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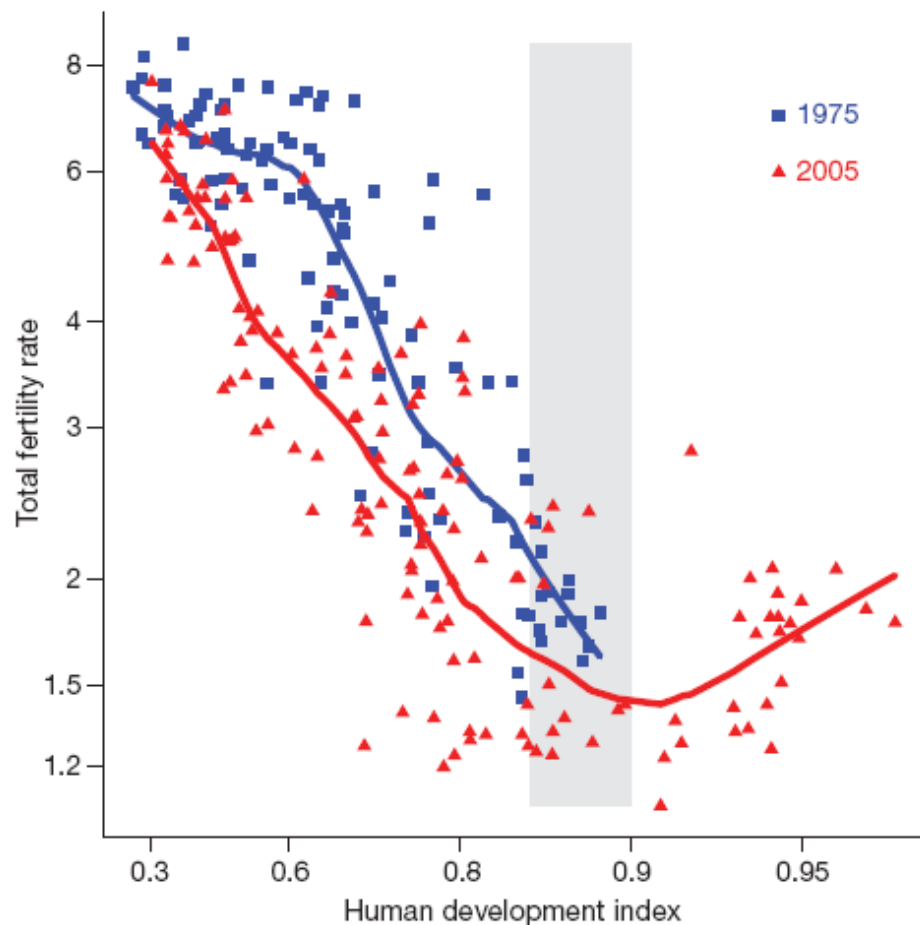
# Socioeconomic development and fertility: Extended analyses on the fertility-development reversal

Mikko Myrskylä, MPIDR  
Hans-Peter Kohler, University of Pennsylvania  
Francesco C. Billari, Università Bocconi



# Advances in Development Reverse Fertility Declines

Source: Myrskylä, Kohler, Billari (2009)



**Figure 1 | Cross-sectional relationship between TFR and HDI in 1975 and 2005.** The TFR reflects the number of children that would be born to a

HDI = combined index of Wealth, Health, Education

## Others documenting fertility increases:

Goldstein, Sobotka, Jasilinione 2009  
Luci and Thevenon 2010, Trovato 2010  
VID Population Data sheet 2010

## Questions left unanswered:

- 1) What components of development drive the increase?
- 2) Whose fertility is increasing?
- 3) Why is fertility increasing?

**This paper extends the development-fertility analyses and addresses the above questions**



# Data

## **Fertility**

Period Total Fertility Rate TFR

Cohort Fertility Rate CTFR

Mean Age at Birth MAB

## **Development**

Human Development Index HDI

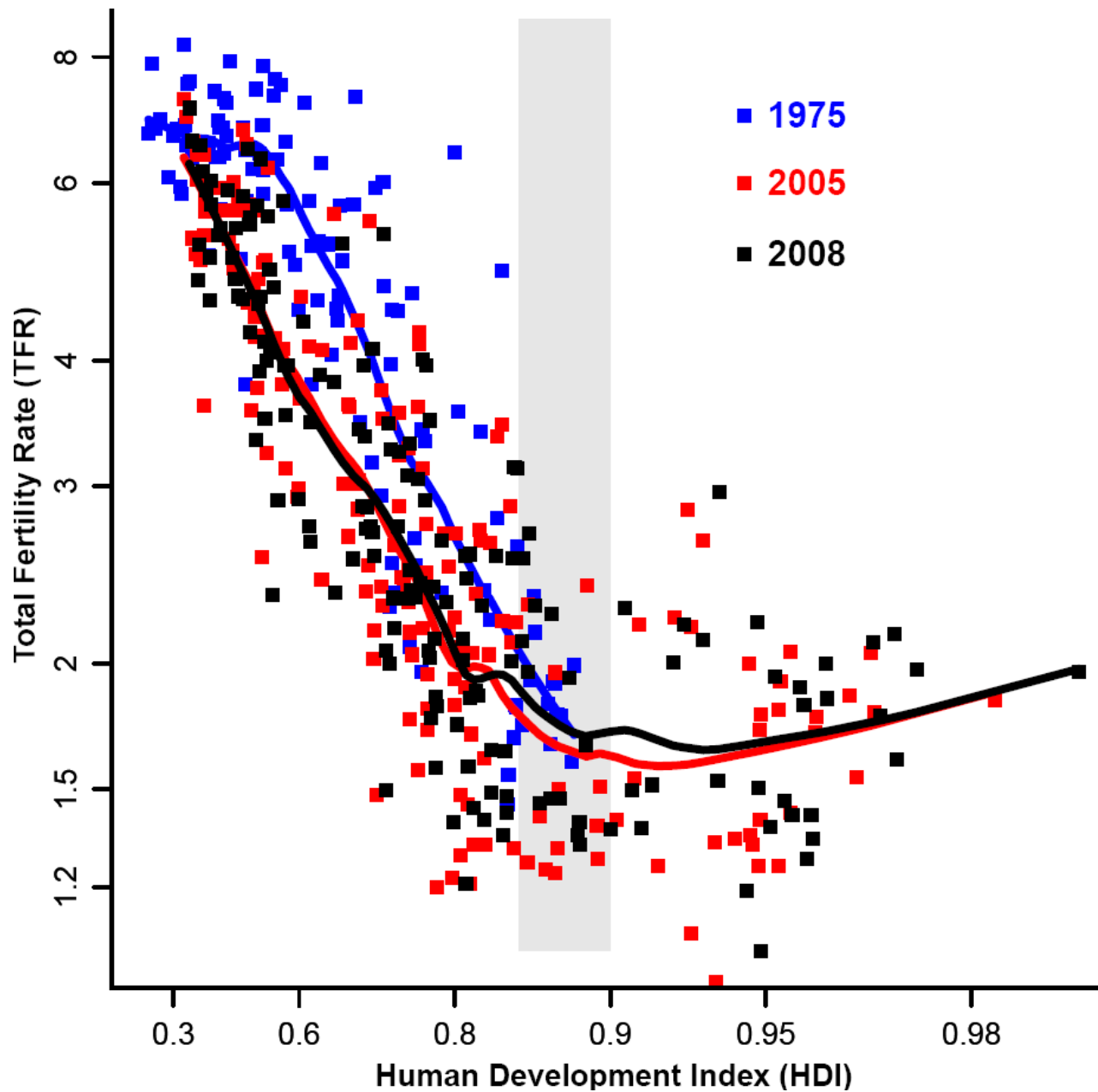
Components of HDI: GDP per capita, Life Expectancy,  
School enrollment and literacy

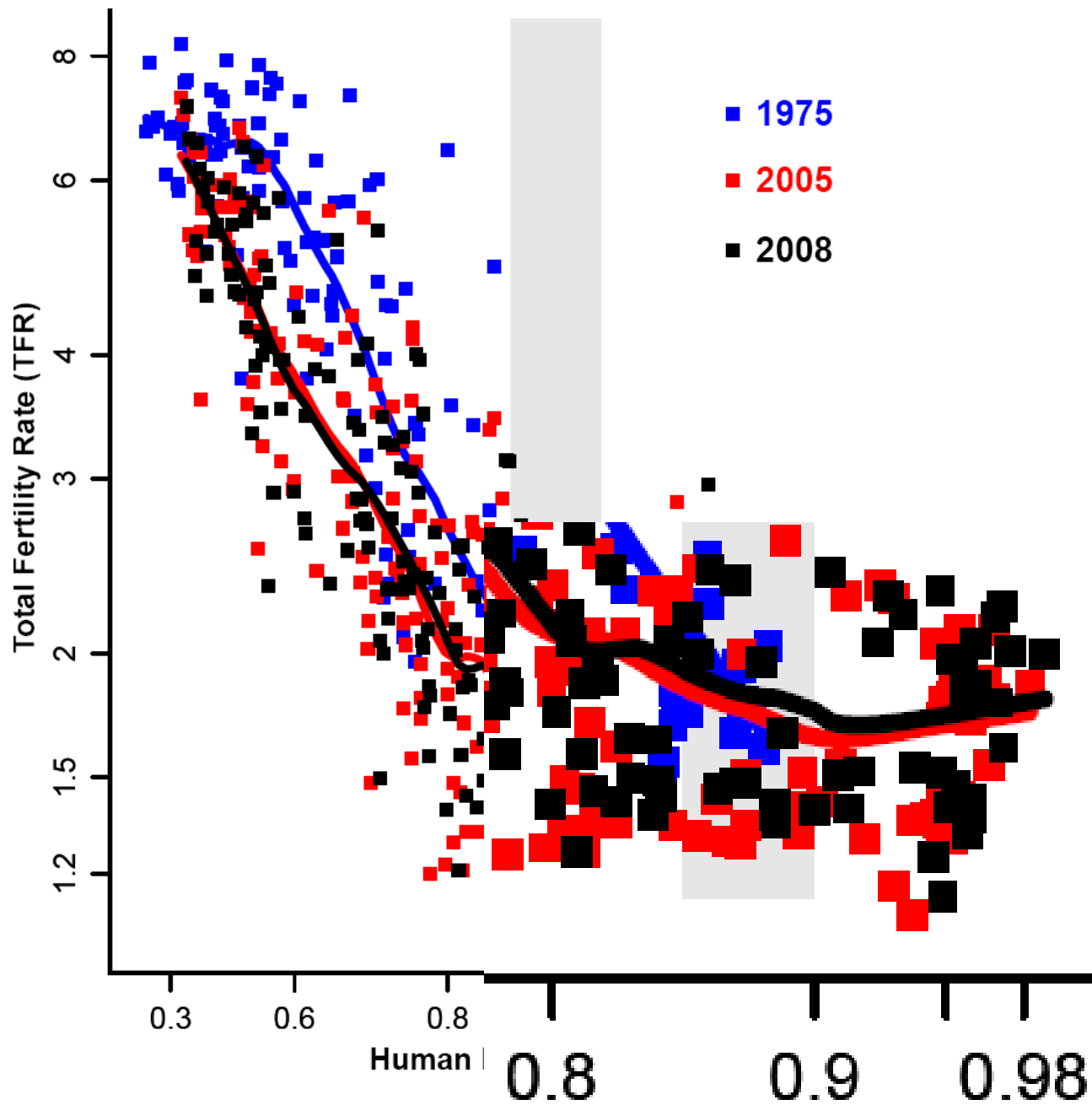
Gender Equality: Global Gender Gap Index GGG

**Years** 1975-2008

**Countries:** 174 in cross-sectional analyses, 51 in longitudinal analyses

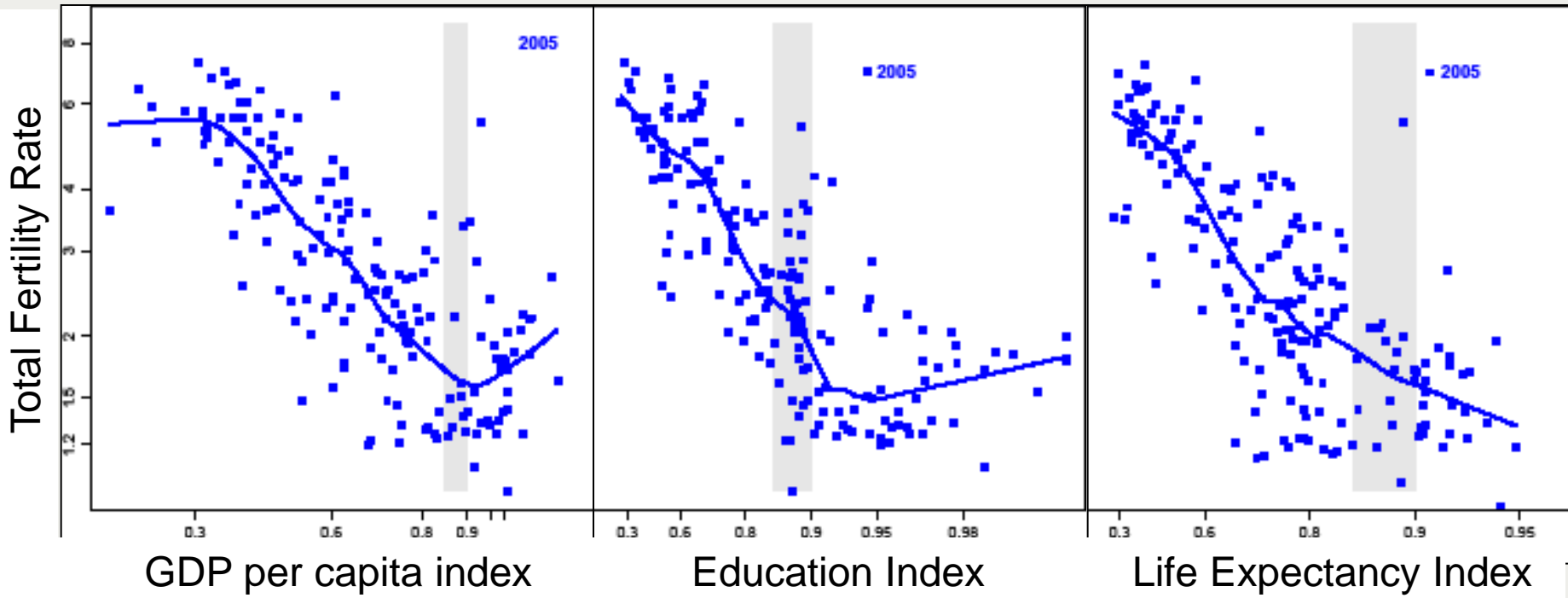
**Sources:** World Bank, National Statistical Offices,  
World Economic Forum, Human Fertility Database



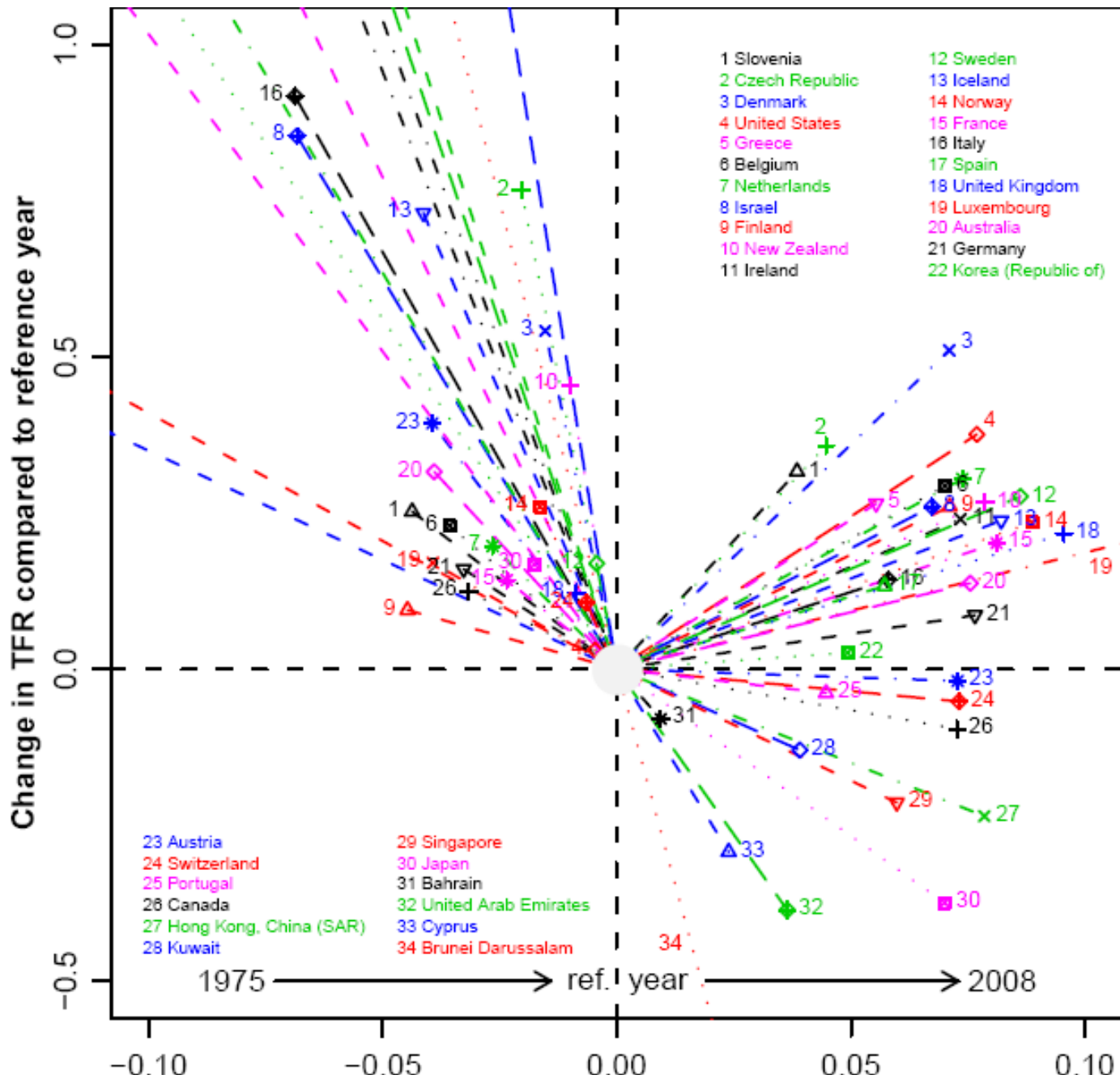




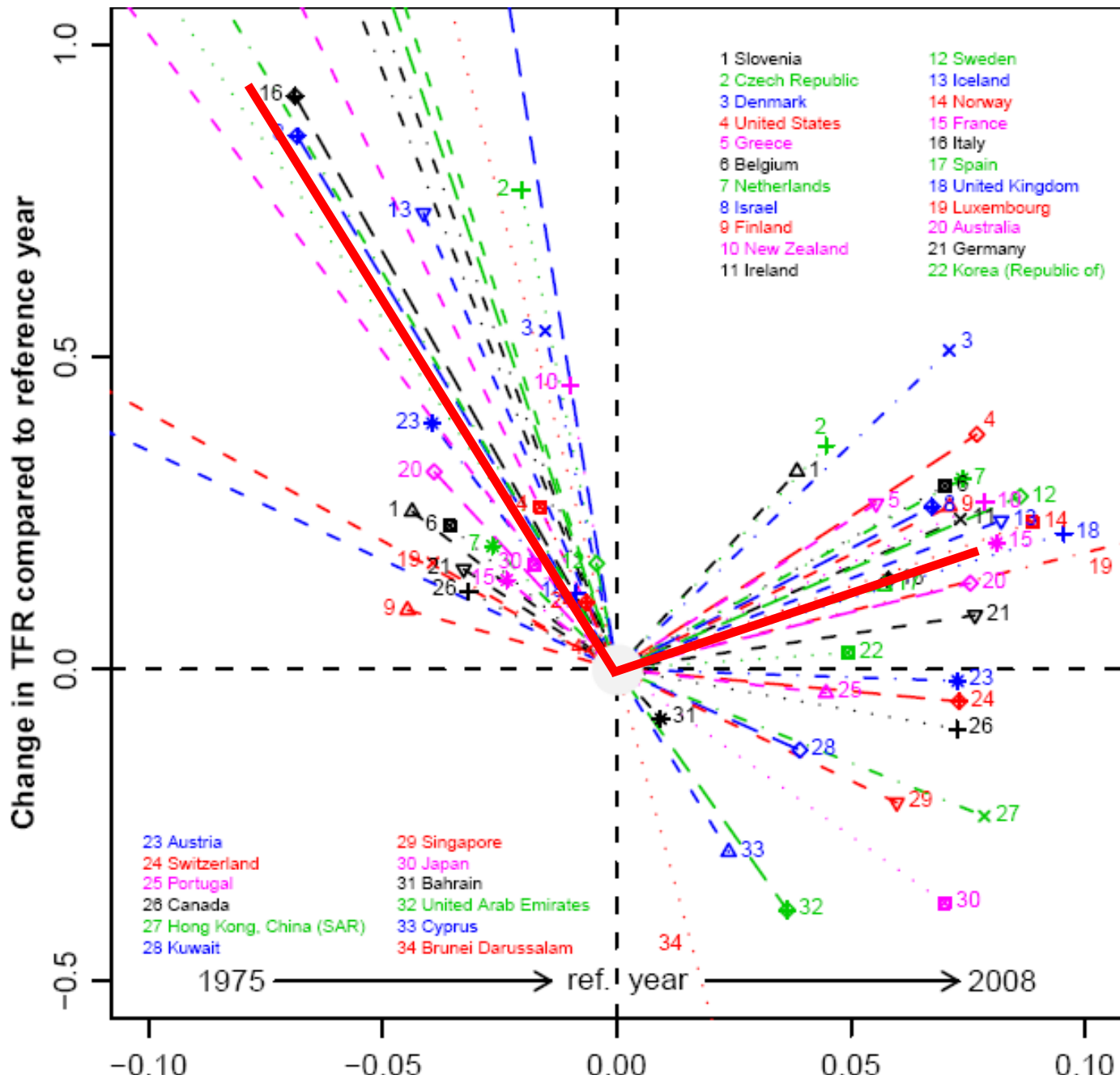
# Fertility and wealth, education, and health (year 2005)



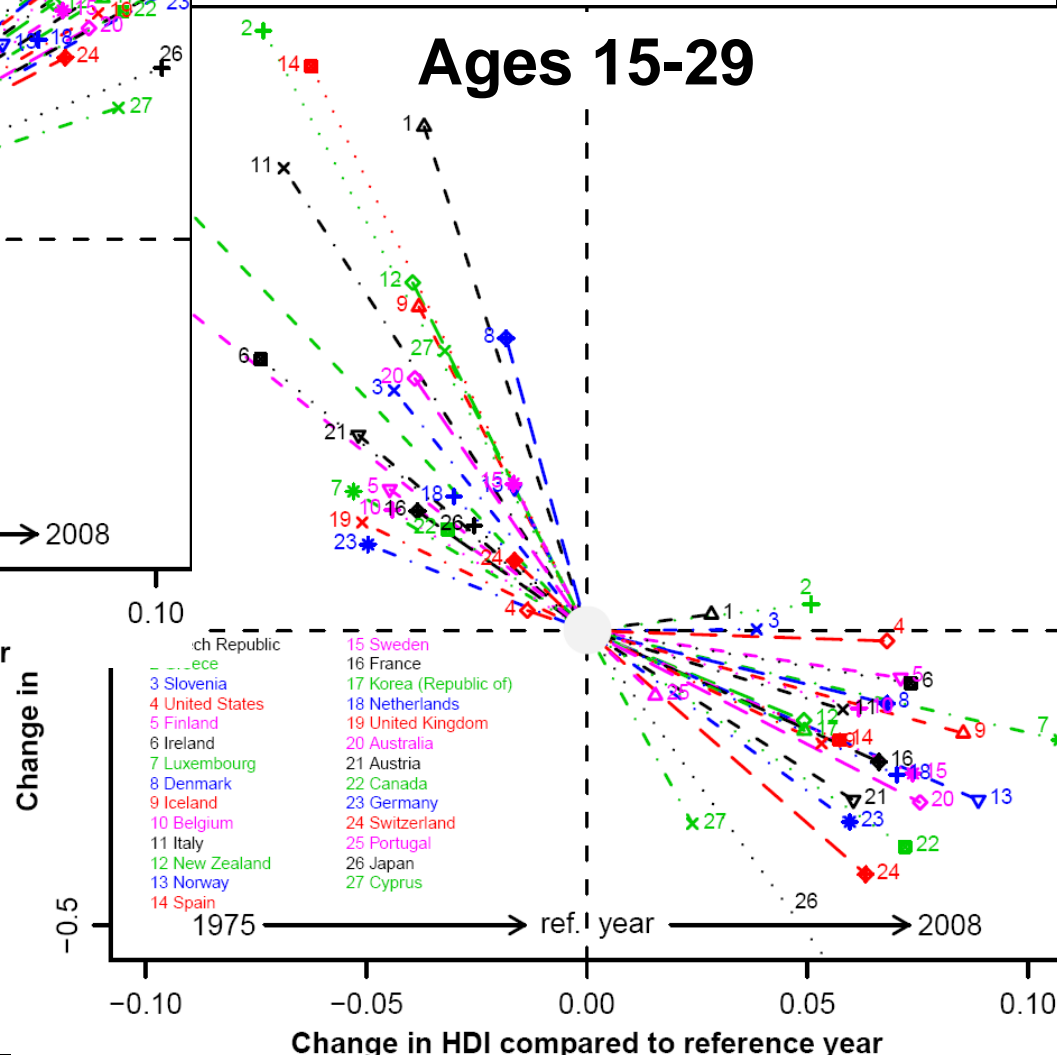
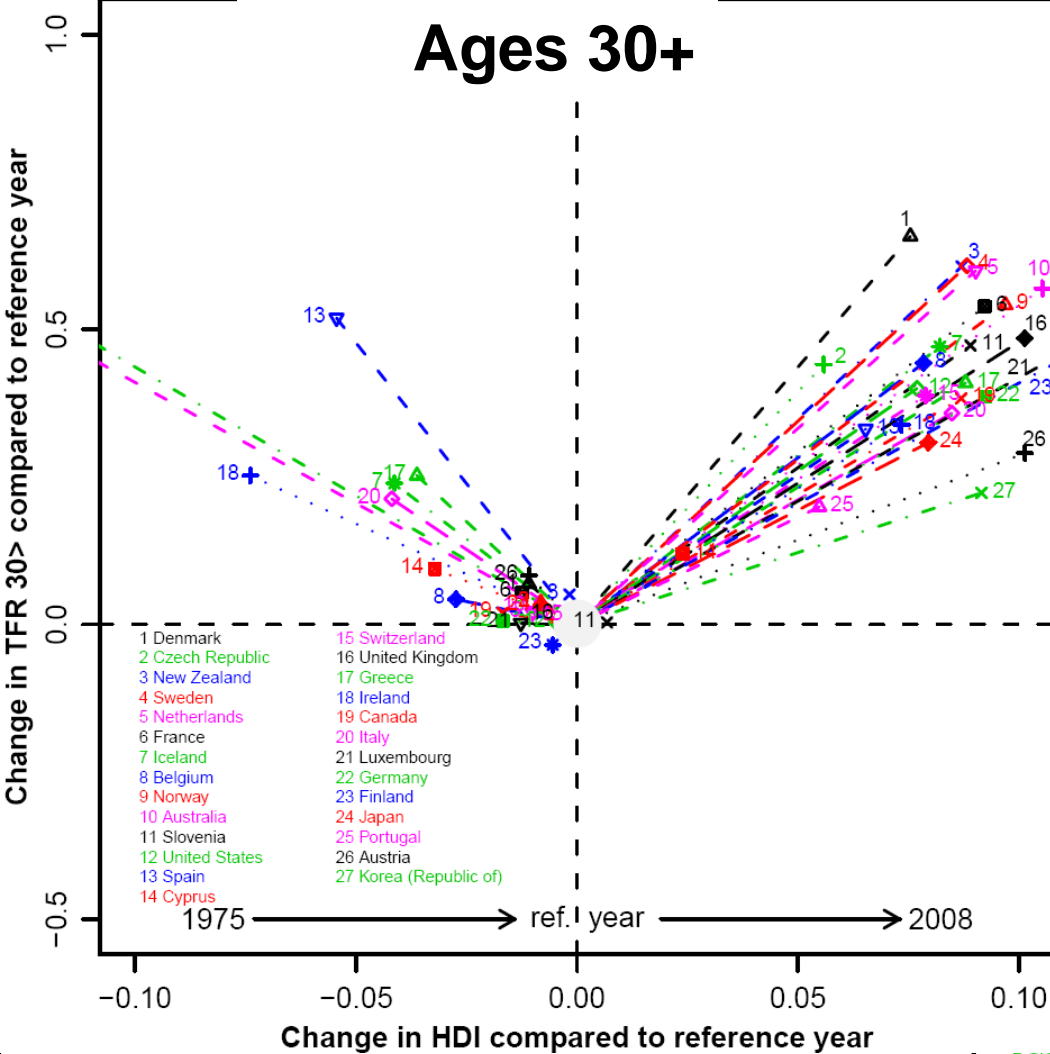
Period fertility positively correlated with wealth and education among the most advanced countries, but not with health

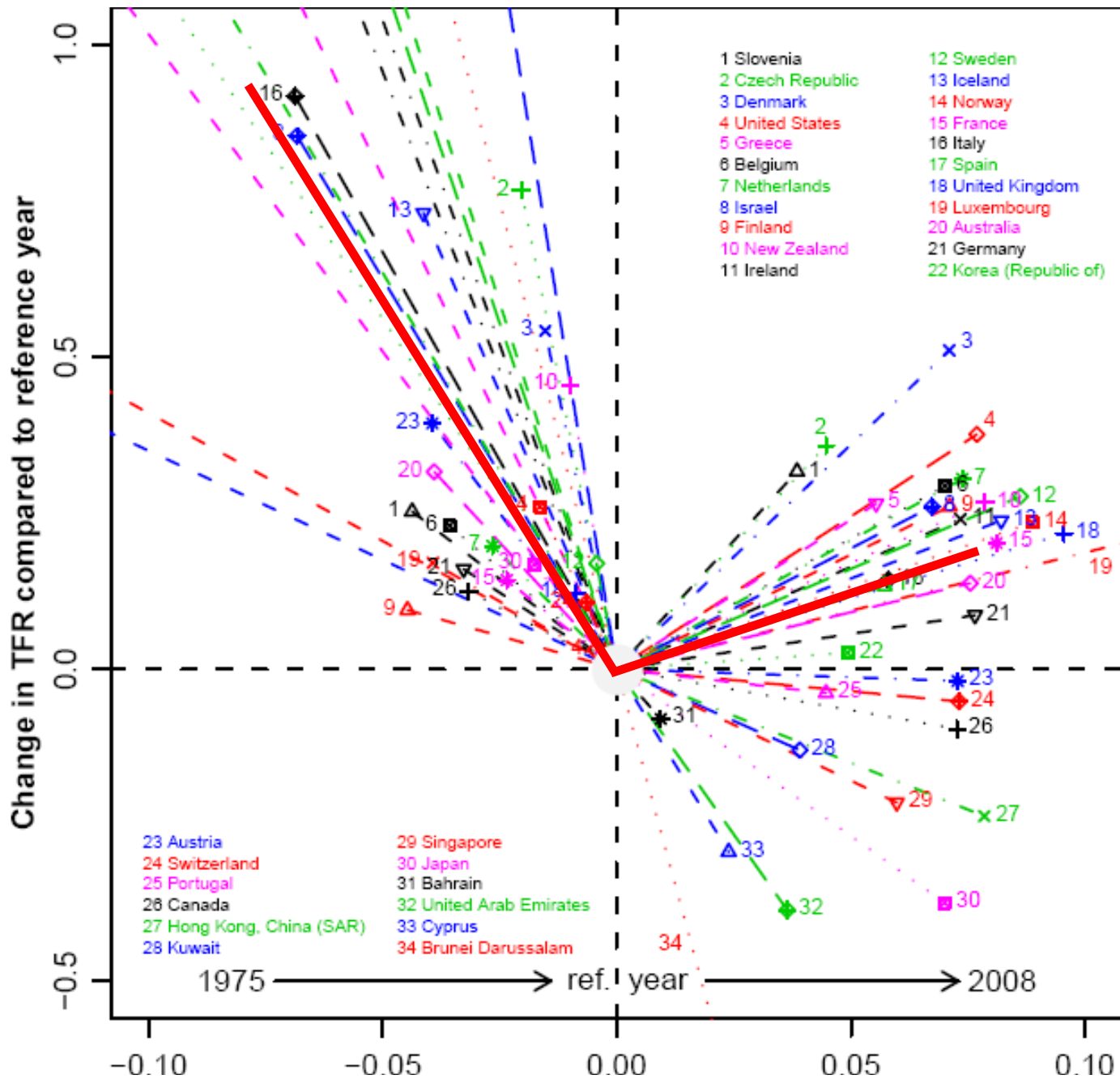


Change in HDI compared to the ref. year (HDI in .85-.90, TFR at its lowest)



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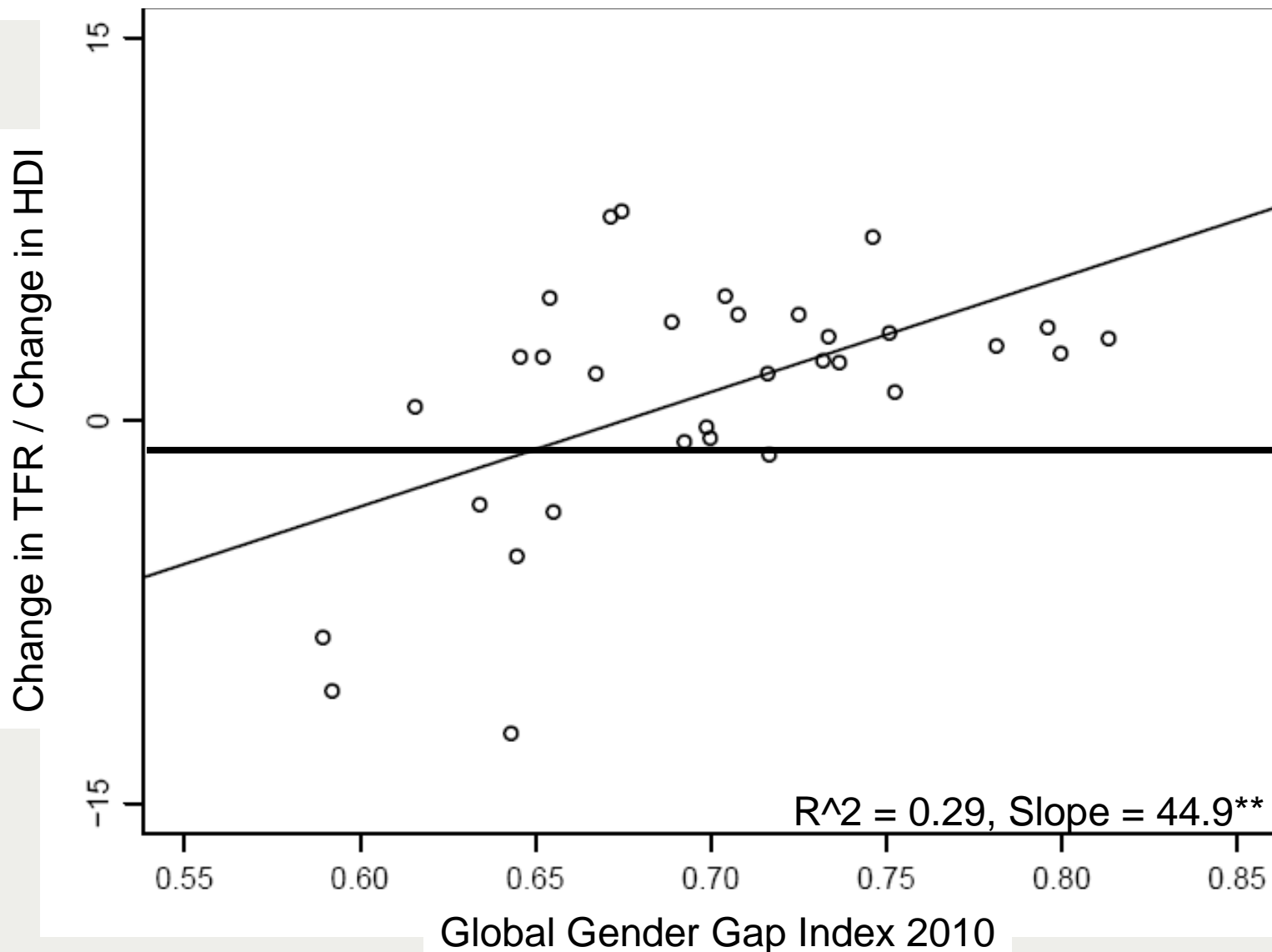




Change in HDI compared to the ref. year (HDI in .85-.90, TFR at its lowest)



## Fertility change at HDI levels > 0.90 and Gender Equality



\*Results similar for fertility level (period), and cohort fertility (1970 cohort)



## Regression analyses: Data points with HDI > .85

- (1)  $TFR_{i,t} = \alpha + \beta_1 HDI_{i,t} + \beta_2 HDI_{i,t}^2 + \varepsilon_{i,t}$
- (2)  $TFR_{i,t} = \alpha + \beta_1 HDI_{i,t} + \beta_2 HDI_{i,t}^2 + \gamma_i + \theta_t + \varepsilon_{i,t}$
- (3)  $\Delta TFR_{i,t} = \beta_1 \Delta HDI_{i,t} + \beta_2 \Delta HDI_{i,t}^2 + \Delta \theta_t + \Delta \varepsilon_{i,t}$
- (4)  $TFR_{i,t} = \alpha + \beta_1 HDI_{i,t} + \beta_2 HDI_{i,t}^2 + \gamma_i + \theta_t + \delta_1 \Delta MAB_{i,t} + \delta_2 \Delta \Delta MAB_{i,t} + \varepsilon_{i,t}$



## Regression analyses: Data points with HDI>.85

- (1)  $TFR_{i,t} = \alpha + \beta_1 HDI_{i,t} + \beta_2 HDI_{i,t}^2 + \varepsilon_{i,t}$
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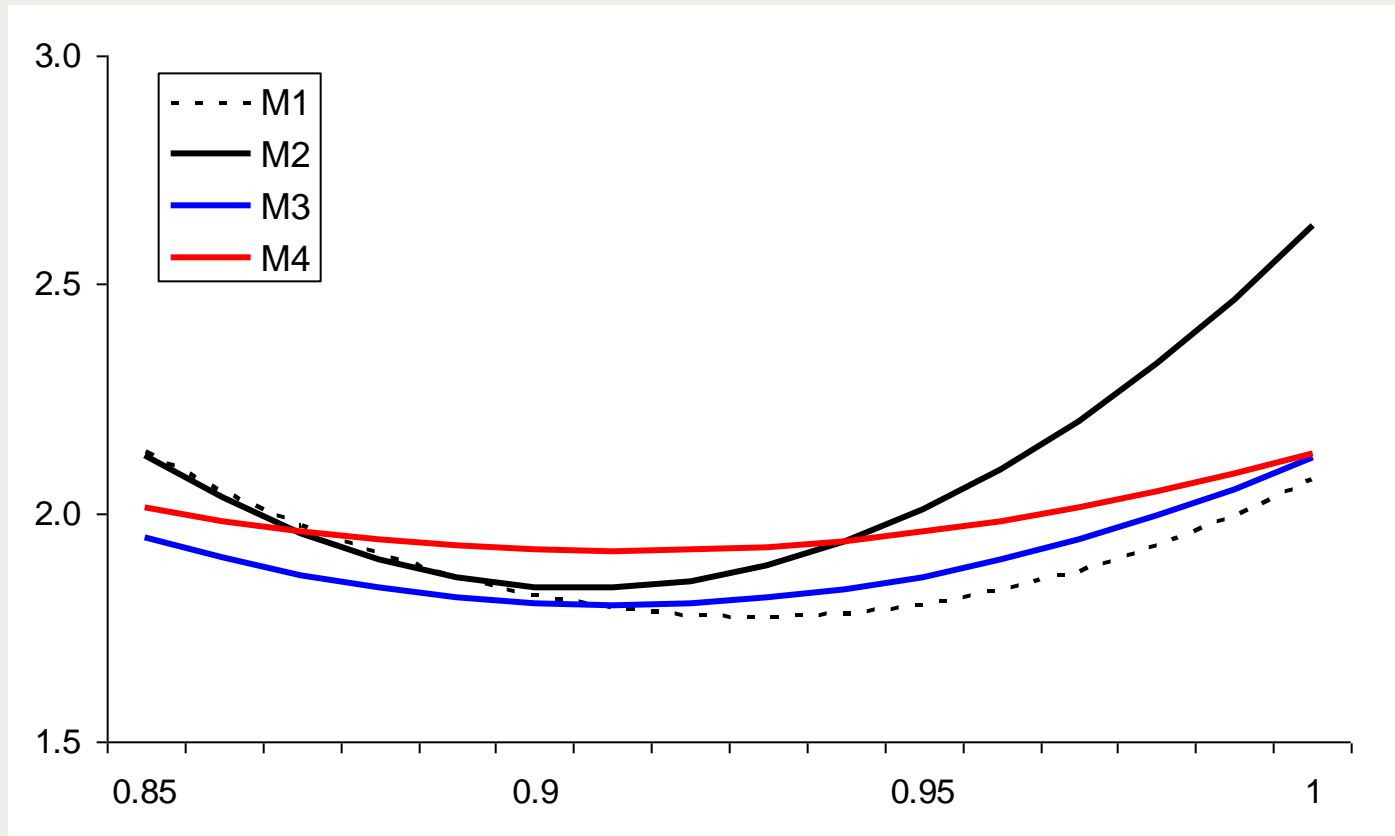
	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>
	<b>Corr's</b>	<b>2-way fixed effects</b>	<b>1<sup>st</sup> Dif, time fixed eff</b>	<b>2-way fixed effect + MAB</b>
Total N	976	976	925	763
# Countries	51	51	50	32
HDI	-109.2	-165.9	-73.4	-48.2
HDI <sup>2</sup>	58.5	91.4	40.3	25.4
dMAB				-0.44
ddMAB				0.22

All coefficients significant at .01



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## Conclusions: Development and Fertility

Fertility is going up in much of the developed world. Wealthy, healthy and well-educated countries have the highest fertility:

**Top 10 HDI countries have average TFR 1.84**

Those ranking 11-20 have average TFR 1.67

Those ranking 21-30 have average TFR 1.62

Longitudinal regressions confirm that development, and especially wealth and education, contribute importantly to the recent fertility increases.

The reversal is driven by increasing fertility at older ages (recuperation?)

**Low-equality countries unable to reap the fertility benefits of development**

-- Increasing development (of which wealth is an important part) rarely happens without women taking a major role in paid work

-- Failure to develop institutions that facilitate work–family balance may explain why some wealthy countries continue to experience declining fertility







# Cohort fertility and development

**Table 2. Regression of cohort fertility (1970 birth cohort) on human development index and on components of human development index.**

Bivariate regressions regress cohort fertility on each of the variables one at a time; Multivariate regression estimates simultaneously the associations with education, wealth, and life expectancy.

N=21	Bivariate regressions				Multivariate regression			
	b	t	p	R2	b	t	p	R2
HDI 2005	9.49	2.6	0.018	0.26				
Education Index 2005	11.4	4.1	0.001	0.47	11.2	4.2	0.001	0.59
Log of GDP/capita 2005	0.51	1.7	0.098	0.14	0.46	2.1	0.052	0.59
Life Expectancy 2005	-0.01	-0.2	0.867	0.00	0.00	0.1	0.943	0.59