

u<sup>b</sup>

UNIVERSITÄT  
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***(Persistent) Inequalities Revisited: Social Origin, Education & Social Mobility***

*Social Mobility Patterns: Change and Stability: Monte Verità, July 28<sup>th</sup>*



# ***SOCIAL MOBILITY AND EDUCATION IN SPAIN BETWEEN 1956 AND 2011: DRAWING NEW EVIDENCES ON FLUIDITY TRENDS FROM THE O-E-D TRIANGLE DECOMPOSITION***

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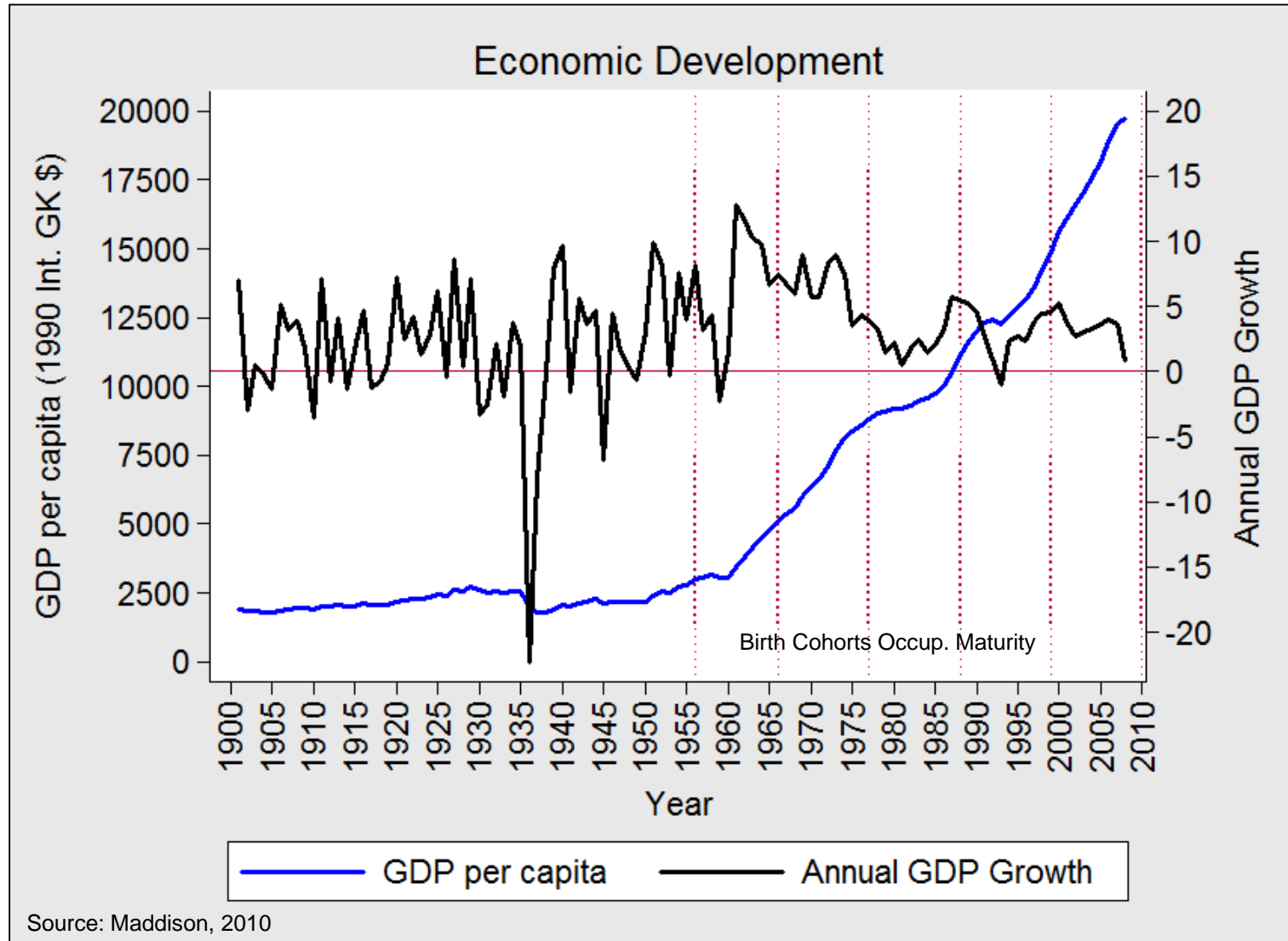
# OUTLINE

- INTRODUCTION: THE SPANISH CONTEXT
- THEORETICAL REVIEW AND HYPOTHESES
- PREVIOUS RESEARCH FINDINGS
- DATA & VARIABLES
- METHODS
- RESULTS
- LIMITATIONS, FUTURE RESEARCH & CONCLUSIONS

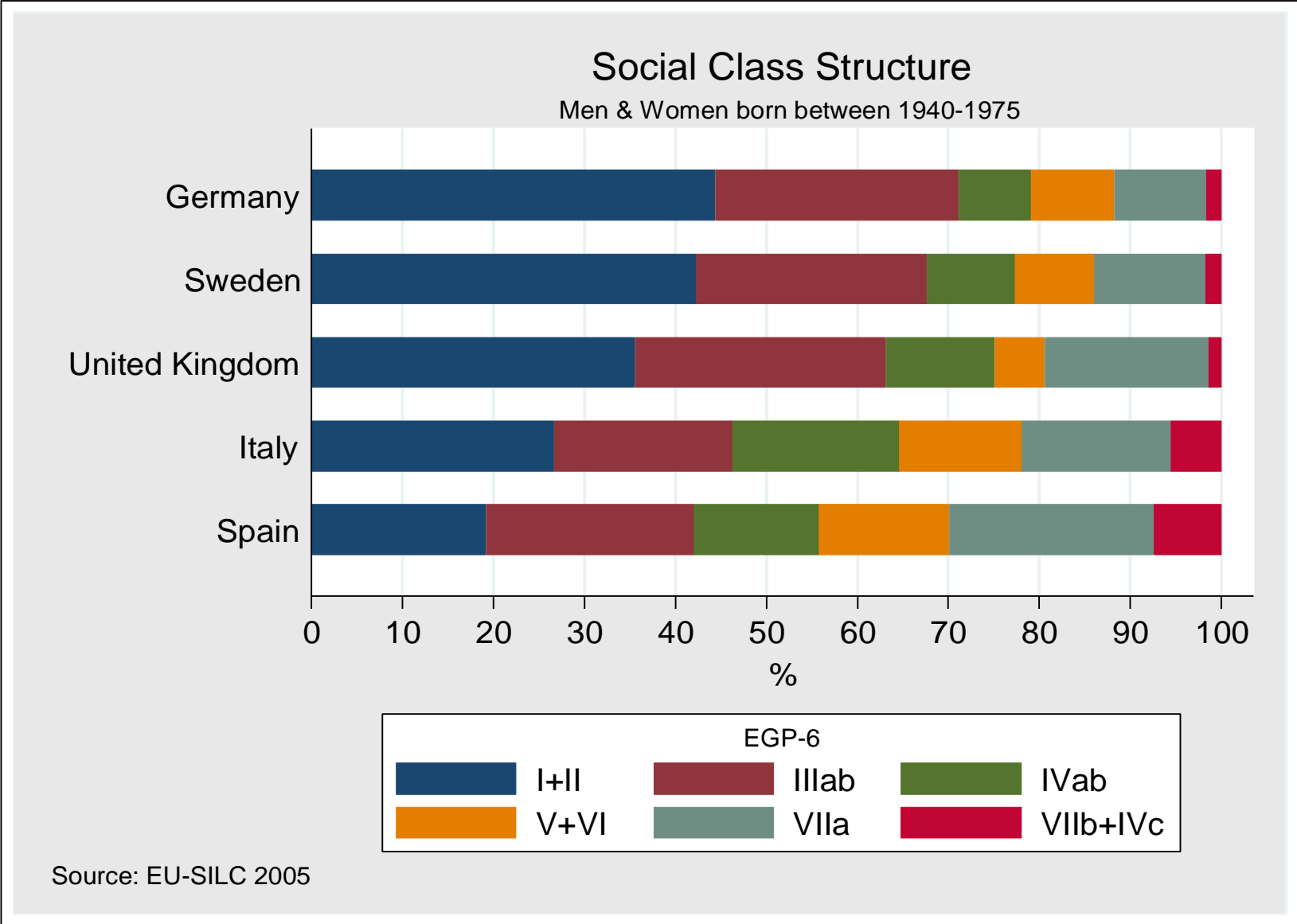
## THE SPANISH CONTEXT (1): *Institutional Particularities*

Welfare State	Family	Labour Market
Low social spending and family services	<i>Familiarism</i> : Low female labour force participation & gender inequity	Late industrialization & structural unemployment
High income inequality	Strong ties	Low-qualified occupational structure (IIIab; VIIa; IVc+VIIb)
High school failure & university graduation rates (high inequality)	Low geographical labour mobility	Small and medium-sized enterprises
Rapid but limited public sector expansion (women)	Late emancipation age	Deregulation at the margin: age & gender inequality

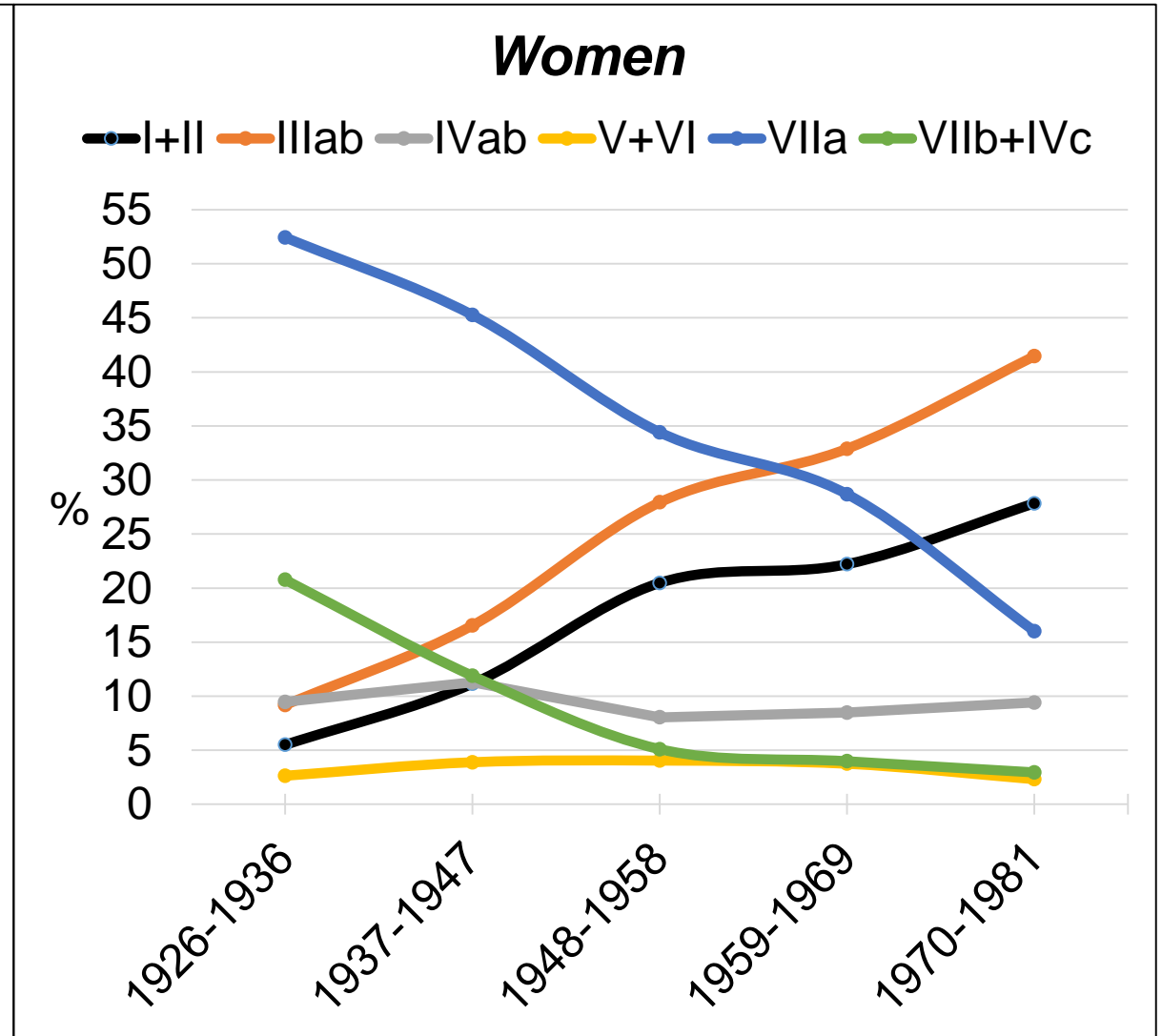
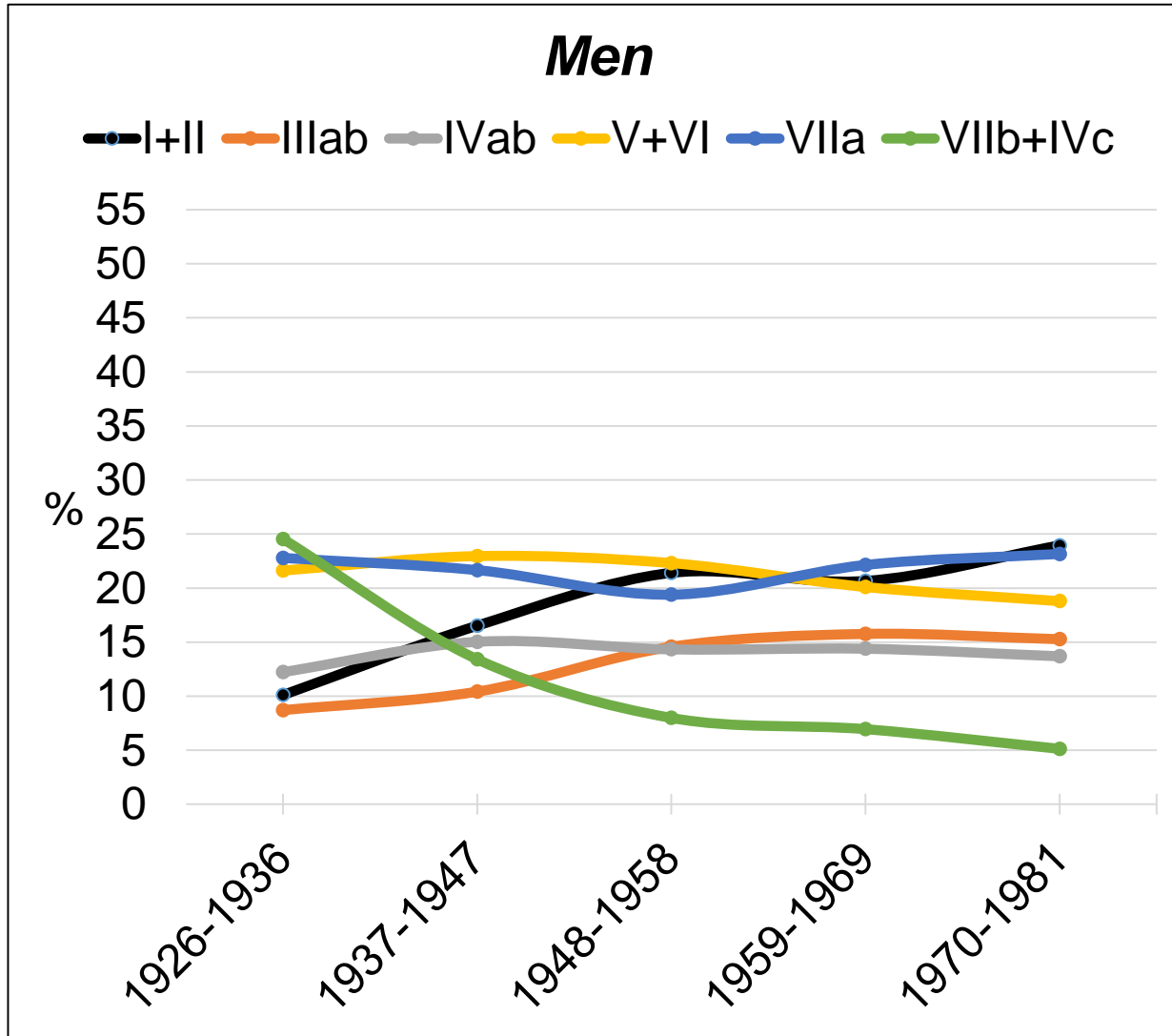
## THE SPANISH CONTEXT (2): *Rapid Modernization*



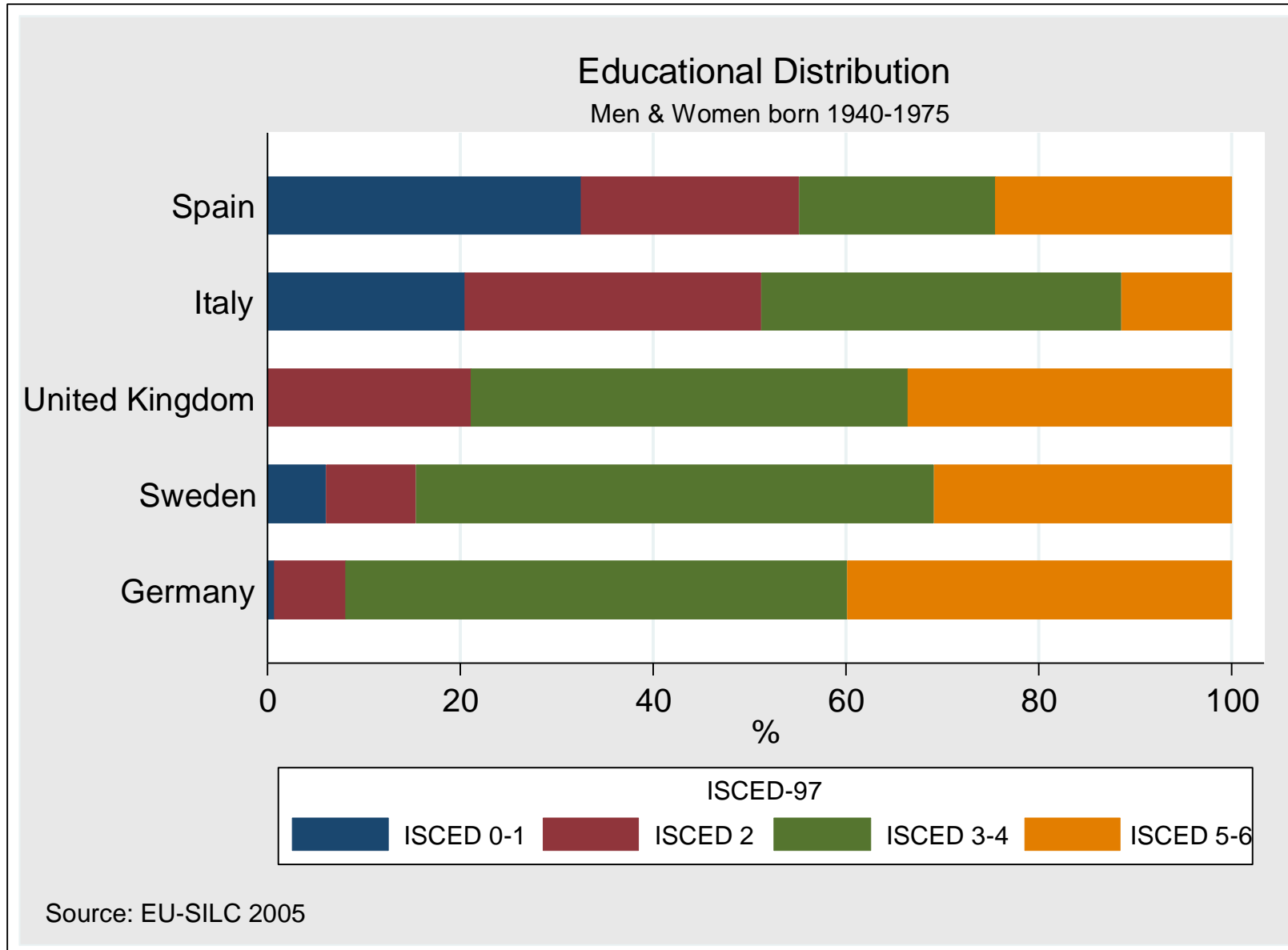
# THE SPANISH CONTEXT (3): *Social Class Structure*



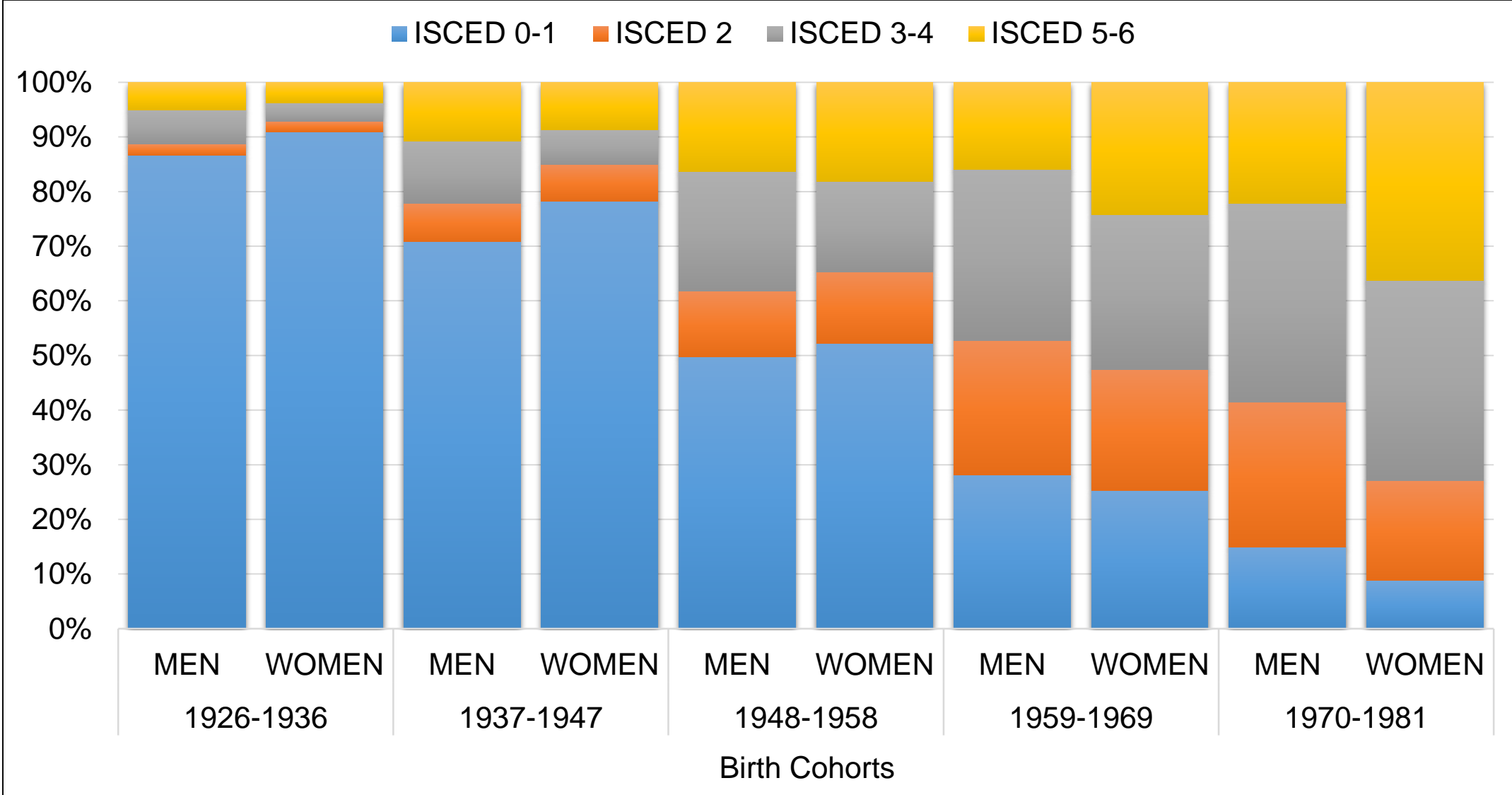
# THE SPANISH CONTEXT (3): *Occupational Upgrading*



# THE SPANISH CONTEXT (4): *Educational Distribution*



# THE SPANISH CONTEXT (4): *Educational Expansion in Spain (CE)*





# THEORETICAL REVIEW AND HYPOTHESES

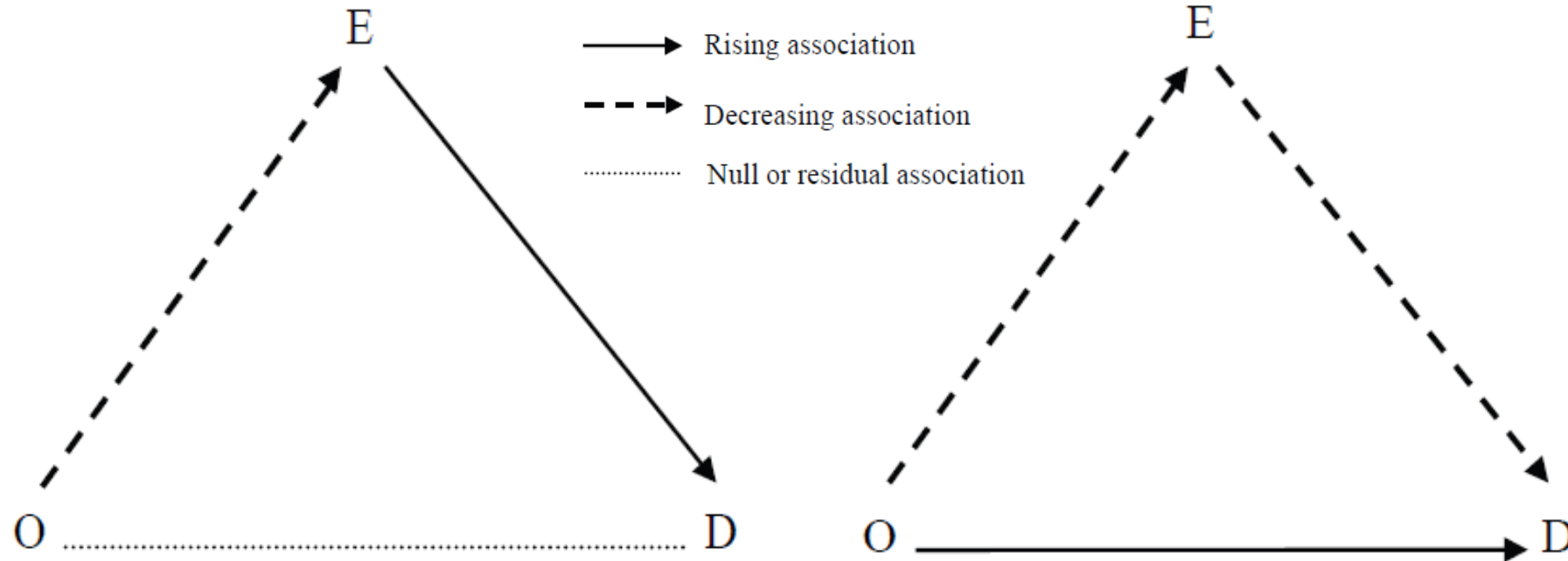
(Breen, 2004; Jackson, Goldthorpe & Mills, 2005; Treiman, 1970)

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*Modernization theory*

*Criticism of the modernization theory*

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Notes: O=Origin; E=Education; D=Destination

## PREVIOUS RESEARCH FINDINGS (GROSS COD): SPAIN

AUTHORS	DATA	RESULTS
<b>1993.</b> Rodríguez Menés	- <i>CIS</i> (1988)	-Industrialization and fluidity
<b>1999.</b> Echevarría	- <i>Survey on Class Structure, Class Consciousness and Class Biography</i> (1992)	-Constant Social Fluidity
<b>1999.</b> Carabaña	- <i>Socio-Demographic Survey</i> (1991)	-Constant Social Fluidity
<b>2001.</b> Salido	- <i>Survey on Class Structure, Class Consciousness and Class Biography</i> (1992)	-Women: Fluidity
<b>2010.</b> Marqués Perales & Herrera-Usagre	- <i>Living Conditions Survey</i> (2005)	-Constant Social Fluidity
<b>2012.</b> Martínez-Celorrio & Martín Saldo	- <i>CIS, Survey on Social Classes and Social Structure, 2634</i> (2006)	-Fluidity
<b>2013-2015.</b> Fachelli & López-Roldán	- <i>Living Conditions Survey</i> (2005 & 2011)	-Men: Constant Social Fluidity -Women: Fluidity

# DATA & SAMPLE: *COHORTS vs. PERIOD* (Breen & Jonsson 2007)

- **Data:** Socio-Demographic Survey (1991)\* & Living Conditions Survey (2005 & 2011)
- **Source:** Spanish Statistical Office (INE); Pooled cross-sectional surveys
- **Sample:** Active population men and women aged 30-65 and their fathers

MEN					WOMEN				
BIRTH COHORTS	PERIOD			Total	BIRTH COHORTS	PERIOD			Total
	1991	2005	2011			1991	2005	2011	
1926-1936	11,191	0	0	11,191	1926-1936	8,475	0	0	8,475
1937-1947	8,517	821	0	9,338	1937-1947	6,203	350	0	6,553
1948-1958	12,602	2,160	1,353	16,115	1948-1958	9,893	1,351	965	12,209
1959-1969	4,388	2,665	2,443	9,496	1959-1969	3,861	2,029	2,077	7,967
1970-1981	0	1,343	2,310	3,653	1970-1981	0	1,155	2,063	3,218
Total	36,698	6,989	6,106	<b>49,793</b>	Total	28,432	4,885	5,105	<b>38,422</b>

\*We thank José Saturnino Martínez García for providing us with this database.

## VARIABLES (1): *Social Class Schema (EGP-6)*

<b>Original Social Classes (EGP-7)</b> (Erikson, Goldthorpe & Portocarero, 1979)		<b>Six Social Classes</b> (Luijkx, 1994)
<i>I</i>	Large proprietors, higher professionals and managers	<i>I+II</i>
<i>II</i>	Lower professionals and managers	
<i>IIIab</i>	Routine non-manual workers	<i>IIIab</i>
<i>IVab</i>	Small proprietors with employees	<i>IVab</i>
<i>V</i>	Lower Grade technicians and Manual Supervisors	<i>V + VI</i>
<i>VI</i>	Skilled Manual Workers	
<i>VIIa</i>	Unskilled manual Workers	<i>VIIa</i>
<i>IVc</i>	Self-employed farmers	
<i>VIIb</i>	Agricultural workers	<i>IVc + VIIb</i>

## VARIABLES (2): *Educational System and Schema*

EDUCATIONAL SYSTEM (LAW)	STANDARDIZATION	STRATIFICATION	PRIVATIZATION	BIRTH YEAR	BIRTH COHORTS
1857; 1954. MOYANO LAW (LM)	<b>HIGH</b> <i>Administrative Centralization</i>	<b>HIGH</b> <i>Tracking at 10 (dead-end track)</i>	<b>HIGH</b> <i>Catholic Institutions 80% in private schools (secondary)</i>	≤ 1960	1926-1936 1937-1947 1948-1958 1959-1969
1970. GENERAL EDUCATION LAW (LGE)	<b>MEDIUM-HIGH</b>	<b>MEDIUM</b> <i>No Early Tracking Compulsory until 14</i>	<b>HIGH</b> <i>Public funding of private schools</i>	1961-1979	1959-1969 1970-1981
TRANSITION BETWEEN LGE & LOGSE				1980-1984	1970-1981
1990. ORGANIC LAW ON THE GENERAL ORGANISATION OF THE EDUCATIONAL SYSTEM (LOGSE)	<b>MEDIUM-LOW</b> <i>Regional Administration</i>	<b>LOW</b> <i>No Early Tracking Compulsory until 16</i>	<b>HIGH</b> <i>30% of private non- subsidised and subsidised schools</i>	≥ 1985	-

## VARIABLES (3): *Educational Schema*

EDUCATIONAL LEVELS (ISCED-97)	ISCED-97 CATEGORY	MOYANO LAW (1857-1954)	GENERAL EDU. LAW (1970)
1. Less than primary education (0) + Primary (1)	<i>0 + 1</i>	Compulsory	Compulsory
2. Lower secondary education (2)	<i>2</i>	Post-Compulsory	
3. Upper secondary education (3) + Post-secondary non-tertiary education (4)	<i>3 + 4</i>		Post-Compulsory
4. First stage of tertiary education + Second stage of tertiary education (5 + 6)	<i>5 + 6</i>		

## Methods (1): Log-linear Modelling

### 3-Way Models (COD / COE / CED / OED)

*Constant Social Fluidity*       $\log F_{ijk} = \mu + \lambda_i^O + \lambda_j^D + \lambda_k^C + \lambda_{ik}^{OC} + \lambda_{jk}^{DC} + \lambda_{ij}^{OD}$

*Unidiff*  
(Layer: Cohorts or Education)       $\log F_{ijk} = \mu + \lambda_i^O + \lambda_j^D + \lambda_k^C + \lambda_{ik}^{OC} + \lambda_{jk}^{DC} + \beta_K X_{ij}^{OD-C}$

### 4-Way Models (COED)

*Constant Social Fluidity*       $\log F_{ijkl} = \mu + \lambda_i^O + \lambda_j^D + \lambda_k^C + \lambda_l^E + \lambda_{ki}^{CO} + \lambda_{kj}^{CD} + \lambda_{kl}^{CE} + \lambda_{il}^{OE} + \lambda_{kl}^{OD} + \lambda_{il}^{ED}$

*Multivariate Unidiff*  
(Layers: Cohorts)       $\log F_{ijkl} = \mu + \lambda_i^O + \lambda_j^D + \lambda_k^C + \lambda_l^E + \lambda_{ki}^{CO} + \lambda_{kj}^{CD} + \lambda_{kl}^{CE} + \lambda_{il}^{OE} + \beta_K X_{ij}^{ED-C} + \beta_K X_{ij}^{OD-C}$

## METHODS (2): *Measures of Goodness of Fit*

### Likelihood-Ratio $X^2$ ( $L^2 / G^2$ )

$$L^2 = 2 \sum_{i=1}^I \sum_{j=1}^J n_{ij} \cdot \log \left( \frac{n_{ij}}{n_{ij}^e} \right)$$

### $L^2$ Difference Test

$$\left. \begin{array}{l} L_1^2 - L_2^2 \\ df_1 - df_2 \end{array} \right\} \text{p-value } (X^2)$$

### Bayesian Information Criteria (*BIC*)

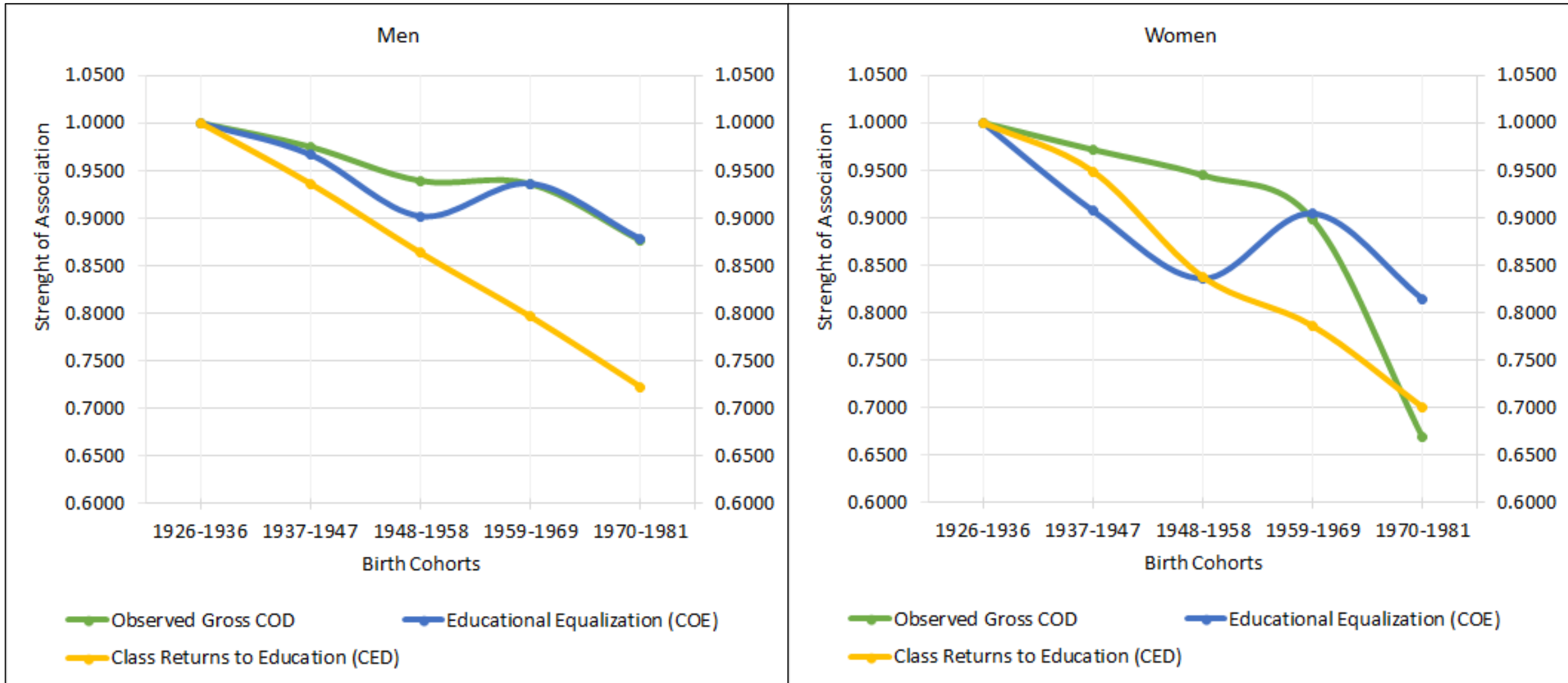
$$BIC = L^2 - df \times \log(N)$$

### Duncan's Index of Dissimilarity ( $\Delta$ )

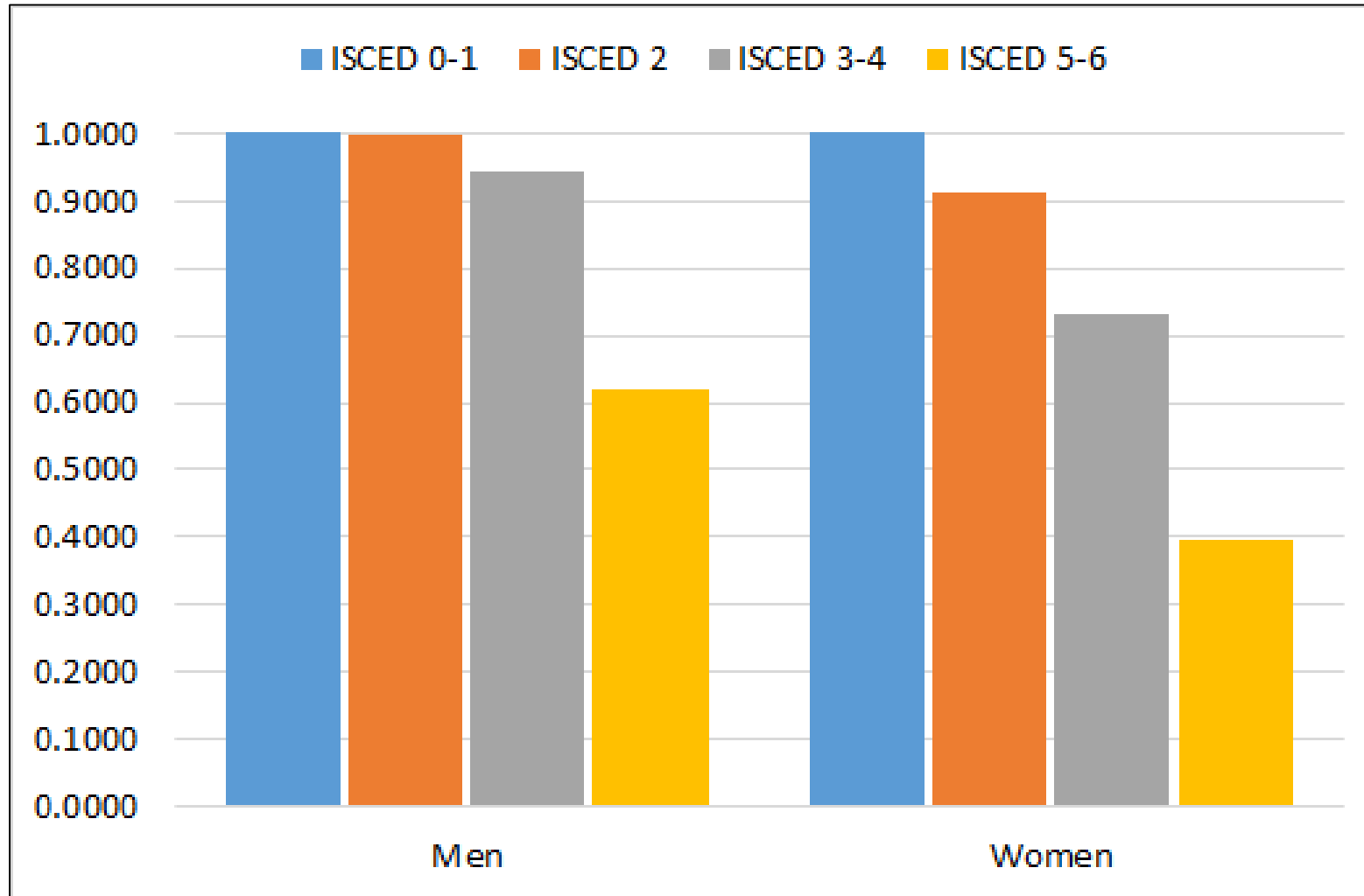
$$\Delta = \frac{1}{2N} \sum_i \sum_j |f_{ij} - F_{ij}|$$



# THREE-WAY RESULTS: *Observed Trends (COD / COE / CED)*



## THREE-WAY RESULTS: *Compositional Effect of Education (OED)*

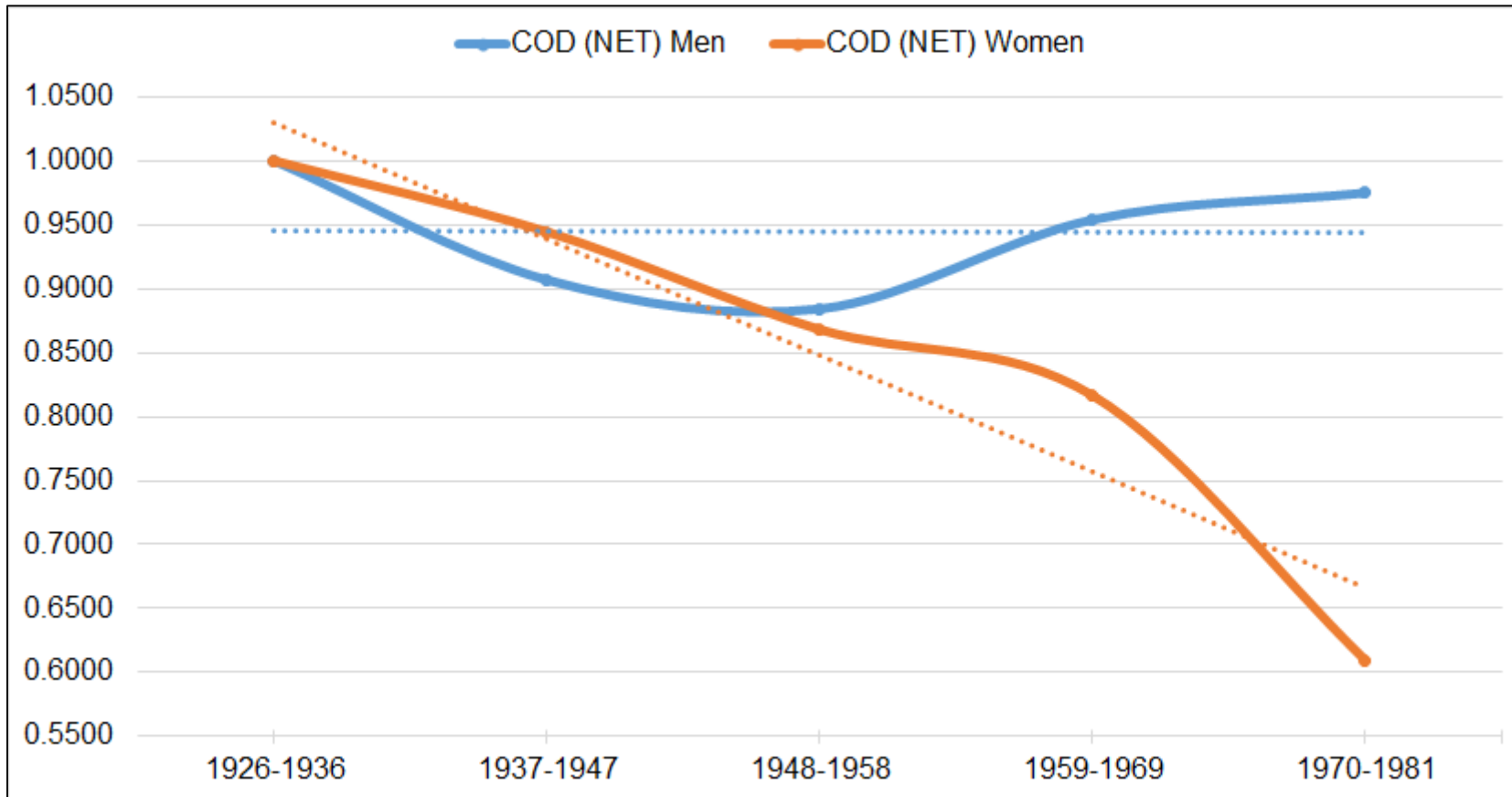


## Goodness of Fit: Constant Social Fluidity vs. Unidiff

Sex	$L^2$	d.f.	Sig.	n	BIC	$\Delta$	$L_1^2 - L_2^2$	d.f. <sub>1</sub> - d.f. <sub>2</sub>	p-value (X <sup>2</sup> )
<b>Gross Origins-Destination Association (COD):</b> $\log F_{ijk} = \mu + \lambda_i^O + \lambda_k^D + \lambda_{ij}^{OC} + \lambda_{jk}^{DC} + \beta_j X_{ik}^{OD} - c$									
Men	157.5	96	0.0001	49435	-880.07	1.84%	12.836	4	0.0121
Women	169.6	96	0.0000	38026	-842.86	2.01%	41.283	4	0.0000
<b>Inequality of Educational Opportunities (COE):</b> $\log F_{ijk} = \mu + \lambda_i^C + \lambda_j^O + \lambda_k^E + \lambda_{jk}^{CE} + \lambda_{ji}^{CO} + \beta_i X_{jk}^{OE} - c$									
Men	196.7	56	0.000	49784	-408.93	1.80%	11.629	4	0.0203
Women	237.5	56	0.000	38416	-353.63	2.08%	18.935	4	0.0008
<b>Class Returns to Education (CED)</b> $\log F_{ijk} = \mu + \lambda_i^C + \lambda_j^E + \lambda_k^D + \lambda_{ij}^{CE} + \lambda_{ik}^{CD} + \beta_i X_{jk}^{ED} - c$									
Men	308.6	56	0.000	52380	-299.88	2.16%	86.867	4	0.0000
Women	341.8	56	0.000	40457	-252.29	2.22%	96.267	4	0.0000
<b>Compositional Effect of Education (OED)</b> $\log F_{ijk} = \mu + \lambda_i^O + \lambda_j^E + \lambda_k^D + \lambda_{ij}^{OE} + \lambda_{jk}^{ED} + \beta_j X_{ik}^{OD} - E$									
Men	197.0	72	0.000	49428	-581.19	1.86%	42.112	3	0.0000
Women	149.5	72	0.000	38023	-609.83	1.59%	50.279	3	0.0000

# FOUR-WAY RESULTS: *Direct-Net COD Effect (Economic, Social and Cultural Resources)*

$$\log F_{ijkl} = \mu + \lambda_i^O + \lambda_j^D + \lambda_k^C + \lambda_l^E + \lambda_{ki}^{CO} + \lambda_{kj}^{CD} + \lambda_{kl}^{CE} + \lambda_{il}^{OE} + \beta_k X_{lj}^{ED-C} + \beta_K X_{ij}^{OD-C}$$



Sex	$L^2$	$d.f.$	Sig.	$n$	BIC	$\Delta$	$L_1^2 - L_2^2$	$d.f._1 - d.f._2$	p-value ( $\chi^2$ )
Men	1085.1	587	0.0000	49431.1	-5259.41	4.30%	87.167	8	0.0000
Women	1051.1	587	0.0000	38031.5	-5139.48	4.64%	104.765	8	0.0000

# Methods (3): Counterfactual Simulations

(Breen 2010; Torche 2010; Pfeffer & Hertel 2015)

- Joint probabilities and expected frequencies (COED & COD table) via log-linear modelling:

1.1. Three-way table. Conditional Probability: **E | CO**

$$f_{ijk.} = \mu \gamma_i^C \gamma_j^O \gamma_k^E \gamma_{ij}^{CO} \gamma_{ik}^{CE} \gamma_{jk}^{OE} \gamma_{ijk}^{COE}$$

$$F_{ijkl} = p(E | CO) \times p(D | COE) \times F_{CO}$$

$$F_{ijl} = \sum_k p(E | CO) \times p(D | COE) \times F_{CO}$$

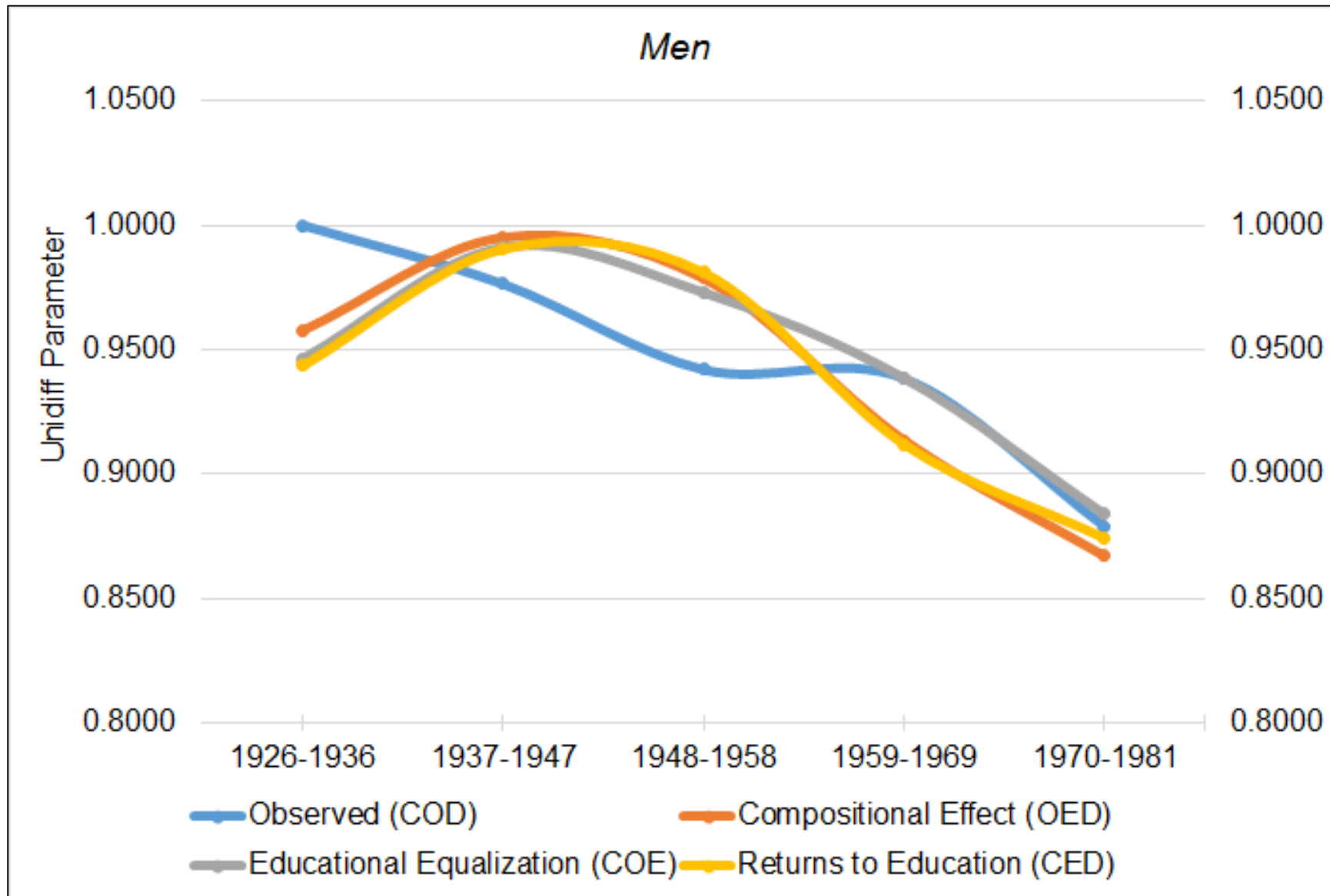
1.2. Four-way table. Conditional Probability: **D | COE**

$$f_{ijkl} = \alpha \beta_i^C \beta_j^O \beta_k^E \beta_l^D \beta_{ij}^{CO} \beta_{ik}^{CE} \beta_{il}^{CD} \beta_{jk}^{OE} \beta_{jl}^{OD} \beta_{kl}^{ED} \beta_{ijk}^{COE} \beta_{ijl}^{COD} \beta_{ikl}^{CED} \beta_{jkl}^{OED}$$

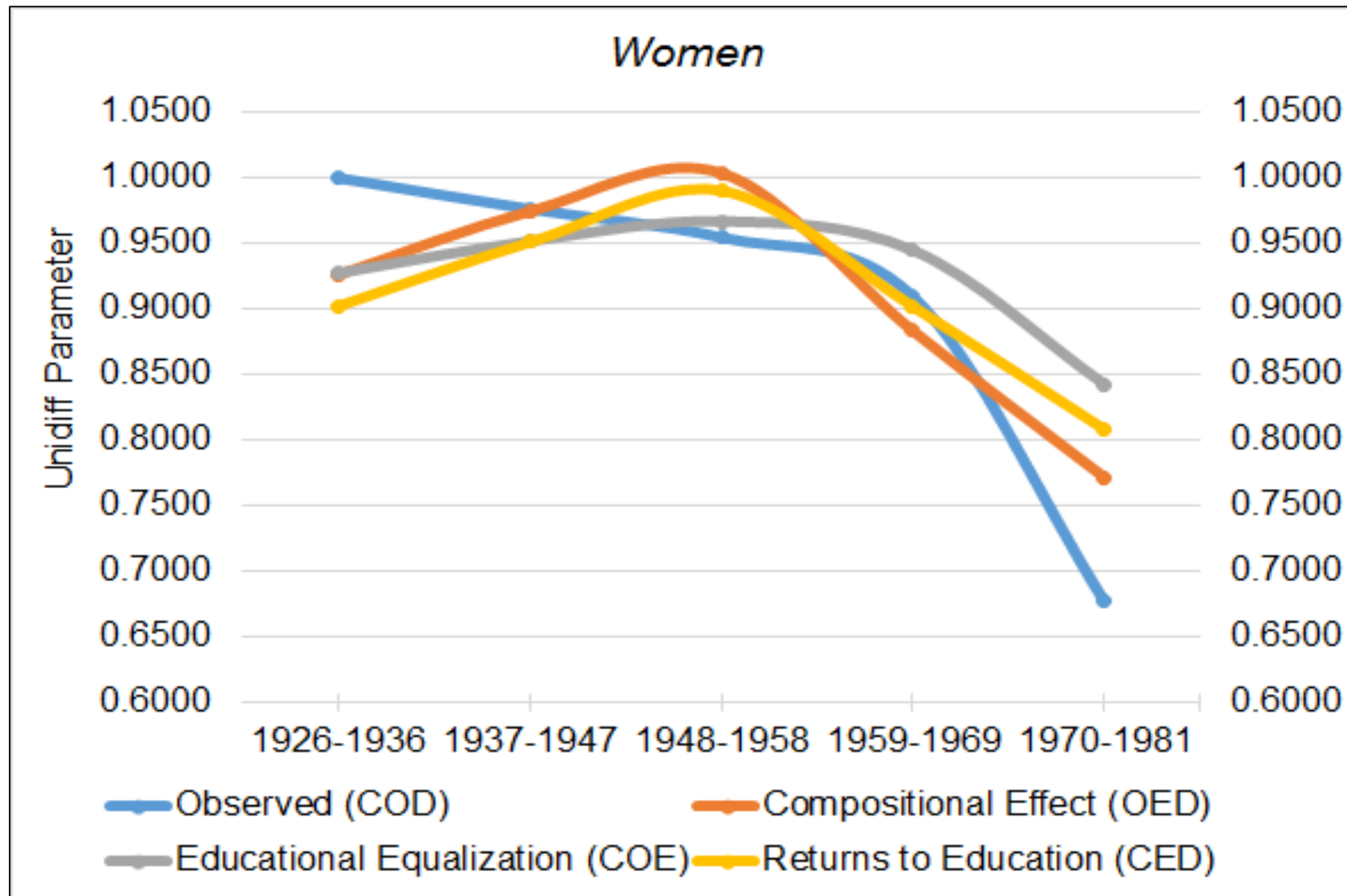
- Counterfactual models & expected frequencies for the COD tables (4) by collapsing over the E margin:

<b>MODELS</b>	<b>1<sup>st</sup> Equation (COE)</b>	<b>2<sup>nd</sup> Equation (COED)</b>
0. Observed	COE	COE CED OED COD
1. Compositional	CO CE OE	COE <b>OED</b> CD
2. Equalization	<b>COE</b>	<b>COE</b> CD ED OD
3. Returns	CO CE OE	COE <b>CED</b> OD

# COUNTERFACTUAL SIMULATIONS RESULTS (1)



## COUNTERFACTUAL SIMULATIONS RESULTS (2)



## LIMITATIONS & FUTURE RESEARCH

- Aggregation of educational categories from different educational systems (imperfect harmonization with ISCED-97).
- Social classes built from different occupational classifications (ad hoc classification in 1991, ISCO-88 (2005) & ISCO-08 (2011)).
- Women: low labour force participation and high inequality among older cohorts.  
Exploratory results from 4-way COED tables (structural zeros and sparse tables).
- Period effects (economic crisis in 1993 & 2008-2011): More surveys needed before 1991.



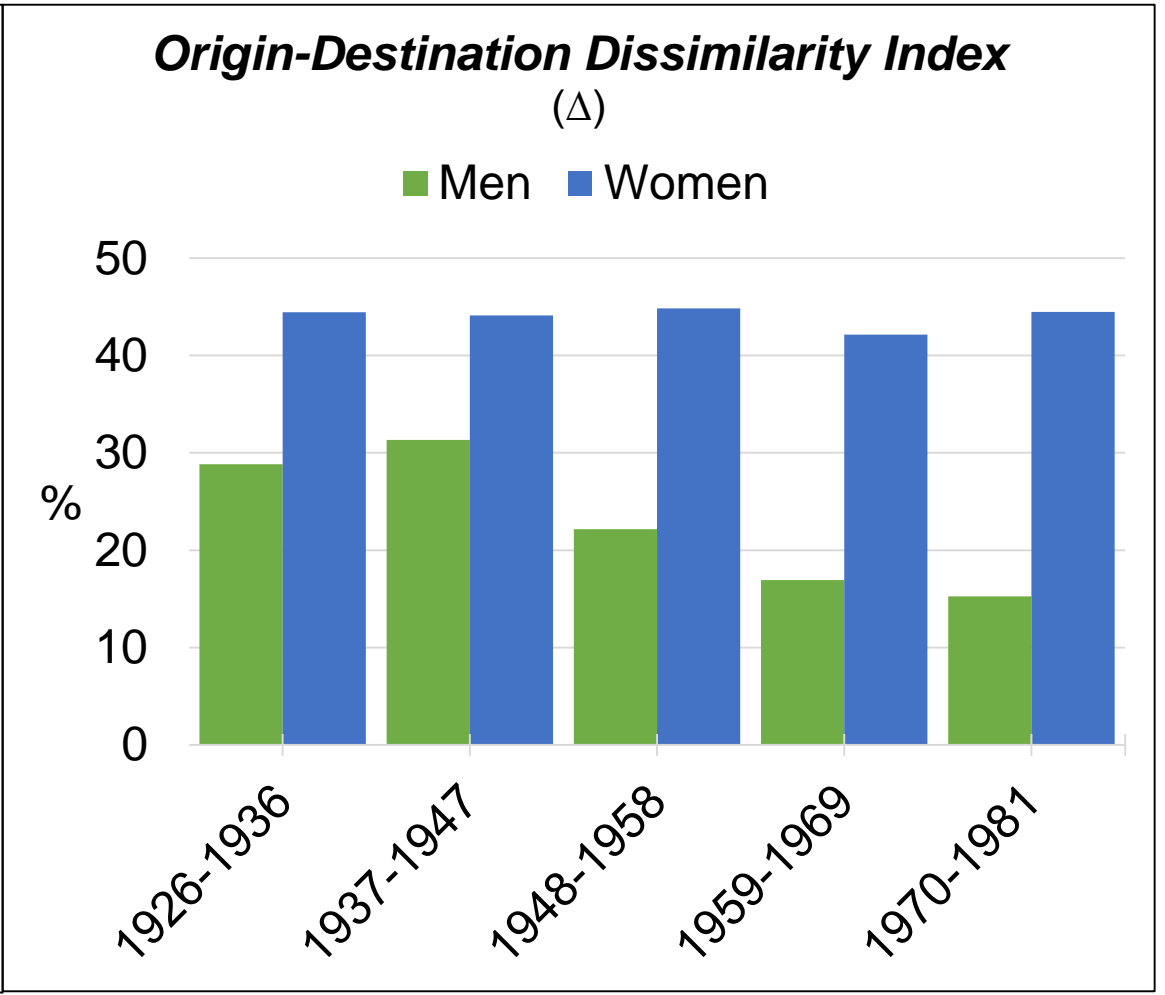
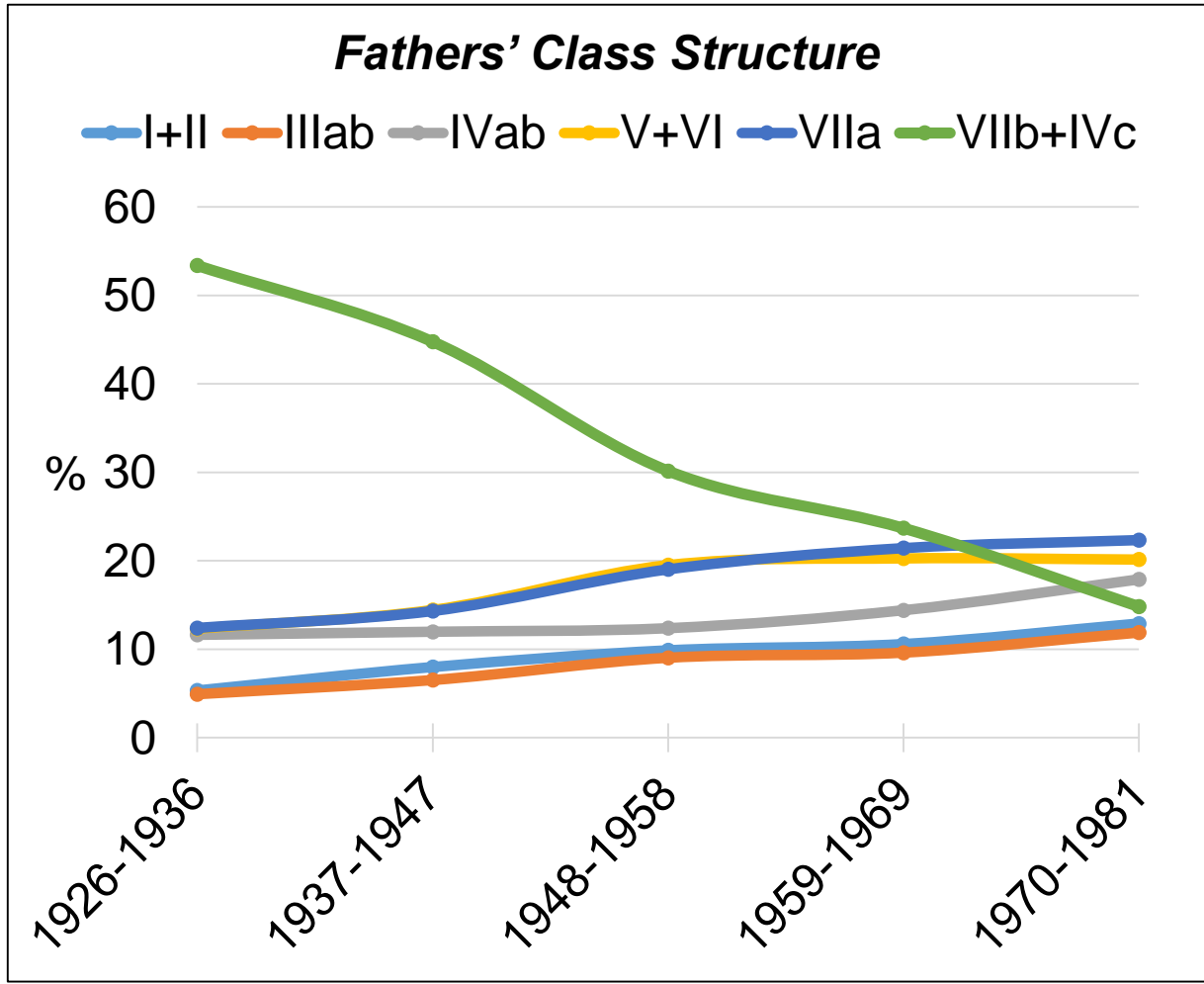
# CONCLUSIONS

- Considerable economic modernization and late industrialization
- Educational expansion (CE), Occupational upgrading (CD) and polarization (qualif. and gender)
- **Gross COD:** Slight decline (men) and strong decline (women), specially in 1970-81 (2000-2011)
- **COE:** Slight decline in inequality of educational opportunities (secondary, not university)
- **CED:** Steep decline in class returns to education (e.g., widespreading overeducation)
- **OED:** Weak origin-destination association among the highly educated (women: more university graduates and qualified social classes. More merit to access same class positions)
- **Net COD:** Relatively constant (men) and strong decline (women)
- Fluidity trends mainly explained by: Net COD, OED and CED effects
- The Modernization Theory does not hold for the Spanish case
- First results devoted to the Spanish case

Thanks for your attention! 😊

# **APPENDIX**

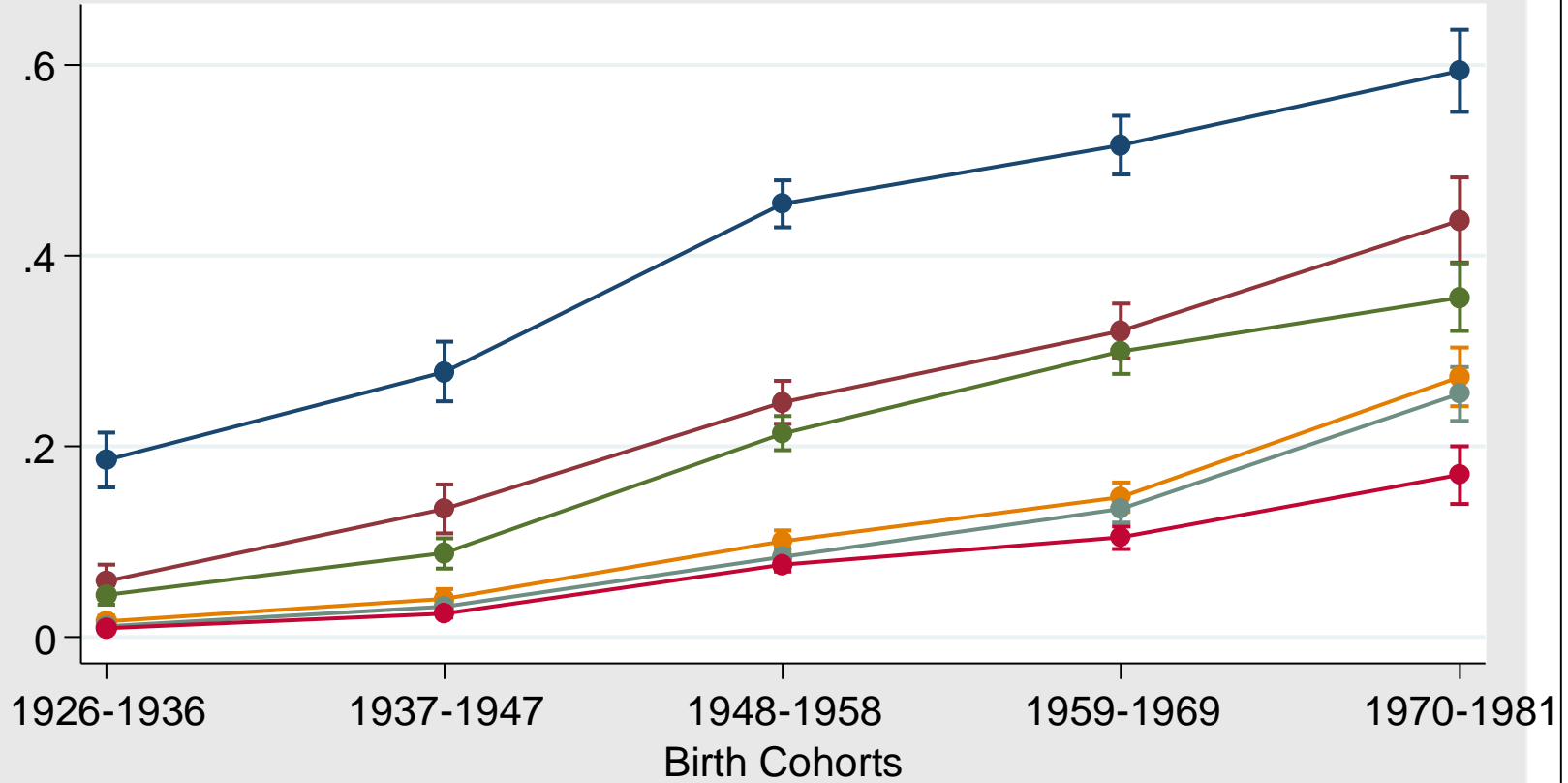
# THE SPANISH CONTEXT: *(Post)Industrialization*



## PREVIOUS RESEARCH FINDINGS (GROSS COD): SPAIN

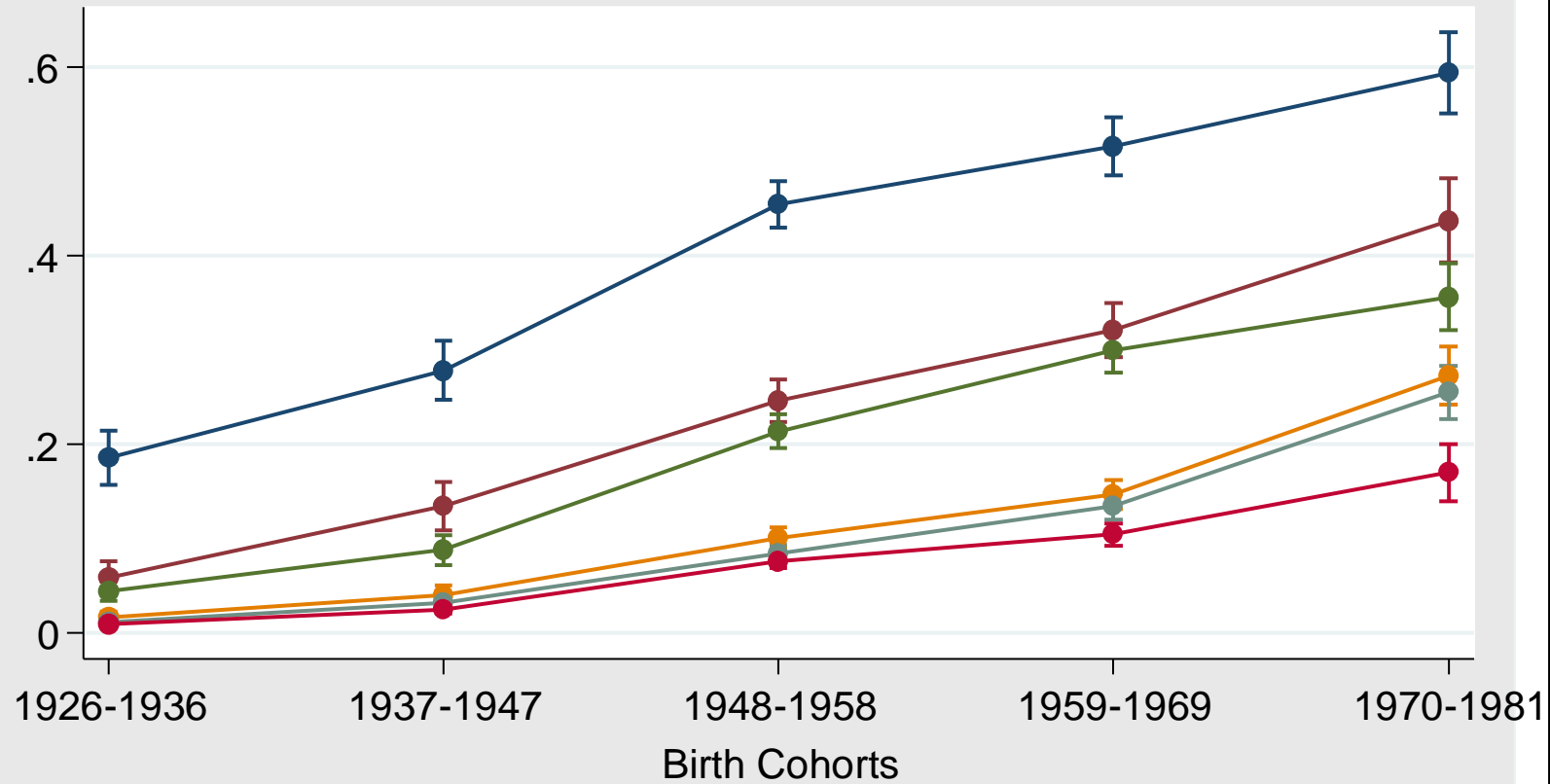
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2012. Martínez-Celorrio & Martín Saldo	- <i>CIS, Survey on Social Classes and Social Structure, 2634</i> (2006)	-Fluidity
2013-2015. Fachelli & López-Roldán	- <i>Living Conditions Survey</i> (2005 & 2011)	-Men: Constant Social Fluidity -Women: Fluidity

Predicted Margins of Attaining ISCED 5-6 (Men): Fathers' EGP\*Birth Cohorts



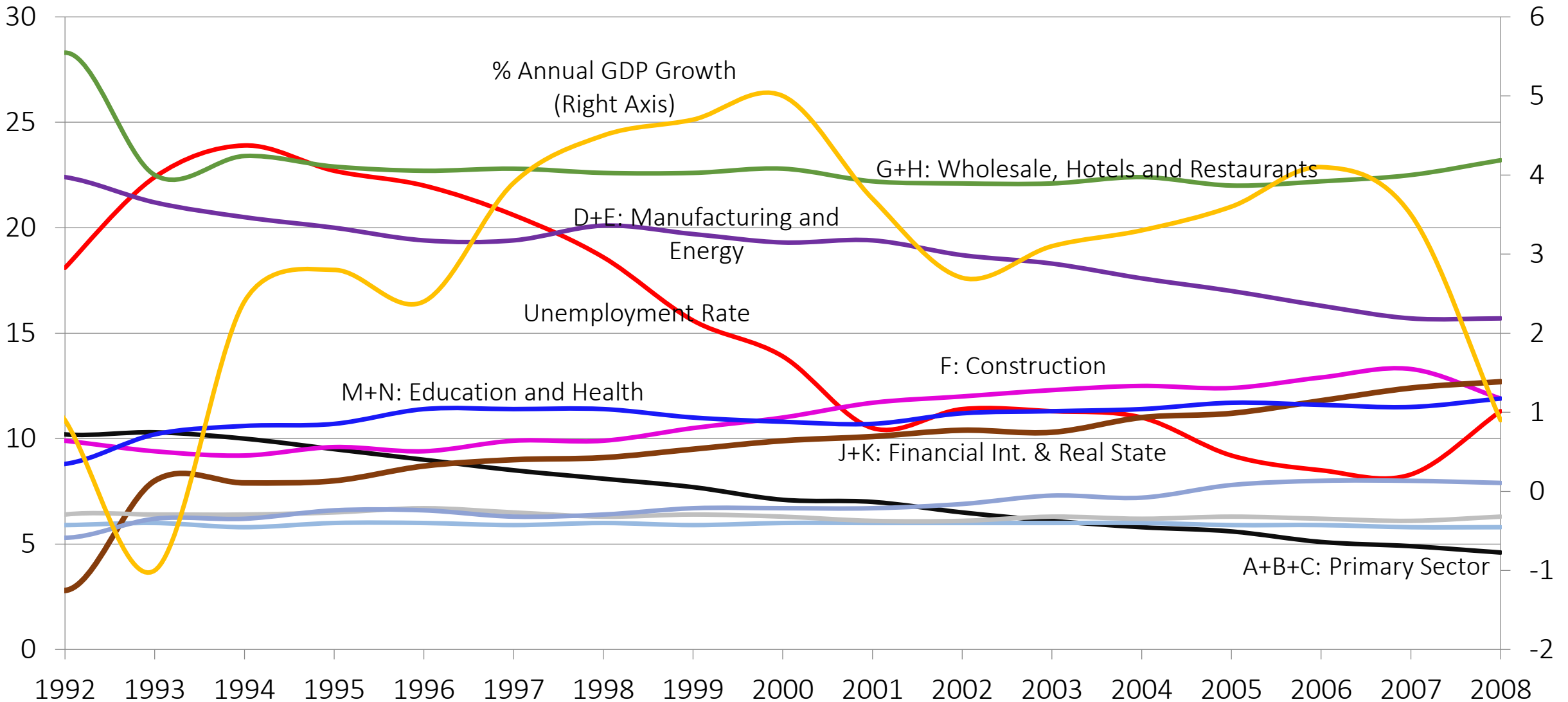
Source: ESD-1991; ECV-2005; ECV-2011 (INE)

Predicted Margins of Attaining ISCED 5-6 (Women): Fathers' EGP\*Birth Cohorts



Source: ESD-1991; ECV-2005; ECV-2011 (INE)

# Spanish Labour Force by Economic Sectors (1992-2008)



Source: International Labour Organization