# Transitioning towards more equality? Wealth gender differences and the changing role of explanatory factors over time

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# Our paper in a nutshell

- **Intro**: Importance of wealth gender differences, in light of changes in labour market outcomes
- **Focus**: Germany, 2002-2012 (G-SOEP)
- **Methodology**: Investigate the determinants of wealth (OLS); decomposition techniques at the mean and along the distribution
- **Main results**:
  - Between 2002 and 2012 the gender wealth gap decreased from 35,500€ to 30,700€ (13.5%)
  - For both sexes median & mean wealth declined, but more for men
  - Labour market, occupational status and income play an increasing role in wealth accumulation for women

# Background

Growing importance of wealth for economic and social functions

- Increasing reliance of economic well-being and living standards on private assets (e.g. pensions)
- Importance of wealth in general
  Collateral, consumption smooting in case of income fluctuations, source of income, usage of properties, ...
- Social status

# Background

Difficulties in studying wealth empirically

- Wealth surveyed at the hh level (data constraints)
  - Forced to assume intra-household inequalities negligible
  - Assume wealth equal share
  - Deceptive picture of inequality
- Necessity of looking within the household

Deere and Doss, 2006

- Differences in wealth among women and men, even in married couples.
- Labour market outcomes among the most important factors

Sierminska et al., 2010; Grabka et al., 2013

# Why do we care about women's individual wealth?

- Increasing role of private assets
- Women live longer than men and lower pension
- Growing number of single-headed female households
- Elderly women more at risk of poverty
  - Pressure for women to take care of own wealth
- Bargaining within the household
- Within household inequalities

# Men and women accumulate differently

Standard life-cycle model of accumulation

$$A_{t+1} = (1 + r)(A_t + Y_t - C_t) \tag{1}$$

Wealth accumulated during working age, than decumulated

- Women and men have different income ($Y_t$):
  - Women weaker attachment to the labour market — Warren et al. 2001
  - Different occupations — Goldin 2014
  - Gender wage gap — Blau & Kahn 2000
- Women and men save differently ($Y_t - C_t$) — Fisher 2010
- Women and men have different returns ($r$):
  - Different preference for risk, W less risky assets — Cartwright 2011
  - Financial literacy, W. more conservative inv. — Lusardi & Mitchell 2008

# Men and women accumulate differently

Previous work indicates

- Most studies: Single men richer than single women

  e.g. Yamokoski, Keister 2006; Ruel, Hauser 2013; Ravazzini, Chesters 2018

- Significant gender wealth gap of about 30,000 euros in Germany (50,000 for married couples)
  - Gap driven mostly by differences in characteristics
  - Labour market variables explain a substantial amount (own income, lbr mkt experience), particularly at the bottom and top of w. distribution
  - Middle of the distribution driven by wealth function

  Sierminska et al. 2010

- A marriage wealth premium exists, but lower for women

  Lersch 2017

- A gap exits also in France and Italy

  Bonnet et al. 2014, D'Alessio 2018

# Research question

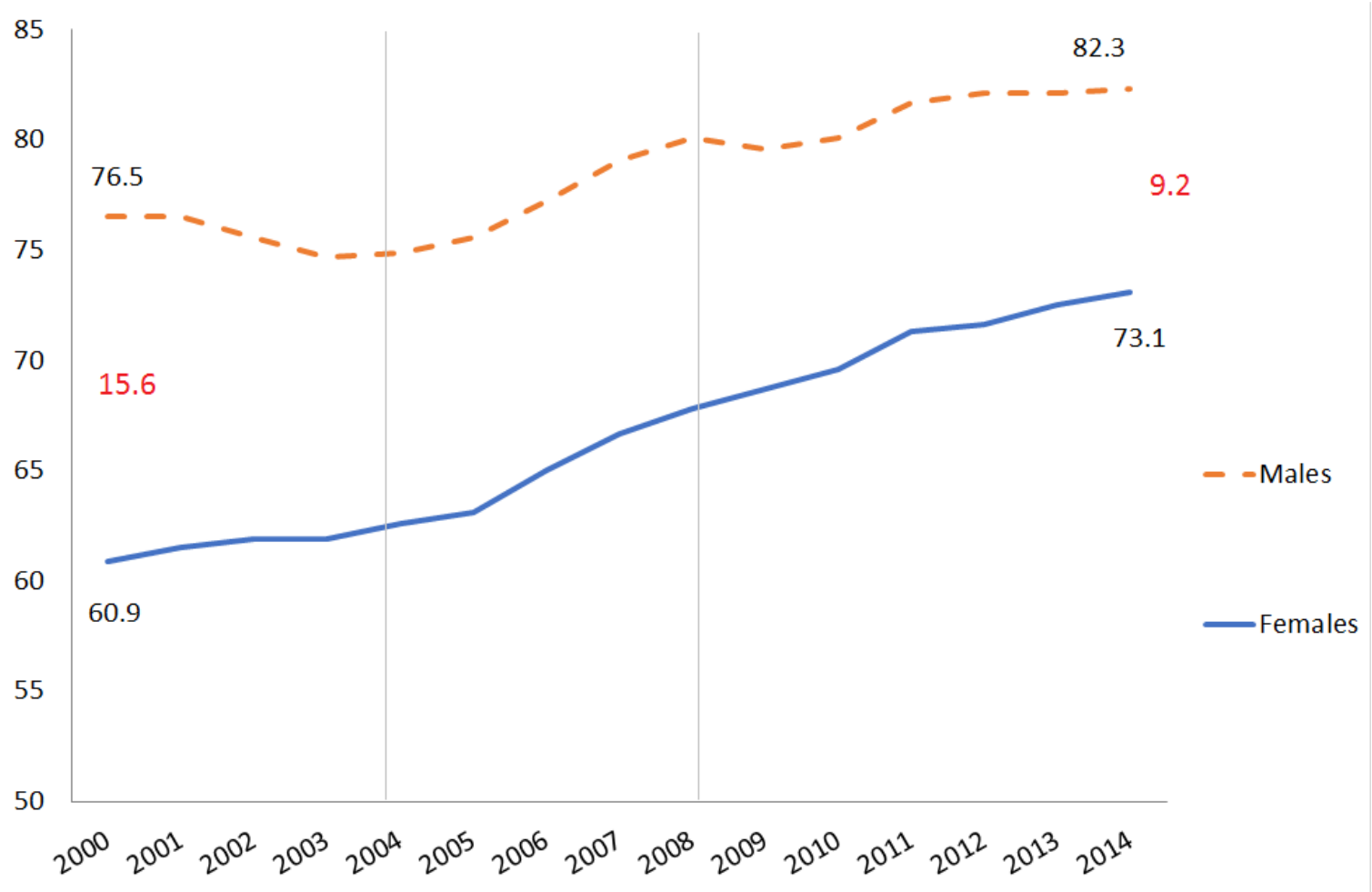
**How did the role of explanatory factors change over time in explaining wealth gender differences in Germany?**

- Investigate the explanatory factors that contribute to changing wealth levels
- Before and after Great Recession
- Role of changes in labour market attachment
  - Participation
  - Number of hours
  - Part-time
  - Occupational choices
- Considering also other forces
  - Marital transitions
  - Risk preferences

# Why focus on Germany?

- Hit hard by the financial crisis
  - GDP dropped by 5% in 2009
  - At the beginning of the crisis, men sectors shrank by 20%
    Manufacturing and engineering
  - Quick recover
- Substantial changes in the labour market
  - Women's attachment to the labour market largely increased
    - Female participation from 55.9% (2003) to 62.5%
    - Earn wages, savings, and thus larger accumulation
  - Changes in occupation
  - Labour market reforms (Hartz reform).
- Unique micro-data on private wealth, at the individual level (G-SOEP);

# Employment rate in Germany, by gender



# Empirical strategy

- Examine wealth and wealth gap over time (increase or decrease)
- Examine determinants of wealth over time
- As LM attachment for women increased, has the role of LM characteristics, as an explanatory factor of the wealth gap, been changing?
- Are other factors important?
- Is it enough to increase LMP of women to close the gap?
- Decompose wealth gap at the mean and along the distribution

# Data: the German Socio-Economic Panel

Ongoing panel (from 1984) on households in Germany
(about 20,000 individuals/wave)

Wealth topic module in 2002, 2007, 2012.

- Sample selection: 25-64 years old

Two samples:

- Cross-sectional sample: 2002, 2007, 2012
  to analyze the evolution of wealth over time
- Panel sample: 2002-2007 (pre-crisis) and 2007-2012 (post-crisis)
  about 4,000-5,000 obs. per sex per period

Additional sample: only married (in $t-1$)

# Dependent variable

Household and individual wealth:

- *Own property*
- *Other real estate*
- Financial assets
- Business assets
- Tangible assets
- Building loan and private insurance
- Consumer credits

**Dependent variable: net worth = assets - debts**

- 0.1% coding
- Inverse hyperbolic sign transformation
  (similar to log but allows negative and zero values)

$$log(y_i + (y_i^2 + 1)/2)$$

# Methodology I
# Changes in determinants of wealth accumulation

Wealth function separately for men and women:

$$w_t = \alpha_t + \beta T_t + \gamma Z_{t5} + \delta L_{t-1} + \zeta \Delta C_t + \epsilon_t = \qquad \text{(OLS)}$$
$$= \theta X_t + \epsilon_t$$

$w_t$ : net real wealth (inverse hyperbolic tr.)

$T_t$ : control variables observed in $t$

$Z_{t5}$ : control variables over the 5 previous yrs.

$L_{t-1}$ : lagged control variables

$\Delta C_t$ : change in control variables between $t-1$ and $t$

$t = 2007, 2012$

$t-1 = 2002, 2007$

# Control variables

Preferred specification:
demographic, labour market and income variables

- $T_t$: migratory background, residence, age, kids, n. marriages, length current marriage;
- $Z_{t5}$: months in fulltime/parttime work, long term unempl., IHS perm. income, IHS windfall income (inheritance, bequest, lottery);
- $L_{t-1}$: education, occupational status, risk aversion, share financial assets;
- $\Delta C_t$: change in marital status.

# Methodology I
# Changes in gender wealth gap

1. Oaxaca-Blinder decomposition:

$$g_t = w_t^M - w_t^F = (\overline{X}_t^M - \overline{X}_t^F)\hat{\vartheta}_t^M + \overline{X}_t^M(\hat{\vartheta}_t^M - \hat{\vartheta}_t^F) \qquad \text{(OB)}$$

2. Firpo, Fortin, Lemieux (2009) decomposition:
   Decomposes the differences between two distribution of a variable

$$\Delta_{Q\tau} = (\overline{X}_t^M - \overline{X}_t^F)\hat{\vartheta}_{Q\tau}^M + \overline{X}_t^M(\hat{\vartheta}_{Q\tau}^M - \hat{\vartheta}_{Q\tau}^F) \qquad \text{(Firpo)}$$

   $\Delta_{Q\tau}$ : difference in quantile $\tau$ of the wealth distrib.

   $\hat{\vartheta}_{Q\tau}^{M,F}$ : coefficients from the regression of the RIF variables of quantile $\tau$ on the set of explanatory var.

# Descriptive: Wealth and wealth gap over time

| | | Mean | Median |
|---|---|---|---|
| Men | 2002 | 112,516 | 31,643 |
| | 2007 | 102,678 | 24,974 |
| | 2012 | 93,617 | 24,976 |
| Women | 2002 | 77,030 | 18,059 |
| | 2007 | 69,393 | 15,088 |
| | 2012 | 62,902 | 14,409 |
| Gap | 2002 | 35,487 | 13,585 |
| | 2007 | 33,284 | 9,886 |
| | 2012 | 30,715 | 10,567 |

Mean: Overall reduction of the gap of 5,000€ (13.5%)
Median: Overall reduction of 3,000€ (mostly in the period 2002-2007)
$>$ different wealth changes along distribution for men and women

# Selected descriptive statistics

## Education, labour market and occupations, income

| Variables | Men 2007 | Men 2012 | Women 2007 | Women 2012 |
|---|---|---|---|---|
| Lagged Low educated | 0.13 | 0.11 | 0.14 | 0.11 |
| Lagged Lower vocational | 0.52 | 0.51 | 0.54 | 0.53 |
| Lagged Upper vocational | 0.15 | 0.15 | 0.14 | 0.15 |
| Lagged University | 0.18 | 0.20 | 0.15 | 0.17 |
| Full-time (months) | 47.40 | 47.88 | 20.98 | 24.98 |
| Part-time (months) | 2.16 | 1.80 | 16.37 | 14.18 |
| Long-term unempl. | 0.17 | 0.13 | 0.16 | 0.12 |
| Lagged not empl. | 0.02 | 0.01 | 0.20 | 0.14 |
| Lagged trainee | 0.06 | 0.05 | 0.05 | 0.06 |
| Lagged self employed | 0.09 | 0.10 | 0.04 | 0.04 |
| Lagged white collar | 0.34 | 0.33 | 0.43 | 0.49 |
| Lagged blue collar | 0.36 | 0.36 | 0.17 | 0.14 |
| Lagged low civil serv. | 0.03 | 0.03 | 0.01 | 0.02 |
| Lagged high civil serv. | 0.04 | 0.04 | 0.02 | 0.02 |
| Permanent income | 34,329.79 | 34,082.86 | 16,565.16 | 18,210.13 |
| Lagged risk preferences | 5.01 | 5.03 | 4.24 | 4.21 |

# Results

# Changing role of explanatory factors: labour market and occupations

| | Men | | Women | |
|---|---|---|---|---|
| | 2007 | 2012 | 2007 | 2012 |
| Full time empl. | 0.03*** | 0.02* | 0.01* | -0.00 |
| Part time empl. | 0.01 | -0.01 | 0.01 | 0.01* |
| Long term unempl | -2.50*** | -2.89*** | -2.72*** | -2.03*** |
| *Ref: blue collar* | | | | |
| Lagged Not empl | 1.28 | 0.84 | 0.43 | 1.83*** |
| Lagged Trainee | 0.49 | 0.10 | 0.97* | 2.34*** |
| Lagged Self empl | 1.29*** | 1.65*** | 1.12** | 1.89*** |
| Lagged White collar | 0.91*** | 0.95*** | 1.09*** | 2.04*** |
| Lagged civil serv low | 0.75 | 2.57*** | 2.20** | 2.97*** |
| Lagged civil serv high | 0.24 | 0.99* | 1.40** | 1.43** |
| Asint. perm. income | 0.78*** | 0.31*** | 0.00 | 0.13* |
| Fin. assets share | 0.50*** | 0.51*** | 0.44*** | 0.46*** |
| Migrant | -1.95*** | -1.49*** | -1.90*** | -1.27*** |

+ p <0.10, * p < 0.05, ** p <0.01 *** 0.001

# Changing role of explanatory factors: education and marital status

| | Men | | Women | |
|---|---|---|---|---|
| | 2007 | 2012 | 2007 | 2012 |
| Lagged lower voc. edu | 0.53+ | 1.38*** | 1.50*** | 1.08*** |
| Lagged upper voc. edu | 0.91* | 2.04*** | 1.98*** | 1.68*** |
| Lagged university | 1.38*** | 2.54*** | 2.61*** | 2.63*** |
| *Ref: always married* | | | | |
| Married > widowed | 1.41 | 3.09 | 0.64 | -1.75+ |
| Married > divorced/sep | -2.35*** | -2.26*** | -2.65*** | -2.32*** |
| NM > married | -0.47 | -0.06 | -0.86+ | 0.34 |
| Always NM | -2.01*** | -1.66** | -2.47*** | -2.77*** |
| Single > married | -0.00 | -1.15+ | -1.54** | -0.43 |
| Single (other) | -1.93*** | -1.36** | -2.22*** | -2.49*** |
| Num. of marriages | -1.34*** | -1.61*** | -0.94*** | -1.49*** |
| Obs. | 5,240 | 3,813 | 5,824 | 4,388 |
| Adj. R2 | 0.21 | 0.20 | 0.19 | 0.18 |

+ p <0.10, * p < 0.05, ** p <0.01 *** 0.001

# Changing role of explanatory factors: summing up

- Large role of labor market factors;
- Increasing importance of occupations and income for women;
- Importance of education (more for women)
- Importance of marital transitions

# Oaxaca-Blinder decomposition

| | | 2007 | | 2012 | |
|---|---|---|---|---|---|
| | | Coef. | SE | Coef. | SE |
| Overall | Men | 8.45*** | 0.10 | 8.49*** | 0.11 |
| | Women | 7.97*** | 0.09 | 7.97*** | 0.10 |
| | Difference | 0.48*** | 0.13 | 0.52*** | 0.15 |
| | Explained | 1.58*** | 0.25 | 1.04*** | 0.24 |
| | Unexplained | -1.10*** | 0.27 | -0.53* | 0.27 |
| Expl. | Age | 0.06** | 0.02 | 0.02 | 0.02 |
| | Education | 0.05*** | 0.02 | 0.05** | 0.02 |
| | Lab. market | 0.36 | 0.25 | 0.62** | 0.23 |
| | Occupation | -0.02 | 0.02 | -0.00 | 0.03 |
| | Income | 1.14*** | 0.17 | 0.35*** | 0.10 |
| Unexpl. | Age | -1.34 | 2.64 | -5.93+ | 3.08 |
| | Education | -0.89** | 0.31 | 0.18 | 0.41 |
| | Lab. market | 0.47 | 0.50 | -0.10 | 0.52 |
| | Occupation | -0.16 | 0.19 | -0.68** | 0.24 |
| | Income | 7.43*** | 1.17 | 1.77+ | 0.98 |

+ p <0.10, * p < 0.05, ** p <0.01 *** 0.001

# Oaxaca-Blinder decomposition

- Wealth gap due to differences in income (2007) and labour market outcomes (2012)
- Unexplained portion is negative: differences in returns favor women (e.g. education)
- Explained proportion declined by 1/3 and unexplained by 1/2
  - Differences in characteristics and in returns decline
- In 2007, age, education, **income**, num. of marriages explain the gap
- In 2007 returns to education reduce the gap
- In 2012, also labour market participation explains the gap (when women entered into lab mkt), reducing role for income
- In 2012, returns to income much smaller effect; returns to occupation reduce the gap

# Firpo, Fortin, Lemieux decomposition

| | | 2007 | | | 2012 | | |
|---|---|---|---|---|---|---|---|
| | | Q25 | Q50 | Q90 | Q25 | Q50 | Q90 |
| Ov. | Men | 8.94*** | 11.38*** | 13.33*** | 8.95*** | 11.43*** | 13.26*** |
| | Women | 7.49*** | 10.95*** | 13.00*** | 8.43*** | 10.96*** | 12.95*** |
| | Diff. | 1.45*** | 0.43*** | 0.33*** | 0.52 | 0.47*** | 0.31*** |
| | Expl. | 3.06*** | 0.62*** | 0.50*** | 2.03*** | 0.58*** | 0.38*** |
| | Unexpl. | -1.61*** | -0.19 | -0.17* | -1.50+ | -0.11 | -0.07 |
| Ex. | Educ. | 0.09*** | 0.03*** | 0.02*** | 0.08* | 0.02* | 0.01* |
| | Lab. mkt. | 1.15** | -0.11 | -0.11 | 01.26*** | 0.28* | 0.13 |
| | Occup. | -0.05 | 0.01 | 0.07*** | -0.00 | -0.00 | 0.06*** |
| | Income | 1.83*** | 0.67*** | 0.46*** | 0.76*** | 0.26*** | 0.15*** |
| | Risk | -0.06 | 0.02 | 0.03** | -0.13* | 0.01 | 0.03+ |
| Un. | Educ. | -5.20*** | -0.30* | -0.11 | -9.00*** | -0.24 | 0.05 |
| | Lab. mkt. | 0.54 | 0.08 | -0.40* | -4.33* | -0.39 | -0.40* |
| | Occup. | -0.95+ | -0.09 | -0.05 | -8.62*** | -0.22+ | -0.05 |
| | Income | 10.11*** | 4.02*** | 3.04*** | -5.79 | 1.75*** | 1.37*** |
| | Risk | -0.01 | -0.07 | 0.08 | -0.00 | 0.05 | 0.13 |

+ p <0.10, * p < 0.05, ** p <0.01 *** 0.001

# Firpo, Fortin, Lemieux decomposition

- Gap largest at the bottom (Q25), and decreased along wealth distribution
- At Q25 decreases the most between 2007 and 2012

  thanks to labour market and occupations returns
- Gap due to differences in characteristics; differences in returns reduce it
- Both share of explained and unexplained decrease in 2012 (esp. at the bottom)

# Firpo, Fortin, Lemieux decomposition

| 2007 | 2012 |
|---|---|
| **Explained** | |
| Education (decreasing with wealth) | |
| **Labour market part. (bottom)** | |
| **Occupation (top)** | |
| Income (decreasing with wealth) | |
| **Risk preferences (top)** | |
| **Returns** | |
| Education (-; decreasing in abs. val.) | |
| Occupation (-; bottom) | |
| Income (large and +; decreasing) | |
| Marital status (+; decreasing) | |

# Firpo, Fortin, Lemieux decomposition

| 2007 | 2012 |
|---|---|
| **Explained** | |
| Education (decreasing with wealth) | Education less important |
| **Labour market part. (bottom)** | Labour mkt part. more important |
| **Occupation (top)** | Occupation less important |
| Income (decreasing with wealth) | Income less important |
| **Risk preferences (top)** | Same |
| **Returns** | |
| Education (-; decreasing in abs. val.) | Education more important at bottom |
| Occupation (-; bottom) | Occupation more important at bottom |
| Income (large and +; decreasing) | Income less important |
| Marital status (+; decreasing) | Mar. stat. more important at bottom |

# Limitations

- Under-representation of multimillionaires and billionaires
  - Our estimates of wealth gap likely a lower bound
- Married couples:
  - We lack good measures of bargaining power
  - We lack infos on couples agreements
- We lack information on pension entitlements
  - Our estimates of wealth gap and of its decrease likely a lower bound (pensions relate to labour mkt)

# To sum up

- The gender wealth gap for 25-64 y.o. individuals has declined from 35,000€ to 30,000€;
- For both sexes mean and median wealth has declined, but more for men;
- Labour market, occupational status, and income play an increasing role in wealth accumulation for women.

# To sum up

## Decompositions

- More equal wealth accumulation in terms of characteristics and returns;
  - The explained wealth gap is positive, but decreasing;
  - The unexplained wealth gap is negative, but decreasing (in abs.val.);
- Largest gap at the bottom (Q25), but decreasing most
- Increasing (sig.) effect of labour market in explaining the gap (mean and median), compensated by a decreasing effect of permanent income;
- the return to occupations contributes in reducing the gap (mean and median);
- at the top of the wealth distribution:
  - differences in the occupation still contributes to the explained gap;
  - preference for risk contributes to the explained gap

# Discussion

Improve labour market outcomes and occupation possibilities for women affect not only their income, but also their possibility to save, increasing their wealth level.

Policy implications:

- Ind. level: improve the wealth condition of women (single, divorced, or widowed);
- HH level (bargaining models): increase the bargaining power of women during the marriage, and their outside option;
- HH level (as a unit): improve the condition of the entire family.

# Thank you

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