

Educational Homogamy and Income Inequality: A 22-Country Study

Changing Gender Inequalities, Changing Families? Workshop

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Context: Increased income inequality between households

Is there a role for partnering behavior in this story?

US studies find up to 50% of increases in inequality explained by increasing correlation in earnings between partners

Can changes in educational homogamy among partners explain changes in income inequality over time?

Education major socioeconomic marker on which partners select

Studies so far: No or very small role

Denmark, Norway, UK, US (Breen & Salazar, 2010; 2011; Breen & Andersen, 2012; Greenwood et al., 2014; Eika et al., 2014)

Open Questions (1)



Does the conclusion of no influence of changes in educational homogamy on income inequality between households extend to more countries?

Is there cross-country variation in the influence of educational homogamy on income inequality?

This study: 21 European countries plus United States

Open Questions (2)



How can the (possible) limited influence of changes in educational homogamy be explained?

Two hypotheses (Schwartz, 2013):

- 1) Changes in educational homogamy were not big enough (or not in the right direction)
- 2) The joint level of education of couples is a relatively weak predictor of household income

Does the validity of these hypotheses differ across countries?



Goal 1: Estimate the (possible) contribution of changes in educational homogamy to changes in income inequality over time for the 22 countries of the study

Goal 2: Test hypothesis of whether changes in homogamy have not been big enough: would extreme changes in homogamy affect income inequality?

Data & Method



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Luxembourg Income Studies

All European countries with at least two years of data spaced more than a decade apart + United States

Households comprised of singles or couples living with or without children; heads of households aged 30-64

Equivalized Disposable Household Income

Education: ISCED 1-2 / ISCED 3-4 / ISCED 5-6

Datasets



Country	n	Country	n
Austria 1987	4,335	Italy 1989	4,791
Austria 2004	2,675	Italy 2010	3,671
Belgium 1985	3,712	Luxembourg 1991	1,004
Belgium 1997	2,561	Luxembourg 2013	2,182
Czech Rep. 1992	8,454	Netherlands 1983	2,628
Czech Rep. 2013	3,559	Netherlands 2013	5,800
Denmark 1987	5,610	Norway 1986	2,613
Denmark 2010	40,167	Norway 2013	109,950
Estonia 2000	2,753	Poland 1986	5,999
Estonia 2010	2,107	Poland 2013	17,667
Finland 1995	5,665	Slovakia 1992	8,119
Finland 2013	6,317	Slovakia 2010	2,443
France 1978	5,787	Slovenia 1997	1,377
France 2010	5,236	Slovenia 2012	1,901
Germany 1994	3,751	Spain 1990	10,896
Germany 2013	8,210	Spain 2013	5,699
Greece 1995	2,283	Sweden 1992	7,475
Greece 2010	2,582	Sweden 2005	8,267
Hungary 1991	827	UK 1999	11,792
Hungary 2012	798	UK 2013	9,129
Ireland 1994	1,760	US 1979	28,412
Ireland 2010	1,956	US 2013	23,903



Method: Decomposition of Theil

Theil-Index of inequality (following Breen & Salazar, 2010;2011):

$$T = \sum_j p_j \frac{\bar{x}_j}{\sum_j \bar{x}_j p_j} \ln \left(\frac{\bar{x}_j}{\sum_j \bar{x}_j p_j} \right) + \sum_j p_j \frac{\bar{x}_j}{\sum_j \bar{x}_j p_j} T_j$$

P_j = Share of population in group j

\bar{x}_j = Average household income in group j

T_j = Inequality *within* group j $\frac{1}{n_j} \sum_{i=1}^{n_j} \frac{x_{i|j}}{\bar{x}_j} \ln \left[\frac{x_{i|j}}{\bar{x}_j} \right]$

25 groups of households defined according to 'his' and 'her' level of education (5x5 table)

(ISCED 1-2; ISCED 3-4; ISCED 5-6; missing education; no partner)

Simulations Example (1)



Table 2a. Distribution of Households Spain '13:

	Her education			
His education	Low	Middle	High	Row Total
Low	19.9%	9.1%	9.9%	39.0%
Middle	5.0%	7.2%	10.4%	22.7%
High	4.7%	4.8%	28.8%	38.4%
Column Total	29.7%	21.2%	49.1%	100%

Observed Theil 2013: 0.222

Table 2b. Distribution of Households Spain '90:

	Her education			
His education	Low	Middle	High	Row Total
Low	59.8%	4.2%	1.7%	65.6%
Middle	8.2%	5.0%	2.2%	15.4%
High	6.1%	4.4%	8.4%	19.0%
Column Total	74.1%	13.7%	12.3%	100%

Observed Theil 1990: 0.187

Simulations Example (1)



Table 2a. Distribution of Households Spain '13:

	Her education			
His education	Low	Middle	High	Row Total
Low	19.9%	9.1%	9.9%	39.0%
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Observed Theil 2013: 0.222

Table 2b. Distribution of Households Spain '90:

	Her education			
His education	Low	Middle	High	Row Total
Low	59.8%	4.2%	1.7%	65.6%
Middle	8.2%	5.0%	2.2%	15.4%
High	6.1%	4.4%	8.4%	19.0%
Column Total	74.1%	13.7%	12.3%	100%

Observed Theil 1990: 0.187

Simulations Example (2)



Table 2a. Distribution of Households Spain '13:

	Her education			
His education	Low	Middle	High	Row Total
Low	19.9%	9.1%	9.9%	39.0%
Middle	5.0%	7.2%	10.4%	22.7%
High	4.7%	4.8%	28.8%	38.4%
Column Total	29.7%	21.2%	49.1%	100%

Observed Theil 2013: 0.222

Table 2c. Simulated Distribution of Households, Assortative Mating as in Spain '90

	Her education			
His education	Low	Middle	High	Row Total
Low	24.3%	7.0%	7.7%	39.0%
Middle	3.5%	8.6%	10.6%	22.7%
High	1.9%	5.6%	30.8%	38.4%
Column Total	29.7%	21.2%	49.1%	100%

Simulated Theil: 0.225;

Observed Theil 1990: 0.187

Results



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Trends in Inequality between Households



Country	First Year Theil	Last Year Theil	% Change in Theil
Austria ('87/'04)	0.084	0.127	51.2
Belgium ('85/'97)	0.091	0.105	15.4
Czech Rep. ('92/'13)	0.081	0.144	77.8
Denmark ('87/'10)	0.107	0.144	34.6
Estonia ('00/'10)	0.266	0.205	-22.9
Finland ('95/'13)	0.094	0.124	31.9
France ('78/'10)	0.195	0.177	-9.7
Germany ('94/'13)	0.145	0.195	34.5
Greece ('95/'10)	0.223	0.202	-9.3
Hungary ('91/'12)	0.148	0.175	18.2
Ireland ('94/'10)	0.248	0.166	-33.1
Italy ('89/'10)	0.166	0.202	21.7
Luxembourg ('91/'13)	0.106	0.151	42.5
Netherlands ('83/'13)	0.113	0.132	16.8
Norway ('86/'13)	0.084	0.130	54.8
Poland ('86/'13)	0.118	0.234	98.3
Slovakia ('92/'10)	0.074	0.134	81.1
Slovenia ('97/'12)	0.097	0.163	68.0
Spain ('90/'13)	0.187	0.222	18.7
Sweden ('92/'05)	0.083	0.117	41.0
UK ('99/'13)	0.270	0.228	-15.6
US ('74/'13)	0.163	0.281	72.4

Simulations: Homogamy as in First Year



Country	Observed Theil Last Year	Simulated Theil Homogamy as First Year	% Difference	% of Change in Income Inequality due to Changes in Homogamy
Austria ('87/'04)	0.127	0.127	0.1%	-0.2%
Belgium ('85/'97)	0.105	0.104	-0.5%	3.9%
Czech Rep. ('92/'13)	0.144	0.144	0.2%	-0.6%
Denmark ('87/'10)	0.144	0.146	1.4%	-5.6%
Estonia ('00/'10)	0.206	0.205	-0.4%	-1.4%
Finland ('95/'13)	0.125	0.125	0.4%	-1.6%
France ('78/'10)	0.177	0.183	3.2%	33.1%
Germany ('94/'13)	0.194	0.197	1.5%	-6.1%
Greece ('95/'10)	0.202	0.196	-3.2%	-30.9%
Hungary ('91/'12)	0.176	0.175	-0.1%	0.9%
Ireland ('94/'10)	0.166	0.169	1.6%	3.2%
Italy ('89/'10)	0.202	0.203	0.4%	-2.0%
Luxembourg ('91/'13)	0.151	0.150	-0.5%	1.8%
Netherlands ('83/'13)	0.132	0.139	4.9%	-34.4%
Norway ('86/'13)	0.130	0.130	0.3%	-0.9%
Poland ('86/'13)	0.234	0.232	-0.7%	1.5%
Slovakia ('92/'10)	0.132	0.132	-0.3%	0.6%
Slovenia ('97/'12)	0.163	0.164	1.0%	-2.4%
Spain ('90/'13)	0.222	0.225	1.6%	-10.3%
Sweden ('92/'05)	0.117	0.112	-4.6%	15.7%
UK ('99/'13)	0.228	0.229	0.4%	2.4%
US ('74/'13)	0.282	0.282	0.1%	-0.3%
Median across countries			0.3%	-0.5%

Further Analysis Summary (1)



Have changes in educational homogamy not been large enough?

Would extreme changes in homogamy affect income inequality?

Simulation 1: Minimizing educational homogamy

Simulation 2: Maximizing educational homogamy ([example](#))

Even moving from minimal to maximal homogamy would at most lead to a 14.2% increase in income inequality (Netherlands)

Conclusion

Conclusions



Changes in educational homogamy cannot explain changes in income inequality between households

Conclusion holds across 22 countries

Hypothesis that changes in homogamy were not large enough mostly rejected

Even the most extreme changes in educational homogamy would at most increase inequality by 14%

Combined levels of partners' education explain relatively little of variation in income across households

In some countries changes in educational homogamy could to some extent affect income inequality

In countries with: High income differences between groups
 High variation in educational levels



Does this imply that homogamy among partners in general matters little?

Does partner selection on other socioeconomic characteristics matter for income inequality?

Better indicators of earnings potential?

Do processes after union formation matter for income inequality?

Division of labor

Increased female employment -> increased correlation in earnings?

Educational homogamy important for other forms of inequality?

Thank you!

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Simulations (3): Minimal Homogamy



Table 2a. Distribution of Households Spain '13:

	Her education			
His education	Low	Middle	High	Row Total
Low	19.9%	9.1%	9.9%	39.0%
Middle	5.0%	7.2%	10.4%	22.7%
High	4.7%	4.8%	28.8%	38.4%
Column Total	29.7%	21.2%	49.1%	100%

Table 2c. Simulated Distribution of Households, Minimal Homogamy

	Her education			
His education	Low	Middle	High	Row Total
Low	11.6%	8.3%	19.1%	39.0%
Middle	6.7%	4.8%	11.1%	22.7%
High	11.4%	8.1%	18.8%	38.4%
Column Total	29.7%	21.2%	49.1%	100%

Simulations (4): Maximal Homogamy



Table 2a. Distribution of Households Spain '13:

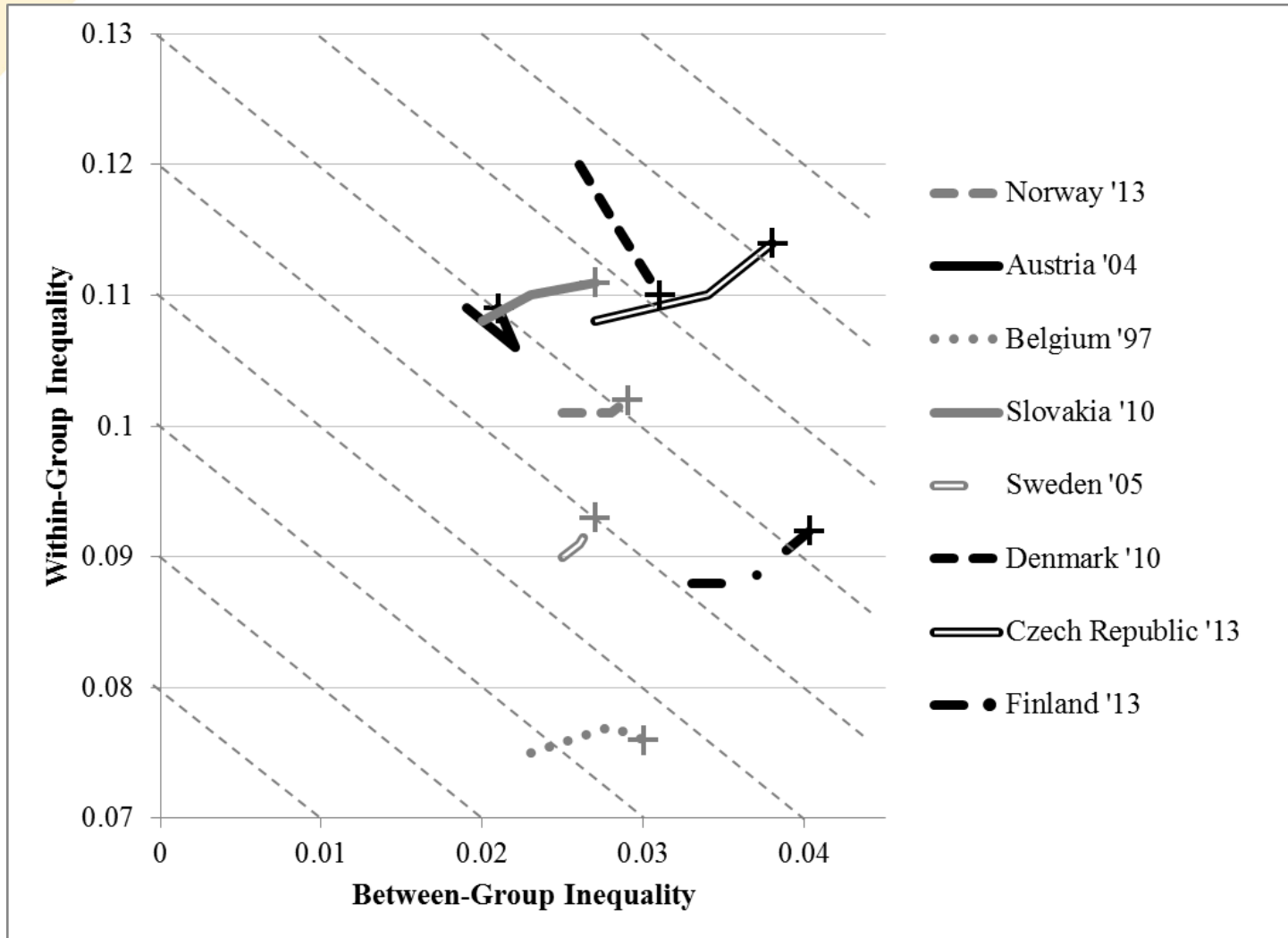
	Her education			
His education	Low	Middle	High	Row Total
Low	19.9%	9.1%	9.9%	39.0%
Middle	5.0%	7.2%	10.4%	22.7%
High	4.7%	4.8%	28.8%	38.4%
Column Total	29.7%	21.2%	49.1%	100%

Table 2c. Simulated Distribution of Households, Maximal Homogamy

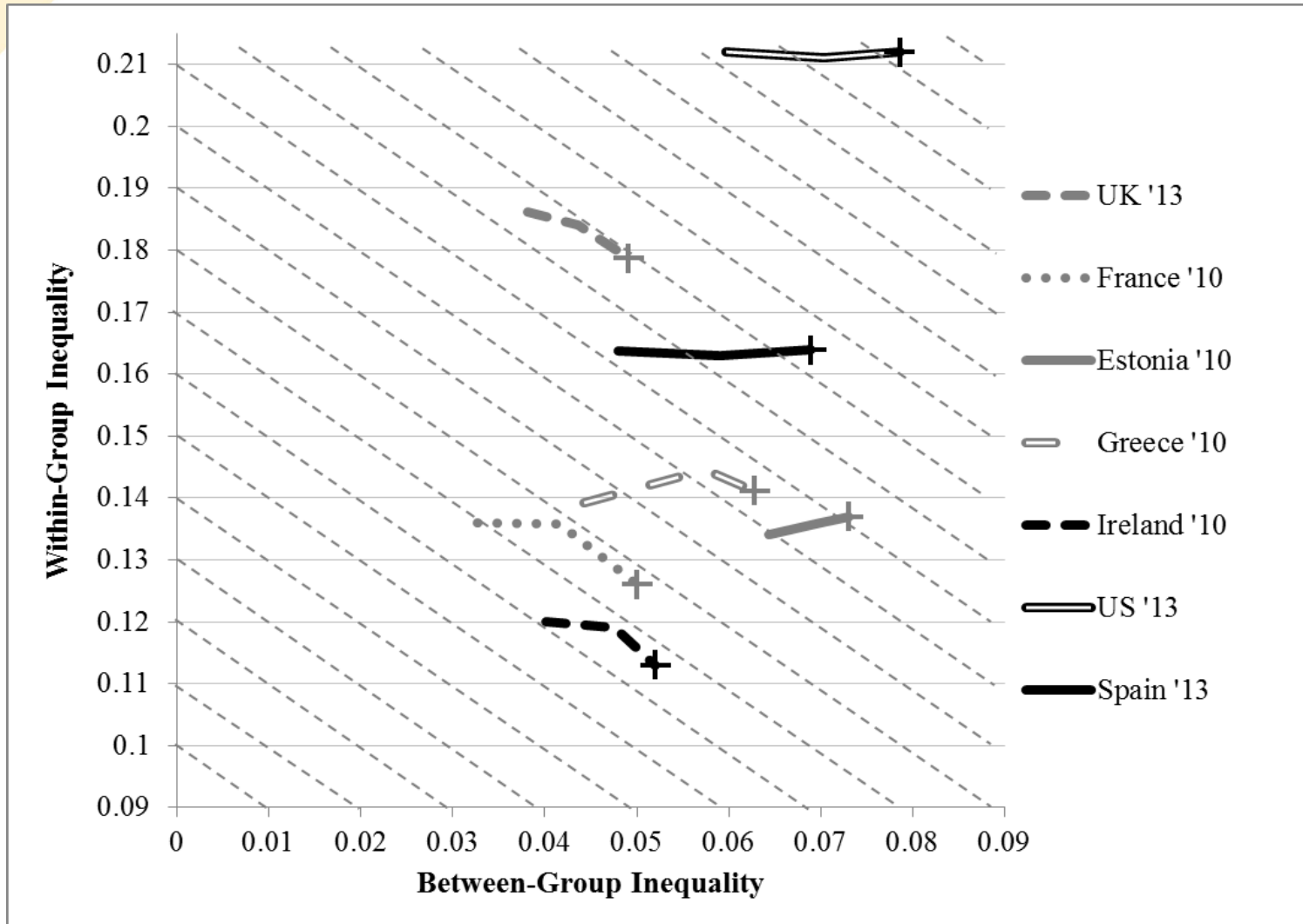
	Her education			
His education	Low	Middle	High	Row Total
Low	29.7%	0.0%	9.3%	39.0%
Middle	0.0%	21.2%	1.5%	22.7%
High	0.0%	0.0%	38.4%	38.4%
Column Total	29.7%	21.2%	49.1%	100%

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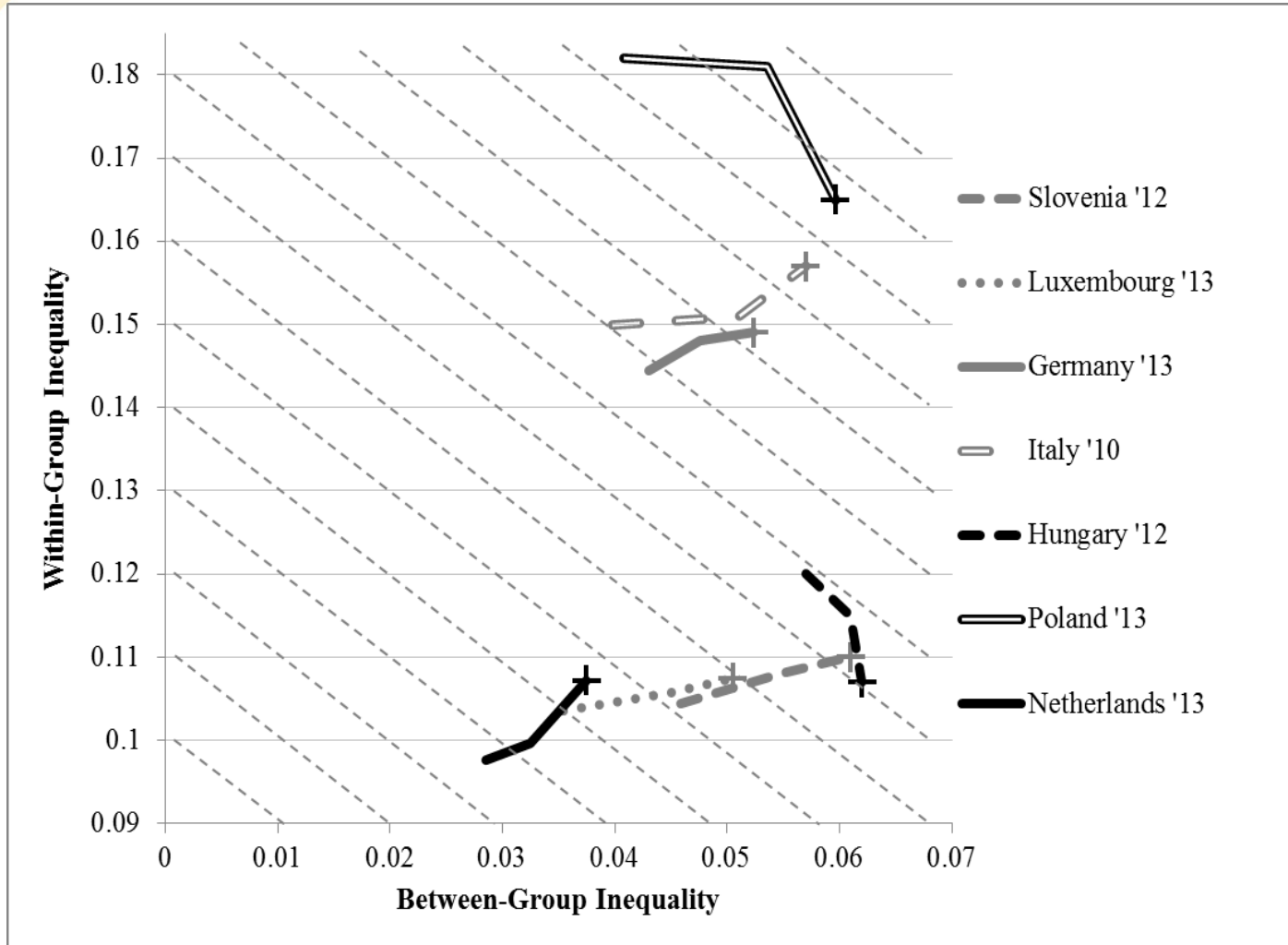
Actual and simulated levels of homogamy (1)



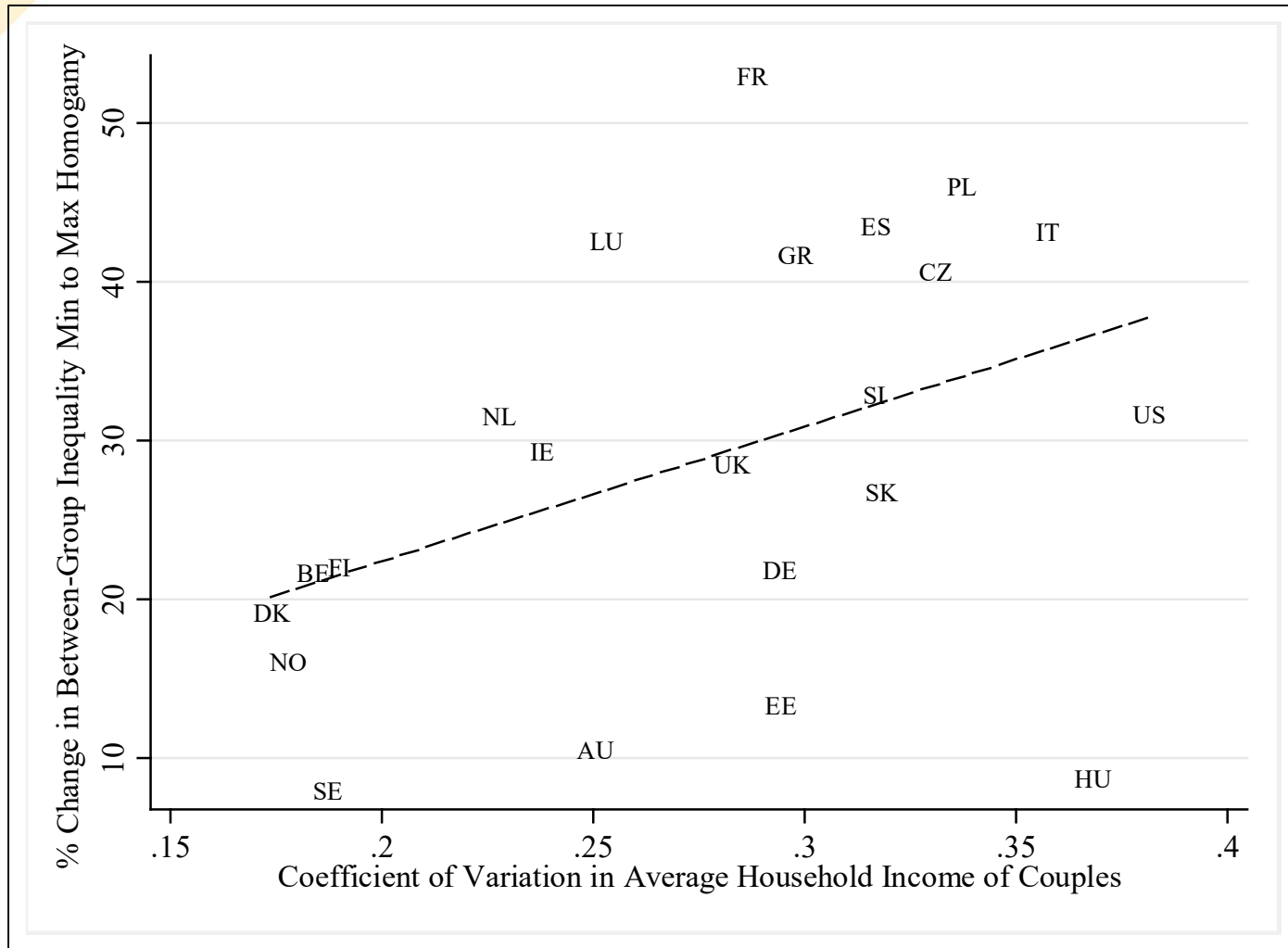
Actual and simulated levels of homogamy (2)



Actual and simulated levels of homogamy (3)



Coefficient of variation and influence of homogeneity



Scope for redistributing households

