A Mirage of Persistent Inequality? Comparative Educational Opportunity over the Long Haul

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The Starting Point

- Shavit and Blossfeld (1993, SB93) is a major citation hit, with Google Scholar now registering over 600 cites for the book.
- Data from 13 countries: Czech Republic, England, Germany, Hungary, Israel, Italy, Japan, the Netherlands, Poland, Sweden, Switzerland, Taiwan, the United States.
- The main conclusion is a thesis of persistent inequality of educational opportunity (IEO), measured in terms of the effects of family origins on the rates of educational transitions.

Cameron & Heckman, 1998

- Revisit the problem of dynamic selection bias in the context of Mare's sequential logit model for conditional education transitions. Propose a latent-class method to correct for dynamic selection bias.
- Criticize the arbitrary choice of effect parameters, aggravated by inattention to problems of underidentication, especially for cross-sectional data.
- When applied to US data (OCGII & NLSY), results suggest that declining IEO across transitions is not evident and depends on the choice of indices of IEO.

Design Features of SB93

- Report on OLS regressions and Mare (sequential logit) models.
- Social background indicators for IEO for most cases: father's education, father's occupation (status or EGP scheme), gender.
- Design problems of SB93:
  1. Inherent dynamic selection bias is widely acknowledged but not eliminated, so can't separate out true transition effects.
  2. Only semi-harmonized measures and models. Different chapters deal with varying # of transitions (2 to 5, seven cases with 4), hence difficult to go beyond a qualitative summary.
  3. Less obvious: effectively-small N analysis, especially when
     - breaking down into multiple cohorts,
     - examining the effects of each background variable separately &
     - at later stages of educational transition.

     This feature biases the main findings toward TPI—as documented by Breen, Luijkx, Muller, and Pollak (2009, AJS).

Two Motivations

- Does the thesis of persistent inequality (TPI) remain valid despite inherent dynamic selection bias?

- How is it possible that widespread educational expansion fails to reduce the influence of family background at all stages of educational transition?
  - Breen et al. have articulated an opposite thesis of nonpersistent inequality (TNI) and offered a new empirical test of TPI vs TNI for 8 European countries.
  - They found: TNI is strongly supported; the old evidence & support for TPI is misguided, largely driven by effectively small N.

- High time for a major replication of SB93's study
  - with due adjustment for bias and much larger samples,
  - a daunting task but feasible with our collaboration.

ISMF

- International Stratification and Mobility File (ISMF)
  - Nationally representative samples.
  - Overlapping surveys smooth out survey effects.
  - Always: measure of father's occupation. Often: father's & mother's occupation.

- Harmonization:
  - Father's occupation: all sources recoded into ISCO68 and ISCO88, then scaled by ISEI. Range: 10-90.
  - Father's education: scaled according to level / duration. Range: 0-22 (truncated).
  - Education: organized in 7 levels, ranging from 0 No Education and 6 (Higher/Upper Tertiary).

Extract from ISMF

- Age 25-64. Cohorts born 1900-1980, coded in 10-year blocks.
- Cases with valid data on AGE, FED, FSEI and EDU.

- We have few observations in (0) No Education and (1) Incomplete Primary. Four transitions remain:
  - ED23 From Complete Primary to Lower Secondary and up.
  - ED34 From Lower Secondary to Higher Secondary and up.
  - ED45 From Higher Secondary to Lower Tertiary and up.
  - ED56 From Lower Tertiary to Upper Tertiary.

An Overview of the SB93 Samples

Country	Authors	Sample	ISMF +=has	Cohorts	Age	Fathers' Occ	Fathers Ed	N	Transi-tions	OLS Trend
CSK	Mateju	SCSC, 1984	+	1918-1957, 9 years wide		EGP5	4 levels	6000	2	Some
ENG	Kerckhoff & Trott	Oxford Study, 1972, four cohorts, men	+	1913-1962, 10 year wide (4)	20-59 men	SIOPS	Years	7626	3	No
GER	Blossfeld	GSOEP, 1984-1988		1916-1965, 5 year wide (10)		Wegener Prestige	Average duration	4199	4	No
HUN	Szelenyi & Aschaffen-burg	SMLH, 1983	+	1911-1960, 10 years wide (5)	21-72	SIOPS	Years	24824	5	Yes, for men only
ISR	Shavit	Mobility Study, 1974 and Political Attitudes Study, 1988. Arab samples.	+?	1930-1970, 10 year wide (4)		SEI	3 levels	2579		No
ITA	Cobalti & Schizzerotto	ISM, 1985	+	1920-1961, 14 years wide (3)		EGP, SEI	4 levels	4200	3	Only FED
JAP	Treiman & Yamaguchi	Japanese Stratification Study, 1975. Men only.	+	1906-1955, 10 years wide (5)	20-69 men	SIOPS	Years	2100	3	Yes, FED
NET	De Graaf & Ganzeboom	10 surveys, 1970-1987	+	1891-1960, 10 year wide (7)	>25	SEI / EGP	4 levels	11244	3	Yes
POL	Heyns & Bialecki	Social Structure and Mobility, 1987	+	1920-1969, 10-17 years wide (4)	21-65, 21-60	SIOPS, EGP9	Years	5434	4	no
SWE	Jonsson	ULF, 1976-1987		1902-1961, 9 year wide (7)	26-74	EGP6	5 levels	17276	4	Only Focc
SWI	Buchman & Charles	Career Study, 1989. Two Swiss-German cohorts born 1950 and 1960		1950-1960, 3 years wide (2)	30, 40	SIOPS	Years	1931	5	No
TAI	Tsai & Chiu	Island wide survey, 1988. Men only		1919-1968, 11-15 years wide (3)	men	SEI	Schooling	988	4	Yes
USA	Hout, Raftery & Bell	GSS, Experienced Labor Force	+	1905-1954, 10 year wide (6)		Siegel Prestige	5 cats	8876	4	Yes

Sample Size Comparison: ISMF versus SB93

CZE	ENG	GER	HUN	ISR	ITA	JAP
13,068 > 6,000	10,404 > 7,626	31,518 > 4,199	83,806 > 24,824	12,714 > 2,579	36,520 > 4,200	8,473 > 2,100
NET	POL	SWE	SWI	TAI	USA	
61,756 > 11,244	76,625 > 5,434	8,532 < 17,276	5,547 > 1,931	39,977 > 988	57,880 > 8,876	

Analytics-1

- Like SB93, IEO here is based on logit coefficients of parental background.
- Focused on father education and SEI:
  - This focus is most directly comparable to the focus of the Blau and Duncan tradition.
  - A single measure of Total Family Effect="Sum of partial FED & net FSEI".
  - But also compare (a) total effect of FED & (b) partial effect of FSEI (net of FED)

Analytics-2

- All patterns are effectively "margin-free"—
  - free of systemic variation or pure noise in the marginal distributions of education and so on,
  - i.e., logit models are estimated after offsetting (as deviations from) the observed country-cohort-transition odds of making a transition.
- Explicitly test for linear trends & interactions with models of micro data.
  - As useful first-order summary of temporal trends, dramatically reducing the number of parameters.
  - Easy to visualize and conduct significance test.

Analytics-3

- Additionally, to implement the Cameron-Heckman correction for dynamic selection bias with cross-sectional data, we apply a latent-class logit regression model (LatentGold 4.0)
  - Stipulating two to three probability masses as the basis of nonparametric approximation for the stable component of unobserved heterogeneity.
  - Note that this happens to be a clever approx. to a one-dimensional continuous latent variable.
- A recent simulation study has demonstrated that the method works remarkably well in recovering true persistence of inequality using cross-sectional data (Tam 2008).

Country/Society List & Codes

- LIST

  Czech Republic, England, Germany, Hungary, Israel, Italy, Japan, the Netherlands, Poland, Sweden, Switzerland, Taiwan, the United States.

- CODES

  Except for USA, a case label in the figure is the first 3 letters of the name of a country/society.

Fig 1a. Consequences of Adjusting for Dynamic Selection Bias (3C) or Not (1C)

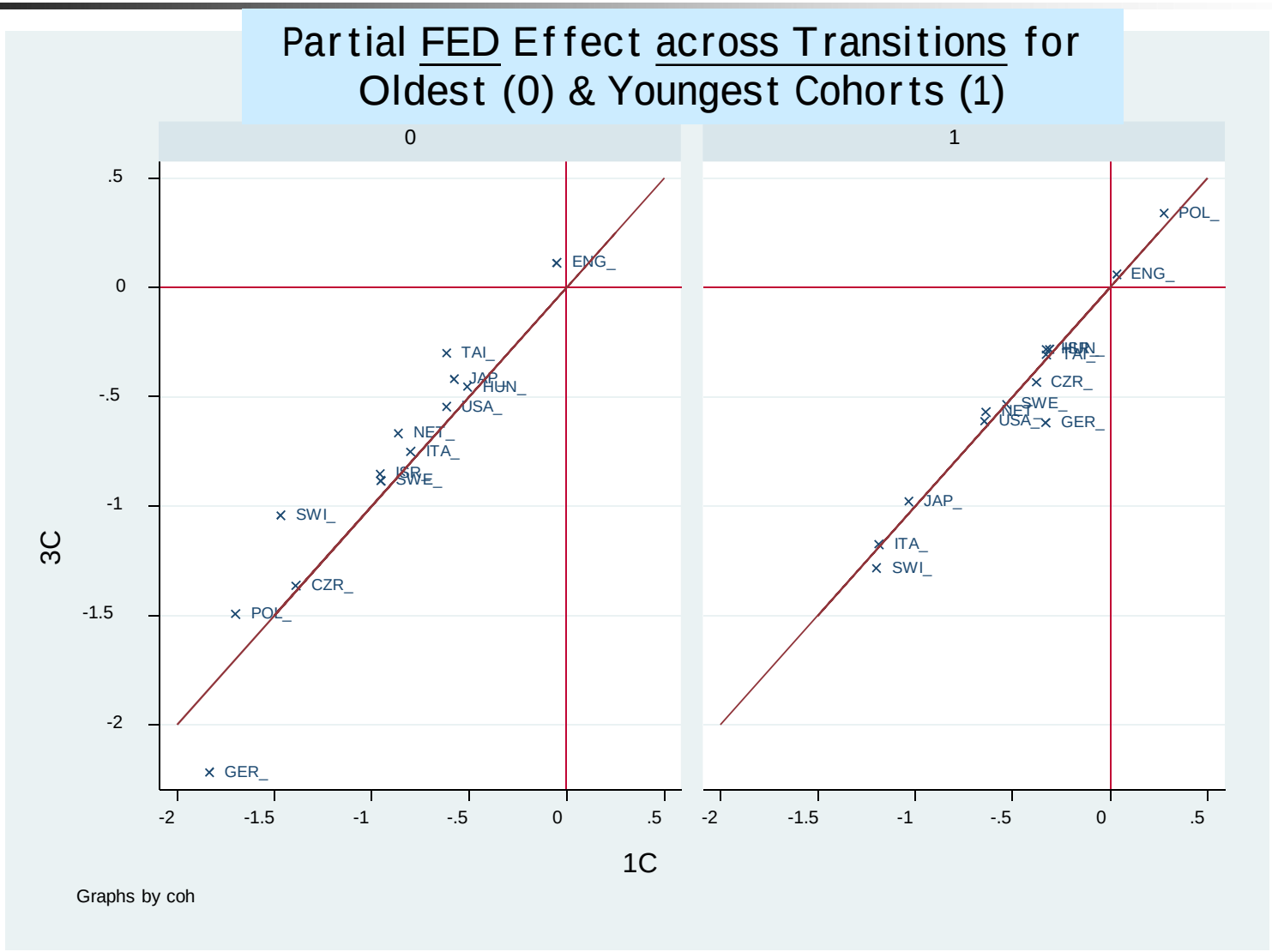


Fig 1b. Consequences of Adjusting for Dynamic Selection Bias (3C) or Not (1C)

Partial FSEI Effect across Transitions for Oldest (0) & Youngest Cohorts (1)

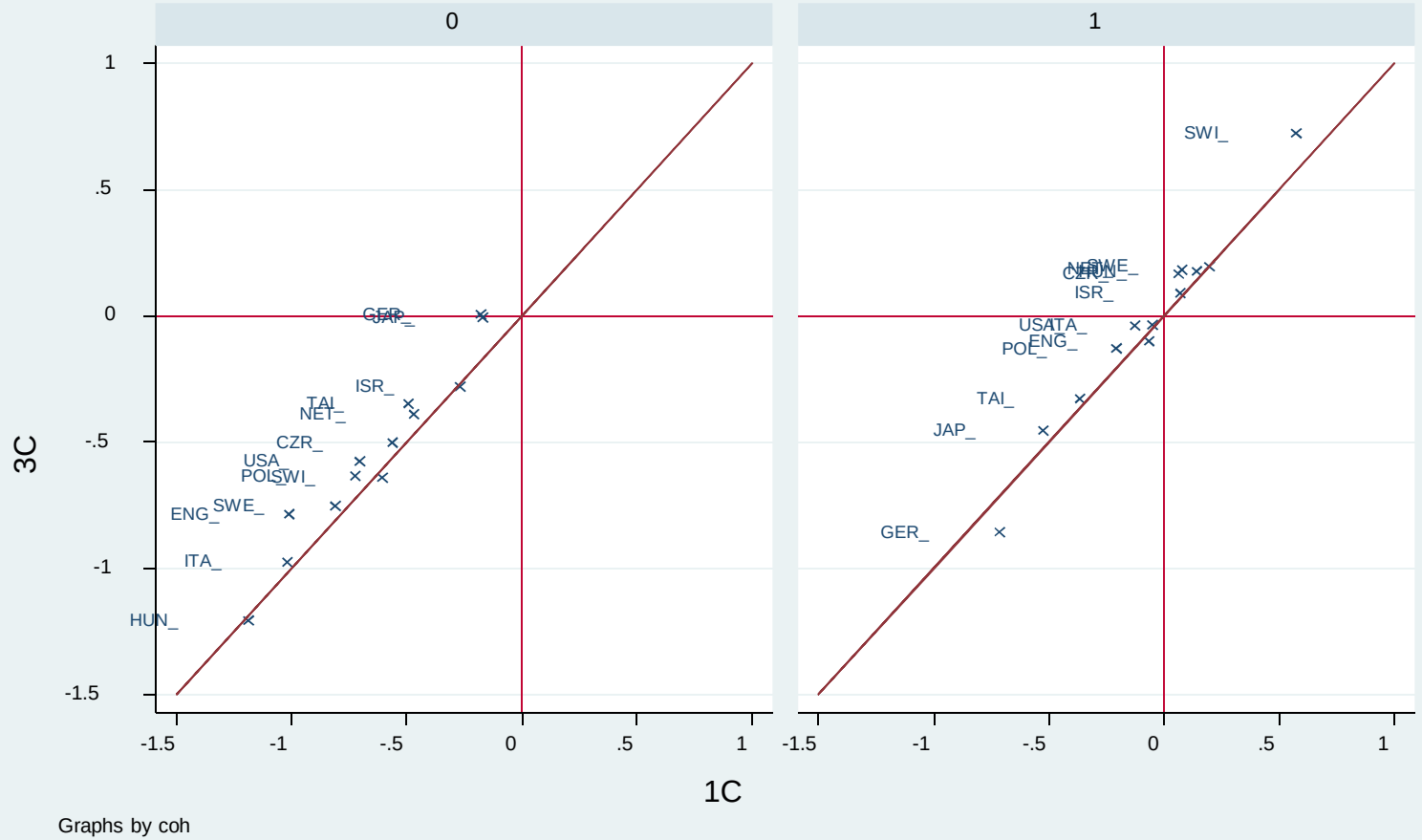
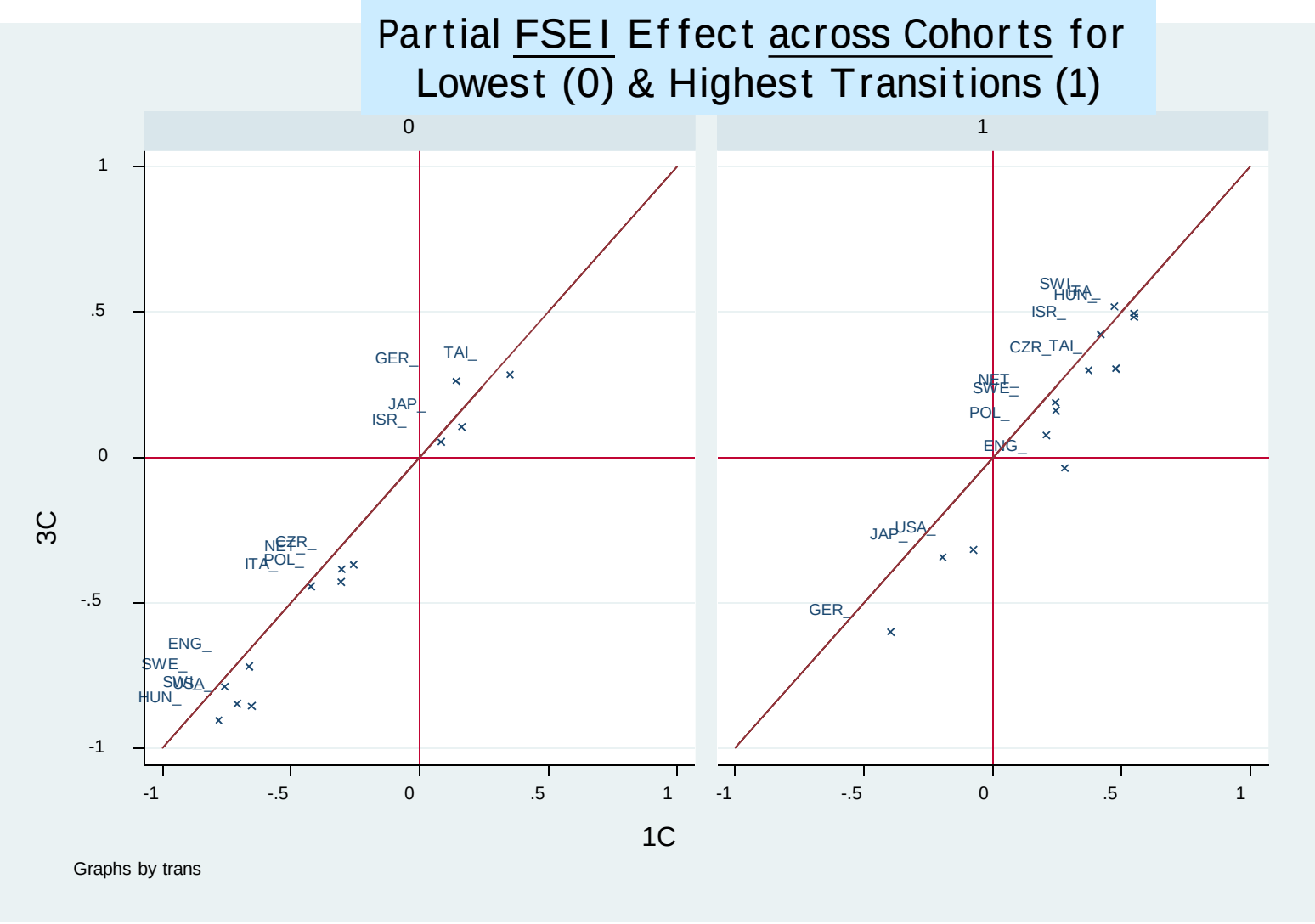


Fig 1c. Consequences of Adjusting for Dynamic Selection Bias (3C) or Not (1C)



Punch Line 1 (Adjustment for Bias)

- To our pleasant surprise, adjustment for dynamic selection bias in general does not alter any of the qualitative results; both the life-cycle and cohort trends in IEO remain intact.
  - Even though dynamic selection bias is present, the impact of the bias in the context of our 13 countries proves to be quantitatively minor and qualitatively inconsequential.

- Life-cycle dynamics (IEO across transitions): Life-cycle decline is real. The widely observed phenomenon of declining IEO from low to high educational transitions remains quantitatively strong after adjustment for dynamic selection bias.
  - That is, only a small fraction of the unadjusted decline is a statistical artifact.

The Curse of Hyper-dimensionality

- The next central finding is much harder to present: there are simply too many parameters involved.
  - Even the analysis based on the simplest specification of cohort trends & variation across 4 transitions & 13 societies results in the need to digest patterns (Fig 2a) determined by about 100 parameters.
  - Adding the nonlinear trend for the average transition (i.e. the transition experience of a representative person) brings the total number of relevant parameters to about 300.
- Our solution to the curse of dimensionality is graphical.

Fig 2a. Sum of Father Education & SEI Effects

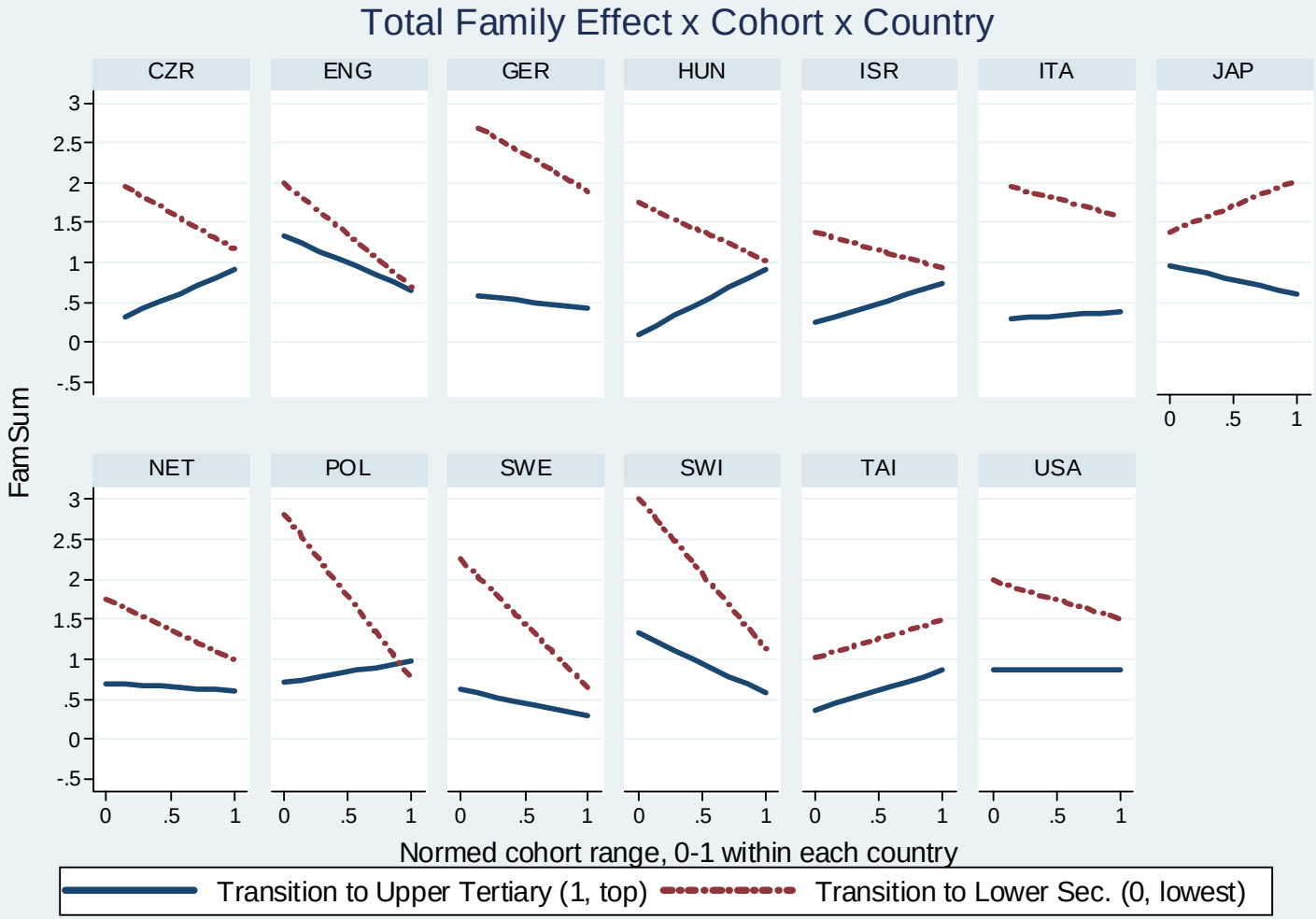


Fig 2b. The Average Transition

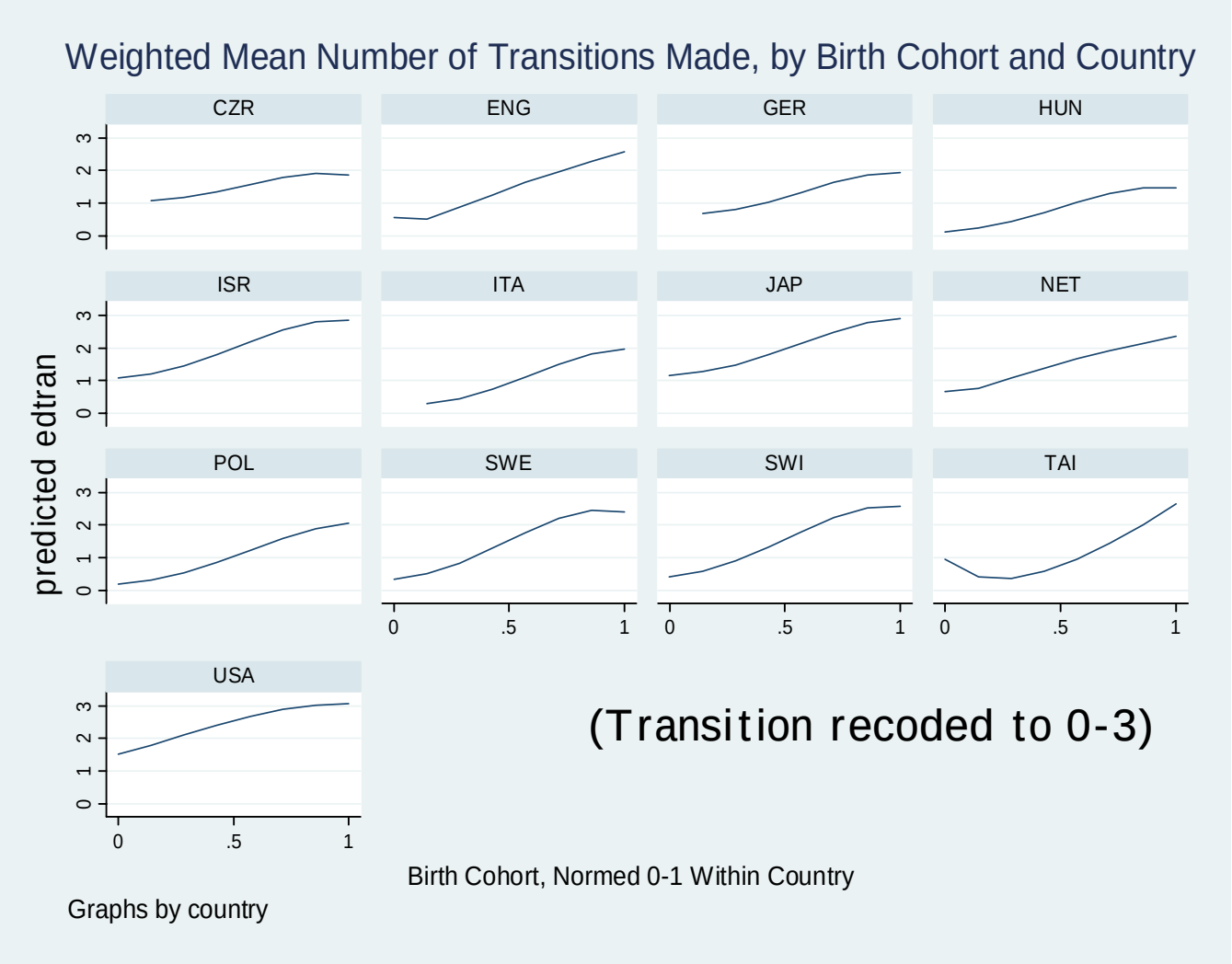
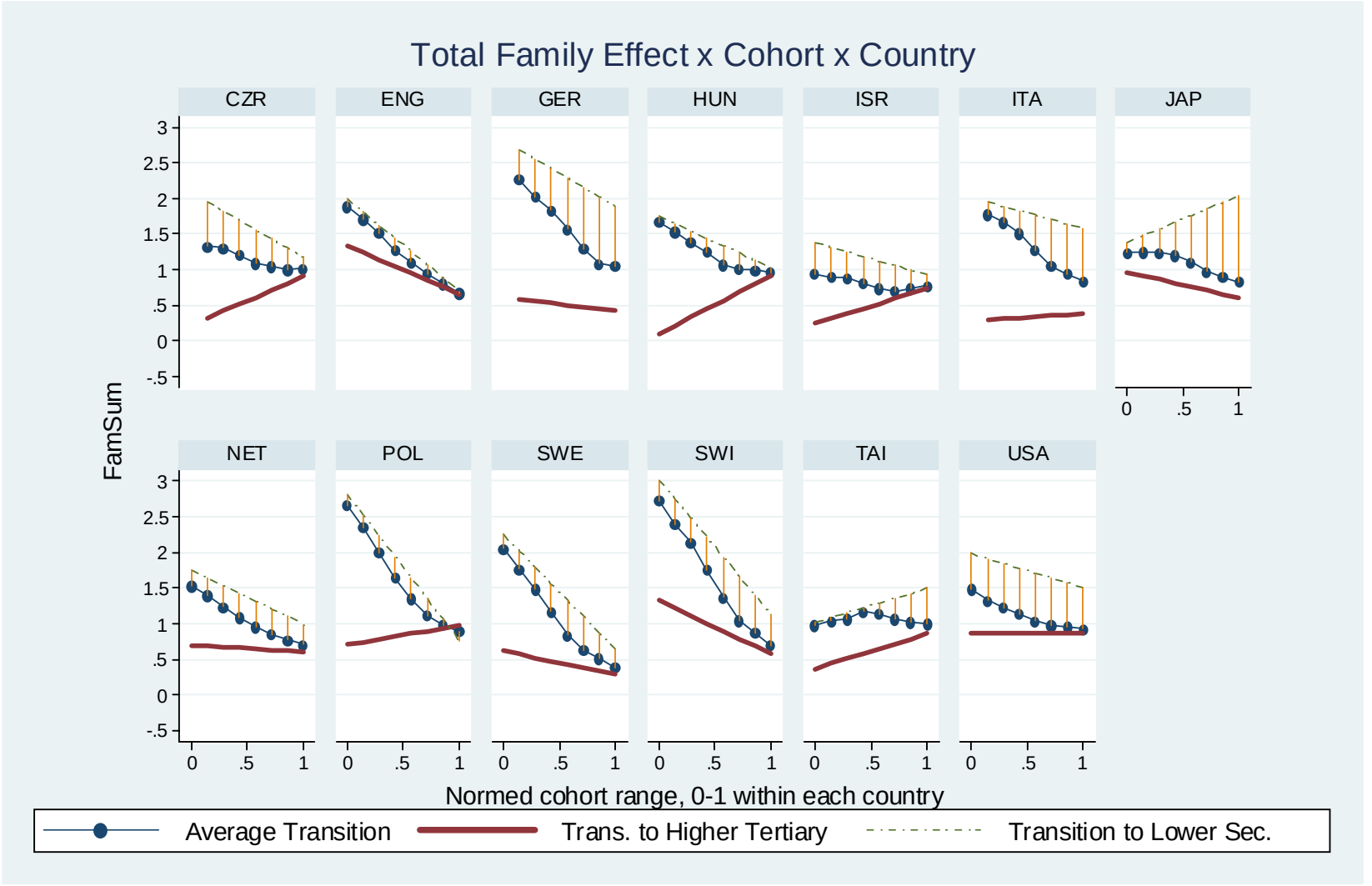


Fig 2c. Sum of Father Education & SEI Effects

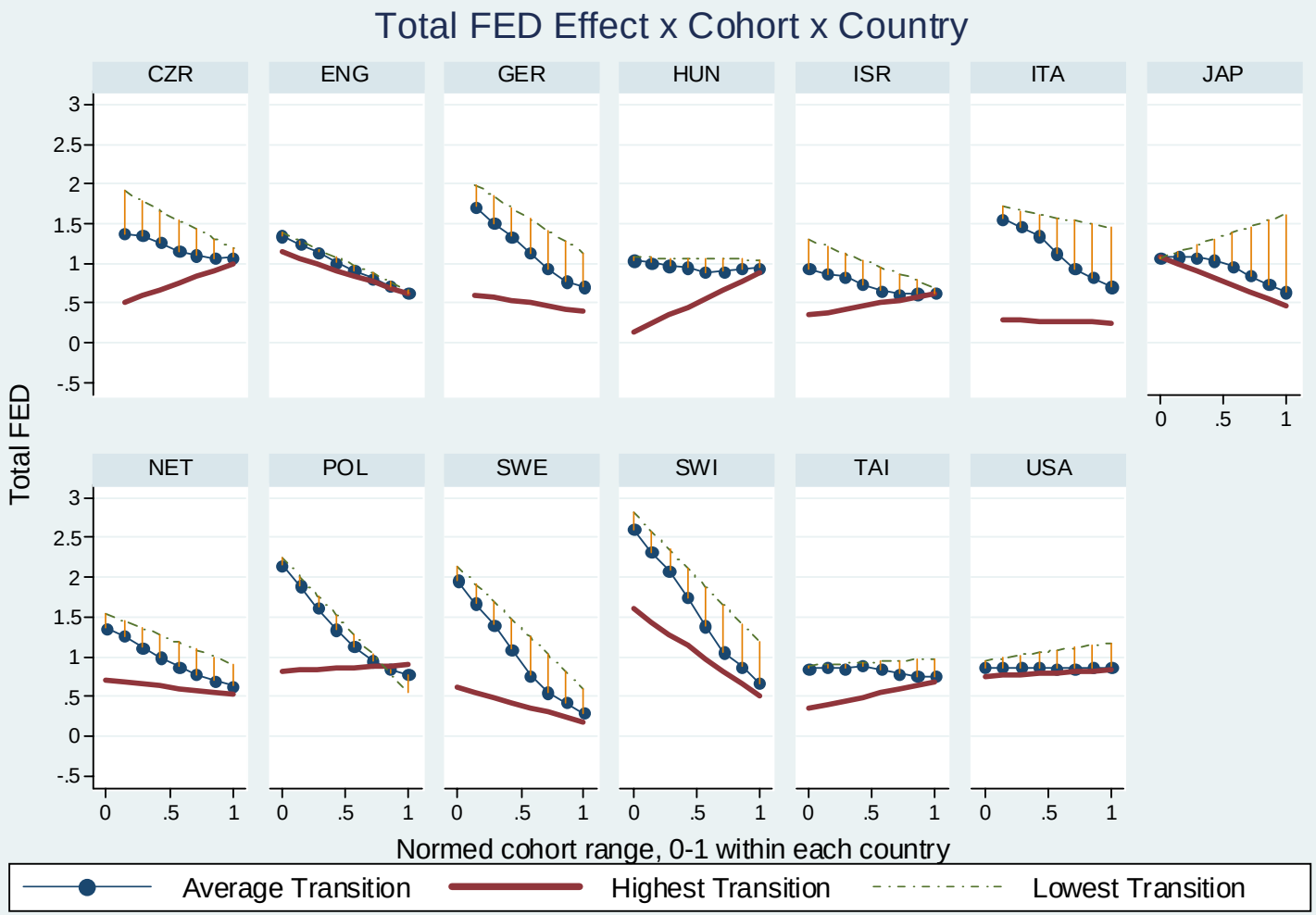


Punch Line 2 (Intercohort Trend)

- As far as our index of total family effects is concerned, persistent inequality is hardly the norm for most societies in the twentieth century (Figure 2).
  - Specifically, pervasive long-term convergence of IEO for the highest and lowest transitions.
    - The exceptions are Japan (divergence) and Taiwan (parallel).

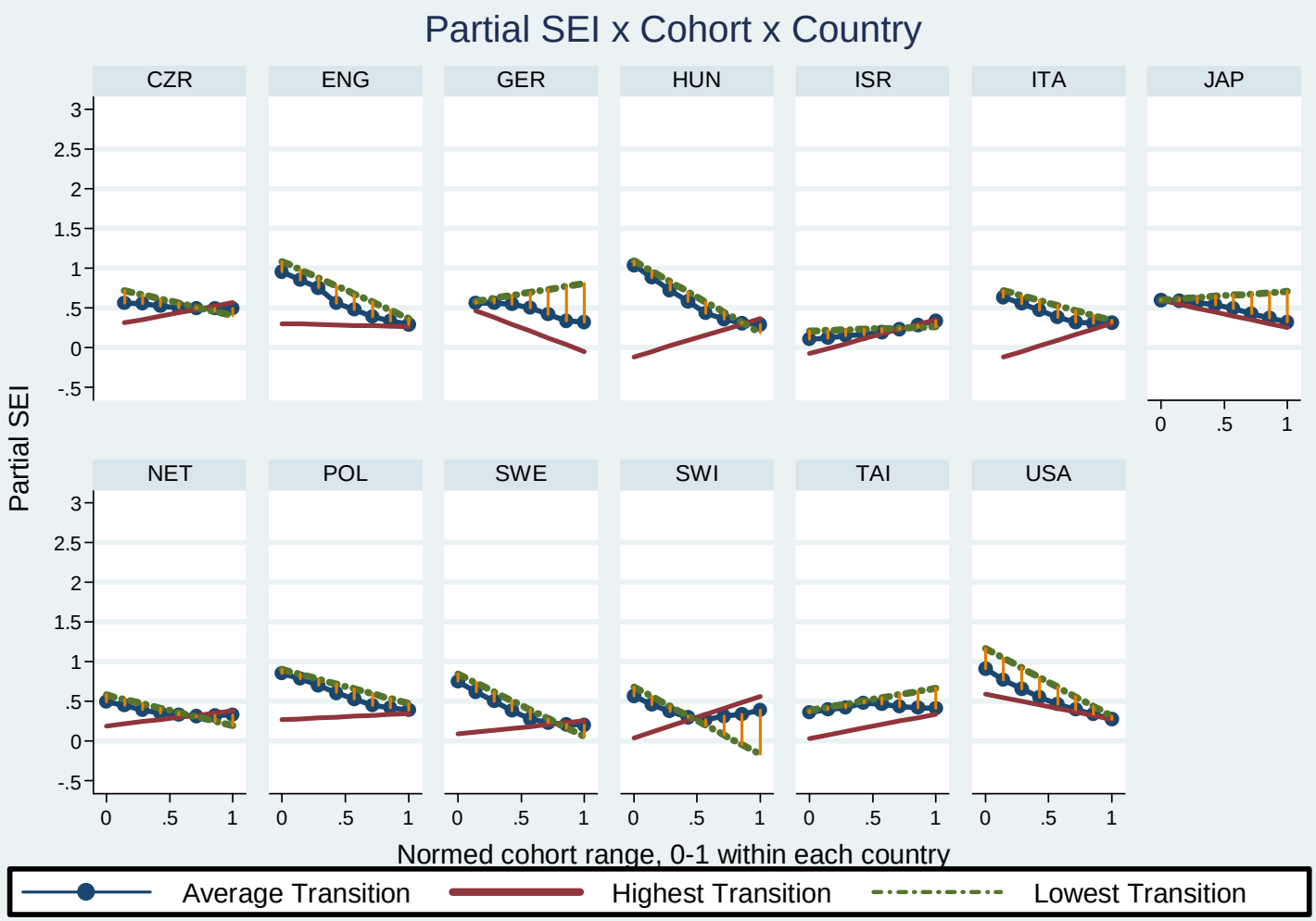
- For most societies, the cumulative experience of IEO has been in decline.
  - If we zoom in on the "average transition" experienced by a typical person within each cohort, the cumulative experience of IEO as a person travels from the bottom to the average transition can be represented by the shaded area.

Main Engine of IEO:
Total Father Education Effect



IEO in 13 countries

Minor Component of IEO: Father SEI



Additional Findings

- Source of the decline: Mostly driven by declining total IEO at low transitions (note tight directional coupling of line for tran=0 & line for mean trans in 11 cases; and small area between the two lines for 7—CZR, ENG, HUN, NET, POL, SWE, SWI).
  - Aided by a new graphic tool, we can show that ITA, JAP, recent TAI, and GER are the only ones showing substantial role of increased attainment in lowering mean trans IEO.

- FED matters most. TOTFED, not partial FSEI, is the driver of the size and cohort trend of overall IEO.
  - When focus on the shaded area for TOTFED, can see consistent decline (not so much for HUN, TAI, USA, JAP).
  - In contrast, partial FSEI has 8 declines. Rest are quite stable.