Parenthood and Academic Career Trajectories

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"After graduation, as soon as women give birth and become mothers, they fall behind and don't end up in leadership positions." (Katalin Kariko, 2023 Nobel Prize Winner in Medicine[1])

Despite women pursuing degrees in economics for over a century, they remain under-represented at the top of the profession. In Europe, women constitute 27 % of researchers with tenure and 38 % of junior researchers. In the US, these numbers are even lower at 20 % and 32 %, respectively (Auriol, Friebel, Weinberger, & Wilhelm, 2022). One factor that may be contributing to this disparity is parenthood. The extent to which having a child can affect labor market outcomes, known as the 'child penalty', has been extensively studied (e.g. (Harkness & Waldfogel, 2003), (Kleven, Landais, & Søgaard, 2019)). As the arrival of children often takes place early in the research career, it is important to understand how parenthood contributes to 'the leaky pipeline' of women.

This paper documents how fertility affects women's academic careers in the field of economics. To do so, we use administrative data from Denmark covering all individuals enrolling in Ph.D. programs in economics linked with information on their family and labor market outcomes. We track individuals from their first step into academia and overcome important issues related to the first source of survivorship bias - getting an academic position. We document child penalties on the likelihood of working in academia and we distinguish between universities and the broader research sector. Moreover, we are able to answer how fertil-

ity impacts the promotion to a position as a senior researcher, e.g. getting tenure. To do so, we use earnings obtained from administrative data and newly collected data from centralized collective bargaining, allowing us to approximate the position of researchers.

Our research provides two useful insights relevant to understanding the under-representation of women and the role parenthood plays in career trajectories in academia. First, we document that the vast majority of both men and women economists have children and we show that those who stay in either universities or the broader research sector do not delay or reduce fertility compared to those who leave research. Second, we show a persistent gender gap in attrition from research following parenthood using event study estimates.

We find that new parents are more likely to leave universities. New fathers are more likely to go into the broader research sector upon parenthood, and new mothers are likelier to leave research completely. We also find that women are less likely to hold senior positions following parenthood. While some of this is driven by mothers leaving research, motherhood also delays time to tenure.

Reconciling this with existing evidence, our results underscore the importance of examining the early career stages.

I. Data and Institutional Setting

We use Danish administrative data on the population of individuals enrolling in Ph.D. programs from 1996 until 2018 linked to their fertility and labor market outcomes. We capture a broader definition of economists than the ones working in economics departments. We include everyone with a Master's degree in Economics or an adjacent field (Business Economics, Math and Economics, Resource Economics, and Statistics), subsequently enrolling in a Ph.D. program. These subsamples are similar in terms of age at Ph.D.-enrollment, the share who becomes parents, and graduation rates.

[1]https://www.aargauerzeitung.ch/leben/interview-top-scientist-katalin-kariko-women-should-have-a-career-and-a-happy-family-ld.2352504?s=09

Economics stands out as the program with the smallest share of women.[2] This provides us with an initial sample of 1265 individuals. 796 became parents before 2018 and among those, 278 were parents before they enrolled in the Ph.D.

We use three measures of academic career trajectory. The first measure is whether or not a person is employed at a university, and the second is whether or not a person is employed in the broader research sector (to capture e.g. think tanks and public research institutes). When we combine universities and the broader research sector, we refer to this as the research sector. Sectorial employment is obtained from the employer-employee-matched data.

Our third outcome is a measure of the position of the researcher. The academic career in Denmark is similar to other European and Anglo-Saxon countries. The position equivalent to assistant professors (*ad junkt*) precedes the associate professorship (*lektor*) equivalent to obtaining tenure in other settings. Obtaining a full professorship follows. A useful feature of the Danish institutional setting is centralized collective bargaining that sets the wages for all academics in Denmark. This translates into floors in yearly earnings for each academic position. We have collected these values from 1996 to 2018 from the archives of the labor unions for academics (see Online Appendix A.A2 for more details). These floors change yearly, and in combination with administrative data on earnings, we approximate the rank of the researchers. If an individual is i) employed in the research sector and ii) has earnings at or above the associate professor level, we classify them as in a senior position.[3]

Both faculty and Ph.D. students have the right to paid parental leave, and public policies include heavily subsidized childcare. Throughout the period we consider, generous maternity and parental leave have been in place. The dura-

tion of wage replacement is also set via collective bargaining. Mothers working at universities are offered full wage replacement for half a year, and fathers are offered fully compensated parental leave for three months. After this period is exhausted, individuals can receive benefits corresponding to unemployment insurance and job-protected leave for an additional three to six months. For individuals on temporary contracts, this arrangement works as a contract extension equivalent to the months spent on parental leave. Ph.D. programs are three years long. Students are usually employed at the university with earnings equivalent to a junior civil servant, also set via collective bargaining.

II. Research Design

To investigate the impact of parenthood on the likelihood of staying in academia, and on promotions, we use an event study research design. Methodologically, the event study approach exploits the fact that changes in labor market outcomes due to parenthood occur sharply, while other determinants influencing labor market outcomes evolve more smoothly. Thus, a causal interpretation of the obtained estimates relies on the assumption that the effect of children on the outcomes of interest evolves orthogonally to unobserved determinants of those outcomes, conditional on year and career stage. The event study approach has the additional advantage of tracing out the dynamic effects of parenthood and exploits individual-level variation in the timing of first births.

Our sample consists of everyone who enrolled in a Ph.D. between 1996 and 2018. For the event studies estimates, we limit our sample to those who become parents after enrollment. We denote the year that an individual has their first child by $j = 0$. We run the following regression:

$$(1) \quad Y_{i,j,t} = \alpha + \sum_{j=-3}^{5} \lambda_j YearSinceBirth_{i,j}$$

$$+ \sum_{j=-3}^{5} \sigma_j YearSinceBirth_{i,j} \cdot Female$$

$$+ \beta_i X_{i,t} + \gamma_t + \varepsilon_{i,j,t}$$

where $Y_{i,t,j}$ is the outcome of individual i in year t and at event time j. We include a full set of

event time dummies, λ_j, for j=-3, ..., 5, and year fixed effects, γ_t, to capture general changes such as increased competitiveness. $X_{i,t}$ includes sex, and a full set of dummies for years since enrollment, allowing us to flexibly control for underlying changes to academic productivity. Our coefficients of interest are the λ's which capture the effect of parenthood, and the σ's which capture a potential gender gap.[4]

III. Results

This section presents two sets of results in the following order. First, we show that there are no differential patterns in the timing, the intensive margin, and the extensive margins of fertility among researchers compared to those who leave academia. This is important for the interpretation of the child penalty estimates. We also show that the arrival of children does not influence graduation rates. Second, we show that all parents are more likely to leave universities following parenthood and mothers are also likelier to leave the broad research sector. Moreover, a gender gap in obtaining senior positions (i.e. getting tenure) emerges after parenthood.

A. Fertility of Academic Economists

Neither women nor men who stay in academia mitigate the career costs of children by having fewer children, delaying parenthood, or refraining from having children. On the contrary, the large majority of women and men who are working as researchers have children. In Table 1, we show that for a given number of years after enrollment in the Ph.D., those who work as researchers are more likely to be parents and they have more children than those who have left research. Individuals working in research are consistently more likely to have children than those outside of research, and women have more children than men. 5 years after enrollment, 64 % of women working at universities have children and 68 % of women in the broader research sector have children. Among women no longer in research, 53 % are mothers. Among men, those numbers are 61 % and 53 % in universities and the broader research sector, while 43 % of men outside research are fathers. This pattern persists. 10 years after enrollment in the PhD, 81 %

of women working at universities and 94 % of women working in the broader research sector have children. For men, those numbers are 86 % and 82 %. For those who have left research, 74 % of women and 66 % of men have children 10 years after enrollment. 10 years after enrollment, women in universities have on average 1.49 children, and those no longer in academia have 1.27 children. For men, those numbers are 1.56 and 1.19, respectively.

In the Online Appendix A.A3, we report associations between parental status and graduation rates and time to graduation. Women are as likely as men to graduate, and controlling for motherhood before enrollment or during the Ph.D. does not change this. Men who become fathers during the Ph.D. are more likely to graduate while motherhood during the Ph.D. does not alter graduation rates. While women take a longer time to graduate (conditional on graduation), this is driven by those who become mothers during the Ph.D., which delays graduation time by 0.5-0.8 years for mothers but does not change graduation time for fathers.

B. The Impact of Children

Following the birth of the first child, both men and women experience substantial changes in their career trajectories. In general, our confidence intervals are wide and often overlapping but distinguishing between universities and the broader research sector reveals a striking gender divergence in career trajectories.

For mothers, the attrition out of research is increasing in the years after parenthood and is 8 pp. higher for women compared to men. This is reported in Figure 1 panel (a) showing no change in the trajectories of men but a substantial increase in attrition among new mothers. This gender gap appears to be persistent. Panel (b) shows the results for working at universities, where there is no difference between men and women. Panel (c) shows a stark increase in women leaving the broader research sector immediately in the year of childbirth, while fathers are moving into these positions. This implies that a gender gap emerges, and again this appears to be permanent. Panel (d) shows the child penalty for obtaining a senior position (i.e. getting tenure), showing a gender gap of 10 pp. in tenure rates for the 5 years after parenthood.

[4]We set $\sigma_{-1} = \lambda_{-1} = 0$.

Table 1—: Total Fertility and Timing

	At least one child			Number of children		
	5 years	7 years	10 years	5 years	7 years	10 years
	Women					
University	0.64 (0.48)	0.75 (0.43)	0.81 (0.40)	0.95 (0.88)	1.18 (0.93)	1.49 (0.91)
	102	77	63	102	77	63
Broader Research	0.68 (0.48)	0.76 (0.43)	0.94 (0.39)	1.11 (0.88)	1.36 (0.93)	2.00 (0.91)
	44	33	18	44	33	18
Other sectors	0.53 (0.50)	0.65 (0.48)	0.74 (0.44)	0.87 (0.85)	0.99 (0.87)	1.27 (0.95)
	199	165	113	199	165	113
	Men					
University	0.61 (0.49)	0.72 (0.45)	0.86 (44)	0.87 (0.85)	1.11 (0.87)	1.56 (0.95)
	202	167	147	202	167	147
Broader Research	0.53 (0.50)	0.67 (0.48)	0.82 (0.39)	0.79 (0.84)	0.98 (0.83)	1.32 (0.81)
	79	57	34	79	57	34
Other sectors	0.43 (0.50)	0.54 (0.50)	0.66 (0.48)	0.65 (0.85)	0.90 (0.95)	1.19 (1.03)
	352	325	262	352	325	262

Note: This table reports the share and the mean number of children (sd in brackets) of individuals who are parents among those who enrolled in a Ph.D. program in 1996 or later at 5, 7, and 10 years after Ph.D. enrollment, split by employment in universities, the broader research sector or outside research, measured in the year. As our sample covers individuals enrolled up until 2018, the longer time horizon implies fewer people.

To gain precision, we estimate the immediate impact, defined as the years 0 to 2, and the medium-term impact defined as the years 3 to 5. We report these results in the Online Appendix A.A4 mirroring in Figure 1. We run the regression without distinguishing between fathers and mothers and show that new parents are leaving universities. In years 0 to 2 after parenthood, this effect is 4.1 pp.. For all outcomes, the gender gaps documented in Figure 1 are more precisely estimated. New fathers are 3.3 pp. more likely to move into the broader research sector, while women are 8.5 pp. more likely to leave research altogether. Moreover, women are 10.4 pp. less likely to hold senior positions immediately after parenthood after which the gap disappears. This effect is slightly larger than the baseline gender gap in obtaining a senior position.

IV. Discussion

Our results speak to the forces driving the persistent underrepresentation of women in economics. Existing research has highlighted the numerous obstacles that women in economics face ((Lundberg & Stearns, 2019), (Sarsons, Gërxhani, Reuben, & Schram, 2021), (Wu, 2018)). On the role of parenthood and institutional support for new parents, (Antecol, Bedard, & Stearns, 2018) document increased gender gaps in tenure rates from gender-neutral extension policies applied to new parents on the tenure track at top-50 economics departments in the US. In their sample, the vast majority become parents, and in places where the extension policy is in place, pre-tenure fertility rates are higher. Importantly, the extension policy decreased the likelihood that women get tenure at that university by 22 pp. while tenure rates for men increased by 19 pp.. While long-run tenure rates for women are not impacted, time to tenure is delayed and they get tenure at lower-ranked universities.

Some of our results mirror this: the majority of individuals in our sample become parents fairly early in the research career, and the gender difference in tenure rates following parenthood closes over time. This suggests that some aspects of parenthood and the academic career are fairly similar across settings. We do, however, also show evidence of parenthood pushing women out of the research career, while men move into the broader research sector. Our sam-
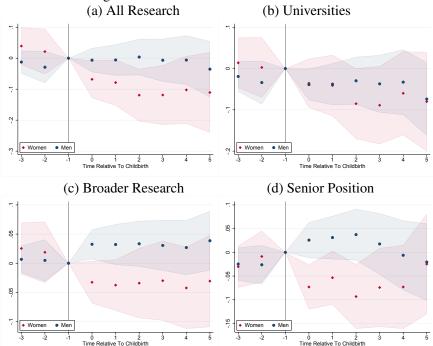
Figure 1. : Parenthood and Career Outcomes

(a) All Research

(b) Universities

(c) Broader Research

(d) Senior Position

Note: The figure shows event time coefficients estimated from equation (1) for men (in blue) and women (in red) estimated jointly and for different outcomes: working in research, working at universities, working in the broader research sector, and working as a senior researcher. A senior researcher is defined as i) working in research and ii) earning at or above the associate professor level. The sample consists of everyone enrolling in a Ph.D. in 1996 or later, and who became parents after enrollment. The effects on senior positions are unconditional on sectorial employment. The shaded areas represent 95 percent CI. SE are clustered at the individual level.

ple covers the very initial step into the profession, enrolling in a Ph.D. program. This underscores the need for broadening the analysis beyond faculty when analyzing the forces driving women's underrepresentation in the field.

References

Antecol, H., Bedard, K., & Stearns, J. (2018, September). Equal but inequitable: Who benefits from gender-neutral tenure clock stopping policies? *American Economic Review*, *108*(9), 2420-41. doi: 10.1257/aer.20160613

Auriol, E., Friebel, G., Weinberger, A., & Wilhelm, S. (2022). Underrepresentation of women in the economics profession more pronounced in the united states compared to heterogeneous europe. *Proceedings of the National Academy of Sciences*, *119*(16), e2118853119. doi: 10.1073/pnas.2118853119

Harkness, S., & Waldfogel, J. (2003). The Family Gap in Pay: Evidence from Seven Industrialised Countries. , *22*, 369–413. doi: 10.1016/S0147-9121(03)22012-4

Kleven, H., Landais, C., & Søgaard, J. E. (2019, October). Children and gender inequality: Evidence from denmark. *American Economic Journal: Applied Economics*, *11*(4), 181-209. doi: 10.1257/app.20180010

Lundberg, S., & Stearns, J. (2019, February). Women in economics: Stalled progress. *Journal of Economic Perspectives*, *33*(1), 3-22. doi: 10.1257/jep.33.1.3

Sarsons, H., Gërxhani, K., Reuben, E., & Schram, A. (2021). Gender differences in recognition for group work. *Journal of Political Economy*, *129*(1), 101-147. doi: 10.1086/711401

Wu, A. H. (2018, May). Gendered language on the economics job market rumors forum. *AEA Papers and Proceedings*, *108*, 175-79. doi: 10.1257/pandp.20181101

ONLINE APPENDIX

A1.   Sample Composition, by Degree and by Gender

	Women	Age at Enrollment	Graduation Rates	Publishing	First Child Before Enroll	At Least One Child	Year of Enrollment	N
By Degree								
Economics	0.27	27.90	0.60	0.35	0.19	0.67	2007.52	547
	(0.45)	(4.35)	(0.49)	(0.48)	(0.39)	(0.47)	(6.62)	
Business Economics	0.44	29.89	0.51	0.26	0.29	0.71	2007.65	451
	(0.50)	(5.96)	(0.50)	(0.44)	(0.46)	(0.46)	(6.52)	
Statistics	0.47	27.55	0.66	0.60	0.17	0.65	2007.79	98
	(0.50)	(2.97)	(0.47)	(0.49)	(0.36)	(0.48)	(7.14)	
Economics and Math	0.36	26.34	0.65	0.48	0.08	0.73	2006.74	113
	(0.48)	(2.65)	(0.48)	(0.50)	(0.29)	(0.44)	(7.06)	
Resource Economics	0.30	29.08	0.52	0.41	0.29	0.80	2009.34	56
	(0.46)	(4.86)	(0.50)	(0.50)	(0.45)	(0.40)	(5.99)	
By Gender								
Women	-	28.76	0.53	0.36	0.26	0.62	2008.58	454
		(4.79)	(0.50)	(0.48)	(0.44)	(0.45)	(6.23)	
Men	-	28.34	0.60	0.35	0.19	0.68	2007.05	811
		(5.09)	(0.49)	(0.48)	(0.39)	(0.47)	(6.81)	
Total	0.36	28.50	0.57	0.35	0.22	0.69	2007.60	1265
	(0.48)	(4.98)	(0.49)	(0.48)	(0.41)	(0.46)	(6.64)	

Note: The table reports the sample composition by the type of Master's Degree, and by Gender. We report the share of women, age at enrolment, share graduating, the share of individuals ever publishing, the share who had a child before enrollment in the Ph.D. program, the share who became parents before 2018, and the year of enrollment in the Ph.D. Standard errors are reported in parentheses.
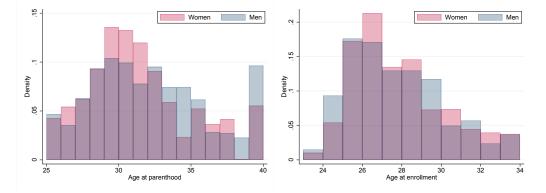

Figure A1. : Age at Parenthood, and Age at enrollment, by Gender

Note: The left-hand panel shows the age at parenthood for men and women, respectively, with truncated tails to mask individual observations. The right-hand panels show the age at enrollment for men and women, respectively.

A2. Position of Researchers - Collective bargaining and earnings

To infer to position of researchers, we combine yearly earnings and thresholds obtained from collective bargaining. The data on collective bargaining has been collected from the archives of the trade union for academics (*Dansk Magisterforening*). In collective bargaining, earnings consist of a base salary (grundløn) and an allowance (tillæg). The archives covered the years 1997-2014, and 2022 and 2021. The union further provided an index covering 2011 to 2021, which is used for adjustment for the years where the precise levels are unavailable.

The base salary varies by years of relevant sector experience. According to the union, Ph.D. students are usually placed on the lowest level, assistant professors on a salary level corresponding to four years of experience, and associate professors and professors on a salary level corresponding to seven years of experience. The allowance varies by position. The evolution of the base salary for the relevant levels as well as the allowances for each type of position are reported here.

An assistant professor can then be defined as having a salary with four years of experience + the assistant professor allowance, but below the level of seven years of experience + the associate professor allowance for a given year, i.e. between the light grey and dashed blue line. Both an associate professor and a professor would earn at least the base salary corresponding to 7 years of experience but their allowances would differ. Head of Department, Head of the Ph.D. school, etc. are likely to receive a bonus and thus earn a professor wage. Moreover, members of management also earn wages at the professor level. In addition, bonuses may be given for e.g. teaching excellence, success in funding, and publications.

As of 1997, a change to the collective agreement system was agreed on and gradually phased in. Until 1997, wages increased mechanically with years of employment and the position of the researcher. This was replaced with a system with fewer steps and more discretion to allocate bonuses, whether yearly or permanent. From 1997 to 2008, new hires could choose between the 2 schemes. As of 2008, the new scheme was fully in place, leading to a discrete jump in the base salary for all individuals, regardless of experience. Information on the wage scheme before this reform was unavailable.
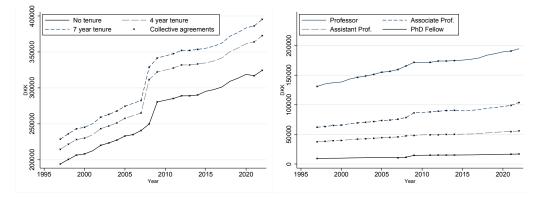

Figure A2. : Evolution of base wages and allowances, by years of experience and positions

Note: The left-hand panel shows the base earnings for each year of tenure in the sector. Ph.D. students would usually be placed on the lowest level (marked in solid black). Assistant professors would be placed as having at least four years of experience (marked in dashed grey) and senior researchers would be placed as having at least seven years of experience (marked in dashed blue). The right-hand panel shows the additional allowance for each position in academia ranging from Ph.D. students (in black), assistant professors (in dashed grey), associate professors, (in dashed blue), and full professors (in dashed black).
Source: Collective bargaining data obtained via the Danish labor union for academics (*Dansk Magisterforening*) marked with crosses. For years without data, the levels are calculated using an index provided by the union.

A3.　　Parenthood and graduation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
			Ever graduating					Time to graduation		
Female	-0.0570*	0.0313	-0.0275	-0.00606	-0.0496	-0.0256	0.249**	0.0360	-0.0909	0.0457
	(0.0293)	(0.0508)	(0.0410)	(0.0334)	(0.0329)	(0.0269)	(0.115)	(0.284)	(0.163)	(0.158)
Child during PhD			0.0973***	0.0854***					0.162	-0.0413
			(0.0353)	(0.0306)					(0.131)	(0.135)
Female#Child during PhD			0.0232	0.0290					0.780***	0.506***
			(0.0468)	(0.0392)					(0.186)	(0.186)
Ever Parent		0.416***						0.191		
		(0.0352)						(0.182)		
Female#Ever Parent		0.267***						0.449*		
		(0.0491)						(0.251)		
Child before PhD					0.0707	0.0629				
					(0.0476)	(0.0450)				
Female#Child before PhD					0.0172	0.0345				
					(0.0554)	(0.0498)				
Constant	0.544***	0.262***	0.502***	0.700***	0.532***	0.709***	3.828***	3.667***	3.751***	4.634***
	(0.0175)	(0.0289)	(0.0231)	(0.189)	(0.0191)	(0.189)	(0.0664)	(0.168)	(0.0902)	(0.964)
N	1,265	1,265	1,265	1,265	1,265	1,265	662	662	662	662
R-squared	0.003	0.121	0.009	0.394	0.005	0.391	0.007	0.014	0.035	0.198
Time FE				YES		YES				YES
Age FE				YES		YES				YES

Note: The table reports gender gaps and the relationship between parental status and graduation rates (columns 1-6) and parental status and time to graduation (columns 7-10), conditional on graduating. The sample consists of individuals who enrolled in a Ph.D. between 1996 and 2018, and naturally not all have graduated.
*** p<0.01, ** p<0.05, * p<0.1

A4.   Child penalty estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Total research		Universities		Broader Researcher		Senior Position		AP at uni	
Prior	-0.00238	-0.0203	-0.0143	-0.0262	0.0119	0.00591	-0.0229	-0.0255	-0.00286	0.00194
	(0.0175)	(0.0198)	(0.0182)	(0.0204)	(0.0126)	(0.0135)	(0.0141)	(0.0174)	(0.0140)	(0.0170)
Female	0.00503	0.0439	-0.0277	-0.0238	0.0327	0.0678**	-0.0828***	-0.0342	-0.0108	-0.0327
	(0.0378)	(0.0454)	(0.0359)	(0.0445)	(0.0222)	(0.0302)	(0.0262)	(0.0335)	(0.0136)	(0.0270)
Prior#Female		0.0512		0.0348		0.0164		0.00574		-0.0133
		(0.0351)		(0.0352)		(0.0245)		(0.0272)		(0.0283)
Immediate	-0.0299	-0.00297	-0.0409**	-0.0356	0.0110	0.0326**	-0.00240	0.0313	-0.00901	-0.0230
	(0.0194)	(0.0219)	(0.0192)	(0.0219)	(0.0127)	(0.0146)	(0.0158)	(0.0194)	(0.0148)	(0.0177)
Immediate#Female		-0.0846**		-0.0174		-0.0672***		-0.104***		0.0435
		(0.0351)		(0.0366)		(0.0232)		(0.0282)		(0.0269)
Medium	-0.0430	-0.0140	-0.0543	-0.0455	0.0113	0.0315	-0.0194	-0.00116	-0.0172	-0.0302
	(0.0346)	(0.0371)	(0.0332)	(0.0368)	(0.0207)	(0.0217)	(0.0291)	(0.0331)	(0.0189)	(0.0210)
Medium#Female		-0.0960*		-0.0300		-0.0660*		-0.0584		0.0427
		(0.0526)		(0.0520)		(0.0356)		(0.0453)		(0.0327)
Constant	0.801***	0.801***	0.420*	0.424*	0.382*	0.377	0.0395*	0.0312*	0.0296	0.0284
	(0.180)	(0.177)	(0.226)	(0.222)	(0.225)	(0.229)	(0.0208)	(0.0181)	(0.0243)	(0.0263)
Observations	3,961	3,961	3,961	3,961	3,961	3,961	3,961	3,961	3,956	3,956
R-squared	0.065	0.068	0.086	0.086	0.112	0.115	0.116	0.119	0.049	0.051

Note: Standard errors are clustered at the individual level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

The table reports the event time coefficients estimated from equation (1) and corresponding to Figure 1 for different outcomes: working in research, working at universities, working in the broader research sector, and working as a senior researcher. To gain precision, we have collapsed to one period before parenthood, and two periods after parenthood. We also report the outcome of holding a junior position at a university. The sample consists of individuals who enrolled in a Ph.D. in 1996 or later, and who became parents after enrollment. The effects on senior positions are unconditional on sectorial employment. A senior researcher is defined as i) working in research and ii) earning at or above the associate professor level. A junior position is defined as having lower earnings than an associate professor.