“The Career Cost of Children” by Adda, Dustmann, Stevens (2017 JPE)

Minamo Mikoshiba (U Tokyo)
2021 August 2@Family Macro RG

Introduction

- Motivation: In developed countries
  - Women still earn less than men
  - Women are often underrepresented in leading position and its promotion speed is slow

- This papers focus on **having a child**
  - **How large is the cost of having a child to a women’s career and lifetime earnings?**
  - **How does fertility plan affect women’s career choices ?**

This Paper: what they do

- Construct a dynamic life cycle model of
  - labor supply, fertility, saving and <u>occupational choices</u> (specific wages path and skill atrophy)
  - Heterogeneity: ability, taste for children, taste for leisure, potential infertility

- Quantify the lifecycle career cost of children
  - Examine trade-off between occupational choice and desired fertility, and sorting both into the labor market across occupations
  - Decompose the lifetime earning cost into three elements; (1) loss of skill during interruptions, (2) lost earning opportunities, (3) selection into more child-friendly occupations
  - Analyze the effects of policies that encourage fertility: long-run and short-run

This Paper: summary of result

- Estimated model show the career cost of children and its composition
  - 3/4 of the cost : lost earnings due to interruption or reduced labor supply
  - 1/4 of the cost : skill depreciation and lost investments in skill by prior selection into child-friendly occupations

- Simulate the long-run and short-run effect of cash transfer at birth
  - most of previous literature focuses on short-run effect by using DiD
  - this model shows that the long-run effects are considerably smaller than short-run effects in terms of raising fertility while the policy has strong impact on the early stage of career

Data: source

- Use German data
  - German education system: there school types after their primary education periods at age 10
    - low- and intermediate track (end at 15-16) → 2-3 year vocational training program
    - high-track (end at age 18-19) → university
  - This paper focuses on Women born in West Germany b/w 1955 and 1975 who attend low- and intermediate-tracks and enroll in an apprenticeship training after graduation
- Data Source
  - Administrative data (IABS), Survey data (GSOEP, EVS)

Data: occupational choices, labor supply and fertility

- Three occupational type based on Author, Levy and Murnane (2003)
  - Routine : mostly routine
  - Manual : mostly manual but not routine
  - Abstract : mostly analytic or interactive

Data: occupational choices, labor supply and fertility

TABLE 1
DESCRIPTIVE STATISTICS, BY OCCUPATION

	Routine	Abstract	Manual	Whole Sample
Initial occupation	25.0%	44.8%	30.3%	100%
Occupation of work	25.4%	52.7%	21.9%	
A				
Annual occupational transition rates:				
If in routine last year	97.9%	1.5%	.5%	
If in abstract last year	.7%	99.0%	.2%	
If in manual last year	.9%	.8%	98.3%	
B				
Log wage at age 20	3.598	3.742	3.470	3.634
	(.297)	(.301)	(.386)	(.337)
Log wage growth, at potential experience = 5 years	.0485	.0551	.0450	.0510
	(.187)	(.156)	(.196)	(.175)
Log wage growth, at potential experience = 10 years	.0181	.0240	.0152	.0208
	(.187)	(.206)	(.223)	(.206)
Log wage growth, at potential experience = 15 years	.00995	.0147	.0127	.0133
	(.206)	(.195)	(.211)	(.200)
C				
Total work experience after 15 years	11.55	12.81	12.14	12.34
	(3.273)	(2.624)	(2.880)	(2.909)
Full-time work experience after 15 years	10.32	11.92	10.86	11.29
	(3.907)	(3.348)	(3.570)	(3.617)
Part-time work experience after 15 years	1.229	.889	1.274	1.056
	(2.187)	(1.828)	(2.125)	(1.997)
D				
Total log wage loss, after interruption = 1 year	−.0968	−.147	−.105	−.121
	(.560)	(.636)	(.633)	(.613)
Total log wage loss, after interruption = 3 years	−.152	−.253	−.223	−.216
	(.604)	(.639)	(.619)	(.625)
E				
Age at first birth	27.27	28.39	25.94	27.56
	(4.138)	(3.783)	(3.517)	(3.943)
No child (%) at age 38	14.39	20.08	14.86	17.58
	(3.067)	(2.544)	(4.164)	(1.787)
One child (%) at age 38	25.00	28.92	18.92	26.15
	(3.783)	(2.879)	(4.584)	(2.063)
Two or more children (%) at age 38	60.61	51.00	66.22	56.26
	(4.269)	(3.174)	(5.536)	(2.328)

NOTE.—Occupation of work is defined conditional on working. Log wage growth is defined for all consecutive work spells after apprenticeship training. Total log wage loss after interruption is the change in log real daily earnings between return to work and the last quarter before interruption. The total wage loss has been purged of a change in occupation, in firm size (if change of firm) and changes in hours of work. Standard deviations are in parentheses

Model: overview

- One periods 6 months. Individual i lives from 15 to 80 years old
  - At age 15 (t=0), individuals decide first occupation by enrolling in 2-3 year apprenticeship training scheme. After training, individual begin making decision about fertility.
  - Individuals are retired at age 60

- Ex-ante heterogeneity
  - (1) ability f_i^P, (2) taste for leisure f_i^L, (3) taste for children f_i^C, (4) potential infertility f_i^F (5% of pop)

- In each period, individual choose consumption c_{it}, saving, whether to have additional child b_{it}, labor supply l_{it}, the type of occupation o_{it}

- Labor market friction: unemployment shock & individuals have to wait for offers

Model: occupation, labor supply, skill and wages (1)

- In any occupation, individuals choose labor supply l_{it}

$$l_{it} = \begin{cases} \text{FT} & \text{(Full time)} \\ \text{PT} & \text{(Part time)} \\ \text{U} & \text{(Unemployed)} \\ \text{OLF} & \text{(Out of the labor force)} \end{cases}$$

- Each occupation has specific wage paths and skill depreciations
  - skill accumulation x_{it}

$$x_{it+1} = \begin{cases} 1 + x_{it} & \text{if } l_{it} = \text{FT} \\ 0.5 + x_{it} & \text{if } l_{it} = \text{PT} \\ x_{it}\rho(x_{it}, o_{it}) & \text{if } l_{it} = \text{U or OLF} \end{cases}$$

where $\rho(x_{it}, o_{it}) < 1$ is the rate of skill depreciation and

$$\rho(x_{it}, o_{it}) = \rho_1(o_{it})1_{x_{it}\in[0,5[} + \rho_2(o_{it})1_{x_{it}\in[5,7[} + \rho_3(o_{it})1_{x_{it}\in[7,\infty[}$$

Model: occupation, labor supply, skill and wages (2)

- Female full-time daily wages

$$\ln w_t = f_i^P + \alpha_O(o_{it}) + \alpha_X(o_{it})x_{it} + \alpha_{XX}(o_{it})x_{it}^2 + \eta_{it}$$

  where η_{it} is a iid shocks

- Labor market friction
  - Working female faces an exogenous and constant probability of layoff δ
  - New offers for alternative $\tilde{o}$ and $\tilde{l}$ arrive randomly but that arrival rates depends on current o_{it} and l_{it}: $\phi_0(o_{it}, l_{it}), \phi_1(\tilde{o}, \tilde{l} \mid o_{it}, l_{it})$

Prob of receiving job offer   Prob that offer being in new labor supply status

Model: marriage, divorce and husband's earnings

- h_{it} : indicator of existence of husband

- marriage and divorce rate are exogenous
  - marriage prob: $P(h_{it} = 1 \mid h_{it-1} = 0) = \lambda_0^M + \lambda_1^M(\text{age}_{it}^M) + \lambda_2^M x_{it} + \lambda_3^M f_i^C$
  - divorce prob: $P(h_{it} = 0 \mid h_{it-1} = 1) = \lambda_0^D + \lambda_1^D(\text{age}_{it}^M) + \lambda_2^D n_{it}$

- When $h_{it} = 1$, husband earning earn_{it} depending wife's characteristic

$$\text{earn}_{it}^h = \alpha_o^h + \alpha_{a1}^h age_{it}^M + \alpha_{a1}^h age_{it}^{M^2} + \sum_j \alpha_j^h 1_{o_{it}=j} + \alpha_P^h f_i^P + \eta_{it}^h$$

where η_{it} is a iid shock and normally distributed with mean zero

Model: dynamic choices

- State variable is $\Omega_{it} = \{l_{it-1}, o_{it-1}, A_{it-1}, h_{it-1}, \text{age}^M_{it}, x_{it}, n_{it}, \text{age}^K_{it}, \Upsilon_{it}, f_i\}$
- The household's optimization problem is

Υ: vectors of shocks
f_i : vector of ex ante heterogeneity

$$V_t(\Omega_{it}) = \max_{\{c_{it}, b_{it}, l_{it}, o_{it}\}} u(c_{it}, o_{it}, l_{it}, n_{it}, h_{it}, \text{age}^K_{it}, \Upsilon_{it}, f_i) + \beta E_t V_{t+1}(\Omega_{it+1})$$

$$= \max_{\{c_{it}, b_{it}, l_{it}, o_{it}\}} \underbrace{u_1(c_{it}, l_{it}, n_{it}, f_i^L)}_{\text{consumption and leisure}} + \underbrace{u_2(n_{it}, f_i^c, \text{age}^K_{it}, l_{it}, o_{it}, h_{it})}_{\text{utility from children}} + \underbrace{u_3(b_{it}, \Upsilon_{it})}_{\text{preference shock to choice of conception}} + \beta E_t V_{t+1}(\Omega_{it+1})$$

subject to

$$A_{it} = (1 + r)A_{it-1} + \underbrace{\text{net}(GI_{it}; h_{it}, n_{it})}_{\text{Net household income by nonlinear income tax}} - c^{HH}_{it} - \kappa(age^K_{it}, n_{it})1_{l_{it}=\text{FT or PT}, n_{it}>0}$$

where

- GI_{it} : gross household income = female earning + male earning + SS (i.e. unemployment benefit, maternity leave benefit)
- c^{HH}_{it} : total household consumption adjusting c_{it} by equivalence scale
- κ : mother's working cost including child care

Model: timing of dynamic choices

$\Omega_{it} = \{l_{it-1}, o_{it-1}, A_{it-1}, h_{it-1}, \text{age}^M_{it}, x_{it}, n_{it}, \text{age}^K_{it}, \Upsilon_{it}, f_i\}$

1. At the beginning of each period, women takes the state variable Ω_{it} as given
   - Individuals observe h_{it} by marriage and divorce shock depending h_{it-1}
   - From Υ_{it}, individuals observe income shock η_{it} (and η^h_{it} if $h_{it} = 1$)

2. Choose labor supply l_{it} and occupation o_{it} based on the labor status

$$V(\Omega_{it}) = \begin{cases} V^W(\Omega_t) & \text{if } l_{it} = FT \text{ or } PT \\ V^U(\Omega_t) & \text{if } l_{it} = U \\ V^O(\Omega_t) & \text{if } l_{it} = O \end{cases}$$

3. Choose conception b_t
   - If $h_{it} = 1$, she decides whether to conceive a child or not

$$V^k(\Omega_{it}) = \arg \max_{b_{it}=\{C,NC\}} [V^{k,C}(\Omega_{it}), V^{k,NC}(\Omega_{it})],\ k = \{W, U, O\}$$

   - If $h_{it} = 0$, $V^k(\Omega_{it}) = V^{k,NC}(\Omega_{it})$

4. Choose consumption c_{it}
5. Individuals face layoff (if in work) & job offers $\Rightarrow$ the labor status at the begging of the next periods

Model: consumption choices $V^{W,C}$ (working, conception)

$$
\begin{aligned}
V^{W,C}(\Omega_{it}) = & \max_{c_{it}} u(c_{it}, o_{it}, l_{it}, ; n_{it}, h_{it}, \text{age}^K_{it}, \Upsilon_{it}, f_i) \\
& + \pi(\text{age}^M_{it}, f^F_i)\beta E_t V^{Lw}(\Omega^P_{it+1}) \\
& + \delta[1 - \pi(\text{age}^M_{it}, f^F_i)]\beta E_t V^U(\Omega_{it+1}) \\
& + (1-\delta)[1 - \pi(\text{age}^M_{it}, f^F_i)][1 - \phi_o(o_{it}, l_{it})]\beta E \max \\
& + (1-\delta)[1 - \pi(\text{age}^M_{it}, f^F_i)]\phi_o(o_{it}, l_{it})\beta E\tilde{\max}
\end{aligned}
$$

$\pi(\text{age}^M_{it}, f^F_i)$: the prob of child born

V^{Lw}: value function of materiality leave

where

$$
E\max = E\max[V^W(\Omega_{it+1}) + \eta^W_{it+1}, V^U(\Omega_{it+1}) + \eta^U_{it+1}, V^O(\Omega_{it+1}) + \eta^O_{it+1}]
$$

$$
E\tilde{\max} = E_t \sum_{\tilde{o} \neq o_{it}, \tilde{l} \neq l_{it}} \phi_1(\tilde{o}, \tilde{l} \mid o_{it}, l_{it}) \max[V^W(\Omega_{it+1}) + \eta^W_{it+1}, V^W(\tilde{\Omega}_{it+1}) + \tilde{\eta}^W_{it+1}, V^U(\Omega_{it+1}) + \eta^U_{it+1}, V^O(\Omega_{it+1}) + \eta^O_{it+1}]
$$

$\tilde{\Omega}_{it+1}$: the state variable if accept the offer

then $\eta^k_{it}, \tilde{\eta}^k_{it}$ is iid and follow extreme value distribution

Model: initial choices of occupations

- At time t = 0, individuals decide first occupation through 2-3 year apprenticeship training

$$o_{i0} = \arg\max_{o}[\beta^6 E_0 V_6(\Omega_{i6}) - \text{cost}(o, R_i, \text{Year}_i) - \omega_{io}]$$

where R_i region of residence, Year_i the year of labor market entry, preference shock ω_{i0} following extreme value distribution

- After training, individuals begin making decision about fertility b_{it}

Estimation: method of moments

TABLE 2
MOMENTS USED IN THE ESTIMATIONS

Moments	Data Set	No. Moments
	A. Labor Supply and Occupational Choice	
Proportion of full-time work, by age and initial occupation	IAB	25
Proportion of part-time work, by age and initial occupation	IAB	20
Proportion of out of labor force, by age and initial occupation	IAB	20
Work experience, by age	IAB	5
Annual transition rate between occupations	IAB	9
Transition rates between labor market status, by occupation	IAB	48
Proportion work, by number of children	GSOEP	15
Proportion part-time work, no child	GSOEP	5
Proportion in each occupation, initial and at all ages	IAB	6
Initial choice of occupation, by region and time period	IAB	440
	B. Wages	
Wage by age and initial occupation	IAB	21
OLS regression of log wage on experience, by occupation	IAB	9
OLS regression of log wage on age, number of children, occupation	GSOEP	12
OLS regression of log wage on past and future wages	IAB	3
OLS regression of log wage for interrupted spells on duration and experience	IAB	14
OLS regression of wage growth around interrupted work spells by occupation	IAB	10
OLS regression of husbands' log earnings on women's characteristics	GSOEP	6
Variance of residual of log wage on occupation, age, work hours	GSOEP	1
Proportion of women with log wage residual < 1 standard deviation	GSOEP	1
	C. Savings	
OLS regressions savings rate on age, occupation, number of children	EVS	24
	D. Fertility and Marriage	
Proportion with no children, by age	GSOEP	5
Proportion with one child, by age	GSOEP	5
Centiles of age at first birth	GSOEP	10
Centiles of age at second birth	GSOEP	10
Number of children at age 38	GSOEP	3
Average age at first birth, by current occupation	GSOEP	3
Proportion of childbirth within marriage	GSOEP	1
OLS regression of fertility on age and initial occupation	GSOEP	5
Instrumental variable regression of fertility on age and initial occupation (instrumented)	GSOEP	5
Mean of residual of number of children on age, by wage residual	GSOEP	2
Proportion married, by age	GSOEP	5
OLS regression marriage on age, experience, past marital status, occupation, and fertility residual	GSOEP	15
Total		763

NOTE.—IAB: Institut fuer Arbeitsmarkt-und Berufsforschung. GSOEP: German Socio-Economic Panel. EVS: Einkommens- und Verbrauchsstichprobe. Instruments for initial occupation in instrumental variable regressions are the interactions between region of residence at age 16 with year of birth.

Results 1: skill depreciation, wages and amenity values

TABLE 3
OCCUPATION-SPECIFIC PARAMETERS

Parameter	Routine	Abstract	Manual
	A. Atrophy Rates Parameters (Annual Depreciation Rates)		
At 3 years of uninterrupted work experience	−.06%	−.11%	−.03%
	(1e−5%)	(2e−5%)	(2e−5%)
At 6 years of uninterrupted work experience	−.50%	−6.90%	−3.45%
	(.11%)	(.17%)	(.24%)
At 10 years of uninterrupted work experience	−.61%	−2.65%	−3.08%
	(14.2%)	(.01%)	(.18%)
	B. Wage Equation Parameters		
Log wage constant $\alpha_O(o_{it})$	3.39	3.6	3.32
	(.0038)	(.0054)	(.0059)
Years of uninterrupted work experience $\alpha_X(o_{it})$	.1	.09	.123
	(3.3e−05)	(3.6e−05)	(.0001)
Years of uninterrupted work experience, squared $\alpha_{XX}(o_{it})$	−.00382	−.0021	−.00463
	(3e−06)	(4.1e−06)	(6.4e−06)
	C. Amenity Value of Occupations		
Utility of work if children	0	−.056	−.014
		(.001)	(.0005)
Utility of part-time work if children	0	−.42	−.08
		(.003)	(.007)

NOTE.—The wage equation is defined as a function of skills—which corresponds to uninterrupted work experience—and not work experience. The former is allowed to depreciate when out of the labor force. Asymptotic standard errors are in parentheses.

$$\rho(x_{it}, o_{it}) = \rho_1(o_{it})1_{x_{it}\in[0,5[} + \rho_2(o_{it})1_{x_{it}\in[5,7[} + \rho_3(o_{it})1_{x_{it}\in[7,\infty[}$$

$$\ln w_t = f_i^P + \alpha_O(o_{it}) + \alpha_X(o_{it})x_{it} + \alpha_{XX}(o_{it})x_{it}^2 + \eta_{it}$$

Results 2: cost of children and saving

TABLE 4
Estimated Parameters: Consumption Decision and Cost of Children

Parameter	Estimate
Weight of children in consumption equivalence scale	.392 (.00167)
Cost of working, if children, age ≤ 6 (€ per day)	31.1 (.36)
Cost of working, if children, age > 6 (€ per day)	12.6 (.24)

Note.—Asymptotic standard errors are in parentheses.

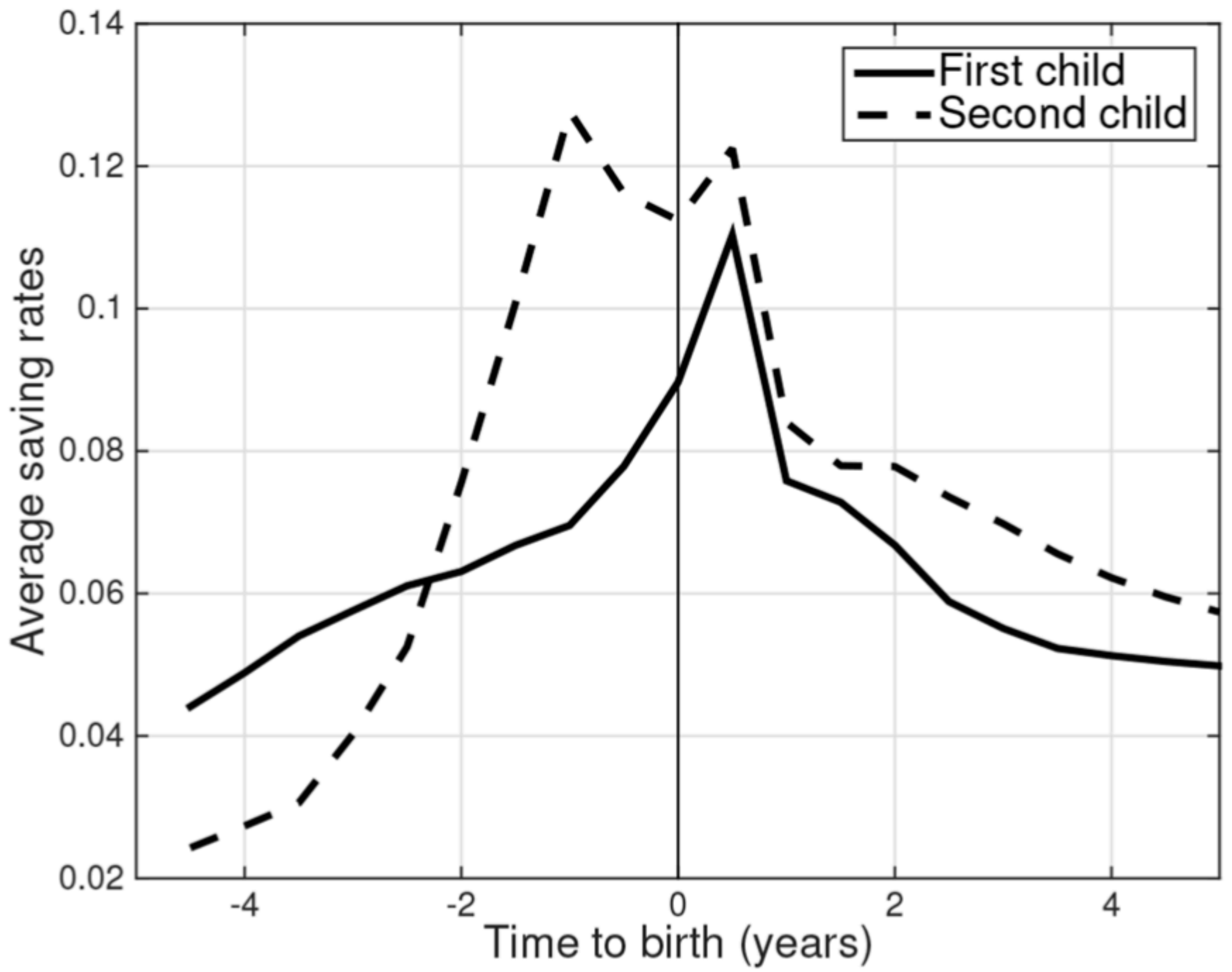


Fig. 2.—Savings rates around first and second births, model prediction. Computed through simulations of the model, involving 12,000 draws.

Model: Unobserved heterogeneity and utility of children

TABLE 5

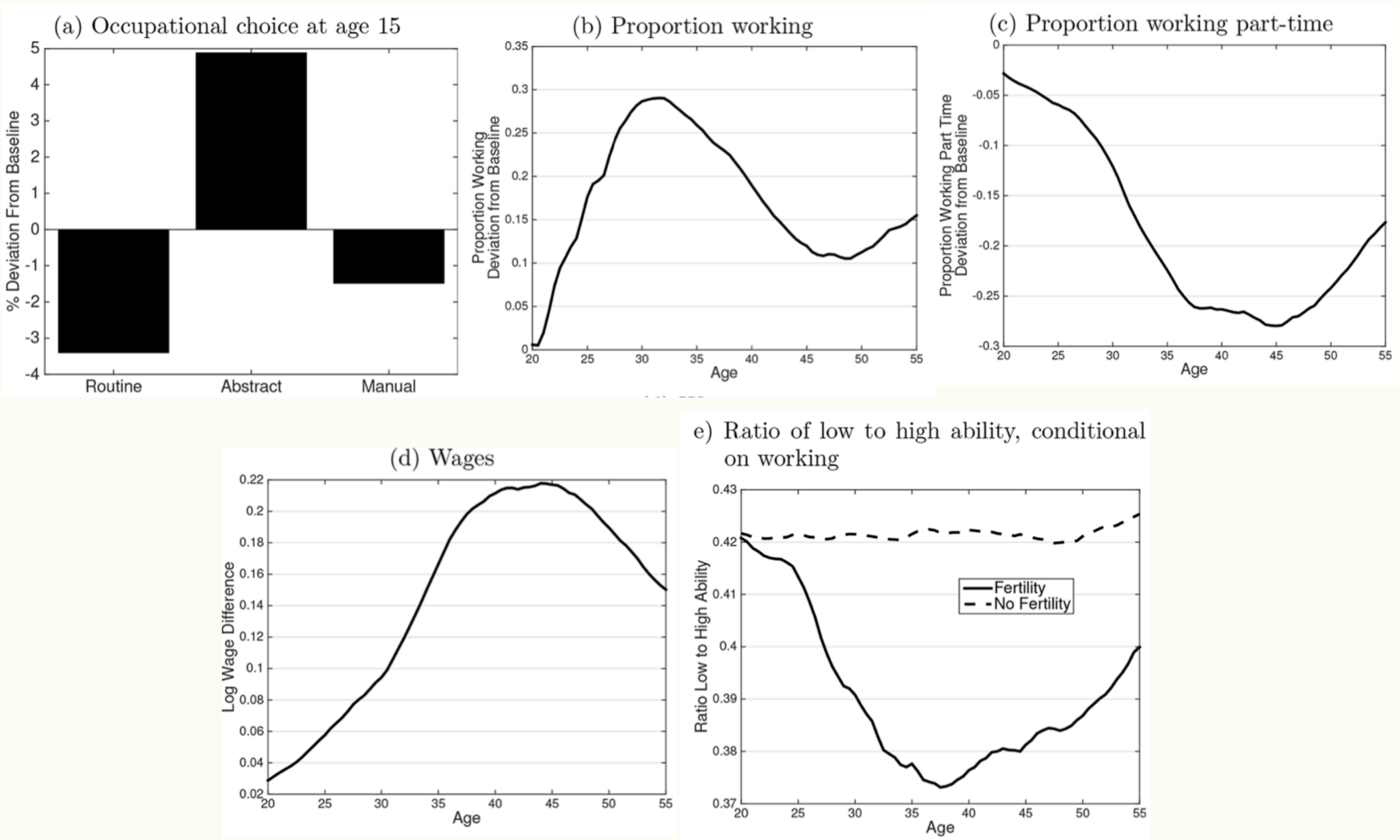
ESTIMATED PARAMETERS: UNOBSERVED ABILITY AND UTILITY OF CHILDREN

Parameter	LA/HC	LA/LC	HA/HC	HA/LC
	A. Individual Type (Ability/Fertility)			
Proportion in sample	.125	.174	.309	.393
	(8.05e–05)	(.0621)	(.00775)	(.0621)
Log wage intercept	0	0	.145	.145
	. . .	. . .	(.0026)	(.0026)
Utility of leisure	0	0	.257	.257
	. . .	. . .	(.0032)	(.0032)
Utility of one child	.484	.158	.484	.158
	(.0056)	(.014)	(.0056)	(.014)
Utility of two children	1.28	−2.04	1.28	−2.04
	(.00026)	(1.3)	(.00026)	(1.3)
Corr(ability, desired fertility)	.02			
	B. Outcome by Type			
Total fertility	1.88	.953	1.88	.951
Proporton in routine occupation	.3	.231	.301	.232
Proportion in abstract occupation	.404	.509	.407	.508
Proportion in manual occupation	.296	.26	.292	.26

NOTE.—LA: low ability; HA: high ability; LC: low taste for children; HC: high taste for children. Note that we allow ability groups to have different tastes for leisure. Asymptotic standard errors are in parentheses. Proportions in given occupation are calculated at the start of the career.

Results 3: career cost of children

- Baseline vs No fertility scenario (zero conceptional probability)



Results 3: career cost of children

- Baseline vs No fertility scenario (zero conceptional probability)
  - The net present value at age 15

$$\text{NPV}_i^s = \sum_{t=0}^{T} \beta^t (w_{it}^s I_{work_{it}^s} + \underbrace{b_{U,it}^s I_{Unemp_{it}^s}}_{\text{unemployment benefit}} + \underbrace{b_{M,it}^s I_{Mat.Leave_{it}^s}}_{\text{maternity leave benefit}}), \quad s \in \{F, NF\}$$

  - The relative costs of children: $1 - \text{NPV}^{NF}/\text{NPV}^{F}$

TABLE 6
CAREER COST OF CHILDREN: PERCENTAGE LOSS IN NET PRESENT VALUE OF INCOME AT AGE 15, WITH AND WITHOUT FERTILITY

	Percentage Loss Compared to Baseline
Total cost	−35.3%
	A. Oaxaca Decomposition of Total Cost
Labor supply contribution	−27%
Wage contribution	−8.5%
	B. Oaxaca Decomposition of Wage Contributions
Contribution of atrophy	−1.8%
Contribution of other factors	−6.7%
Contribution of occupation	−1.6%
Contribution of other factors	−7%

NOTE.—The career costs are evaluated using simulations and comparing the estimated model with a scenario in which the woman knows ex ante that she cannot have children. The costs are computed as the net present value of female incomes, including all wages, unemployment benefits, and maternity benefits in the calculations. The discount factor is set to 0.95 annually. Initial occupation is the one in the no-fertility scenario.

Results 3: career cost of children

- Baseline vs No fertility scenario (zero conceptional probability)
  - The net present value at age 15

$$\text{NPV}_i^s = \sum_{t=0}^{T} \beta^t (w_{it}^s I_{work_{it}^s} + b_{U,it}^s I_{Unemp_{it}^s} + b_{M,it}^s I_{Mat.Leave_{it}^s}), \quad s \in \{F, NF\}$$

  - The relative costs of children: $1 - \text{NPV}^{NF}/\text{NPV}^{F}$

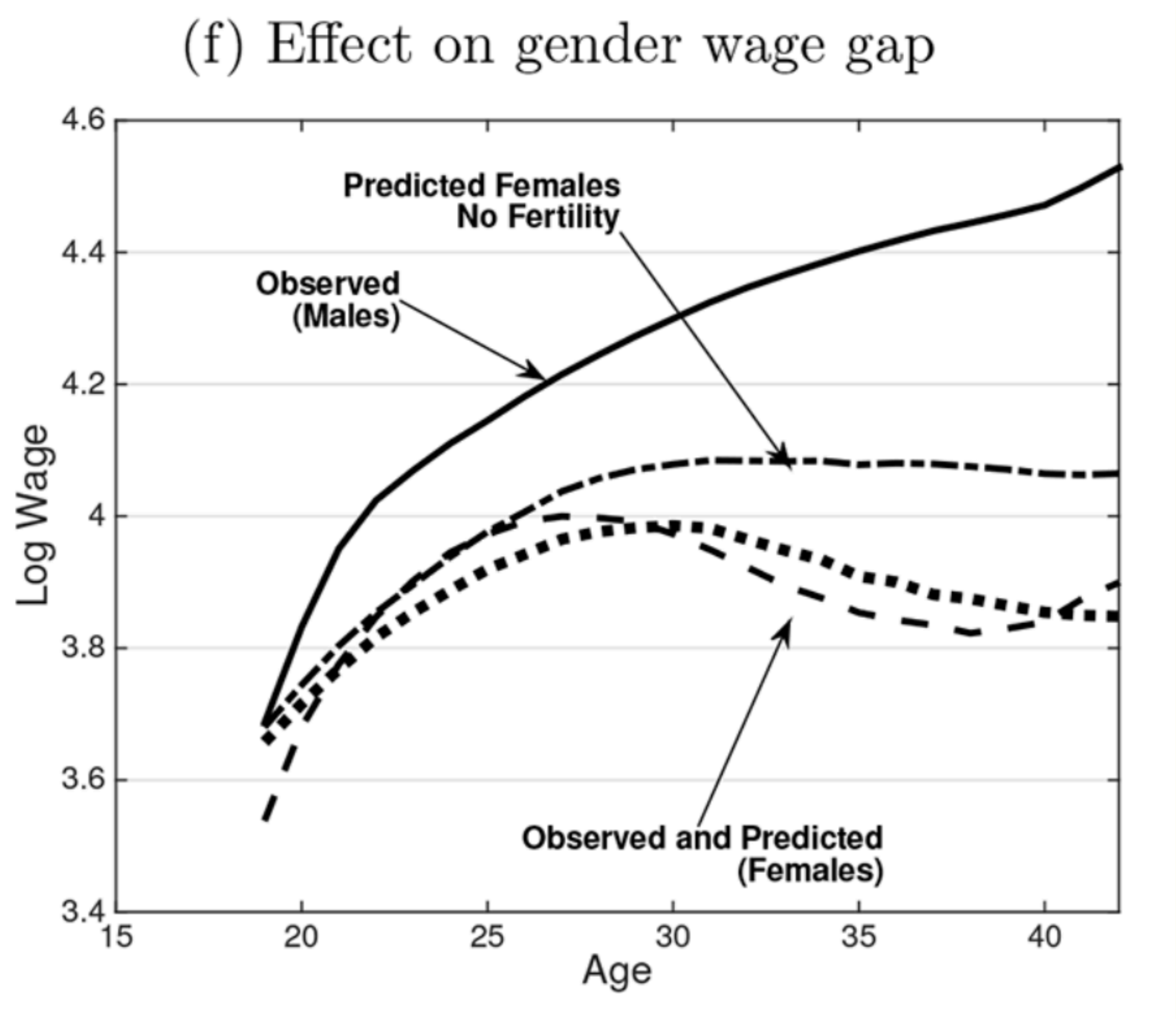
TABLE 7
CAREER COST OF CHILDREN: TIMING AND SPACING OF BIRTHS

Age at First Birth	Only One Child (%)	Age at Second Birth (%) 22	24	26	28	30
20	−31.4	−36.4	−36.6	−36.6	−37	−36.9
22	−30.2	. . .	−34.6	−34.8	−34.8	−35.2
24	−28.1	. . .	. . .	−32.2	−32.3	−32.3
26	−26.0	. . .	. . .	. . .	−29.8	−29.8
28	−24.0	. . .	. . .	. . .	. . .	−27

NOTE.—The career costs are evaluated using simulations and comparing the scenario with no children with one in which either one or two children are born at a given age. The costs are computed as the net present value at age 15. The discount factor is set to 0.95 annually.

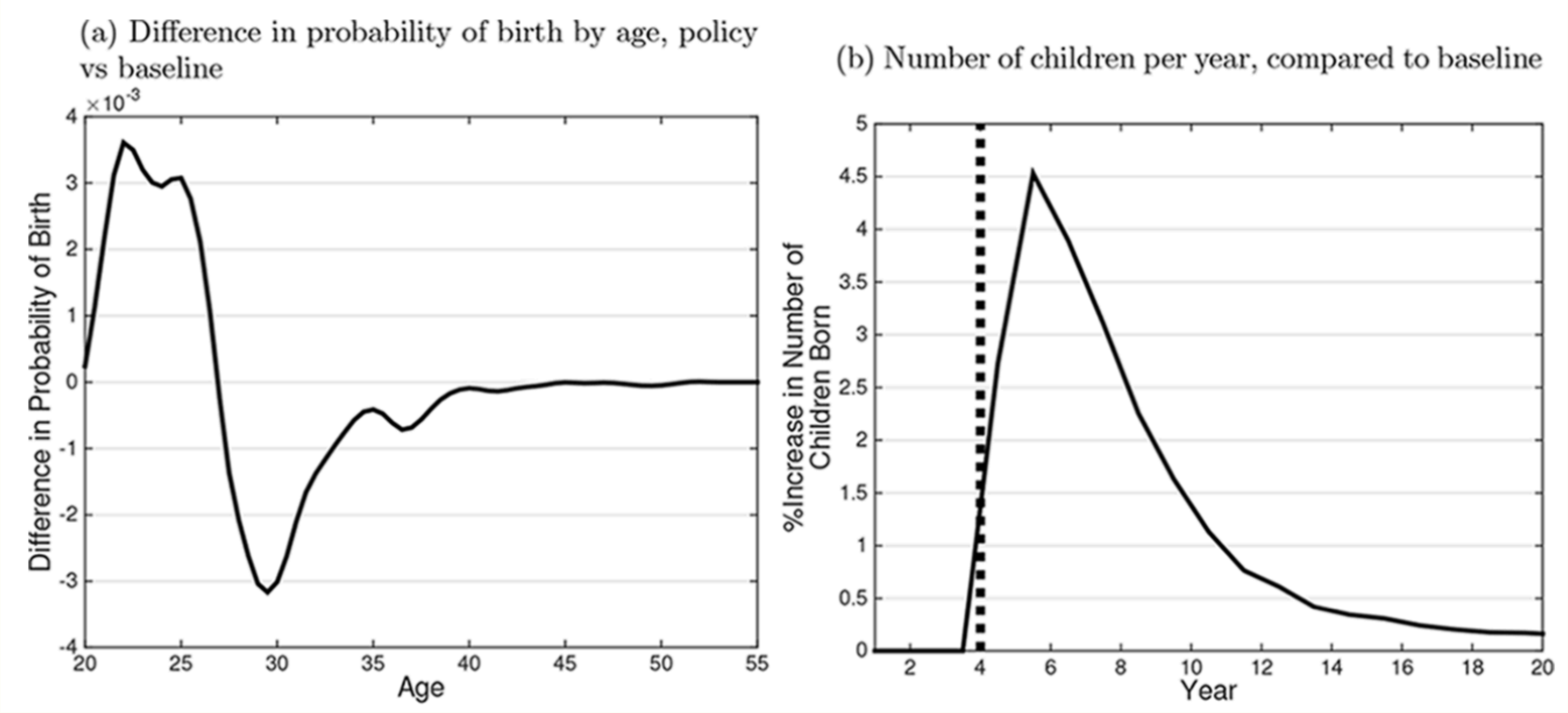
Results 3: career cost of children

- Baseline vs No fertility scenario (zero conceptional probability)



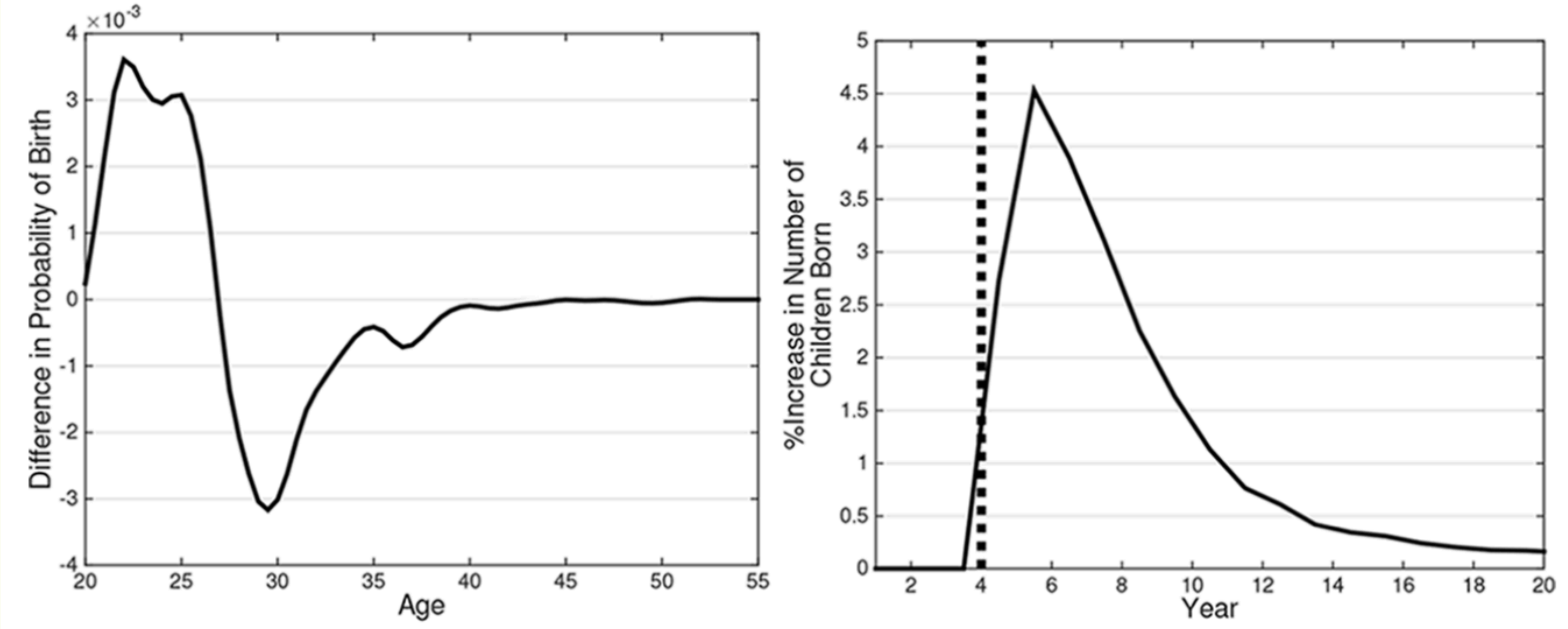
Results 4: the effect of pronatalist transfer

- Baseline vs Cash transfer at birth € 6000



Results 4: the effect of pronatalist transfer

- Baseline vs Cash transfer at birth € 6000



(a) Difference in probability of birth by age, policy vs baseline

(b) Number of children per year, compared to baseline

TABLE 8

Effect of Increased Child Benefits

	Age at Start of Policy			
	15	25	35	45
Change, no child (%)	−.8%	−.7%	0%	0%
Change, one child (%)	−.08%	−.05%	−.05%	0%
Change, two children (%)	.2%	.2%	.07%	0%
Change, age at first birth (years)	−.4	−.1	−.0005	0
Change, age at second birth (years)	−.04	−.007	.002	0
Change, skills (%)	−.29%	−.11%	−.049%	−.0019%
Change, number of years working	−.08	−.03	−.01	−.0004
Change, number of years working part-time	.04	.01	−.007	−.0003
Change, proportion routine	.3%	0%	0%	0%
Change, proportion manual	.07%	0%	0%	0%

Note.—The table compares two scenarios, a baseline one and one that introduces a cash transfer at birth of €6,000. Changes in fertility, skills, and work experience are computed at age 60. Changes in occupations are computed at age 15. Simulations are performed over 12,000 individuals.

Results 4: the effect of pronatalist transfer

- Baseline vs Cash transfer at birth € 6000

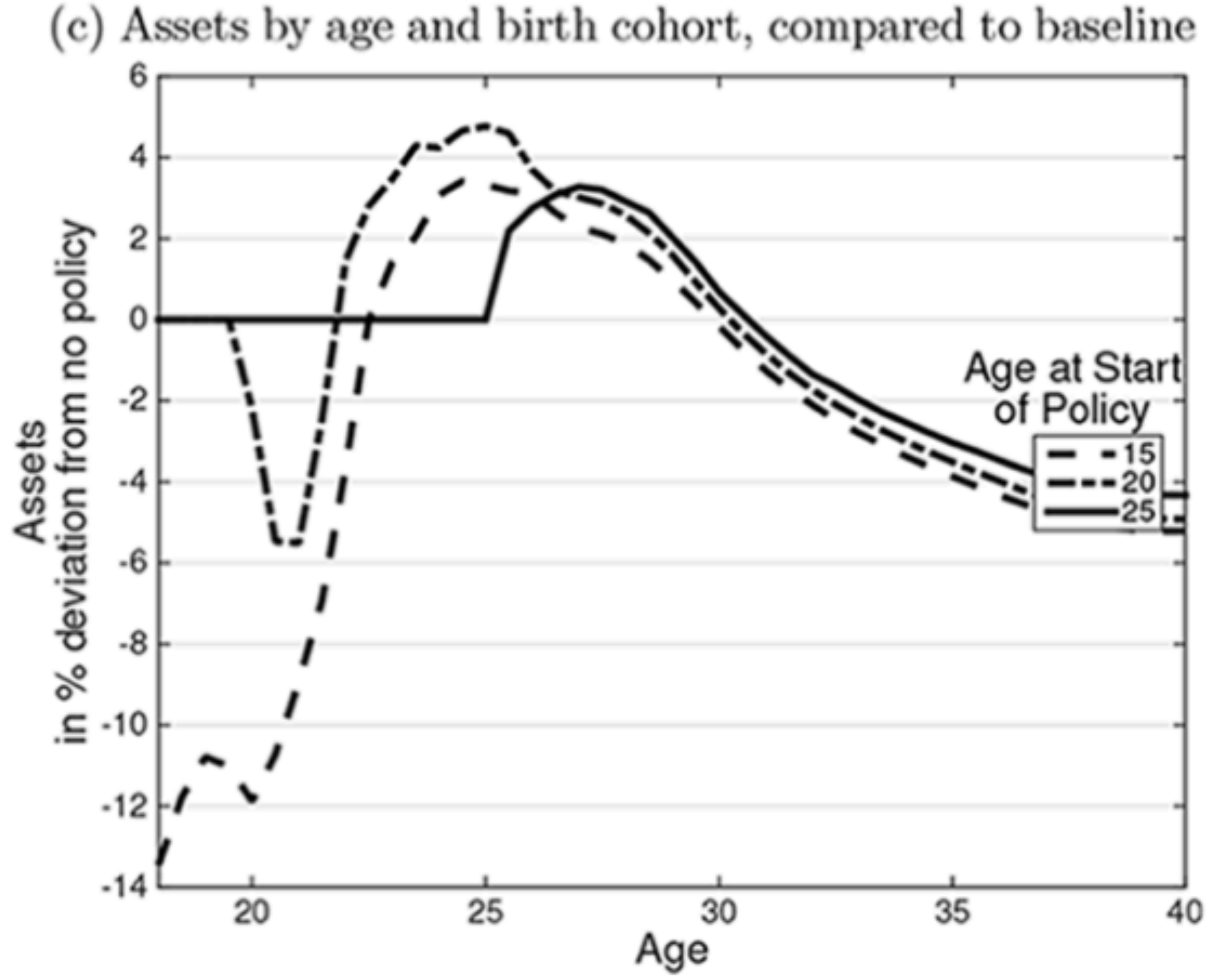


FIG. 4.—Effect of child premium. Panel a shows the effect of the policy (cash transfer of €6,000 at birth) by age on the probability of giving birth, comparing the policy to the baseline. In the policy scenario, women learn at age 15 about the policy. Panel b depicts the aggregate effect of the policy, by year, in an overlapping generation economy. The graph aggregates each year the behavior of women aged 15–60. Each year a new cohort of 15-year-olds enters the economy and the cohort who is 60 exits. The policy starts in year 4. Panel c displays the percentage change in assets as a function of age, compared to a baseline without transfer. The birth cohort who is 15 at the start of the policy can adjust right away their behavior. The cohorts who are 20 or 25 when the policy starts do not anticipate the policy.

Conclusion

- Occupational choices are key for the career cost of children
  - occupation differs in wage paths, skill depreciation rate and amenity value
  - fertility plans affect career decisions from first occupational choices through training
- The long-run impact of policies that encourage fertility is important
  - short-run: number of child born increases by the timing of first birth becomes earlier
  - long-run: the rise of fertility becomes considerably smaller than short-run effects but the policy affects not only fertility decision but also other choices about fertility (i.e. initial occupational choices)

Data:saving rate by age

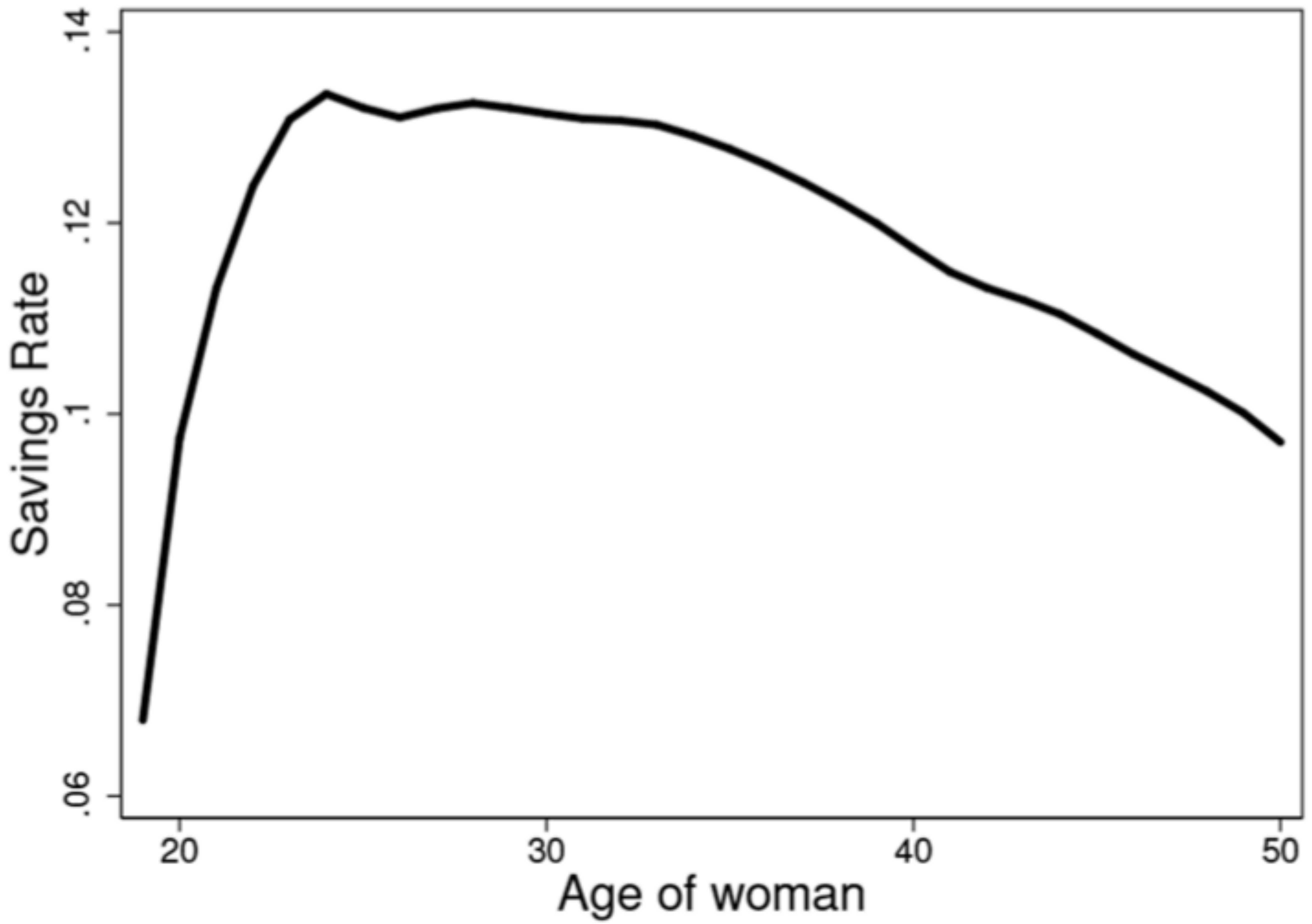


FIG. 1.—Savings rates and age: evidence from EVS data set. Computed from EVS data, by pooling the waves 1993–2008.

Model: Utility function

$$
\begin{aligned}
u_{it} = & \frac{(c_{it}/\bar{c})^{(1-\gamma c)}-1}{1-\gamma c} \exp\Big[\gamma^1_{PT} I_{l_{it}=PT} + (\gamma^1_U + f^L_i) I_{l_{it}=U} \\
& + (\gamma^1_{\mathrm{OLF}} + f^L_i) I_{l_{it}=\mathrm{OLF}}\Big] \exp\Big(\gamma_{NC} I_{n_{it}>0}\Big) \\
& + \Big[\gamma^1_N (f^C_i) I_{n_{it}=1} + \gamma^2_N (f^C_i) I_{n_{it}=2}\Big] \cdot \exp\Big(\gamma_{NH} I_{n_{it}>0 \& h_{it=1}}\Big) \\
& \cdot \exp(\gamma_U)^{I_{l_{it}=U}} \cdot \exp\Big(\gamma_{\mathrm{OLF}} + \gamma^1_{A,\mathrm{OLF}} I_{\mathrm{age}^K_{it} \in [0,3]} \\
& + \gamma^2_{A,\mathrm{OLF}} I_{\mathrm{age}^K_{it} \in [4,6]} + \gamma^3_{A,\mathrm{OLF}} I_{\mathrm{age}^K_{it} \in [7,9]}\Big)^{I_{l_{it}=\mathrm{OLF}}} \\
& \cdot \exp\Bigg(\sum_{i_o=1}^{3} \gamma_{i_o,PT} I_{o_{it}=i_o} + \gamma^1_{A,PT} I_{\mathrm{age}^K_{it} \in [0,3]} \\
& + \gamma^2_{A,PT} I_{\mathrm{age}^K_{it} \in [4,6]} + \gamma^3_{A,PT} I_{\mathrm{age}^K_{it} \in [7,9]}\Bigg)^{I_{l_{it}=PT}} \\
& \cdot \exp\Bigg(\sum_{i_o=1}^{3} \gamma_{i_o,W} I_{o_{it}=i_o}\Bigg)^{I_{l_{it}=PT,FT}} + \eta^C_{it} b_{it} + \eta^{NC}_{it}(1 - b_{it}).
\end{aligned}
$$