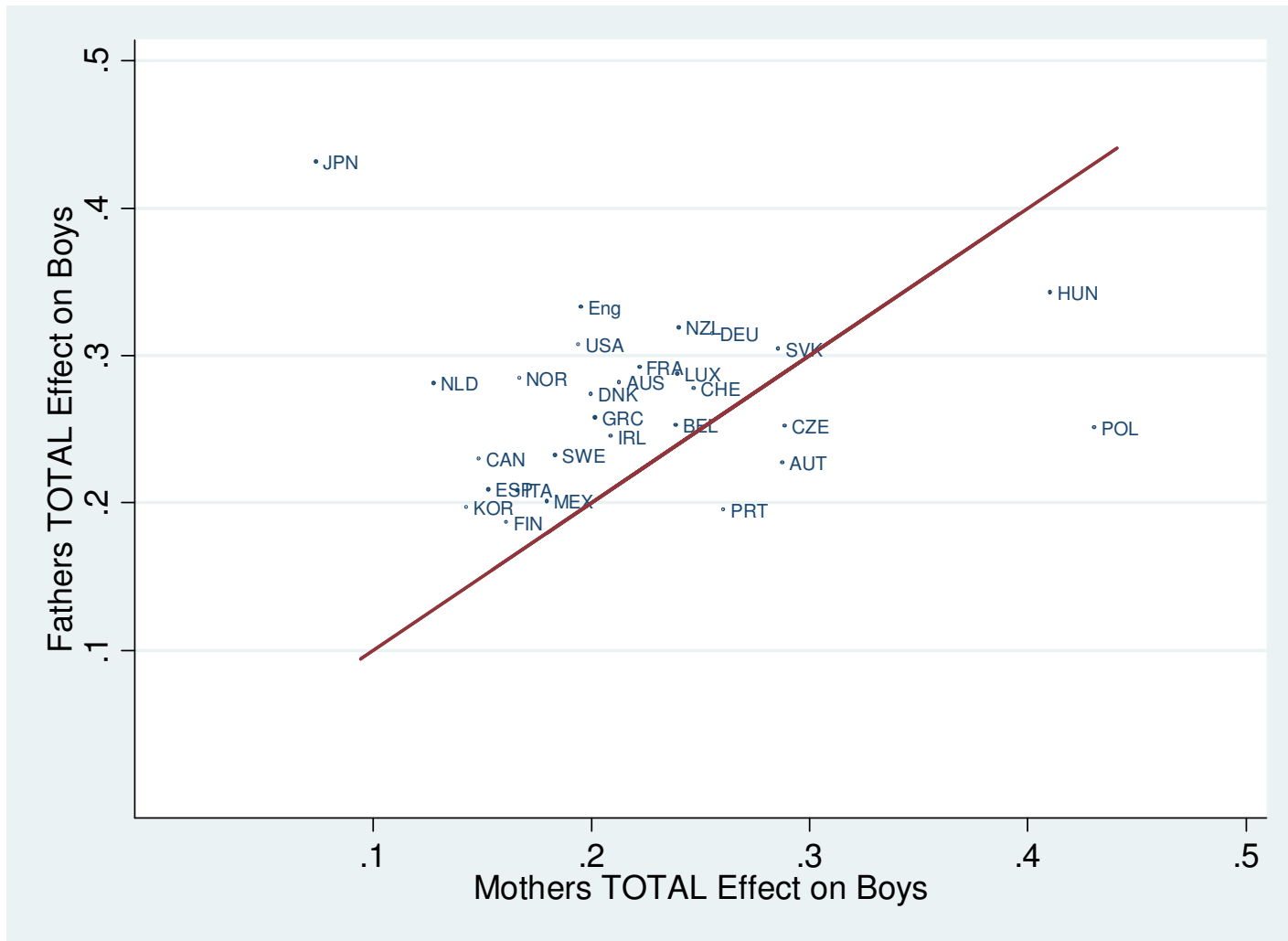
Regressions with parents' occupations included

$$\begin{aligned} A_i = & \alpha_0 + \alpha_1 \cdot \text{Boy}_i \\ & + \beta_1 \cdot \text{Pa-Years}_i + \beta_2 \cdot \text{Ma-Years}_i \\ & + \beta_3 \cdot \text{Boy}_i \cdot \text{Pa-Years}_i + \beta_4 \cdot \text{Boy}_i \cdot \text{Ma-Years}_i \\ & + \gamma_1 \cdot \text{Pa-Occo}_i + \gamma_2 \cdot \text{Ma-Occo}_i \\ & + \gamma_3 \cdot \text{Boy}_i \cdot \text{Pa-Occo}_i + \gamma_4 \cdot \text{Boy}_i \cdot \text{Ma-Occo}_i \\ & + \text{missing value dummies} + \varepsilon_i \end{aligned}$$

- Two sets of hypothesis tests for the β and the γ
- Can't quite think of a suitable test for the combined effect of parental education and occupation

Fathers → Boys = Mothers → Boys

(effect of one SD of education and one SD of occupation)



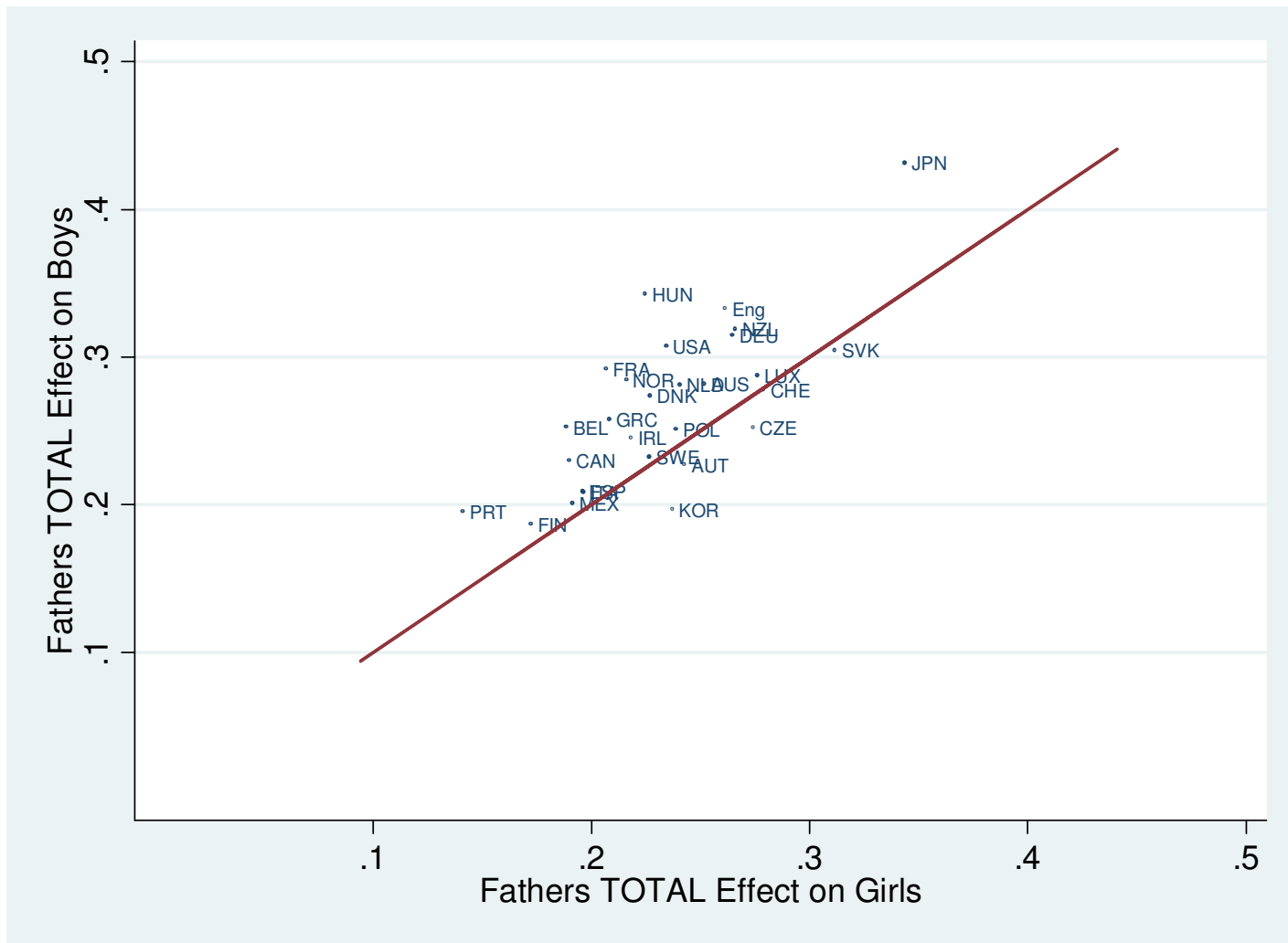
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(effect of one SD of education and one SD of occupation)



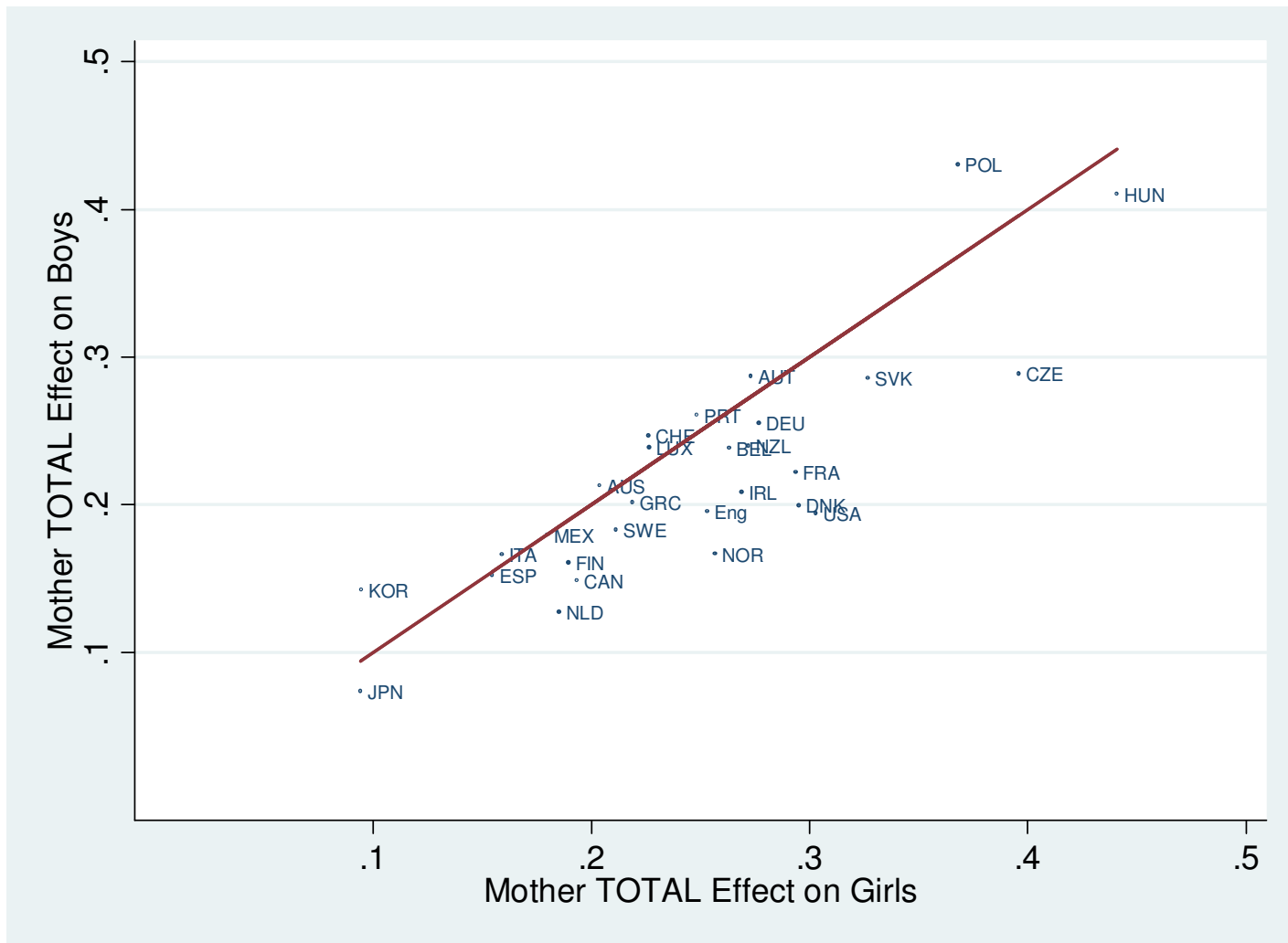
Fathers → Boys = Fathers → Girls

(effect of one SD of education and one SD of occupation)



Mothers → Boys = Mothers → Girls

(effect of one SD of education and one SD of occupation)



Conclusions

NB looked at cognitive achievement, not schooling level

- existing evidence on schooling level pretty mixed/patchy
- reasonably clear stories on some countries
 - Japan, Korea $P_a > M_a$ boys
 $P_a > M_a$ girls
 - Cen. Europe $P_a < M_a$ boys
 $P_a < M_a$ girls
- general patterns (lots of insignif. coefficients)
 - $P_a > M_a$ boys (esp. whenocco. included)
 - $M_a \rightarrow \text{boys} < M_a \rightarrow \text{girls}$

Regressions – USA and Canada

(coefficients not scaled, so marginal effects on reading point scores shown)

	USA		Canada	
Variable	coeff	t-stat	coeff	t-stat
Constant	366.66	27.9	436.58	77.9
Boy	-19.33	-1.2	-25.2	-3.1
Pa-Years	1.39	1.6	1.82	5.3
Ma-Years	3.84	3.8	2.04	5.1
Boy.Pa-Years	2.30	1.9	-0.26	-0.5
Boy.Ma-Years	-2.15	-1.5	-0.94	-1.6
Pa-Occo	1.05	9.0	0.69	10.8
Ma-Occo	0.88	7.1	0.66	9.7
Boy.Pa-Occo	-0.11	-0.7	0.30	3.2
Boy.Ma-Occo	-0.13	-0.7	-0.04	-0.5