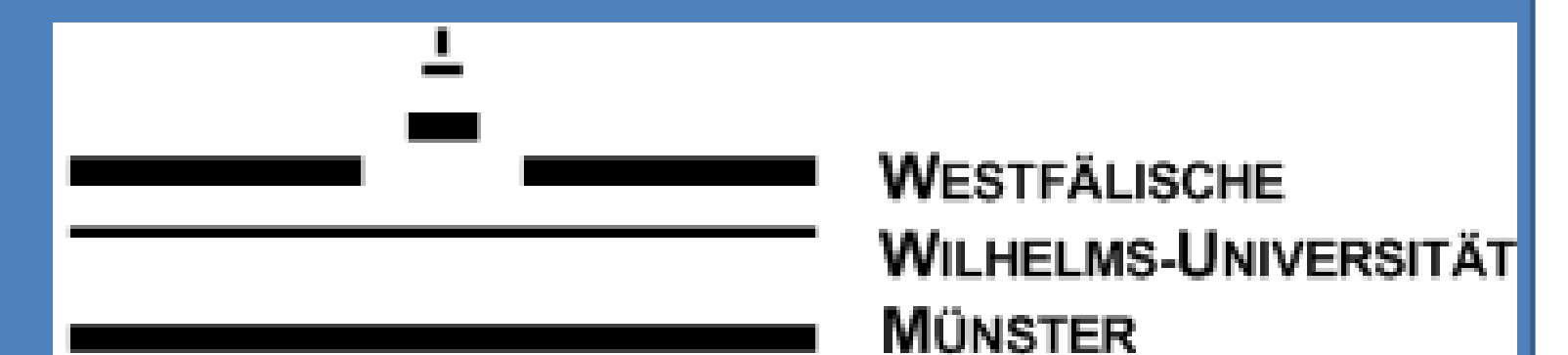


The motherhood wage gap: Does timing matter?

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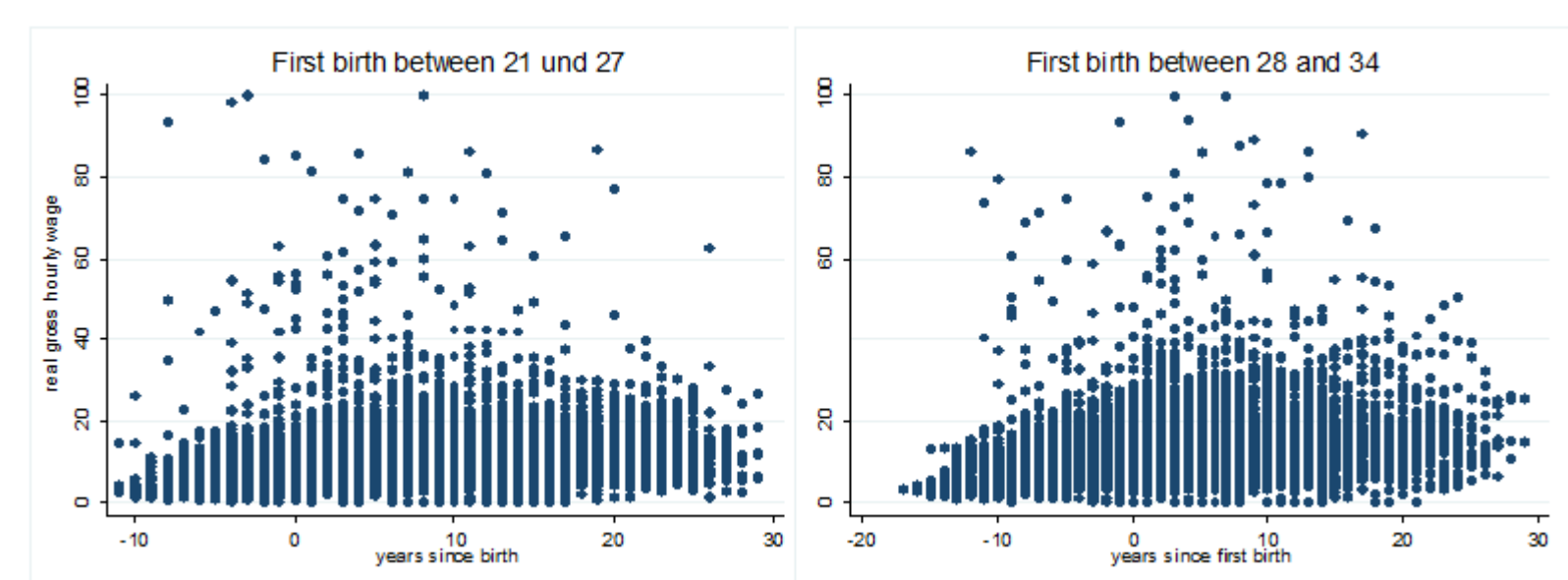
INTRODUCTION

- Although the gender wage gap decreased in the last decades, there is still a not negligible and persistent difference in wages between men and women. One of the reasons is often assumed to be vertical segregation.
- The motherhood wage gap is investigated extensively: Mothers with children earn on average less than childless women. In Germany, the wage difference is with an amount of about 10 percent comparable high.
- Average age at first birth increased from 24 years in 1970 to 29 years today.
- Late motherhood is often accompanied by disadvantages like health risks, fewer time with children or a lower likelihood to become a mother at all.
- Research questions:
 - What are the underlying mechanisms of the motherhood wage penalty?
 - Does a delay of motherhood mitigate the wage penalty and how high is the benefit?
 - Do female migrants differ in respect to their fertility behavior and do they experience higher penalties due to motherhood?

DATA

- German Socio-Economic Panel Study (GSOEP)
- Sample of women who have their first child between 1984 and 2013, living in West Germany (N=2356)
- First and second generation migrants

	First birth between 21 and 27		First birth between 28 and 34	
	Mean	Std. Dev.	Mean	Std. Dev.
Ln wage	2.30	0.60	2.45	0.56
Age at first birth	25.32	1.80	30.62	1.71
Age	31.72	8.49	32.47	8.52
Age squared	1078.33	559.87	1126.70	593.23
Duration of mat. leave	19.11	13.96	26.20	23.52
Mother*Age	24.66	17.66	18.96	20.31
Years of schooling	11.12	1.51	12.52	2.37
Family Status	0.61	0.49	0.52	0.50
Plant Size	6.08	3.06	7.18	2.98
Tenure	4.96	5.42	5.92	6.59
Part time	0.53	0.50	0.40	0.49
Public Service	0.19	0.39	0.29	0.46
Fem. Occup.	0.82	0.39	0.78	0.42
Observations	6839		5660	



METHOD

1) Estimate how fertility timing affects wages and employment status after the fertility period (here: wage at 40 years)

2) Estimate a fixed-effect model to reveal the mechanisms through which age at first birth and motherhood affects wages:

$$\ln w_{it} = \beta_0 + \beta_1 Age_{it} + \beta_2 Age_{it}^2 + \beta_3 X_{it} + M_{it}(\beta_{4.1} Age_{it} + \beta_{4.2} Mat_{it}) + \alpha_i + \varepsilon_{it}$$

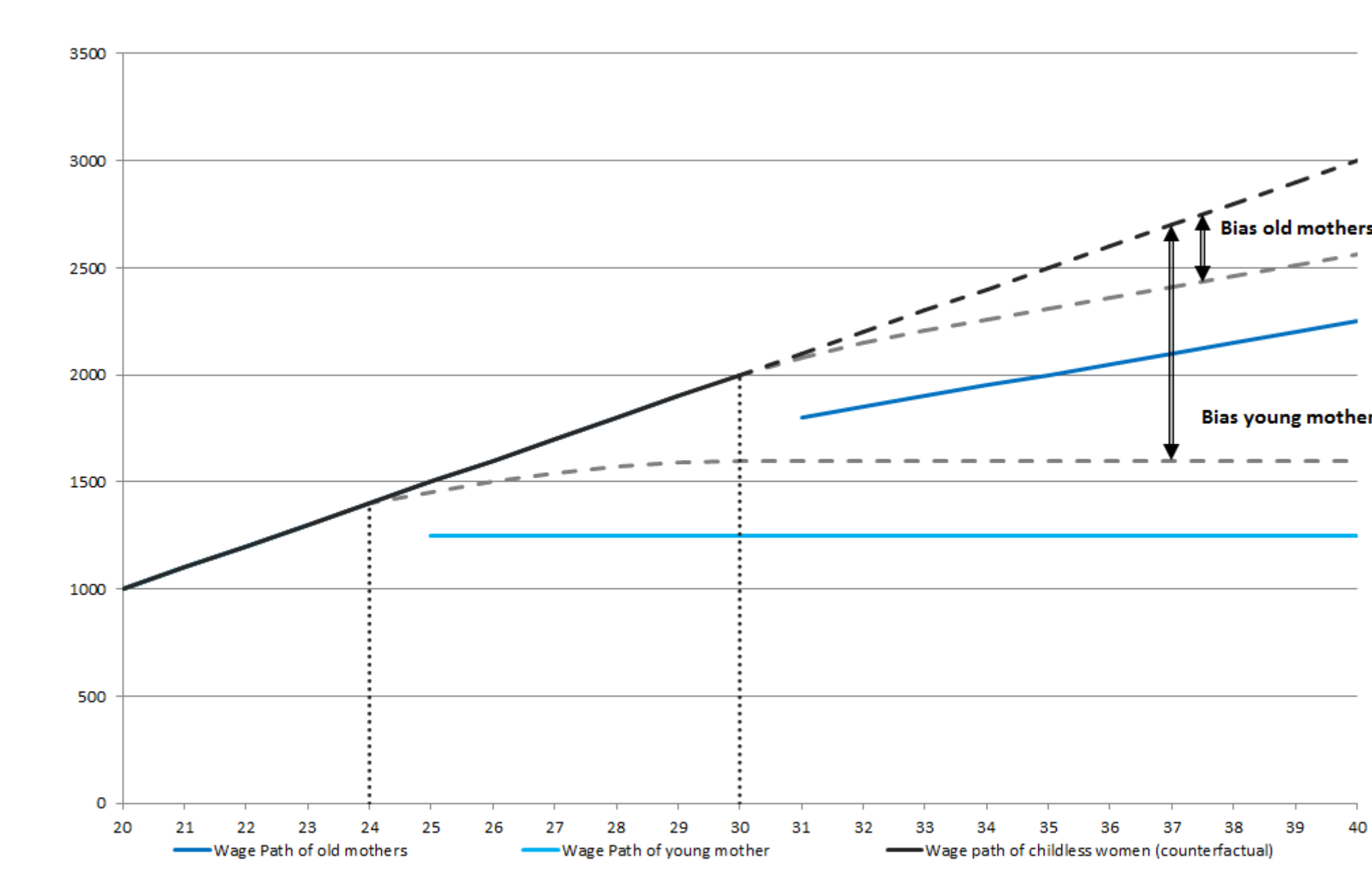
- $\ln w_{it}$ Real gross hourly wage
- M_{it} Mother, $\beta_{4.1}$: How motherhood affects the slope of the wage growth
- Mat_{it} Duration of maternity leave
- X_{it} Covariates: years of schooling, marital status, firm size, tenure, working in part time or full time employment, working in a female or male occupation
- α_i Fixed-effects that are deleted by transformation
- ε_{it} Represent the idiosyncratic error term

Age at first birth is time-invariant, so it is included via interaction terms.
Final model:

$$\ln w_{it} = \beta_0 + \beta_1 Age_{it} + \beta_2 Age_{it}^2 + \beta_3 X_{it} +$$

$$M_{it}(\beta_{4.1} Age_{it} + \beta_{4.2} Mat_{it} + A1b(\beta_{5.1} Age_{it} + \beta_{5.2} Mat_{it})) + \alpha_i + \varepsilon_{it}$$

Identification



RESULTS

- Fertility delay has a positive effect on wages and on the probability to work in part time employment compared to work in full time.
- However, the probability to work at all compared to be out of the labor force is negatively affected by a fertility delay.
- The inverse mills ratio is insignificant indicating that there is no sample selection

Estimation results: Determinants of career outcome at an age of 40

	wage (1)	in labour force (2)	working part time (3)	wage (4)	wage (full time) (5)
Age at first birth	0.0182** (0.0075)	-0.0264*** (0.0061)	0.0117* (0.0064)	0.0282** (0.0122)	0.0325* (0.0176)
Dur. of mat. leave	-0.0028* (0.0014)	-0.0003 (0.0011)	0.0012 (0.0015)	-0.0021 (0.0016)	0.0005 (0.0033)
Inverse mills ratio				0.0283 (0.2241)	-0.2722 (0.1690)
Observations	393	572	403	572	571

Source: GSOEP 1984 - 2013, own calculations.
Note: Table represent marginal effects, std. errors in parentheses.

Estimation Results: Fixed-Effects regression for the mother sample

	Robust Std. Err.			Robust Std. Err.		
	Coef.	Err.	t-value	Coef.	Err.	t-value
Age	0.1612***	0.0086	18.76	0.1819***	0.0182	10.02
Age squared	-0.0019***	0.0001	-15.90	-0.0019***	0.0001	-15.83
Age*A1b				-0.0007	0.0005	-1.30
Dur. of mat. leave	-0.0018	0.0082	-0.23	0.0003	0.0083	0.04
*A1b	0.0000	0.0003	0.01	-0.0001	0.0003	-0.24
Mother*Age	-0.0278***	0.0062	-4.49	-0.0365***	0.0088	-4.16
*A1b	0.0006***	0.0002	3.00	0.0009***	0.0003	3.11
Years of schooling	0.0748***	0.0106	7.06	0.0749***	0.0106	7.07
Family Status	0.0012	0.0168	0.07	0.0025	0.0168	0.15
Plant Size	0.0102***	0.0032	3.21	0.0102***	0.0032	3.20
Tenure	0.0106***	0.0017	6.27	0.0106***	0.0017	6.24
Part time	0.4055***	0.0436	9.30	0.4088***	0.0441	9.27
*Dur. Mat	-0.0011	0.0013	-0.84	-0.0012	0.0013	-0.91
*A1b	-0.0084***	0.0013	-6.65	-0.0085***	0.0013	-6.65
Public Service	0.0567***	0.0205	2.76	0.0563***	0.0206	2.74
Fem. Occup.	-0.1235***	0.0351	-3.52	-0.1236***	0.0350	-3.53
Constant	-1.4870***	0.1673	-8.89	-1.5041***	0.1685	-8.93
R-squared			0.2271			0.2273
Observations			13324			13324
Individuals			1569			1569

Source: GSOEP 1984-2013, own calculations.
Note: * 10%, ** 5%, *** 1%.

- Mothers experience a lower wage growth than they would have had if they remained childless. This difference is smaller the older a women is when she gives first birth and higher if she works in part time employment after returning to the labor market.

- Women have to postpone the first birth beyond an age of 40 to fully offset the negative effect of being a mother on wages.
- Wage growth declines even before the first birth, thus the motherhood wage penalty is higher for earlier mothers.

MIGRANTS

- Age at first birth is with an average of 26.54 years lower for migrant mothers than for native mothers.
- Concerning labor market participation, migrants and natives differ, too: 55 percentage of migrant mothers and 71 of native mothers work at an age of 40.
- the younger a woman is at her immigration to Germany, the earlier she has her first child.
- Fixed-effects results for migrants show an contradictory picture: Whereas the returns to fertility delay are higher, the length of maternity leave has a positive effect on wages.

CONCLUSION

- My results support previous research that mothers are on a slower wage track after an interruption related to the birth of the first child.
- It's not clear if supply or demand side factors (or both) lead to this result.
- Fertility timing does matter!
- Part time employment is a career harming factor.
- Political implication: Reduce human capital depreciation.

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