Birth Control and the Rise in Female LFP; What Can We Learn from Women's Occupational Choices?*

John Knowles†

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Abstract

The rate at which young women enter managerial /professional occupations began to rise steadily in the early1960s, when oral contraceptives first became available in the US. The fact that young mothers are comparatively rare in these occupations suggests that the advent of more effective contraception may have played an important role in the occupational trend. This paper uses a lifecycle model of contraception, abortion and occupational choice to ask how much of the trends in women's LFP and occupational choice could be explained by the changes in birth-control technology since 1960. Preliminary results suggest that these effects are much larger than those of the destabilisation of marriage or the advent of easier access to daycare.

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†Economics Division, University of Southampton, and IZA. jknowles@econ.sas.upenn.edu

1 Introduction

Since WW2, we have witnessed strong and persistent growth in women's labor-force participation and wages. A number of papers, such as Olivetti (2006) and Buttet and Schoonbroodt (2006) have pointed out that one or both of these phenomena could be explained by a shift upwards in returns to experience (RTE) for women's work. However the origins of these shifts are often left unexplored. Why should technological change at the industrial level have more of an impact on women than on men? Conversely, there is a literature on the advent of market substitutes for women's domestic work, including Greenwood, Seshadri, and Yorukoglu (2005) , Albanesi and Olivetti (2006) and Attanasio, Low, and Sanchez-Marcos (2004), but that literature tends to ignore the implications of technical change for RTE.

In neither literature does fertility choice play a role. The work of Erosa, Fuster, and Restuccia (2005) suggests that this omission may be critical; they find that a lifecycle model of women's fertility and occupational choices entirely explains the gender gap in wages for the 1990s as a function of two main factors: the age-pattern of women's work experience and the stochastic nature of fertility timing. As Light and Ureta (1992) demonstrated, returns to experience in the labor market are highest precisely at the ages, 24-33, when women are most likely to be working less in order to raise children. The stochastic nature of fertility implies that it is costly for women to perfectly time their fertility around labor-market requirements, and hence anticipation of inopportune fertility timing reduces the ex ante returns to investment on the job, an effect first analysed by Mincer and Polachek (1974).

This paper attempts to combine all three lines of argument to explore the implications of the technological and social changes of the 1960s on women's LFP via fertility and occupational choices. The main idea is that these changes, by sheltering women from the impact of fertility that was inopportune from the point of view of career dynamics, raised the incentives for women to invest in skilled careers, drawing into the labor force the high-ability women who could gain most from such careers. The list of changes that seem relevant to this argument include an improved contraception technology, declining marriage rates, acceptance of abortion, and increased availability of market substitutes for mother's time, such as daycare centers,

The method used here is similar in spirit to Attanasio, Low, and Sanchez-Marcos (2004) (ALS) and Erosa, Fuster, and Restuccia (2005) (EFR). A lifecycle model is developed and calibrated to US household data, and the contributions of the various changes are isolated through the use of computational experiments. Two new elements are critical however: 1) fertility decisions are modeled as choices over contraception and abortion, subject to an exogenous process for fecundity, and 2) women can choose between skilled and unskilled occupations, the distinction being that RTE are much stronger in the skilled than in the unskilled occupation. The first feature implies that the model can therefore be calibrated to actual contraception and abortion statistics drawn from the data, so that the effect of shifts in contraception technology or abortion costs can be isolated. The abortion margin is critical for ensuring that the cost of pregnancy in the model is neither exagerated by assumed irreversiblity, nor minimized by counting only pregnancies carried to term.

In addition to unobservable effort on the job, as in EFR, the sectoral choice here plays a key role in generating the response of RTE to fertility choices[1]. Workers who put in more time on the job get more job offers per period and higher wage growth. Both effects are assumed to be stronger in the skilled job. To impose discipline on this argument, the job offer and wage-growth mechanisms are calibrated to statistics on men's wages and occupational mobility drawn from the Panel Study of Income Dynamics(PSID). The skilled job is identified with managerial-professional (MP) occupations and the unskilled job with all other (NM) paid employment. Given the parameterization of these two mechanisms, the remaining free parameters of the model are chosen to match occupational shares, average fertility choices, and mother's LFP by age of the youngest child.

The calibrated model succeeds in generating some fundamental features of the work and fertility patterns of the 1990s, such as the crossing of the fertility profiles by occupation, while matching age profiles for occupational choice, MP women's wage growth, and LFP patterns for mothers. A version of the model without effort choice is also developed; in that version differences across workers in ability to attain high wage growth rates takes the place of effort on the job. Both models can also generate a provocative feature of the data: contracepting women are much less likely to get pregnant if they are working in MP jobs than in other jobs.

These two competing versions of the model are then subjected to 4 experiments. In the first, the environment is changed to resemble the 1950s: the effectiveness of contraception is reduced, the cost of abortion is increased, and daycare is made unavailable. In the second, marriage/divorce probability profiles are set so as to match those of the 1950s. In the third, the intial conditions of the model (wages, distribution over occupation, children and marital status) are replaced with those for 1950 . In the fourth, all of these changes are imposed at once.

The main result is that the effects on women's career choices of changing the environment or the marriage process are negligible in the ability model, and modest in the effort model. In the effort model these effects do accumulate over time, so that by age 40 the fraction of women in skilled jobs has fallen 40%, relative to the benchmark model, but at age 25 there is no impact. What does make a difference for both models is the initial conditions; the fraction of women skilled at both age 25 and at age 40 is 65% lower, even when the enviroment is kept constant. While the calibration of the effort model is still quite tentative, an inescapable conclusion is that if the economic environment explains the occupational trend for young women, it must be through its effects on the initial

[1] This not to say that a model with effort on the job is unnecessary; whereas the goal of EFR is to explain the average gender wage gap, here the unskilled wage gap will be taken as given, as are the initial conditions at age 25, so most of the role for effort on the job in the EFR model will be assumed away.

conditions, rather than due to the anticipatory effects of the changes.

The rest of the paper consists of a brief tour of the relevant facts regarding careers, fertility and contraception, and then develops the model in two stages; first a theory of career mobility over the lifecycle, taking working time as given, then expanding this to integerate a theory of working time of women, based on fertiltity and contraception choices. The quantitative analysis describes the calibration of the model to US data and the results of experiments and tests for robustness.

2 Empirical Motivation

Figure 1 shows trends in MP occupations for people aged 25-30 over the period 1962-2000, based on CPS data, using the 1950's Census occupation classification. Weekly hours worked is computed as the product of usual hours per week last year and weeks worked. The occupation last year and this year are both available in the CPS and the Census. Panel (a) shows the fraction of people aged 25-30 in MP jobs by sex[2]. It is apparent that, until the 1990s, the fraction of men in these occupations was stationary, while at the same time, there has been rapid growth of the fraction of women aged 25-30 in these occupations, from about 4% in 1960 to nearly 40% in 2000. The trend is similar if we condition on being in the labor force; indeed before 1977, young female workers were less likely than male workers to be in MP occupations; since then they are much more likely. MP workers are much more likely to be college educated, but the trends here are not explained by the rise in women's college attendance. Even conditional on college, as shown in panel (b), the share of women in MP occupations has increased, by about 50% for women in their late 20s, over birth cohorts. These facts are reflected in the results of Blau and Kahn (1997) who find that shifts of women into MP occupations accounted for 30.1% of the convergence in the gender wage gap in the 1980s.

These women are also working much more while young than they used to. Panel(c) shows that between the 1930s birth cohort and that of the 1960s, hours per capita doubled for college women aged 21-30. This trend in turn may help account for panel 1(d), which shows the average age-wage profile for women in MP jobs. This profile is essentially identical for all 4 birth cohorts up to age27, and then diverge; for the earlier cohorts, the wage profile flattens out thereafter, while for the 1960 birth cohort, the slope of the wage profile appears constant until about age 38.

What forces triggered these trends in hours and in occupational choice? Given that the MP share trends are only positive for women it would seem to be that the starting point in the search for ultimate causes must be something that affects women's labor supply much more than men's and that occurred or

[2] For the 1962-1967 period, the 1950 classification is not available. "nurses" there is taken to be all medical personnel, Managerial/Professional all codes<11, and professional all codes <7.

was commonly anticipated by the early 1960s. That early date rules out institutional changes associated with civil rights and women's liberation movements. Cultural diffusion of the underlying values, as in Fernández, Fogli, and Olivetti (2004), is possible but leaves the origins unexplained. An explanation involving household technology seems plausible because it is in household activities that men and women differ most. Recent papers by Greenwood, Seshadri, and Yorukoglu (2005) and Albanesi and Olivetti (2006) point to home appliances and infant formula, respectively, but since the underlying innovations had been commercialized by the 1930s, there is every reason to believe that the effect of these changes had been fully absorbed by 1960. Rising rates of divorce are also likely to have had a strong impact on career trends, as in Caucutt, Guner, and Knowles (2002) for instance, but marital decisions do not constitute an exogenous shock.

Table 1, based on the Census, adds to the occupational data of Figure 1 by comparing MP and average women aged 25-30 according to two measures of fertiltity history, the fraction of women with no kids, and the mean number of kids.The interesting result is that both measures indicate that MP women are much less likely to have children, and that this pattern has been persistent over time, despite a general decrease in the fertility of young women. It appears plausible therefore that fertility and occupational decisions are strongly linked.

Figure 2 suggests that the mechanism of this linkage is through work experience. Panel (a) shows that with young children are much less likely to work, and panel (b) shows that when they do work , they work fewer hours than women with no children. Panel(c) shows that women's wages are declining in the age of their youngest child. This relationship is strongest for women in MP occupations. A woman in the 30-34 age range with a 6 year old child earns an average wage of roughly \$6.50 per hour, about \$3 less than for a woman whose first first child is less than one year old. Of course the relationships are cross-sectional, not causal, but they indicate that the connections between occupation and fertility are likely to operate in part through the relationship between the time cost of children and the returns to experience.

Figure 3, based on Census data, shows that the age-marriage profiles are similar across occupations, but that parity of MP women, ie the number of children ever born to a woman,expressed as a ratio to the mean for women in NM jobs, is upward sloping, from about 0.65 for the 1950-60 birth cohort of women when they are in their mid 20s, to 0.9 by the time they hit age 39. Similar patterns, not shown, hold for older and younger birth cohorts. The paradox here is that women in MP jobs are delaying children while their wages and hence opportunity costs are low, and having them later when their wages are high. The resolution of course is that the wage for MP women underestimates the opportunity cost of children when they are in the their 20s, because of forgone human capital accumulation. The third panel shows the stock of children under 5 years of age; before age 29, this is much higher for NM women, more than twice as high at age 25. After age 30, it is the women in MP jobs who have the most children under age 5. Therefore MP women tend to not to have time-consuming parental obligations until much later in life, even though their marriage patterns and are quite similar, consistent with the idea of fertility delay due to the career impact of reduced working time.

We now explore more directly the hypothesis of a correlation between hours worked and success in MP jobs, defined as continuation in the job in the following years. Table 2(a), based on the PSID for 1985-1997, shows the hours worked in each occupation, and the fraction working more than 45 hours weekly, grouped by age and by the occupation in the following year.

The tables show that hours are strongly correlated with outcomes. The main results for the age categories in the 25-44 range, all conditional on hours worked category is that while wage growth is higher in the MP jobs than in NMP, almost all of this effect is due to higher wage growth among workers under age 30 with high average weekly hours. For women there is no difference in wage growth rates among workers working less than 35 hours weekly. High weekly hours is also more common in MP jobs.

Because of the small sample, aggregate shocks are likely to distort the age effects. The age effects net of aggregate shocks are shown in Figure A1, which shows the projections from the age coefficients estimated in a median regression model with dummy variables for each year. The top line in each panel represents 45 or more weekly hours, the bottom line 20-35 hours, and the middle 35-44 hours. It is clear that the effects of hours on wage growth decline with age, so that the lines have mostly converged by age 45.

Table 2(c) shows the results of a similar analysis comparing probabilities of work for women working less than 40 hours weekly with those working more. Among women aged 25-29 who worked in MP occupations in the first year, those who were also working skilled the next year were 44% more likely to have worked more than 40 hours per week on average in the preceding year. For women aged 30-34, that differential grows to 53%., and then falls to 19% for women aged 35-39. In all years, the differentials are much smaller for unskilled workers, on the order of 15-20%. This correlation between hours worked and remaining in the MP occupation suggests another form of the return to hours worked, higher probability of skilled work.

To summarize, the relevant facts are that the birth of a child implies significant career interruptions for women, that working long hours appears to be an important component of career advancement, that this effect of long hours is more important in MP occupations, and that the fertility of women in MP occupations converges towards that of non-MP women by age 40.

3 A Model of Aging and Occupational Choice

Agents in the model begin life at age T_0 and live forever.[3] Time is divided into discrete periods. In each period, an agent works in one of three jobs or sectors: at home (H), in a skilled job (S), or in an unskilled job (U). Associated with each job $j \in \{H, U, S\}$ is a wage w^j, which can vary across workers and over time.

The dynamics are driven by the erosion over time of a state variable Y called "youth", which governs labor-market prospects, fecundity, and preferences.The persistent state variable Z that contains, in addition to Y, the worker's ability η, non-working time κ, labor skill a, number of children k, and marital status M. The wage in the skilled sector is a function of the individual's skill ζ, which evolves as a first-order Markov chain over time in response to labor-market experience. Each period, the level of skill can grow at either of two rates, $\{\gamma_0(Y), \gamma_1(Y)\}$, where $\gamma_1(Y) > \gamma_0(Y)$.

The transition probabilities $\Gamma^j(Z', Z)$ to future state Z' from the current state Z depend on the worker's occupation $j \in \{H, U, S\}$ and the labor time L.The amount of time worked each period is $L(\kappa, I_{DC})$, where κ is predetermined. This time cost is in addition to whatever productive time a woman in job H may spend working at home. In the absence of the arrival of new children (fertility), κ declines exogenously to its long-run value, κ^{LR}.For men, $I_{DC} = 0$, so there is no choice of working time. For women, I_{DC} indicates whether the worker has opted for a childcare service, which reduces $\kappa - \kappa^{LR}$ by a fraction κ^{DC}.

Marriage and divorce in the model is represented by an exogenous stochastic process for the indicator variable $M \in \{0, 1\}$, which indexes the processes for non-labor income $y^{NL} = y^M(Y)$ and fecundity $\Psi(Y, M)$. The probability of married agents becoming single next period is $\pi^S(Y)$, and that of single people becoming married is $\pi^M(Y)$.

Each period workers are also subject to a vector of transitory shocks z which include job transitions, and, in the case of women, costs of abortion and contraception. These transitory shocks are intended to reflect the impact of factors outside the model on wages and fertitlity decisions; they also happen to ensure that the value functions described below are smooth with respect to Z despite the discreteness of the decisions, a property that is exploited by the solution method. The joint CDF of the transitory shocks is $F(z)$.

3.1 Occupation Choice

People can start each day in one of three possible states $i \in \{H, U, S\}$. Let the value of working in each of these jobs be V^i. For clarity, we represent the state

[3] It is well-known that while infinite lives constitute a departure from reality, the quantitative impact of this assumption is likely to be quite small , as demonstrated by Rios-Rull (1994). Under infinite lives, the optimal pre-retirement behaviour often does not differ greatly from that in models where people face a realistic age-specific probability of death or a final period that is distant relative to the retirement date..

with the skill level a noted explicitly.

Let the operator T denote the value of starting in the active state, conditional on information at the start of the current period:

$$T(a,Z) = \max\left\{V^H(a,Z), V^U(a,Z), V^S(a,Z)\right\}$$

The value of starting the day in the inactive state, H, is

$$W^H(a,Z) = \lambda_H T(a,Z) + (1-\lambda_H) V^H(a,Z)$$

Let $r^i(a,Z,d) = u\left(c^i(a,Z,d), d\right)$ represent the return function in job i, given decisions d. Let a' and Z' represent next-period values of the state variables. The value of working at home is:

$$V^H(a) = \max_d \left\{r(a,Z,d) + \beta E_a W^H(a',Z';\theta)\right\}$$

The value of working in job $i \in \{U,S\}$ is

$$V^i(a,Z) = \max_d \left\{u\left(c^i(a,Z,d), d\right) + \beta\sigma_i(Z) E W^H(a',Z';\theta) + \beta\left[1-\sigma_i(Z)\right] T(a,Z;\theta)\right\}$$

When choosing today's job, workers take into account the current wage vector $\left\{w^i\right\}$ and the transition probabilities $\lambda_H, \sigma_i(Z)$ and $\Gamma_i(a'|a,z,d)$. For men in the simplest version of the model d is trivial; the only decision is which occupation. For women, d will include daycare, abortion and contraception choices. In the endogenous-effort version of the model, d will include, for both men and women, effort on the job.

A critical assumption is that skill affects wages on the job most strongly in the skilled job S and least of all in the home job H. For men therefore the model is little more than a dynamic version of the Roy(1954) model. The transition functions Γ_i are assumed to be increasing in labor time L, and again, most strongly in the skilled job S and least of all in the home job H.

Together these assumptions imply that workers in job S will tend to be those with the higher skill levels and labor times. Those who choose job H will tend to have lower levels of both than those who chose U or S. Job transitions occur both mechanically, through the lay-off process, and endogenously, as successive losses of skill can transform a worker from one who chooses S to one who chooses U or even H.

Another critical assumption is that the size of the skill transitions and the layoff probabilities decline with age. This allows the model to explain the declining rate of men's job transitions and of wage growth. This is implemented in the model by making the skill increments $\{\gamma_0(Z), \gamma_1(Z)\}$ and the layoff probabilities $\sigma(a,Z)$ increasing in Y.

3.2 Fertility and ChildCare

Women in the model become pregnant each period with probability $\phi(Z, I_{CC})$, where $I_{CC} = 1$ indicates contraception use. Pregnant women deliver a baby at the start of the next period, unless they choose abortion in the period of conception, which is indicated by $I_A = 1$. At the start of the period that a child is born, the working mother is returned with probablity λ_{M0} to the inactive labor-market state.

Having a child increases the share κ of her time endowment a woman must spend in unpaid family work. The law of motion of κ is $\kappa' = K(\kappa, P)$. The critical properties are that κ is persistent but declining (weakly) over time, that fertility causes κ to increase, and that the marginal time cost of fertility is declining in κ:

$$\begin{aligned} K(\kappa, P=1) &> K(\kappa, P=0), K(\kappa, P=0) \leq \kappa \\ K_\kappa(\kappa, P) &> 0, K_{\kappa\kappa}(\kappa, P) < 0 \end{aligned}$$

. From the point of view of occupational choice, women face an additional risk; pregnancy. This entails two problems; women may lose their job on bearing a child, which happens with probability λ_M, and the time endowment for new mothers is smaller by $K(\kappa, P=1) - K(\kappa, P=0)$.

Women may take decisions to mitigate pregnancy risk, and to abort a pregnancy, but once a child is born, the only recourse is the possibility of paying for a market substitute for mother's time, which we call daycare.

To merge these concerns into the above framework, we assume that within each paid occupation, women choose daycare whenever it results a higher value of being in the occupation. These women who choose daycare then have more working time this period, and consequently receive both a higher probability of high wage growth and a lower layoff probability next period. Women who decide to give birth to a child in the event of becoming pregnant are essentially facing a higher layoff risk.

Let the state variable for a woman with k kids be $Z(k)$. Letting the risk of child birth be ϕ, we can write the expected continuation value of working at home as:

$$E_\phi V^H(a', Z') = (1-\phi) V^H(a', Z(k)) + \phi V^H(a', Z(k+1))$$

The value of starting the day at home is :

$$W^H(a, Z(k)) = \lambda_H T(a, Z(k)) + (1-\lambda_H) E_\phi V^H(a', Z')$$

Now let

$$E_\phi W^H(a', Z'(k)) = (1-\phi) EW^H(a', Z'(k)) + \phi EW^H(a', Z'(k+1))$$

The value of working at home is now:

$$V^H(a) = \max_{d,\phi} \left\{ r^H(a, Z, d, \phi) + \beta EW^H(a', Z'(k)) \right\}$$

The expected value of being in the active state next period is:

$$E_\phi T(a', Z'(k')) = (1-\phi) T(a', Z'(k')) + \phi T(a', Z'(k'+1))$$

The value of working in job $i \in \{U, S\}$ is modified by both the direct effect of pregancy on the continuation values in each job and the effect on the layoff rates. Let the probability of a working woman losing her job on child birth be:

$$\widetilde{\sigma}(Z(k)) = \lambda_M + (1 - \lambda_M)[1 - \sigma(Z(k))] = 1 - (1 - \lambda_M)\sigma(Z(k))$$

.

The child-care and fertility choices of women within occupation i are therefore given by the solution to the following Bellman equation:

$$\begin{aligned} V^i(a, Z) &= \max_{d,\phi} \left\{ u\left(c^i(a, Z(k), d), d, \phi\right) \right\} \\ &+ \beta(1-\phi)\left([1 - \sigma(Z(k))] ET(a', Z'(k)) + \sigma(Z(k)) E_a W^H(a', Z'(k))\right) \\ &+ \beta\phi\left([1 - \widetilde{\sigma}(Z(k))] ET(a', Z'(k+1)) + \widetilde{\sigma}(Z(k)) E_a W^H(a', Z'(k+1))\right) \end{aligned}$$

At the start of each period, an agent learns whether she is active. If active, she computes the ex ante value of entering each occupation, compares to her realized taste shocks $\{\varepsilon\}$ and takes the job with the highest total value V^i. She learns the values of the z shocks governing the costs of abortion and contraception just before each decision is made.She then makes her daycare and contraception choices, and, if she becomes pregnant, her abortion decision.

4 Effort Choices

For a woman with ability a, and labor time L, the probability of getting the high growth rate is a function of her effort f^w on the job, given by

$$\pi^w(a, L, f^w) = \left(\frac{f^w}{\alpha_w + f^w}\right) P^w(a, L)$$

, where $P(a, L)$ is a CES aggregator:

$$P^w(a, L) = \Phi\left(\xi_0 + [\xi a^\sigma + (1 - \xi) L^\sigma]^{1/\sigma}\right)$$

, and Φ is the standard normal CDF. Therefore at interior solutions, optimal effort on the job is given by

$$f^w = \sqrt{\frac{\beta \Delta^\gamma V(S) \alpha_w P^w(a, L)}{\eta}} - \alpha_w$$

Now consider the choice of effort in contraception. For a woman with ability a, and fecundity Ψ, the probablity of pregnancy depends on her contraceptive effort f^paccording to the function:

$$\phi(a, L, f^p) = \frac{\alpha_p}{\alpha_p + f^p} P^p(a, \Psi)$$

Where

$$P^p(a,\Psi) = \Psi\Phi\left[\zeta_0 + \zeta_1 (1/a)^{\zeta_2} + (1-\zeta_1)\Psi^{\zeta_2}\right]^{1/\zeta_2} \left(\zeta_0 + \zeta_1 a^{\zeta_2}\right)$$

Solving for f^pyields:

$$f^p = \sqrt{\frac{-\alpha_p P^p(a,\Psi)\,\beta\Delta^p V(S)}{\eta}} - \alpha_p$$

So the pregnacy risk at interior optima is:

$$\phi(a,L,f^p) = \sqrt{\frac{\eta\alpha_p P^p(a,\Psi)}{\beta\Delta^p V(S)}}$$

.

5 Solution Method

For any given set of parameters, the model is solved by iterating on approximations to the value functions $V^m(Z)$, where $m \in \{M, D\}$ represents the marital state . Given the solution and an initial distribution $\mu_0(Z,z)$, the model population is simulated from an initial age of 25 to age 45. The statistical targets from the data are then compared to their analogs in the simulation, and the distance between the two computed. If the distance is greater than some pre-determined tolerance, a new set of parameters is chosen using a standard numerical method such as Gauss-Newton, and the procedure is repeated with the new set of parameters until the distance is less than the tolerance. Each of these stages is now explained briefly.

The value functions $V^m(Z)$ are approximated using the Smolyakov interpolation method as explained in Malin, Krueger, and Kubler (2007). This technique is essentially a multi-dimensional extension of standard collocation methods using orthogonal polynomials.

6 Calibration

The overall calibration strategy is to set the free parameters governing the wage and offer processes so that the model can account for wage growth and occupational transitions of men aged 25-45, and then set the remaining free parameters of the model to match the average fertility and occupational trajectories by age for women aged 25-45. In each case, the procedure requires setting some parameters to standard values, setting the initial distributions of observables to match comparable statistics from household survey data, imposing exogenous processes, ie marriage, divorce and fecundity, that match age-profiles from the data, choosing functional forms, and setting the free parameters so that statistics drawn from simulation of the model cohort match the relevant statistics.

6.1 The Skill-Growth and Employment Processes

For the calibration of the wage and offer processes, the main targets are occupational transitions and wage growth by age from the PSID from the 1985-1996 waves. The analysis uses the PSID manual recodes for occupation, as reported in Kambourov and Manovskii (2008), which are only available up to 1996; due to small sample size, the analysis period was extended back to 1985. Jobs are taken to be managerial/professional (MP) if the PSID occupational codes are less than 249, NM otherwise.

Average weekly hours worked are discretized into 4 bins; 0-19, 20-34, 35-44, and 45 or more. Occupation transition rates were computed by hours worked on an annual basis for 5-year age intervals, and then interpolated by fitting to a 2nd degree exponential. The wage growth is estimated by restricting the sample to those who were working in two adjacent periods, averaging their hours worked over the two periods, and computing the wage in each period as annual labor income divided by annualized average hours. [4] The age profiles for wage growth were then estimated by fitting a regression model with year, age, hours and occupation effects and taking the predicted values, purged of the estimated year effects. The resulting age effects are shown in Figure 4.

The simulation begins with an initial distribution of workers over jobs. For initial NM workers, the means of both the initial skill and ability are set to a fraction θ^{NM} of those of MP workers, while for those who are initially non-workers, the means are scaled down by a factor θ^{H}. Ability is assumed to follow a Beta distribution, so that the skewness can be set to be either positive or negative. The θ^{j} and the distribution parameters are are set in the main calibration procedure. Ability of MP workers relative to the other workers reduces transition rates into MP jobs at all ages, while initial skill is set to ensure that workers who are assigned to NM jobs or H in the model do in fact prefer those jobs.

The wage process consists of a pair of growth rates $\{\gamma_0(Y), \gamma_1(Y)\}$ for skill, a pair of loading factors translating skill into wages in each sector, and a mapping $\pi^{\gamma}(L, \eta, Y)$ on to the probability of the high skill-growth rate. The wage functions are:

$$w^{i}(a, Y) = (1 - a_i)\,\overline{w}(Y) + \alpha_i a$$

To reflect the motivating premise that wage-growth opportunities decline with age, the growth rates $\{\gamma_0(Y), \gamma_1(Y)\}$ are assumed proportional to the state variable Y, which is assumed to decline exponentially to its long-run value. The rate of decline of Y is therefore determined by the need to match the empirical rate of decline of wage growth and occupational transitions.

The probability of transiting from the inactive state H to the active state is given by parameter λ_W. Since not all transitions result in employment, this cannot be mapped directly to data, but instead is set within the calibration to

[4] This deals with random mis-reporting of hours, as evidenced by the fact that wage growth is far too strong for people who work long hours when the wages are computed on annual hours only, suggesting the growth is driven by under-reporting errors.

help match the transition rate. Preferences over consumption are the standard CES form, with ITES parameter $\sigma = 1.5$, a standard value in the literature. There is also a utility parameter a^s to express preferences for skilled work. This is similar to a common procedure in the literature on selection into education; see Heckman, Lochner, and Taber (1998). Let $J^s = 1$ if worker is in a skilled job, then these preferences are summarized by:

$$u(c, J^s) = \frac{c^{1-\sigma}}{1-\sigma} + a^s J^s$$

Initial conditions for men of the 1950s birth cohort, based on the March CPS, are shown in Table 3. The maximum length of the working week is assumed to be 60 hours, so the time costs are computed as 60 hours less observed working time. Although the table lists the statistics by number of children, this variable appears to have little relationship to men's hours. The time cost κ is set by subtracting observed working hours from the assumed maximum of 60. To ensure that the simulated sample matches the actual work hours distribution, the assigned values of κ for employed workers are adjusted to match the distribution of hours worked for ages 25-30 by occupation, as shown in Table 4. In the model, hours worked are allowed to grow exogenously with age in order to match the median age-hours profile for the sample.

6.1.1 Results

The targets and results for the calibration of the wage and offer processes to the male cohort are shown in Table 5 for both the Ability-only and Effort versions of the model. The length of the work week is normalized to 1; weekly quantities are divided by 60. The simulated data is reported as averages by three age groups; ages 26-27, ages 31,32, and ages 41-42. There are 24 targets, 8 for each age group and 24 free parameters. The model in each case appears to be a reasonable approximation to the targets. Figures X show that the age profiles for wage growth and transitional dynamics are reasonably similar in both model and data throughout the lifecycle.

6.2 Fertility and Child Care

The final step of the calibration is to parameterize the aspects of the model governing fertility and child care, taking as given the parameters determined in the previous section. The goal is for the model to match statistics for the 1950s birth cohort of women for average contraception, abortion, occupational choice by age, as well as labor supply and daycare use by age of youngest child.

6.2.1 Initial Conditions

The initial conditions for women are shown in Table 6, which lists wages, nonlabor income and weekly paid hours by number of children the woman has at home and her occupation. The table is computed from the March CPS on all women from the 1950-59 birth cohort when they were 24 years old. The chief source of non-labor income is husband's earnings, so in the model this is allowed to vary according to the woman's marital status and age so as to match the medians in the CPS sample.

The initial conditions and hazards for marriage and divorce are set to match the data shown in Table 7, based on the CDC Monthly Vital Statistics Reports for 1990 and on Carter and Glick (1970) for 1960. Panel (a) shows how marital status varies with occupation and number of kids, while Panel (b) shows the hazards for 1960 and 1990. The benchmark model uses the hazards from the 1990 columns. The rates for each age in the model are found by exponential interpolation on the midpoints of the intervals.

6.2.2 Fertility

The first element of the process for fertility consists of the mapping from Y to married-women's fecundability Ψ , and fecundability of single women, expressed as a fraction ψ of married women's fecundity. These are set so that when the simulated population in the model matches the data for contraception, the model generates the correct numbers for average fertility, as estimated by from age profile for number of children ever born in the Census, given the estimated contraception effectiveness. The resulting fecundability equation is:

$$\Psi\left(Y, I^M\right) = p_0\left(1 + p_1\left(I^M = S\right)\right) e^{p_2 Y}$$

. The three parameters (p_0, p_1, p_2) are therefore fixed outside the calibration procedure.

The second element consists of the effectiveness of contraception, as measured by the monthly pregnancy rates of contracepting women in the National Survey of Family Growth (NSFG) for 1995. Ideally, one would choose earlier surveys for the younger ages of the 1950s cohort. However the different waves of the surveys do not treat abortion consistently, as under-reporting was a severe problem in the earlier waves. Taking the 1995 survey would be perfectly consistent in the case where the 1950's and later cohorts had the same average behaviour. In fact, although the measure of abortion propensity used here, the abortion-birth ratios, were somewhat higher in the 1970s and 1980s than in the 1990s, according to CDC (1999), almost all of the decline is among women under age 25. For women aged 25-34, the ratio remained stable at around 0.22 abortions per birth, and for women aged 35-39, there was a gradual decline from 0.3 to about 0.25.

Table 8 reports the annualized pregnancy rates of sexually active contracepting women by age and occupation for two categories of contraception, Pill and Other. The Pill category contains only oral contraceptives, while the Other category includes all other self-administered methods. Physician-administered methods, such as the IUD, sterilization or injections, are excluded. The main message of the table is that contraception failure rates are much higher for NM workers than for MP workers, and highest of all for non-empoyed women. The differentials are largest for women using the Pill. The occupational differentials could be explained by selection on ability into skilled jobs, although other possibilities are consistent with this, such as a role for income or education[5].

In accordance with this hypothesis, we assume that ability η enters into the pregnancy hazard function for contracepting women according to the following functional form, where Φ indicates the normal CDF:

$$\phi\left(a, L, f^{p}\right)=\frac{\alpha_{p}}{\alpha_{p}+f^{p}} P^{p}(a, \Psi)$$

Where

$$P^{p}(a, \Psi)=\Psi \Phi\left(\zeta_{0}+\Psi+\zeta_{1} a^{\zeta_{2}}\right)^{1 / \zeta_{2}}$$

$$\phi^{*}=\sqrt{\frac{-\eta \alpha_{p} P^{p}(a, L)}{\beta \Delta^{p} V(S)}}$$

The parameters of this function are set within the main calibration procedure, which includes as targets the average pregancy rates by age of contracepting women.

The third element consists of the costs of contraception and abortion. In order to approximate empirical age profiles for usage, these are assumed to be smooth functions of age:

$$\ln \chi_{it}^{l}=\chi^{l}(Y, z)+\varepsilon_{it}^{l}=a_{0\chi}^{l}+a_{1}^{l} \ln Y+\varepsilon_{it}^{l} \qquad l \in\{A, CC\}$$

, where the white-noise components ε_{it}^{l} are normally distributed.

6.2.3 Child-care time, daycare and parental leave

The main cost of fertility is through the impact on women's labor time, both through the risk of job loss (return to the inactive state) and through increased family-care time κ. We assumed that the time cost of children declines with the age of the child, and that the marginal impact of fertility on child-care time is declining in the level of child-care time. To embody these assumptions we assume the following functional form:

$$\kappa^{\prime}=K(\kappa, P)=\left[\kappa^{LR}+\left(\kappa-\kappa^{LR}\right) e^{-a_{1K}}\right]\left(1-a_{2K} P\right)+P a_{2K}$$

, where $P = 1$ indicates the arrival of a new child, and a_{0K}, a_{1K}, a_{2K} are parameters to be set in the main calibration procedure.

Another channel by which fertility affects women's labor–force decisions is through the value of productive time spent at home, ie the wage w^{H}. The model

[5] An important alternative explanation, differential fecundity, is ruled out by Figure 8, where panel (a) shows that the age profiles for pregnancy rates of non-contracepting married women are very similar by occupation, while panel (b) shows how the occupational effects contracepting married women are largest before age 30. The disappearance of the differential after age 30 is a challenge for all of the explanations considered above, but, for now at least, is outside the scope of this paper.

assumes that the home wage is increasing in the number of children and in the age of the mother:

$$w^H = a_0^H w^U \left(1 + a_1^h (1-Y)^{a_2^h}\right) \exp\left(1 + \alpha_3^H n^k\right) + \varepsilon_t^{WH}$$

, where ε_t^{WH} is a white-noise component, normally distributed with standard deviation σ_H.

In contrast to the child-care cost, this effect of children does not decline with child's age, and so helps explain reduced LFP of mothers of teen-age children.The parameters $\left(a_0^H, \alpha_3^H\right)$ will be set in the main calibration procedure; the other parameters, a_1^h, a_2^h and σ_H, are taken from the results of the calibration of the wage process in the preceding section.

Mothers in the model can choose to liberate a fraction $\kappa^{DC}$of their child-care time through the purchase of daycare services at unit cost w^{CC} per period. Since the US Census Bureau publishes data on daycare usage and expenses from its SIPP survey, this information could be used to fix these parameters[6]. The report shows that in 1977 the average usage rate for employed mothers of preschool kids 25-34 years was 35%, and in 1999 the average daycare cost was 18% of the mother's income, so these are useful targets to help fix the daycare parameters.

Job loss due to matenity is represented in the model by the parameter λ_M which gives the probability that a working woman is returned to the inactive state on the birth of a child. Since non-work may be by choice as well, it is necessary to set this parameter in the main fertility calibration.

6.2.4 Results

The above calibration procedure is carried out for both versions of the model, with and without effort on the job and in contraception. The targets and results are shown in Table 10.

7 Experiments

These two competing versions of the model are now subjected to 4 experiments. In the first, the environment is changed to resemble the 1950s: the effectiveness of contraception is reduced, the cost of abortion is increased, and daycare is made unavailable. In the second, marriage/divorce probability profiles are set so as to match those of the 1950s. In the third, the intial conditions of the model (wages, distribution over occupation, children and marital status) are replaced with those for 1950 . In the fourth, all of these changes are imposed at once. The results of these experiments are shown in Table 11.

The main result is that the effects on women's career choices of changing the environment or the marriage process are negligible in the ability model, and

[6]Source: U.S. Census Bureau, Survey of Income and Program Participation (SIPP), 1996 Panel, Wave 10.

modest in the effort model. In the effort model these effects do accumulate over time, so that by age 40 the fraction of women in skilled jobs has fallen 40%, relative to the benchmark model, but at age 25 there is no impact. What does make a difference for both models is the initial conditions; the fraction of women skilled at both age 25 and at age 40 is 65% lower, even when the enviroment is kept constant. While the calibration of the effort model is still quite tentative, an inescapable conclusion is that if the economic environment explains the occupational trend for young women, it must be through its effects on the initial conditions, rather than due to the anticipatory effects of the changes.

8 Conclusion

This paper used a lifecycle model of contraception, abortion and occupational choice to ask whether ability or effort models of success in skilled jobs are better able to explain women's patterns of fertility and selection into occupations. The main result is that both models are equally successful in explaining cross-sectional patterns. We used the calibrated models to ask how much of the trends in women's LFP and occupational choice could be explained by the changes in birth-control technology since 1960, as well as other usual suspects, such as marital stability and availability of daycare. It turns out that none of these explanations are very effective, conditional on the inital conditions at age 25. However shifting the initial conditions back to those of the 1950s does explain most of the differences between 1950 and 1990, particularly, in the effort model, when combined with the changes studied in the other experiments. We conclude that further research must focus on the determinants of the initial conditions, particularly education and fertility decisions between ages 18-25.

[TO BE COMPLETED]

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Year	Fraction in Man/Prof	No Kids	Mean Kids	Man./Prof Occupations	
				No Kids	Mean Kids
1950	0.037	0.225	1.553	0.59	0.64
1960	0.113	0.139	2.178	0.26	1.52
1970	0.178	0.181	1.922	0.36	1.19
1980	0.245	0.319	1.310	0.56	0.70
1990	0.298	0.352	1.236	0.56	0.72
2000	0.368	0.375	1.208	0.57	0.70

Table 1: *Occupation and Motherhood.* Women aged 25-30, from Census, using 1950 Occupational Classification

Age	Weekly Hours	Men N	Men Wage Growth Rate	Women N	Women Wage Growth Rate
25-30	20-34	57	0.04	233	0.02
	35-45	664	0.06	816	0.04
	45+	541	0.08	204	0.09
31-35	20-34	88	-0.01	324	0.04
	35-45	1106	0.02	904	0.03
	45+	970	0.03	231	0.05
36-40	20-34	122	0.00	454	0.03
	35-45	1155	0.02	941	0.03
	45+	1100	0.04	205	0.02
41-45	20-34	120	0.02	491	0.03
	35-45	1034	0.01	867	0.02
	45+	924	0.01	179	0.07
46-50	20-34	121	0.02	317	0.02
	35-45	686	0.00	517	0.01
	45+	623	0.01	161	0.04
51-60	20-34	146	0.00	254	0.01
	35-45	704	0.00	430	0.00
	45+	560	0.00	144	0.00

Table 2(a): Median Wage Growth in MP Jobs. Based on PSID 1985-1996

Age	Weekly Hours	Men N	Men Wage Growth Rate	Women N	Women Wage Growth Rate
25-30	20-34	200	-0.03	500	0.02
	35-45	2156	0.03	1802	0.04
	45+	932	0.04	151	0.05
31-35	20-34	256	-0.01	621	0.02
	35-45	2672	0.01	2078	0.03
	45+	1155	0.03	253	0.03
36-40	20-34	244	0.01	669	0.02
	35-45	2495	0.00	2043	0.02
	45+	1000	-0.01	208	0.05
41-45	20-34	164	-0.01	522	0.02
	35-45	1759	-0.01	1439	0.01
	45+	738	0.02	167	0.05
46-50	20-34	96	-0.01	398	0.02
	35-45	1117	0.00	975	0.02
	45+	459	0.00	113	0.00
51-60	20-34	199	-0.01	756	0.00
	35-45	1590	0.00	1343	0.01
	45+	508	0.01	157	0.01

Table 2(b): Median Wage Growth in NMP Jobs. Based on PSID 1985-1996

Parity	Statistic	Hourly Wage		Non-Labor Income			Weekly Paid Hours	
		NMP	MP	Home	NMP	MP	NMP	MP
No Kids	Mean	$5.94	$6.32	$2,981	$3,019	$4,212	37.54	40.61
	Median	$5.48	$5.96	$589	$129	$500	40.00	40.00
	Std. Dev.	$3.39	$3.55	$5,393	$5,120	$6,804	11.73	13.23
	N	8,229	3,561	1,768	8,229	3,561	8,229	3,561
One Kid	Mean	$6.41	$6.37	$6,696	$4,446	$5,473	40.27	44.23
	Median	$5.87	$6.22	$5,448	$2,919	$3,618	40.00	40.00
	Std. Dev.	$3.35	$3.74	$6,362	$5,011	$6,406	11.25	12.17
	N	2,687	634	149	2,687	634	2,687	634
Two or More Kids	Mean	$6.65	$6.59	$5,991	$3,352	$4,304	40.32	45.68
	Median	$6.07	$6.26	$4,865	$1,365	$1,926	40.00	40.52
	Std. Dev.	$3.69	$3.35	$5,538	$4,927	$7,298	11.93	12.99
	N	2,208	342	108	2,208	342	2,208	342

Table 3: *Wages and Non-Labor Income of Young Men from 1950's Birth Cohort.* Computed from March CPS, men aged 22-44 years, and expressed in terms of 1980 CPI. Non-Labor Income defined as husband's and wife's income, less husband's labor income.

	MP Men				MP Women			
Age	0-19	20-34	35-44	45+	0-19	20-34	35-44	45+
25	11.28	11.47	47.97	29.28	14.86	18.62	52.96	13.56
26	9.14	10.16	50.41	30.29	15.33	16.53	53.81	14.33
27	7.92	10.29	46.87	34.92	15.61	16.60	53.45	14.34
28	6.78	8.59	49.48	35.15	17.27	16.29	51.73	14.71
29	5.90	7.93	49.51	36.66	16.88	18.08	50.63	14.41
30	5.46	7.60	50.52	36.42	15.54	17.41	51.92	15.14
Mean	7.75	9.34	49.13	33.79	15.91	17.25	52.42	14.41

	NM Men				NM Women			
Age	0-19	20-34	35-44	45+	0-19	20-34	35-44	45+
25	12.98	17.72	50.07	19.23	23.44	20.51	50.53	5.52
26	11.90	17.59	50.53	19.98	24.05	21.53	48.66	5.76
27	11.93	15.59	50.79	21.69	23.74	22.44	47.25	6.57
28	10.00	14.61	52.12	23.27	23.71	21.00	48.38	6.90
29	9.63	13.95	53.46	22.96	25.10	21.08	47.06	6.75
30	10.04	13.65	52.84	23.47	24.41	20.46	47.85	7.27
Mean	11.08	15.52	51.64	21.77	24.08	21.17	48.29	6.46

Table 4: *Distribution of hours worked by occupation, age and sex* . 1950's birth cohort of March CPS.

25-26		31-32		39-40		Statistic
Targets	Results	Targets	Results	Targets	Results	
6.57	6.38	7.77	7.16	9.89	8.43	Median MP Wage
0.06	0.06	0.05	0.05	0.03	0.02	MP Wage Gro 35-45
0.07	0.09	0.06	0.06	0.03	0.03	MP Wage Gro 45+ H
0.68	0.69	0.71	0.69	0.73	0.69	MP Weekly Hours
0.04	0.04	0.03	0.04	0.02	0.02	Prob MP to Home
0.05	0.03	0.04	0.02	0.02	0.01	Prob MP to NMP
0.02	0.04	0.02	0.03	0.01	0.02	Prob NMP to MP
0.08	0.11	0.06	0.08	0.04	0.07	Prob Home 2 MP
0.26	0.28	0.31	0.32	0.34	0.40	SkillFracYrs
0.66	0.60	0.62	0.53	0.57	0.46	UnSkillFracYrs

Table 5(a): *Men's model calibration results for model without effort choice.*

25-26		31-32		39-40		Statistic
Targets	Results	Targets	Results	Targets	Results	
6.57	6.70	7.77	7.88	9.89	9.65	Median MP Wage
0.06	0.06	0.05	0.05	0.03	0.02	MP Wage Gro 35-45
0.07	0.09	0.06	0.06	0.03	0.03	MP Wage Gro 45+ H
0.68	0.69	0.71	0.69	0.73	0.69	MP Weekly Hours
0.04	0.04	0.03	0.04	0.02	0.02	Prob MP to Home
0.05	0.04	0.04	0.02	0.02	0.01	Prob MP to NMP
0.02	0.03	0.02	0.02	0.01	0.02	Prob NMP to MP
0.08	0.09	0.06	0.08	0.04	0.07	Prob Home 2 MP
0.26	0.25	0.31	0.28	0.34	0.34	SkillFracYrs
0.66	0.64	0.62	0.60	0.57	0.53	UnSkillFracYrs

Table 5(b): *Men's model calibration results for model with effort choice.*

Parity	Statistic	Hourly Wage		Non-Labor Income			Weekly Paid Hours	
		NMP	MP	Home	NMP	MP	NMP	MP
No Kids	Mean	$4.87	$5.91	$7,209	$5,983	$6,547	35.54	37.57
	Median	$4.52	$5.58	$2,804	$213	$501	39.92	40.00
	Std. Dev.	$2.57	$2.70	$9,549	$8,842	$9,209	9.83	10.42
	N	6,282	3,552	1,964	6,282	3,552	6,282	3,552
One Kid	Mean	$4.50	$5.56	$14,198	$9,975	$10,930	32.51	34.74
	Median	$4.17	$5.32	$14,024	$9,880	$11,243	36.38	39.92
	Std. Dev.	$2.44	$2.85	$9,126	$8,483	$8,602	10.44	10.88
	N	1,908	418	2,574	1,908	418	1,908	418
Two or More Kids	Mean	$4.05	$5.10	$13,564	$10,781	$12,651	30.50	32.47
	Median	$3.85	$4.51	$13,318	$10,847	$13,166	32.00	33.08
	Std. Dev.	$2.15	$2.68	$8,600	$7,992	$7,902	10.81	13.01
	N	1,365	207	3,862	1,365	207	1,365	207

Table 6: *Wages and Non-Labor Income of Young Women In 1990s.* Computed from 1990-2000 March CPS, women aged 22-44 years, and expressed in terms of 1980 CPI. Non-Labor Income defined as sum of husband's and women's income, less women's labor income.

Parity	Statistic	Occupation			Total
		Home	NMP	MP	
No Kids	Married	0.17	0.22	0.25	0.22
	Pop. Share	0.11	0.37	0.17	0.65
One Kid	Married	0.60	0.55	0.66	0.58
	Pop. Share	0.07	0.10	0.02	0.19
Two or More Kids	Married	0.56	0.59	0.67	0.58
	Pop. Share	0.09	0.06	0.01	0.16
Total	Married	0.42	0.32	0.31	0.35
	Pop. Share	0.27	0.53	0.20	1.00

Table 7(a): *Demographic Composition of Young Women by Occupation* . Based on 9721 Women Aged 22-24 in March CPS, 1990-2001

Marriage Rates				Divorce Rates		
1990		1960			1990	1960
25-29	127.4	25-26	190.5	25-29	36.6	12.1
30-34	97.2	27-29	143.9	30-34	27.9	11.2
35-39	69.3	30-34	81.7	35-39	23.1	9.5
40-44	50	35-39	47.3	40-44	19.3	6.7

Table 7(b). Female Marriage/Divorce Rates. *Sources: Carter/Glick(1976) and MVSR 43(9,12). Marriage rates for 1960 refer to first marriages only. Units are rate per 1000 singles for marriage and per 1000 marriages for divorce*

Age	Occupation	Other		Pill		Ratios		
						Pill/Other	US/MP	
		N	Preg/Yr	N	Preg/Yr		Other	Pill
21-24	At Home	1748	0.14	2359	0.08	0.57	1.90	5.05
	Unskilled	6061	0.13	11748	0.06	0.43		
	Man-Prof	2415	0.07	4784	0.01	0.16		
25-29	At Home	2601	0.15	2412	0.06	0.42	1.49	2.74
	Unskilled	10082	0.13	13718	0.04	0.32		
	Man-Prof	3860	0.09	6552	0.02	0.17		
30-34	At Home	1896	0.08	797	0.06	0.81	1.08	1.69
	Unskilled	8959	0.06	6219	0.04	0.67		
	Man-Prof	5368	0.06	2941	0.02	0.43		
35-39	At Home	667	0.01	394	0.00	0.00	0.79	1.92
	Unskilled	2865	0.05	1199	0.04	0.74		
	Man-Prof	1291	0.07	653	0.02	0.31		

Table 8: *Annual Pregnancy Rates by Age, Occupation and Contraception Method* . Based on author's computations from the NSFG 1995. "Other" refers to condom, diaphgram, rhythm and foam.

25-26		31-32		39-40		Statistic
Targets	Results	Targets	Results	Targets	Results	
0.97	0.86	1.54	1.63	1.95	1.94	Kids
0.74	0.70	0.74	0.65	0.78	0.68	FracCCYrs
0.07	0.10	0.05	0.03	0.02	0.00	FailRateCCYrs
0.25	0.33	0.18	0.22	0.30	0.17	FracAbortYrs
0.53	0.56	0.31	0.27	0.18	0.19	FracNoKidYrs
0.80	0.86	0.85	0.88	0.90	0.82	KidMarFrac
0.51	0.42	0.51	0.49	0.14	0.19	KidsLt5Yrs
0.22	0.29	0.26	0.31	0.31	0.31	SkillFracYrs
0.49	0.41	0.46	0.45	0.46	0.51	UnSkillFracYrs
5.82	6.10	6.73	6.51	7.51	7.02	MedianWageSkillYrs
0.06	0.08	0.05	0.09	0.04	0.06	Prob_MP2HomeYrs

Table 9(a): Wom*en's model calibration results for model without effort choice.*

25-26		31-32		39-40		Statistic
Targets	Results	Targets	Results	Targets	Results	
0.97	0.89	1.54	1.81	1.95	2.13	Kids
0.74	0.44	0.74	0.34	0.78	0.27	FracCCYrs
0.07	0.09	0.05	0.03	0.02	0.01	FailRateCCYrs
0.25	0.18	0.18	0.15	0.30	0.18	FracAbortYrs
0.53	0.56	0.31	0.31	0.18	0.25	FracNoKidYrs
0.80	0.77	0.85	0.84	0.90	0.85	KidMarFrac
0.51	0.42	0.51	0.53	0.14	0.26	KidsLt5Yrs
0.22	0.25	0.26	0.32	0.31	0.36	SkillFracYrs
0.49	0.46	0.46	0.41	0.46	0.43	UnSkillFracYrs
5.82	6.25	6.73	6.91	7.51	7.22	MedianWageSkillYrs
0.06	0.06	0.05	0.09	0.04	0.06	Prob_MP2HomeYrs

Table 9(b): Wom*en's model calibration results for model with effort choice.*

Targets	Ability	Effort	Statistic
0.50	0.55	0.55	MomInfantWork
0.60	0.79	0.71	MomToddlerWork
0.78	0.88	0.88	MomYoungTeenWork
0.35	0.21	0.30	Daycare use 25-34

Table 9(c): C*alibration results for mother's LFP*

Parity	Statistic	Hourly Wage		Non-Labor Income		
		NMP	MP	Home	NMP	MP
No Kids	Mean	$3.47	$4.34	$12,125	$10,396	$10,740
	Median	$3.34	$4.02	$11,256	$10,700	$10,422
	Std. Dev.	$2.72	$2.43	$8,257	$6,673	$6,921
	N	1,160	159	1,558	2,798	776
One Kid	Mean	$3.37	$6.17	$12,996	$9,359	$10,296
	Median	$2.81	$4.35	$12,646	$9,867	$10,145
	Std. Dev.	$4.16	$8.49	$7,101	$6,083	$6,332
	N	425	26	5,094	1,894	263
Two or More Kids	Mean	$2.68	$3.52	$12,850	$9,429	$13,160
	Median	$2.51	$3.43	$12,646	$9,867	$12,090
	Std. Dev.	$1.91	$1.88	$7,040	$6,415	$9,975
	N	226	12	9,585	2,135	130

Table 10: *Wages and Non-Labor Income of Young Women In 1950s.* Computed from Census women aged 21-25, and expressed in terms of 1980 CPI. Non-Labor Income, defined as sum of husband's and women's income, less women's labor income, computed from 1960 Census

Experiment	Skill Frac 25-26		Skill Frac 39-40	
	Ability	Effort	Ability	Effort
5 Marriage Rates 1950	103.4%	102.2%	99.9%	98.1%
6 CC/Ab/DC/Mar	104.0%	102.1%	94.9%	60.9%
7 Ini 1950	43.3%	33.1%	52.7%	50.2%
8 All	42.0%	46.3%	44.3%	35.3%

Table 11(a): *Effects of Experiments on the fraction of women in MP occupations, relative to benchmarks.*

Experiment	LFP 25-26		LFP 39-40	
	Ability	Effort	Ability	Effort
5 Marriage Rates 1950	99.2%	97.1%	95.5%	97.5%
6 CC/Ab/DC/Mar	94.9%	97.1%	91.6%	88.6%
7 Ini 1950	75.5%	72.2%	90.6%	84.8%
8 All	69.8%	74.7%	85.7%	82.2%

Table 11(b): *Effects of Experiments on female labor force participation (LFP), relative to benchmarks.*

Experiment	Kids 39-40		MomInfantWork	
	Ability	Effort	Ability	Effort
5 Marriage Rates 1950	125.6%	128.0%	89.5%	96.0%
6 CC/Ab/DC/Mar	177.5%	160.5%	91.8%	97.6%
7 Ini 1950	126.2%	140.3%	41.9%	57.6%
8 All	179.7%	163.6%	50.5%	38.7%

Table 11(c): *Effects of Experiments on fertility and LFP of women with infant children, relative to benchmarks.*

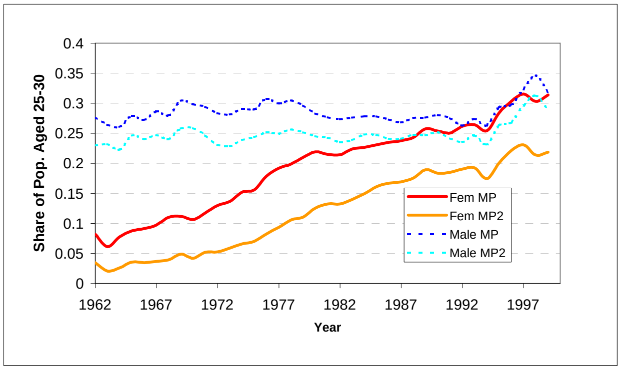

Fig 1(a): *Fraction of Young Population Employed in Managerial or Professional Occupations in March CPS, 1962-2006*

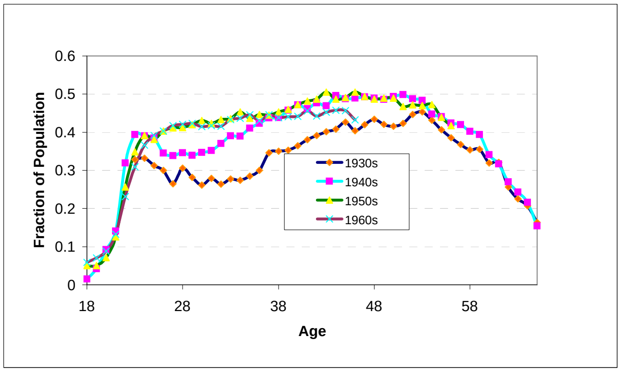

Fig 1(b): *Fraction of College Women in Managerial or Professional Occupations in March CPS, 1962-2006*

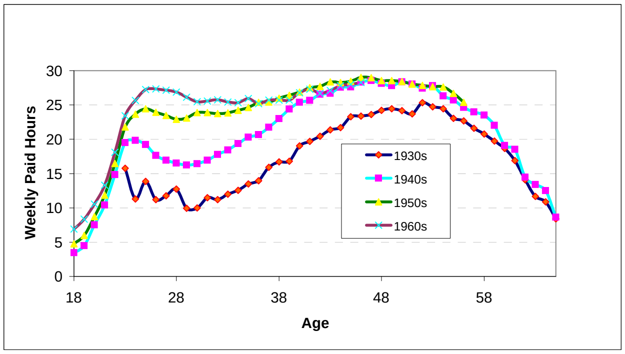

Fig 1(c): *Hours Worked by College-Educated Women. Based on March CPS, 1962-2006*

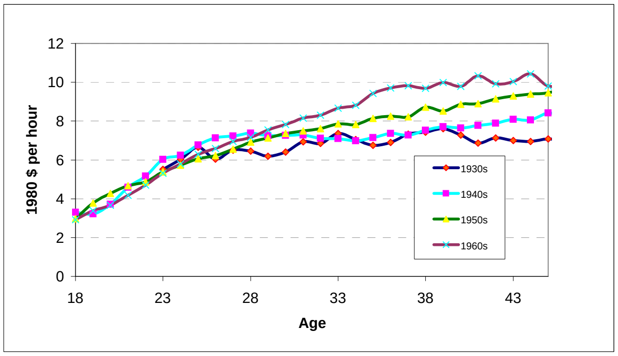

Fig 1(d): *Wages of Women in MP Jobs in March CPS, 1962-2006*

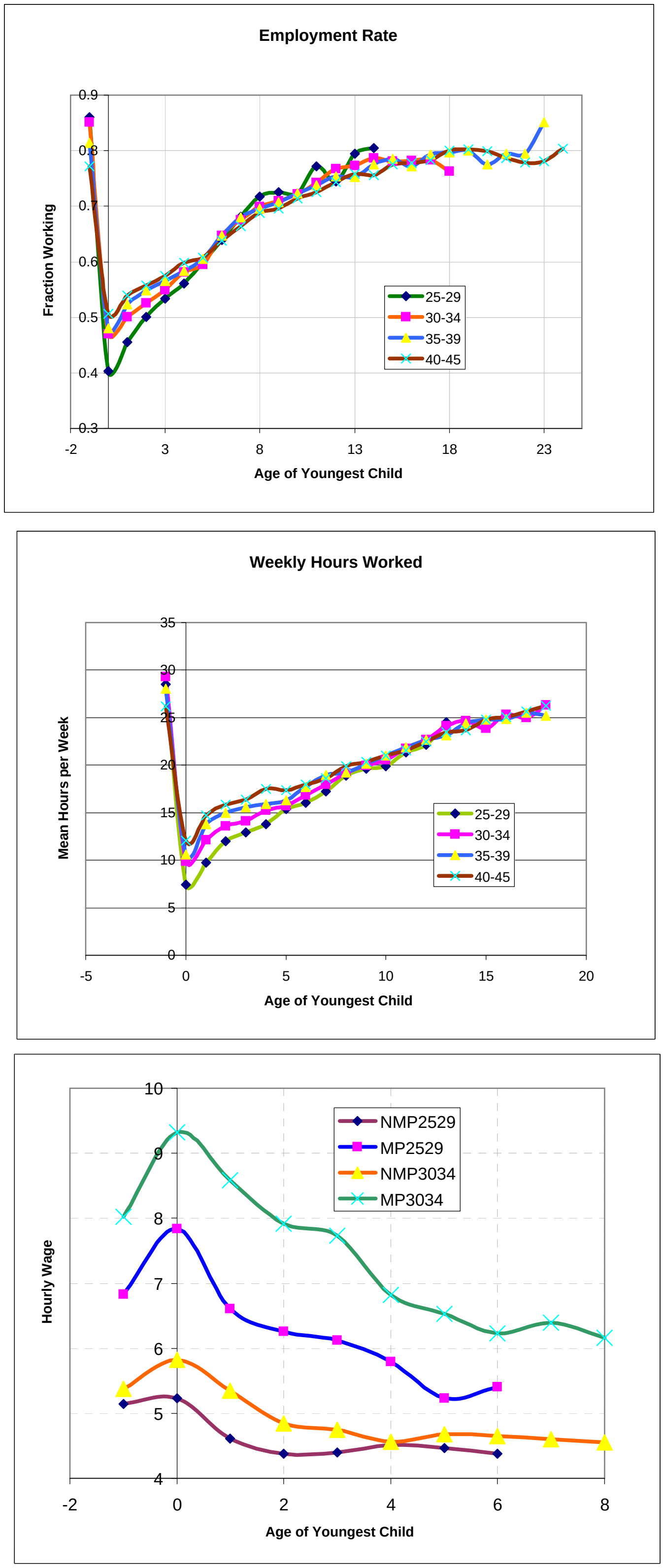

Figure 2: Labor Supply and Wages by Age of Youngest Child. Based on CPS Sample of Women 1990-2001. Negative age indicates no children

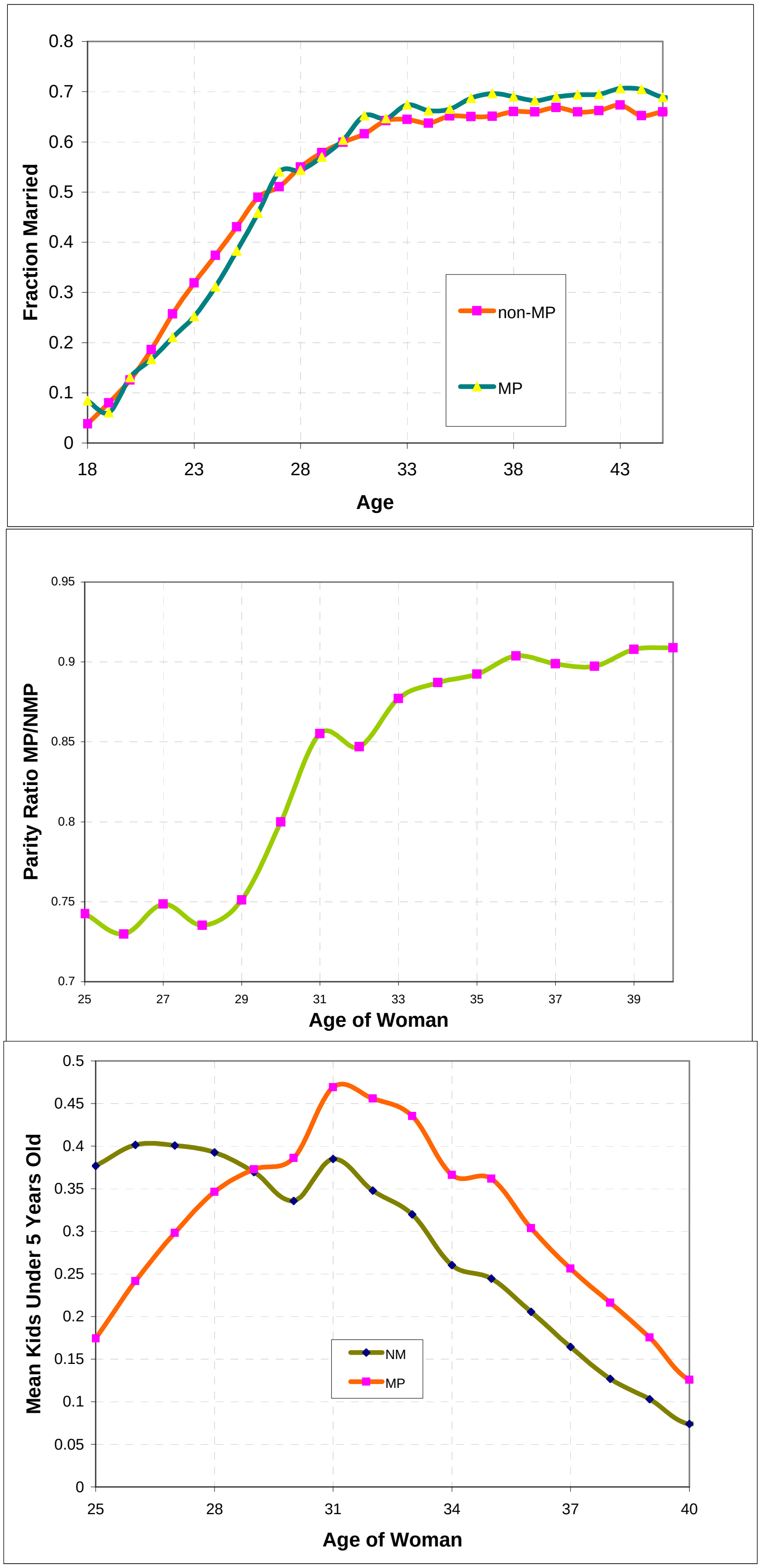

Figure 3: *Marriage and Fertility by Occupation and Age of Woman. Author's computations on 1950-60 birth cohort, US Census 1980-2000. "Parity" refers to total live births up to current age.*

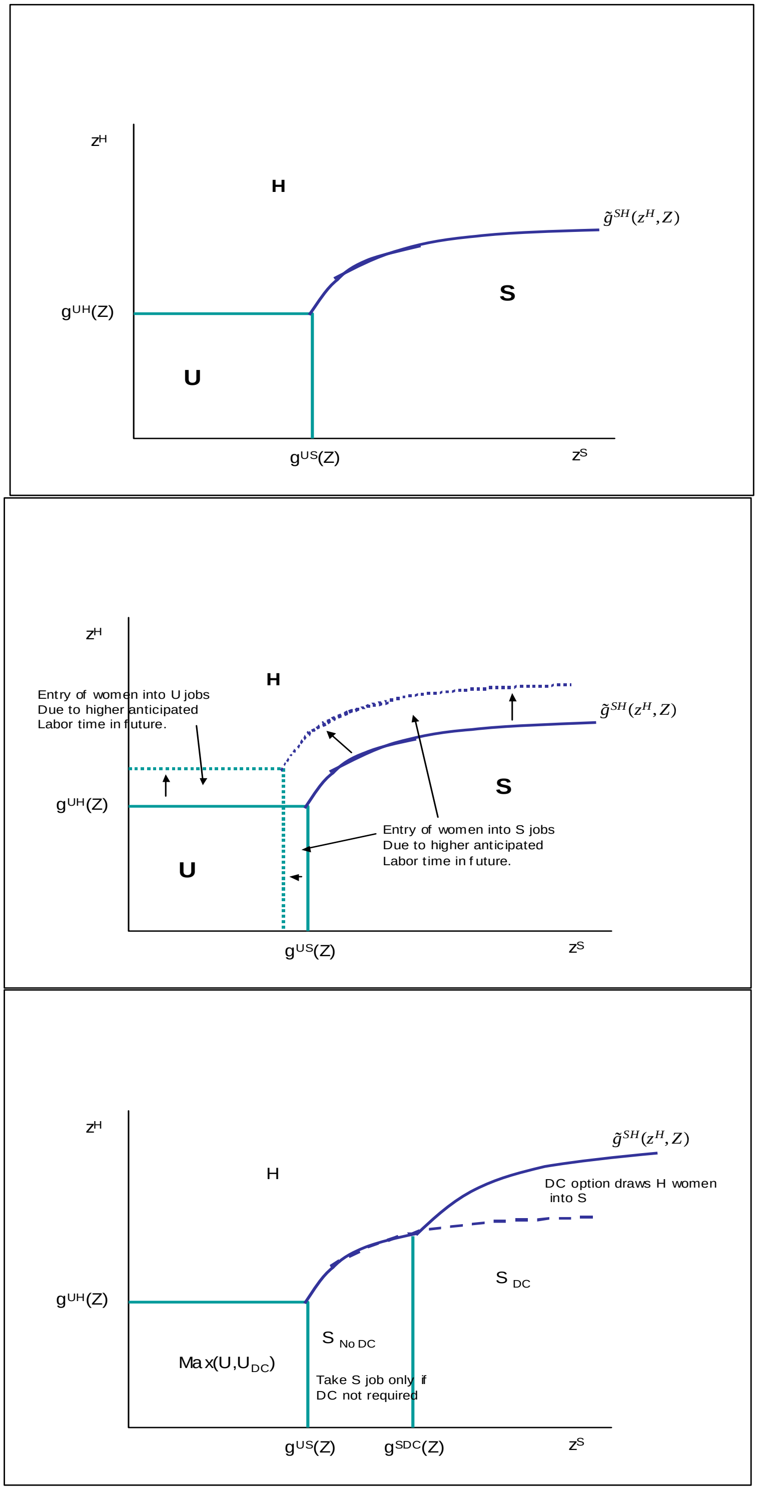

Figure 4: *Probability of High rate of skill growth as a function of working time and effort. Second panel indicates effect on choices of an increase in expected future labor time. Third panel indicates effect of access to daycare*

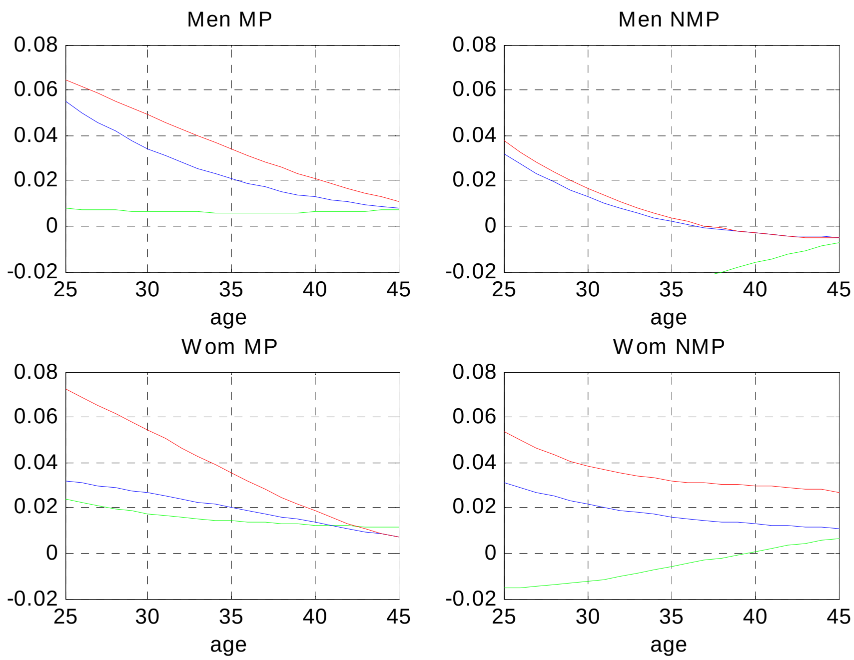

Figure 5: *Predicted wage-growth, net of time effects.* Based on median regression model estimated on PSID, waves 1986-1997

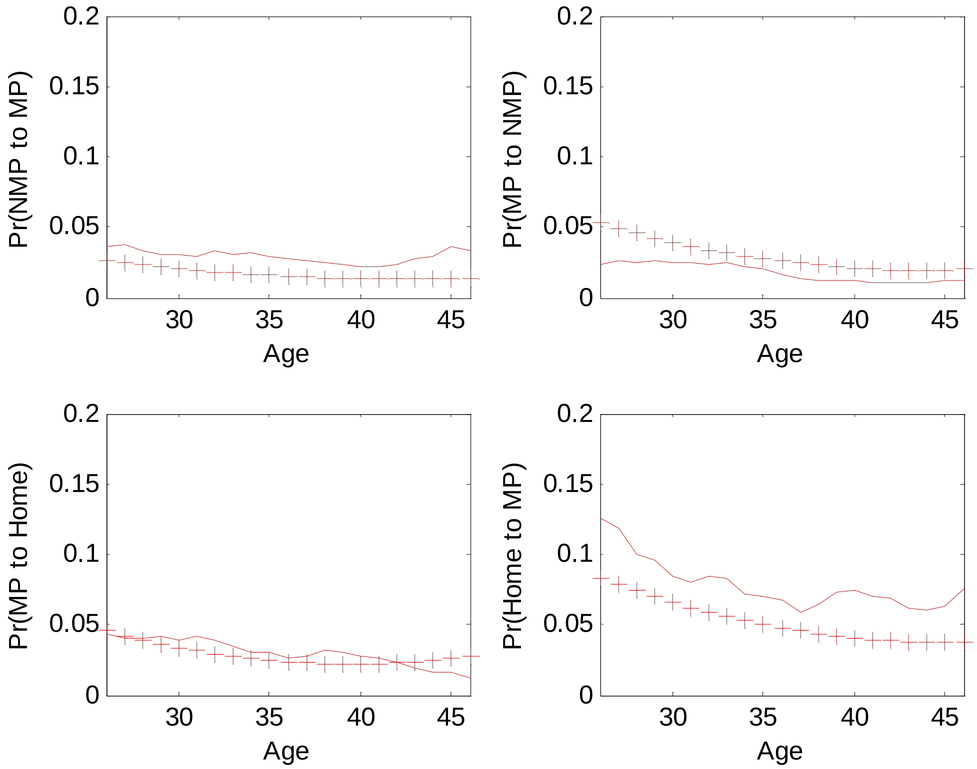

Figure 7: Occupational transitions for men in the benchmark model.