Marital Age Gaps and Educational Homogamy Evidence from a Compulsory Schooling Reform in the UK

Timo Hener
Aarhus University, CESifo

Tanya Wilson
University of Stirling, IZA

CeLSIUS Workshop
28th March 2018

Acknowledgement and Disclaimer

The permission of the Office for National Statistics to use the Longitudinal Study is gratefully acknowledged, as is the help provided by staff of the Centre for Longitudinal Study Information & User Support (CeLSIUS). CeLSIUS is supported by the ESRC Census of Population Programme (Award Ref: ES/K000365/1).The authors alone are responsible for the interpretation of the data.

Motivation

Choice of spouse is one of the most important lifetime decisions

- May affect your LF participation, accepted wage
- May affect your health and happiness
- May affect your children's outcomes
- Household formation is an important determinant of intergenerational mobility and income inequality

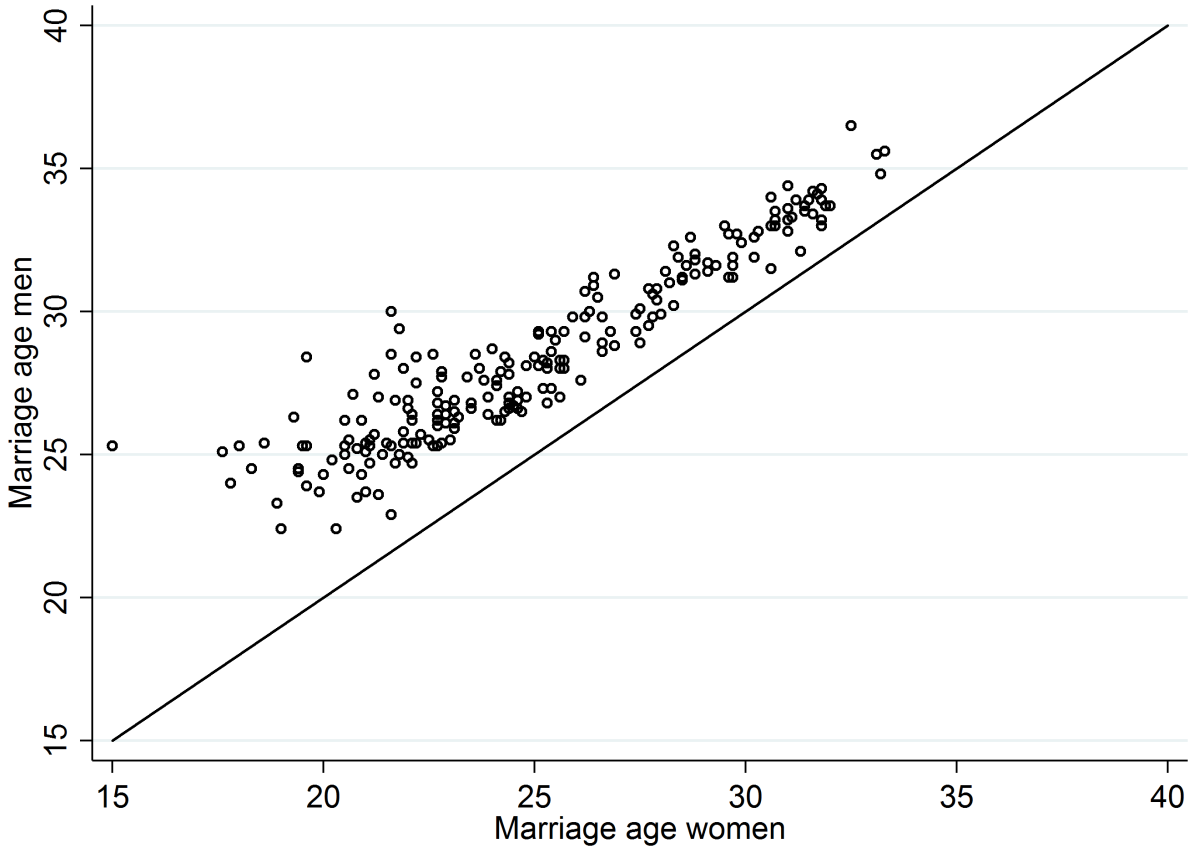
Who you meet and marry depends on individual characteristics - but two noticeable features emerge in the majority of marriages:

- Husbands tend to be older than their wives
- Positive assortative matching on education between spouses

UN World Marriage Data 2012

Marriage age by gender for 218 countries

- 45 degree line would be equally aged spouses



Source: United Nations: World Marriage Data (2012).

Positive Sorting on Education

Assortative matching on education due to complementarities in marital output (Becker 1973, 1974, JPE) is a well-established phenomenon in the marriage literature:

- Mare (ASR,1991) shows increasing homogamy in US data
- Fernandez, Guner and Knowles (QJE,2005) in a cross-country sample find 63% of marriages have equally qualified spouses.
- Sorting - higher educated people meet more similarly aged spouses in college and have smaller age gaps (Mansour and McKinnish, 2012, REStat)

Explanations for the Positive age gap (m-f)

1. Gender specific roles
   - It takes men longer to reveal their type (Bergstrom and Bagnoli, 1993, JPE)
2. Biology
   - Sex difference in fecundity explains why women marry younger (Diaz-Gimenez and Giolito, 2013, IER)
3. Marriage squeeze
   - Fluctuations in cohort sizes affect age gaps due to excess supply and scarcity (Bergstrom and Lam, 1989)
   - Cohort size positively related to marriage rates, negatively related to marital age differences (Bronson & Mazzocco, 2012)
     - However Bhaskar (2012) argues secular population growth does not explain the age gap

UNIVERSITY of STIRLING

This paper

We look at a situation where it is not possible for everyone to maintain the typical matching pattern.

Specifically we:

- Exploit a reform that induced an exogenous increase in education
  - As implemented at cohort level, implies that younger cohorts more educated relative to older cohorts
- RDD approach to examine the response in the marriage market wrt sorting on age gaps and education

Preview of Results:

- We find typical matching patterns cannot be obtained in the neighbourhood of the discontinuity
  - Spouses choose smaller age gaps and differently qualified partners
- Women affected by the reform face a disadvantage as their potential partners are from untreated cohorts

The Role of Age Gaps in Cohort Specific Shocks

For transitory shocks to cohort sizes the age-gap is the margin of adjustment to allow the marriage market to clear

- E.g 1958-1961 famine in China (Brandt, Siow, Vogel: 2009)

In contrast to a shock to cohort size, we look at a transitory shock to cross-cohort composition wrt education distribution.

- The degree of adjustment on the age-gap will depend on the strength of the preferences for age vs education, and the number of cohorts the adjustment occurs over - Bhaskar (2012)

If a reform affects a whole cohort,

- without an age gap there is no imbalance for certain qualifications in the marriage market
- age gaps impose imbalances for certain matches.
- Some individuals will not be able to match according to **both** age gap and educational preferences

Education Reform

UK reform of school leaving age induces imbalance in marriage market

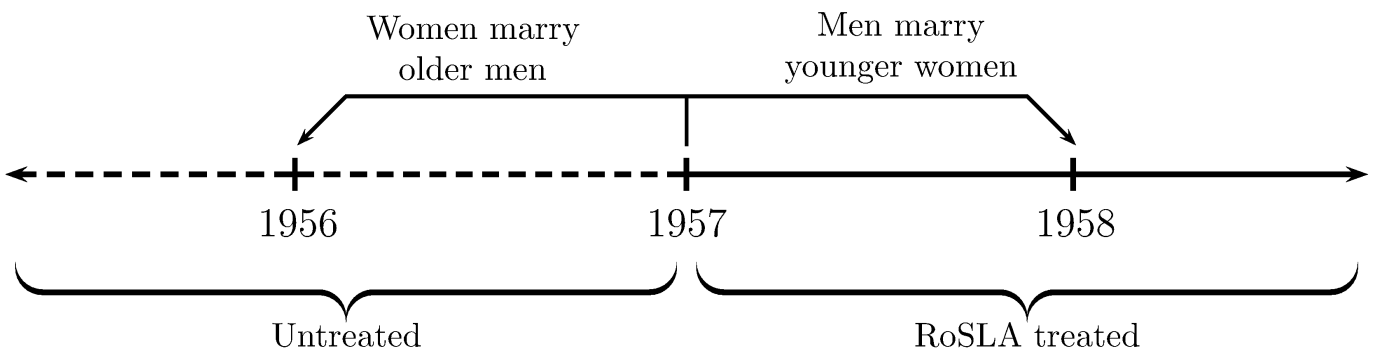
The Raising of the School Leaving Age (RoSLA) was enacted in 1972

- Increased minimum age from 15 to 16 years
- Affected academic cohorts from 1957, born September or later
- Effectively increased years of schooling and academic qualifications by keeping students in school until O' levels or CSEs

Literature confirms effects on earnings, child health and education, life-time wealth, happiness and crime.

Cross-cohort qualifications imbalance

With a prevailing age gap individuals form matches across academic cohorts (women match with men from older cohort). But at the threshold this implies that candidate spouses are from different educational regimes:



1957 women - face an undersupply of equally qualified men

- Attractiveness of younger post-RoSLA men increases

1957 men - no imbalance - candidate partners are 'treated'

- In contrast, the imbalance materializes for the 1956 cohort

Why the ONS LS?

The analysis requires rich information on both spouses

- age of each spouse - to calculate age difference
- qualifications obtained by each spouse

ONS Longitudinal Study

- administrative data from five successive linked censuses (1971-2011)
- ca 1% sample of the population of England and Wales
- data contains rich set of socio-economic characteristics of both LS and household members (spouses)

Create two samples - husbands, wives:

- Both spouses born in UK and resident in England & Wales at time of census
- Prime age individuals born 1951-1962
- Exclude age gaps $> \pm$ 10 years

UNIVERSITY of STIRLING

Empirical Method

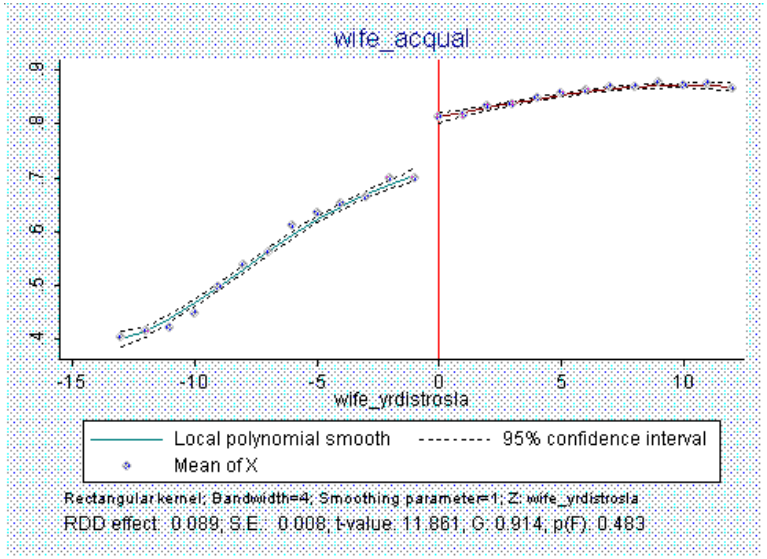
Regression discontinuity (RD) approach. As running variable discretely measured we apply parametric estimation following Lee & Card (2008):

$$Y_{ij} = \alpha_0 + D_j\beta_0 + P_j^l\gamma_0 + (D_j \times P_j^l)\delta_0 + \epsilon_{ij}$$

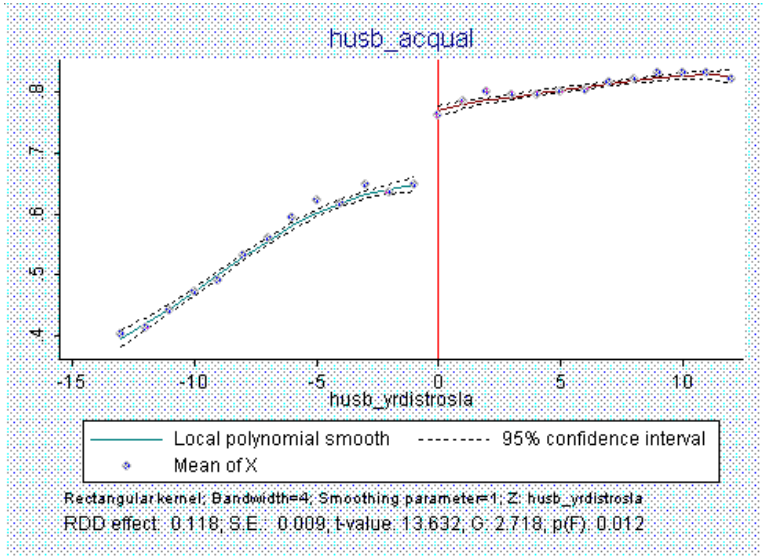
Where Y_{ij} is the outcome for individual i born in month j; D_j is a treatment indicator (1 if MOB j Sept 57 or later); using polynomial functions P_j^l with (l=1,2,3).

- Ludwig & Miller (2007) cross-validation procedure for choice of bandwidth
- AIC and Lee & Card (2008) G-stat to determine polynomial degree

Impact on qualifications



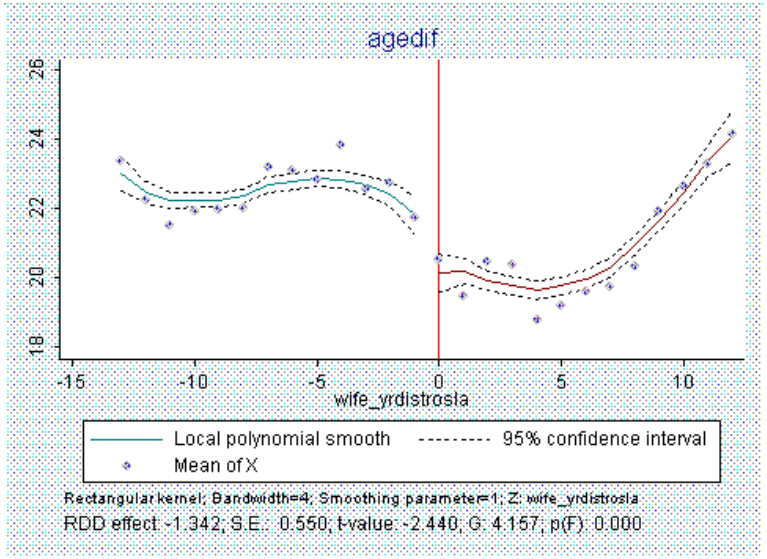
(a) Married women



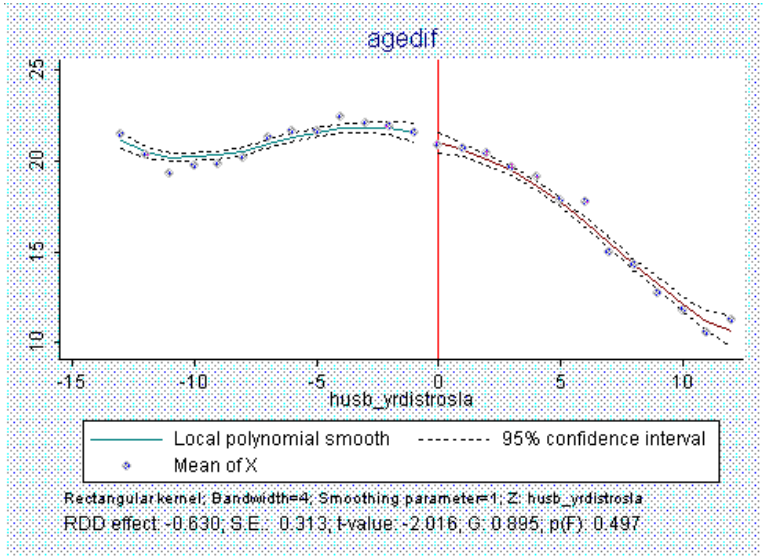
(b) Married men

Source: ONS Longitudinal Study.

Impact on Spousal Age Difference



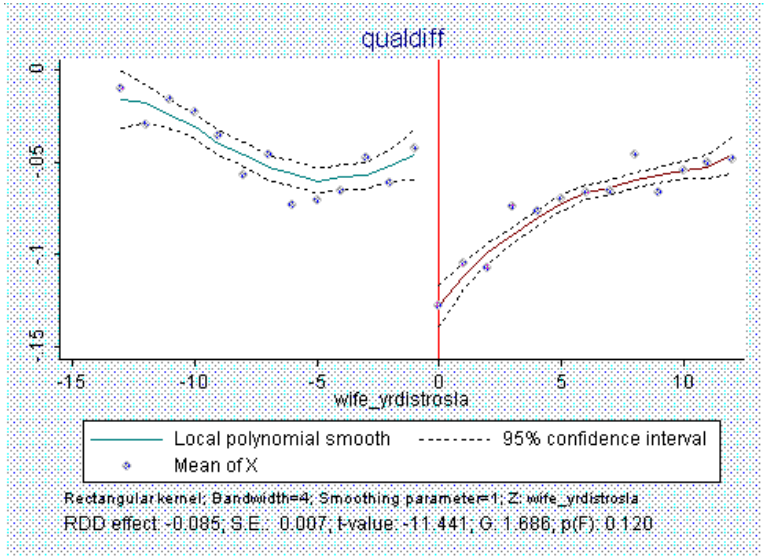
(a) Married women



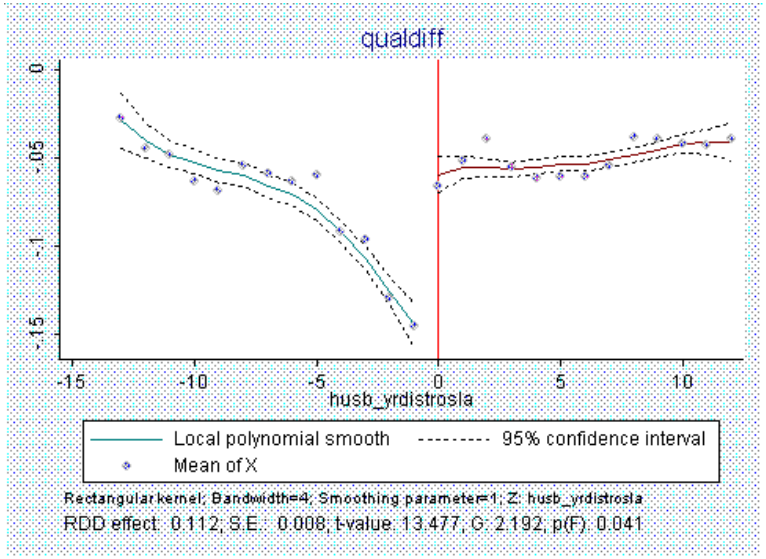
(b) Married men

Source: ONS Longitudinal Study.

Impact on Qualifications Difference



(a) Married women



(b) Married men

Source: ONS Longitudinal Study.

Analytical Results

	Wives			Husbands		
	Qual	Agediff	Qualdiff	Qual	Agediff	Qualdiff
RoSLA	0.133**	-2.192**	-0.085**	0.139**	-0.630	0.073**
	(0.012)	(0.417)	(0.007)	(0.011)	(0.313)	(0.015)
N	26,068	48,097	26,068	28,147	46,533	28,147

*Robust standard errors reported in parentheses. * $p < 0.05$, ** $p < 0.01$. Source: ONS Longitudinal Study*

Discussion

We find the reform induced a substantial decrease in the marital age gap for women (2.5 months - approx 10% relative to the sample mean) and women cannot achieve same degree of qualifications sorting

Corresponding but reversed effect for men - those born just before the threshold cannot achieve typical marital matches

Our results have potential implications for analyses using compulsory schooling laws to elicit causal effects of education

- For individual outcomes the marriage market effect is another channel of the educational effect
- For household level outcomes the marriage market effect should be taken into consideration when justifying the identifying assumption
    - May be especially important for long-term outcomes, such as intergenerational effects, which are more heavily dependent on the household environment than individual outcomes

Reflection of using ONS LS

Some set-up “costs":

- Detailed application required
- SURE training
- Access only via SRS
- Clearance procedures

But many advantages:

- Very helpful helpdesk
- Detailed documentation for data cleaning/analysis
- On-site help
- Remote coding

Vast potential for future work

Next project

Long-run Health and Mortality Effects of Exposure to Universal Health Care at Birth (with Melanie Luhrmann)

- Impact of birth exposure to universal healthcare on mortality and health around ages 50-60
- Intervention: NHS introduction in 1948
- Outcome: *very long-run, almost life-long* consequences 50 to 60 years after exposure
- Method: RD design combined with DiD
  exploiting geographical variation in medical services expansion