Appendix. Why are Married Men Working So Much?

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A Optimal Allocations

A.1 Singles

The indirect utility flow of a single household of sex i is:

$$U_i^S = max_{c,l,g,h,e}\left\{u\left(c,l,G\left(h,e_q\right)\right)\right\}$$

subject to

$$c + w_i l + T\left(Y^T\right) = w\left(1-h\right) + y - p_e e_q$$

where w is the wage, p_e the price of equipment and y_i the non-labor income of the household. Taxable income is:

$$Y^T = w_i\left(1-l-h\right) + y_i$$

.

Letting the multiplier on the budget constraint be λ, we can write the FOC as

$$\begin{aligned} u_c &= \sigma_c c^{-\sigma_1} = \lambda \\ u_l &= \sigma_l l^{-\sigma_1} = \lambda w_i \frac{1-T'}{1+t_n} \\ u_g G_h &= \sigma_g g^{-\sigma_1} z\theta\left[e_q^{1-\theta}\right] h^{\theta-1} = \lambda w_i \frac{1-T'}{1+t_n} \\ u_g G_e &= \sigma_g g^{-\sigma_1} z\left(1-\theta\right)\left[e_q^{-\theta}\right] h^{\theta} = \lambda p_e \end{aligned}$$

To solve this problem, we take as fixed the average and marginal tax rates, denoted T^A and T^M, respectively. Obviously, these will depend on household decisions, but ultimately we will deal with this by solving numerically for the labor income level that satisfies the optimality conditions above, subject to the additional constraint that the observed income generates T^A and T^M from the tax function $T\left(Y^T\right)$. If we evaluate these tax rates at the optimum, we can write the time-allocation FOC as:

$$\begin{aligned} \sigma_l l^{-\sigma_1} &= \lambda w_i^M \\ \sigma_g g^{-\sigma_1} z\theta\left[e_q^{1-\theta}\right] h^{\theta-1} &= \lambda w_i^M \end{aligned}$$

Where $w_i^M \equiv w_i \frac{1-T^M}{1+t_n}$.

The full income of the household is given by $Y_i = \left[w_i \frac{1}{1+t_n} + y_i\right]\left[1-T^A\right] = w_i^A + y_i^A$, where $w_i^A = \frac{1-T^A}{1+t_n}$, where $y_i^A = y_i\left(1-T^A\right)$.

A.1.1 The Demand Functions

Exploiting the functionl forms of the technology, we can express the home output and factor demands, at the optimum, as proportional to the home-labor input h. We thus define the ratios $x_g \equiv g/h$ and $x_e = e/h$, for the factors. We will derive below the expressions for these ratios at the optimum.

Rearranging the FOC for equipment, we get that the demand for home goods is

$$g = \left(\frac{\sigma_g z \theta \left[e_q^{1-\theta} \right] h^{\theta-1}}{\lambda w_i^M} \right)^{1/\sigma_1} = \left(\frac{\sigma_g}{\lambda} \right)^{1/\sigma_1} \left(\frac{z \theta x_e^{1-\theta}}{w_i^M} \right)^{1/\sigma_1} = \left(\frac{\sigma_g}{\lambda D_i^M} \right)^{1/\sigma_1}$$

, where

$$D_i^M \equiv \frac{w^M}{z \theta x_e^{1-\theta}}$$

Rearranging the FOC, we get reduced form demand functions which depend on the budget multiplier:

$$\begin{aligned} c &= \left(\frac{\sigma_c}{\lambda} \right)^{1/\sigma_1} \\ l &= \left(\frac{\sigma_l}{\lambda w^M} \right)^{1/\sigma_1} \\ g &= \left(\frac{\sigma_g}{\lambda D_i^M} \right)^{1/\sigma_1} \end{aligned}$$

,

Using the budget constraint, we solve for λ :

$$Y = w^A g/x_g + p_e x_e g/x_g + c + w^A l = \left(w^A + p_e x_e \right) / x_g g + c + w^A l$$

$$Y = D_i^A \left(\frac{\sigma_g}{\lambda D_i^M} \right)^{1/\sigma_1} + \left(\frac{\sigma_c}{\lambda} \right)^{1/\sigma_1} + w^A \left(\frac{\sigma_l}{\lambda w^M} \right)^{1/\sigma_1}$$

, where

$$D_i^M \equiv \frac{w_i^A + x_e p_e}{x_g}$$

is the unit cost of home production. The expression for λ

$$\lambda = \left(\frac{B}{Y} \right)^{\sigma_1}$$

, where

$$B = \left[\xi \left(\frac{\sigma_g}{D_i^M} \right)^{1/\sigma_1} + (\sigma_c)^{1/\sigma_1} + w^A \left(\frac{\sigma_l}{w^M} \right)^{1/\sigma_1} \right]$$

and

A.1.2 Production

The production FOC imply that

$$\frac{\theta e_q/h}{w^M\left(1-\theta\right)}=1$$

$$e_q/h=\frac{w^M\left(1-\theta\right)}{p_e\theta}\equiv x_e$$

Aside, using the definition of D_i^M

$$D_i^M=\frac{w^M}{z\theta\left(\frac{w^M(1-\theta)}{p_e\theta}\right)^{1-\theta}}=\frac{\left(\frac{w^M}{\theta}\right)^{\theta}}{z\left(\frac{1-\theta}{p_e}\right)^{1-\theta}}=\frac{1}{z}\left(\frac{w^M}{\theta}\right)^{\theta}\left(\frac{p_e}{1-\theta}\right)^{1-\theta}$$

The implications for factor inputs are:

$$g=z\left[e_q^{1-\theta}\right]h^{\theta}=z\left(x_eh\right)^{1-\theta}h^{\theta}=zx_e^{1-\theta}h$$

, so $x_g\equiv zx_e^{1-\theta}$.

The unit cost of home production is

$$\frac{w^Ah+p_ex_eh}{x_gh}=\frac{w^A+p_ex_e}{x_g}$$

so the equipment share of costs is

$$\frac{p_ex_e}{w^A+p_ex_e}=\frac{p_e\frac{w^M(1-\theta)}{p_e\theta}}{w^A+\frac{w^M(1-\theta)}{p_e\theta}}=\frac{\frac{w^M}{w^A}\left(1-\theta\right)}{\theta+\frac{w^M}{w^A}\left(1-\theta\right)}=\frac{\tau\left(1-\theta\right)}{\theta+\tau\left(1-\theta\right)}$$

, where

$$\tau\equiv\frac{1-T^M}{1-T^A}$$

represents the progressivity of taxes.

A.2 Married

The couple chooses the husband's allocation (c_M, l_M, h_M) and the wifes allocation (c_F, l_F, h_F) to maximize

$$v\left(G\left(H\left(h_M,h_W\right),e_q\right)\right)+\mu u^M\left(c_M,l_M\right)+\left(1-\mu\right)u^W\left(c_W,l_W\right)$$

subject to

$$c_M+c_F+p_ee_q=Y^T-T\left(Y^T\right)$$

where Y^T represents taxable income:

$$Y^T=w_M\left(\frac{1-l_M-h_M}{1+\Phi}\right)+w_W\left(\frac{1-l_W-h_W}{1+\Phi}\right)+y$$

; the time cost per unit work is Φ and y represents the couple's non-labor income. In what follows, we

The first-order conditions for home inputs into production in the above problem are:

$$\begin{aligned}
v'G_h H_m &= \lambda \frac{w_M}{1+\Phi}\left(1-T^M\right) = \lambda w_M^M \\
v'G_h H_w &= \lambda \frac{w_W}{1+\Phi}\left(1-T^M\right) = \lambda w_W^M \\
v'G_e &= \lambda p_e
\end{aligned}$$

while those for consumption and leisure are

$$\begin{aligned}
\mu u_c^M\left(c_M, l_M\right) &= \lambda \\
\mu u_l^M\left(c_M, l_M\right) &= \lambda w_M^M \\
\left(1-\mu\right) u_c^W\left(c_W, l_W\right) &= \lambda \\
\left(1-\mu\right) u_l^W\left(c_W, l_W\right) &= \lambda w_W^M
\end{aligned}$$

where we defined

$$w_i^M = \frac{w_i}{1+\Phi}\left(1-T^M\right)$$

A.2.1 Reduced-form demand functions

Exploiting the functional forms of the technology, we can express the home output and factor demands, at the optimum, as proportional to the husband's labor. We thus define the ratios $x_g \equiv g/h_M$ for output and $x_e = e/h_M$, $x_w = h_W/h_M$ and $x_h = H/h_M$ for the factors, where H represents the effective labor input $H\left(h_M, h_W\right)$. We will derive below the expressions for these ratios at the optimum.

Rearranging the FOC for equipment, we get that the demand for home goods is

$$\begin{aligned}
v'G_e &= \sigma_g g^{-\sigma_1} z\left(1-\theta\right)\left(\frac{e_q}{x_h h_M}\right)^{-\theta} = \lambda p_e \\
\Rightarrow \quad g &= \left[\frac{\sigma_g z\left(1-\theta\right)\left(\frac{x_e}{x_h}\right)^{-\theta}}{\lambda p_e}\right]^{1/\sigma_1}
\end{aligned}$$

so we can define the effective price of home goods as

$$D_m^M = \frac{p_e\left(\frac{x_e}{x_h}\right)^{\theta}}{1-\theta} = \frac{1}{z x_h^{\theta}}\left(\frac{w^M}{\theta}\right)^{\theta}\left(\frac{p_e}{1-\theta}\right)^{1-\theta}$$

The reduced-form demand functions are:

$$\begin{aligned}
c_M &= \left(\frac{\mu\sigma_c}{\lambda}\right)^{1/\sigma_1} \\
c_W &= \left(\frac{\left(1-\mu\right)\sigma_c}{\lambda}\right)^{1/\sigma_1} \\
l_M &= \left(\frac{\mu\sigma_l}{\lambda w_M^M}\right)^{1/\sigma_1} \\
l_W &= \left(\frac{\left(1-\mu\right)\sigma_l}{\lambda w_W^M}\right)^{1/\sigma_1} \\
g &= \left(\frac{\sigma_g}{\lambda D_m^M}\right)^{1/\sigma_1}
\end{aligned}$$

we can express the factor demands in terms of g and derive the ratio x_g:

$$g = zx_e^{\theta}x_h^{1-\theta}h_M = x_g h_M$$

where

$$x_g \equiv zx_e^{\theta}x_h^{1-\theta}h_M$$

.Now the FOC for production imply:

$$\begin{aligned} h_M &= \frac{g}{x_g} \\ h_W &= \frac{x_w g}{x_g} \\ e_q &= \frac{x_e g}{x_g} \end{aligned}$$

A.2.2 Full Income

If a household spent all available time in paid labor, the income would be

$$Y^F = \frac{w_W + w_M}{1+\Phi}\left(1 - T^A\right) + y_{NL}\left(1 - T^A\right) \tag{1}$$

, where Φ is the unit time cost of paid work. In fact households spend time on other things, so observed (taxable) income is

$$\begin{aligned} Y^T &= w_W n_W + w_M n_M + y_{NL} = w_W\left(\frac{1 - h_W - l_W}{1+\Phi}\right) + w_M\left(\frac{1 - h_M - l_M}{1+\Phi}\right) + y_{NL} \\ &= \frac{w_W + w_M}{1+\Phi} + y_{NL} - w_W\left(\frac{h_W + l_W}{1+\Phi}\right) - w_M\left(\frac{h_M - l_M}{1+\Phi}\right) \\ &= Y^F / \left(1 - T^A\right) - w_W\left(\frac{h_W + l_W}{1+\Phi}\right) - w_M\left(\frac{h_M - l_M}{1+\Phi}\right) \end{aligned}$$

In terms of observed income, the budget constraint is:

$$\begin{aligned} c_M + c_F + p_e e_q &= Y^T - T\left(Y^T\right) = Y^T\left(1 - T^A\right) \\ &= Y^F - \left[w_W\left(\frac{h_W + l_W}{1+\Phi}\right) - w_M\left(\frac{h_M - l_M}{1+\Phi}\right)\right]\left(1 - T^A\right) = Y^F - \left[w_W^A\left(h_W + l_W\right) - w_M^A\left(h_M - l_M\right)\right] \end{aligned}$$

So we can write the full-income budget constraint as

$$c_M + c_F + w_M^A\left(l_M + h_M\right) + w_W^A\left(l_W + h_W\right) + p_e e_q = Y^F$$

, where

$$w_i^A = w_i \frac{1 - T^A}{1+\Phi}$$

The total cost of production is gD_m^A, where

$$D_m^A \equiv \frac{w_M^A + x_w w_W^A + x_e p_e}{x_g}$$

Using the budget constraint we can write out the expression for λ:

$$\begin{aligned} Y &= c_M + w_M^A (l_M + h_M) + c_W + w_W^A (l_W + h_W) + p_e e_q \\ &= \left(\frac{\mu\sigma_c}{\lambda}\right)^{1/\sigma_1} + \left(\frac{(1-\mu)\,\sigma_c}{\lambda}\right)^{1/\sigma_1} + w_M^A \left(\frac{\mu\sigma_l}{\lambda w_M^M}\right)^{1/\sigma_1} + w_W^A \left(\frac{(1-\mu)\,\sigma_l}{\lambda w_W^M}\right)^{1/\sigma_1} + D_i^A \left(\frac{\sigma_g}{\lambda D_m^M}\right)^{1/\sigma_1} \end{aligned}$$

So we write out the multiplier as $\lambda = (B/Y)^{\sigma_1}$, where

$$B = \sigma_c^{1/\sigma_1} \left(\mu^{1/\sigma_1} + (1-\mu)^{1/\sigma_1}\right) + w_M^A \left(\frac{\mu\sigma_l}{w_M^M}\right)^{1/\sigma_1} + w_W^A \left(\frac{(1-\mu)\,\sigma_l}{w_W^M}\right)^{1/\sigma_1} + D_i^A \left(\frac{\sigma_g}{D_m^M}\right)^{1/\sigma_1}$$

We now derive the expressions for the proportions $x_e = e/h_M$, $x_w = h_W/h_M$ and $x_h = H/h_M$ that appear in the results above.

A.2.3 Labor Inputs

The home labor FOC are:

$$\begin{aligned} w_M^M &= \Phi H_M (h_W, h_M)\, G_h \\ w_W^M &= \Phi H_W (h_W, h_H)\, G_h \end{aligned}$$

so the ratio is

$$\frac{w_M}{w_W} = \frac{w_M^M}{w_W^M} = \frac{H_M (h_W, h_M)}{H_W (h_W, h_M)} = \frac{1-\eta_0}{\eta_0} \left(\frac{h_W}{h_M}\right)^{\eta_1}$$

so we can write the wife's time as

$$h_W = \left(\frac{w_M}{w_W} \frac{\eta_0}{1-\eta_0}\right)^{1/\eta_1} h_M = x_w h$$

.

The effective labor input is therefore:

$$\begin{aligned} H &= \left[\eta_0 \left[x_w h_M\right]^{1-\eta_1} + (1-\eta_0)\, h_M^{1-\eta_1}\right]^{1/(1-\eta_1)} \\ &= h_M \left[\eta_0 x_w^{1-\eta_1} + (1-\eta_0)\right]^{1/(1-\eta_1)} \end{aligned}$$

This in turn implies we can write $H = x_h h_M$, where

$$x_h = \left[\eta_0 x_w^{1-\eta_1} + (1-\eta_0)\right]^{1/(1-\eta_1)}$$

the unit cost of h is therefore

$$\widehat{w}^A = \frac{w_W^A x_w h_M + w_H^A h_M}{x_h h_M} = \frac{w_W^A x_w + w_M^A}{x_h}$$

and the marginal cost is

$$\widehat{w}^M = \frac{w_W^M x_w + w_M^M}{x_h}$$

.

A.2.4 Equipment Inputs

The equipment FOC is

$$p_e = \Phi G_e = \Phi\left(1-\theta\right) z \left(\frac{h_M x_h}{e_q}\right)^{\theta}$$

and that for husband's labor is

$$w_M^M = \Phi G_H H_M$$

The price ratio is therefore equated to:

$$\frac{w_M^M}{p_e} = \frac{G_H H_M}{G_e}$$

We can write the ratio of marginal products as

$$\frac{G_H H_M}{G_e} = \frac{\theta}{1-\theta}\frac{H_M}{H\left(h_M, h_W\right)} e_q$$

, where

$$\frac{H_M}{H\left(h_M, h_W\right)} = \frac{1-\eta_0}{\eta_0 x_w^{1-\eta_1} + \left(1-\eta_0\right)}\frac{1}{h_M} = \frac{1-\eta_0}{x_h^{1-\eta_1}}\frac{1}{h_M}$$

$$\frac{w_M^M}{p_e} = \frac{G_H H_M}{G_e} = \frac{\theta}{1-\theta}\frac{1-\eta_0}{x_h^{1-\eta_1}}\frac{e_q}{h_M}$$

$$\frac{e_q}{h_M} = \frac{w_M^M}{p_e}\frac{x_h^{1-\eta_1}}{1-\eta_0}\frac{1-\theta}{\theta} \equiv x_e$$

A.2.5 Unit cost of home goods

From the production function,

$$g = z\left[\left(x_e h_M\right)^{1-\theta}\left(x_h h_M\right)^{\theta}\right] = z x_e^{1-\theta} x_h^{\theta} h_M$$

$$h_M = \frac{g}{z x_e^{1-\theta} x_h^{\theta}}$$

. Now we can write the cost of home production as

$$\left[w_M^A + w_W^A x_w + p_e x_e\right] h_M = \left[\hat{w^A} x_h + p_e x_e\right] h_M = \left[\hat{w^A} + p_e \frac{x_e}{x_h}\right] H$$

. Using the ratios,

$$\frac{x_e}{x_h} = \frac{w_M^M}{p_e}\frac{1-\theta}{\theta}\frac{1}{1-\eta_0}\frac{\eta_0 x_w^{1-\eta_1} + \left(1-\eta_0\right)}{\left[\eta_0 x_w^{1-\eta_1} + \left(1-\eta_0\right)\right]^{1/(1-\eta_1)}} = \frac{w_M^M}{p_e}\frac{1-\theta}{\theta} a$$

, where

$$a = \frac{1}{\left(1-\eta_0\right) x_h^{\eta_1}}$$

So the equipment share of expenditure S is given by:

$$S = \frac{w_M^M \frac{1-\theta}{\theta} a}{\hat{w^A} + w_M^M \frac{1-\theta}{\theta} a} = \frac{\hat{\tau}\,(1-\theta)}{\theta + \hat{\tau}\,(1-\theta)}$$

, where

$$\hat{\tau} \equiv \frac{w_M^M}{\hat{w^A}} a$$

represents the effective progressivity of taxes.

B Measuring Marriage and Divorce Rates

The goal here is to create from the data annual marriage π_t^M and divorce rates π_t^D that are internally consistent so that we can evaluate the model's predictions. The March CPS reports current marital status and whether the person has ever been married. Thus we can construct the following variables for the population aged 18-65:

symbol	description
μ^M	fraction ever married
μ^S	fraction never married
M	fraction currently married
S	fraction currently not married

If we use these moments to compute the two hazard rates, we will also need an exit rate δ_t out of the sample, and an entrance rate ϕ_t. The first is set from the fraction of the population aged 65, the second from that aged 18. These are normalized by dividing by $(1+\phi-\delta)$ to ensure constant population size. Finally we need the fraction of entrants who are married, μ_t^{M0}.

To back out the hazard rates from the CPS data, we solve a couple of simple equations, one for each hazard. The marriage rate in each year must be consistent with the law of motion for people ever married:

$$\mu_{t+1}^M = \frac{1-\delta_t}{1+\phi_t-\delta_t}\left[\mu_t^M + \pi_t^M \mu_t^S\right] + \frac{\phi_t}{(1+\phi_t-\delta_t)}\mu_t^{M0}$$

, which implies

$$\pi_t^M = \frac{1}{\mu_t^S}\left[\frac{(1+\phi-\delta)\,\mu_{t+1}^M - \phi\mu^{M0}}{1-\delta} - \mu_t^M\right]$$

, while the divorce rate is pinned down by the law of motion for people not currently married:

$$S_{t+1} = \frac{1-\delta_t}{1+\phi_t-\delta_t}\left[\left(1-\pi_t^M\right)S_t + \pi_t^D M_t\right] + \frac{\phi}{1+\phi_t-\delta_t}\left(1-\mu_t^{M0}\right)$$

, which implies

$$\pi^D = \frac{1}{M_t}\left[\frac{(1+\phi-\delta)\,S_{t+1} - \phi\left(1-\mu^{M0}\right)}{1-\delta} - \left(1-\pi^M\right)S_t\right]$$

. Applying this procedure to the annual moments in Table A3 and smoothing the results, as shown in Figure A3, results in the following estimates :

	1975	2003
π^M	0.0929	0.0458
π^D	0.0249	0.0178

. An alternative strategy, shown in Table A2, takes the per-capita hazard rates, as published by the NCHS, assumes that all the action is from the 18-65 population and computes the marriage rate per single woman and the divorce rate per marriage using CPS population numbers. This results in marriage rates of 10.4% in 1975 and 5.6% in 2003, while the divorce rates are 2.4% and 2.18%. The similarity of the results is reassuring.

C Algorithm

The algorithm consists of a set of nested loops. The role of the outermost loop is to find the values of the free parameters P^* that equate the model's steady-state statistics M to the empirical targets M_E. The loop inside this one searches for the equilibrium solution $\left(\varepsilon^M, \varepsilon^D\right)^*$, given a free-parameter set P. Inside this loop is a loop that solves for the expectations $\left\{V_i^M\left(\mu\left(\varepsilon\right), \varepsilon\right)\right\}_{i=m,f}^*$, taking as given P and $\varepsilon^M, \varepsilon^D$. The innermost loop solves for the Nash bargaining solution $\mu\left(\varepsilon\right)$, given $\left\{V_i^M\left(\mu\left(\varepsilon\right), \varepsilon\right)\right\}_{i=m,f}$, P and $\varepsilon^M, \varepsilon^D$.

We begin with a conjecture for $\left\{V_i^M\left(\mu\left(\varepsilon\right), \varepsilon\right)\right\}_{i=m,f}$, P and $\varepsilon^M, \varepsilon^D$. The conjecture for V_i^M takes the form of spline coefficients that generate an approximation $\hat{V}_i^M$. We then iterate over the following steps until the outer loop converges:

1. The equilibrium thresholds, given the conjectures, are found by iterating on $\left(\varepsilon^M, \varepsilon^D\right)$ to solve the system of 4 approximate Bellman equations:

$$V_{tm}^S = U_m^S + \beta\left[\Phi\left(\varepsilon^M\right)\hat{V}_m^S + \hat{E}_m^M\right]$$
$$V_{tm}^M\left(\varepsilon\right) = \widetilde{U}_m^M\left(\mu\left(\varepsilon\right), \varepsilon\right) + \beta\left[F\left(\varepsilon^D|\varepsilon\right)\left(V_m^S - d_c\right) + \hat{E}_f^D\left(\varepsilon\right)\right]$$

$$V_f^S = U_f^S + \beta\left[\Phi\left(\varepsilon^M\right)\hat{V}_f^S + \hat{E}_f^M\right]$$
$$V_{tf}^M\left(\varepsilon\right) = \widetilde{U}_f^M\left(1-\mu\left(\varepsilon\right), \varepsilon\right) + \beta\left[F\left(\varepsilon^D|\varepsilon\right)\left(\hat{V}_f^S - d_c\right) + \hat{E}_f^D\left(\varepsilon\right)\right]$$

, where
$$\hat{E}_i^D\left(\varepsilon\right) = \int_{\varepsilon^D}\hat{V}_i^M\left(\varepsilon'\right)dF\left(\varepsilon'|\varepsilon\right)$$
and
$$\hat{E}_i^M = \int_{\varepsilon^M}\hat{V}_i^M\left(\varepsilon'\right)d\Phi\left(\varepsilon\right)$$
and
$$\hat{V}_i^S\left(\varepsilon^M, \varepsilon^D\right) = \frac{U_i^S + \beta\hat{E}_i^M}{1-\beta\Phi\left(\varepsilon^M\right)}$$
. $\hat{V}_i^M\left(\varepsilon'\right)$ represents the spline approximation to the value function $V_{t-1,f}^M\left(\varepsilon\right)$ computed in the previous iteration. Knowing the values, makes it trivial to compute the gains from marriage $T_i\left(\varepsilon\right)$, net of the Pareto weight for the current period. We then solve for the $\mu\left(\varepsilon\right) = \omega\mu^E\left(\varepsilon\right) + \left(1-\omega\right)\mu^N\left(\varepsilon\right)$ where μ^E and μ^N are the Pareto weights implied by the Egalitarian and Nash bargaining solution concepts, respectively.

2. With the thresholds $\left(\varepsilon^M, \varepsilon^D\right)_t$ in hand, we now compute the value functions $\left\{V_{ti}^M\left(\varepsilon\right)\right\}$ on a grid of marriage-quality $\left[\varepsilon^D, \bar{\varepsilon}\right]$, where the upper bound is chosen far enough into the right-hand tail of the distribution so that it will be rarely reached, making approximation errors inconsequential[1]. The solution for $\mu\left(\varepsilon\right)$ is computed at this step for every ε on the grid.

3. We compute spline coefficients to approximate the value functions $\left\{V_{ti}^M\left(\varepsilon\right)\right\}$.

4. If the thresholds $\left(\varepsilon^M, \varepsilon^D\right)_t$ are close enough to the current conjectures $\left(\varepsilon^M, \varepsilon^D\right)_{t-1}$, we proceed to the next step. Otherwise we re-set the conjectures to the new values and return to step 1.

[1] Things are a bit trickier when ε is very persistent. The algorithm relies on a linear interpolation method to correct the prediction error for high ε. It is easily shown that this method becomes arbitrarily accurate as the persistence of ε increases. The reason is that with high persistence, the divorce probability is zero for high enough values of ε, so the value of marriage is easily computed.

5. We can now simulate the economy. Given a sample size of N women per age, we generate a matrix S of random shocks of size $(65-18) \times N$ to cover the ages 18-65. There is also a vector of N initial shocks S_0. The shocks are uniformly distributed on $[0,1]$.The first step in the simulation consists of assigning initial marital status to the 18-year olds; if the initial shock $S_0(i) < F_0$ then woman i is assumed to be married by age 18. The parameter F_0 is set equal to the fraction of 18 year olds in the CPS who are married in the year of the calibration, roughly 2% for 2003, and 9% for 1975. The simulation then proceeds through each age group a, determining marital status in each age according to the previous marital status and the shock vector equal to the $a-$th row of the shock matrix S.The time allocation of married women with quality ε is determined by a spline approximation to $\mu(\varepsilon)$. Once all age groups have been simulated, the summary statistics are computed from the weighted sum of the averages for each age, where the weight vector is drawn from the population age distribution for that year's sample of married women aged 18-65 in the March CPS.

6. The statistics from the simulated population are compared to the empirical targets. If they are close enough, the procedure ends with $P^* = P$; if not, then a new parameter set P' is chosen, and we return to step 1.

Variable	1985	
	Model 1	Model 2
Intercept	-1.588	-2.579
	(7.107)	(6.735)
Log Wage Ratio	-0.718	-0.827
	(0.601)	(0.524)
Wife is Working		-0.732
		(0.190)
Husband is Working		1.067
		(0.293)
Wife's Age	0.133	0.152
	(0.385)	(0.365)
Wife's Age Squared	-0.002	-0.002
	(0.005)	(0.005)
R-Squared	0.0099	0.122395

Table A1: *Estimates of log-linear model of home-hours ratios on the wage ratio*

	Total	Marriages	Marriage Rate	Population Aged 18-65	Mariage per woman aged 18-65	Married Fraction ages 18-65	Single Population aged 18-65	Marriage rate, single women aged 18-65
1960	180,671	1523	8.43	100,803	30.22	0.83	17,136	17.8%
1975	215,973	2153	9.97	127,937	33.66	0.677	41,324	10.4%
2003	290,210	2245	7.74	180,510	24.87	0.553	80,688	5.6%
	Divorce Base*	Divorces	Divorce Rate	Population Aged 18-65	Divorce Base 18-65	Married Fraction ages 18-65	Married population 18-65	Divorce rate per marriage
1960	180,671	395	2.19	100,803	100,803	0.83	83,666	0.94%
1975	215,973	1036	4.80	127,937	127,937	0.677	86,613	2.39%
2003	239,000	908.2	3.8	180,510	150,850	0.553	83,420	2.18%

Table A2: *Conversion of NCHS marriage rates to relevant populations.* *Divorce base excludes, for 2003 data for California, Hawaii, Indiana, Louisiana and Oklahoma; same as population for other years. Vital statistics source: *Statistical Abstract of the United States: 2008*. Population from March CPS and 1960 Census. Population and Events in thousands; Rates per 1000

Year	CPS Percentages ages 18-65			Age 18		Age 65		Smoothed Hazard Rates	
	Currently Married	Ever Married	Currently Single	Currently Married	Ever Married	Currently Married	Ever Married	Divorce	Marriage
1975	68.42	80.56	31.58	0.09	0.10	0.67	0.94	0.025	0.093
1976	67.73	80.06	32.27	0.10	0.10	0.69	0.95	0.025	0.087
1977	66.77	79.46	33.23	0.08	0.09	0.67	0.93	0.025	0.081
1978	65.43	78.60	34.57	0.07	0.08	0.66	0.93	0.024	0.077
1979	64.70	77.74	35.30	0.07	0.08	0.65	0.93	0.024	0.075
1980	63.98	77.52	36.02	0.07	0.07	0.67	0.95	0.025	0.074
1981	62.91	77.02	37.09	0.06	0.07	0.69	0.95	0.024	0.072
1982	62.23	76.51	37.77	0.07	0.07	0.68	0.94	0.024	0.071
1983	61.86	75.79	38.14	0.05	0.06	0.69	0.96	0.024	0.070
1984	61.25	75.46	38.75	0.05	0.05	0.69	0.94	0.023	0.067
1985	60.86	75.70	39.14	0.05	0.05	0.68	0.95	0.022	0.066
1986	60.67	75.59	39.33	0.05	0.05	0.69	0.95	0.022	0.063
1987	60.64	75.35	39.36	0.04	0.04	0.68	0.94	0.023	0.063
1988	60.08	74.92	39.92	0.04	0.04	0.70	0.96	0.022	0.062
1989	59.83	74.72	40.17	0.04	0.04	0.69	0.95	0.020	0.055
1990	59.54	74.69	40.46	0.04	0.05	0.70	0.95	0.020	0.055
1991	58.84	74.23	41.16	0.03	0.04	0.70	0.95	0.020	0.053
1992	58.61	74.19	41.39	0.04	0.04	0.70	0.96	0.021	0.052
1993	58.63	74.10	41.37	0.04	0.05	0.67	0.95	0.020	0.052
1994	57.57	73.40	42.43	0.03	0.04	0.67	0.96	0.019	0.049
1995	57.94	73.70	42.06	0.02	0.03	0.68	0.96	0.019	0.051
1996	57.20	73.27	42.80	0.03	0.03	0.70	0.96	0.019	0.051
1997	56.47	73.05	43.53	0.03	0.04	0.66	0.96	0.019	0.049
1998	56.50	72.95	43.50	0.02	0.03	0.70	0.97	0.020	0.052
1999	56.14	72.51	43.86	0.02	0.03	0.69	0.96	0.019	0.049
2000	56.35	72.52	43.65	0.03	0.03	0.68	0.96	0.019	0.050
2001	56.00	72.22	44.00	0.02	0.03	0.71	0.96	0.018	0.049
2002	55.62	71.85	44.38	0.02	0.02	0.70	0.96	0.018	0.048
2003	55.48	71.87	44.52	0.02	0.02	0.69	0.96	0.018	0.046

Table A2: *Marriage and Divorce rates for population aged 18-65.* Hazard rates computed from Marital-state shares reported in the March CPS

Weekly Hours	Singles				Married			
	Women		Men		Women		Men	
	Time-Survey	Adjusted to CPS	Time-Survey	Adjusted to CPS	Time-Survey	Adjusted to CPS	Time-Survey	Adjusted to CPS
1975								
Paid Work	19.24	21.26	27.47	25.55	15.51	15.08	38.73	38.01
Job-Related	3.72	4.11	4.86	4.52	2.72	2.64	6.48	6.36
Home Production	24.27	21.72	9.82	10.51	34.27	35.25	11.49	11.70
Total Work	47.23	47.09	42.15	40.58	52.50	52.97	56.70	56.07
Non-Working Hours	70.77	70.91	75.85	77.42	65.51	65.03	61.3	61.93
Total	118	118	118	118	118	118	118	118
Time-Survey Freq.	250		149		719		671	
CPS Population Share	12.12		13.87		37.78		36.23	
2003								
Paid Work	24.83	24.09	30.28	26.90	22.54	23.05	38.87	36.62
Job-Related	2.64	2.56	3.68	3.27	2.08	2.13	4.1	3.86
Home Production	20.53	21.14	11.88	13.21	30.74	30.04	16.59	17.55
Total Work	48.00	47.79	45.84	43.38	55.36	55.22	59.56	58.03
Non-Working Hours	70.01	70.21	72.17	74.62	62.65	62.78	58.43	59.97
Total	118	118	118	118	118	118	118	118
Time-Survey Freq.	3347		2405		4238		3912	
CPS Population Share	19.55		20.94		30.34		29.17	

Table A3: *Reconciliation of Working Hours from Time-Use Surveys to CPS Paid Work Time.* Averages weighted by CPS population distribution. Adjustment includes reallocating paid work hours to, or from, unpaid work and non-work to match CPS paid hours.

Statistic		Experiments					
		Equipment Price	Income and Wage Growth	Tax Schedule	Technology	q level	Work Costs
		(1)	(2)	(3)	(4)	(5)	(6)
Marriage rate		0.078	0.110	0.091	0.104	0.031	0.107
Divorce Rate		0.025	0.020	0.023	0.025	0.049	0.025
Wife/husband leisure ratio		1.056	1.039	1.055	1.064	1.045	1.061
Paid work	Wives	15.58	11.62	15.02	14.71	15.28	15.43
	Husbands	37.56	34.3	37.64	37.8	37.42	39.94
	Single women	21.51	20.99	22.07	21.34	21.34	22.75
	Single men	25.66	23.76	26.19	25.55	25.55	27.06
Home work	Wives	33.87	36.54	35.1	35.15	35.15	35.23
	Husbands	11.25	12.14	11.66	11.68	11.68	11.7
	Single women	21.04	21.72	21.55	21.77	21.77	21.74
	Single men	9.763	10.59	10.38	10.5	10.5	10.49
Leisure	Wives	65.18	67.19	64.62	64.93	64.26	65.12
	Husbands	61.74	64.7	61.23	61.04	61.48	61.35
	Single women	71.62	71.55	70.44	71.08	71.08	71.09
	Single men	78.01	79.41	76.76	77.4	77.4	77.57

Table A4: *Other results with flexible Pareto weights*.

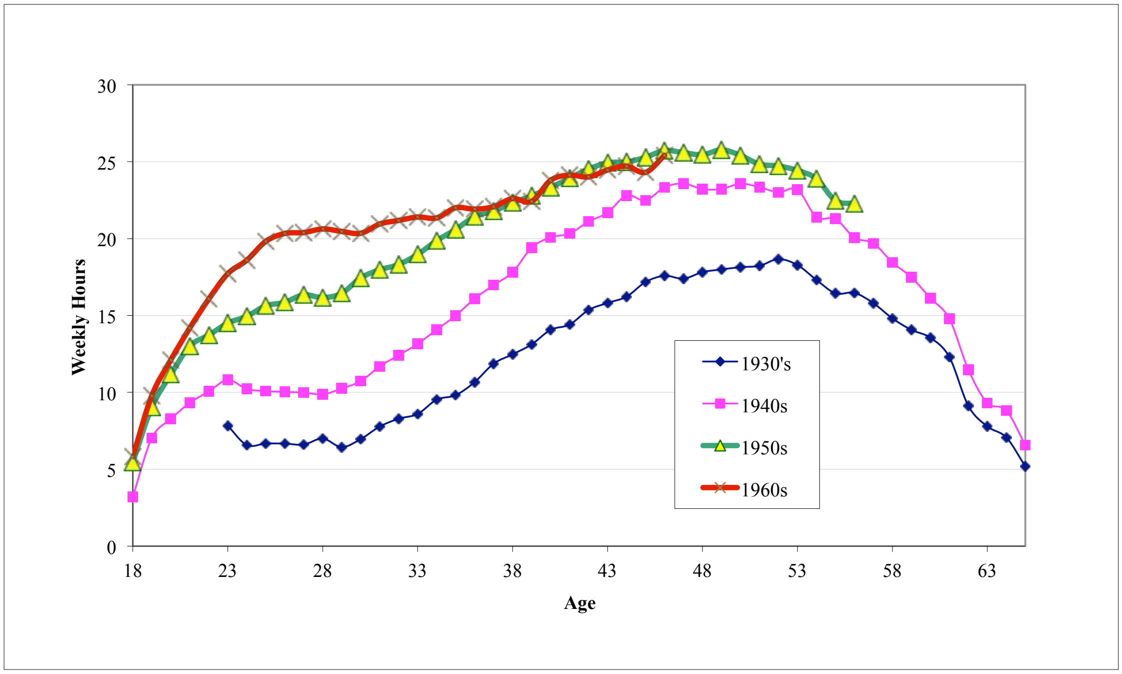

Figure A1 (a): *Weekly Paid Hours of Married Women by Birth Cohort in the March CPS*

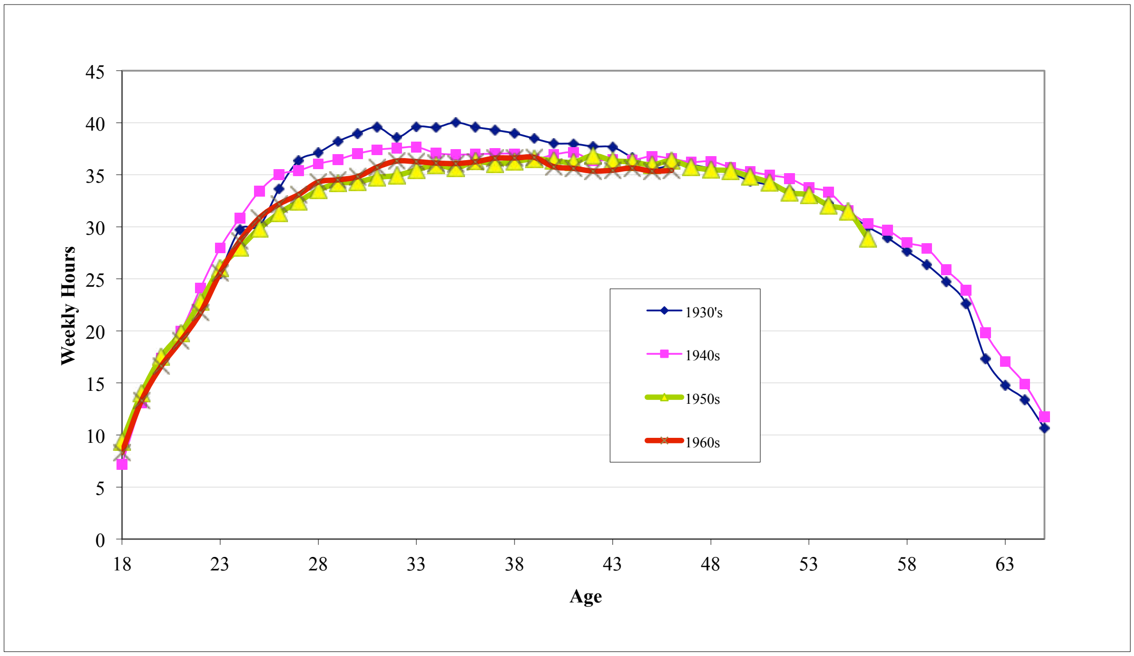

Figure A1(b): *Weekly Paid Hours of Married Men by Birth Cohort in the March CPS*

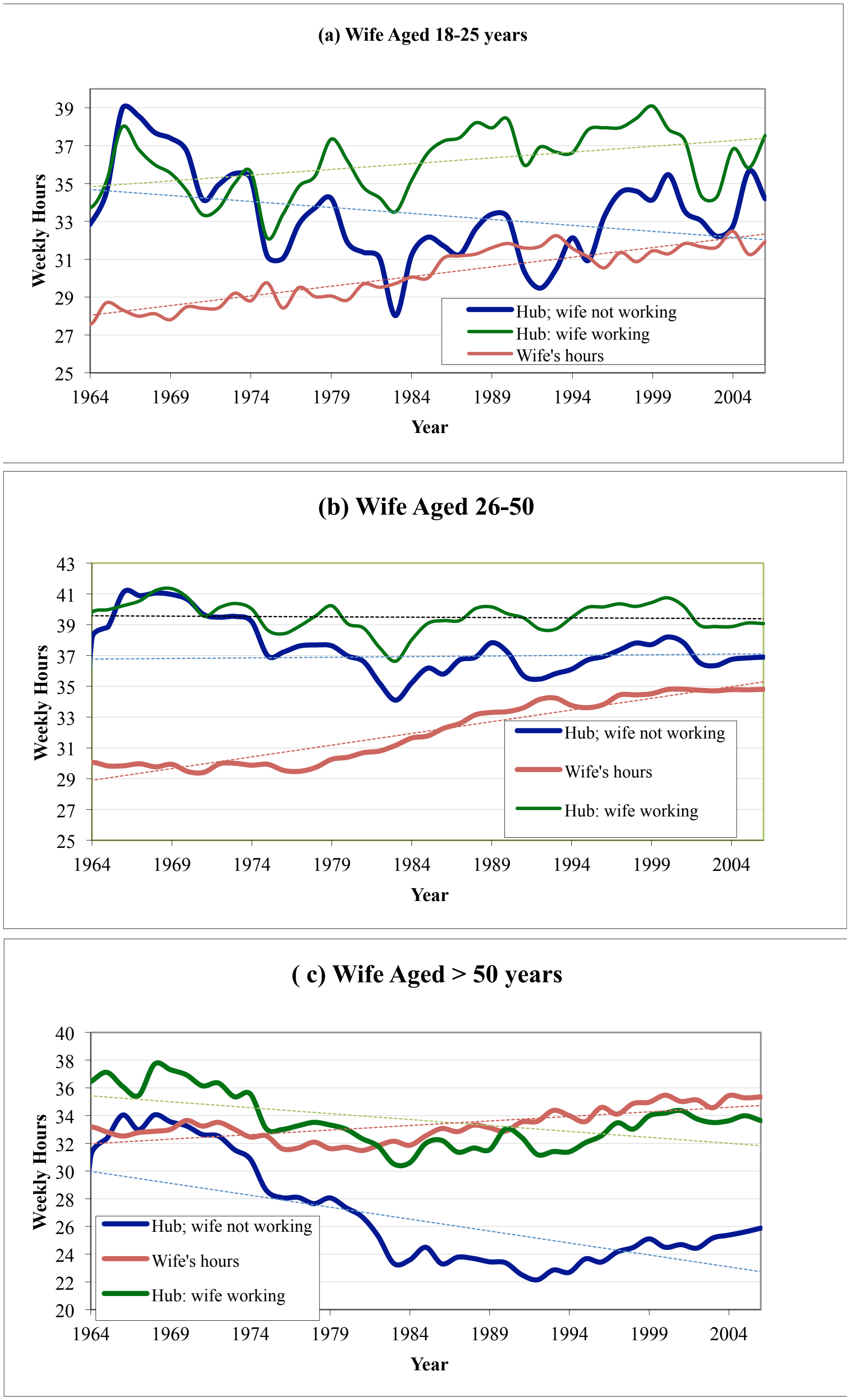

Figure A2: *Weekly Paid Hours of husbands and wives From March CPS, by age sex and work status of wife.*

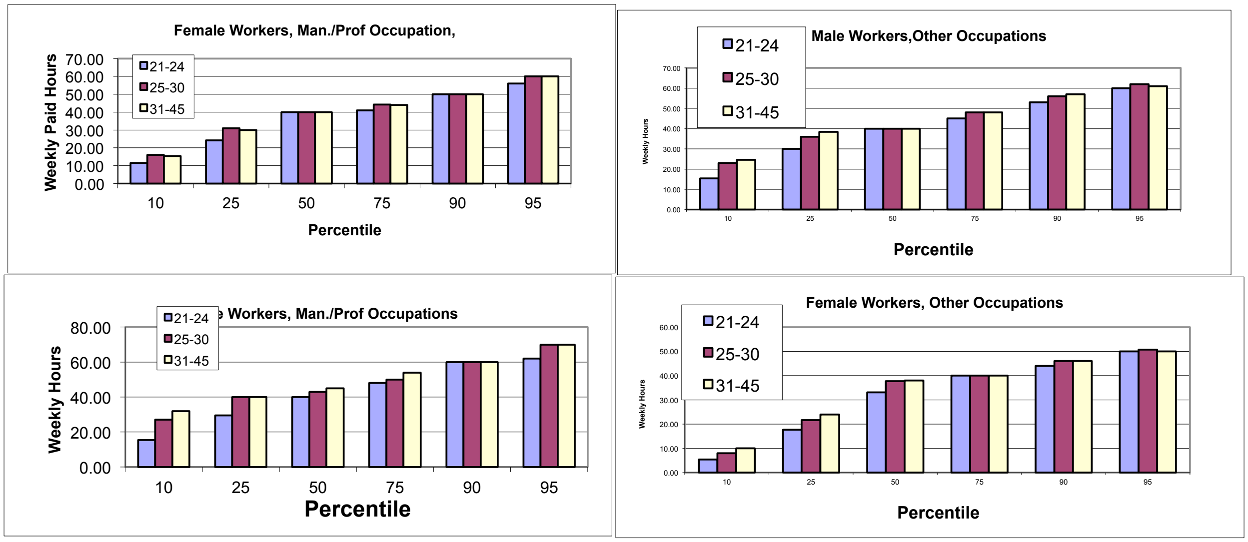

Figure A3(a): *Dispersion in paid hours per worker,* March CPS, 1994-1997, by age of worker

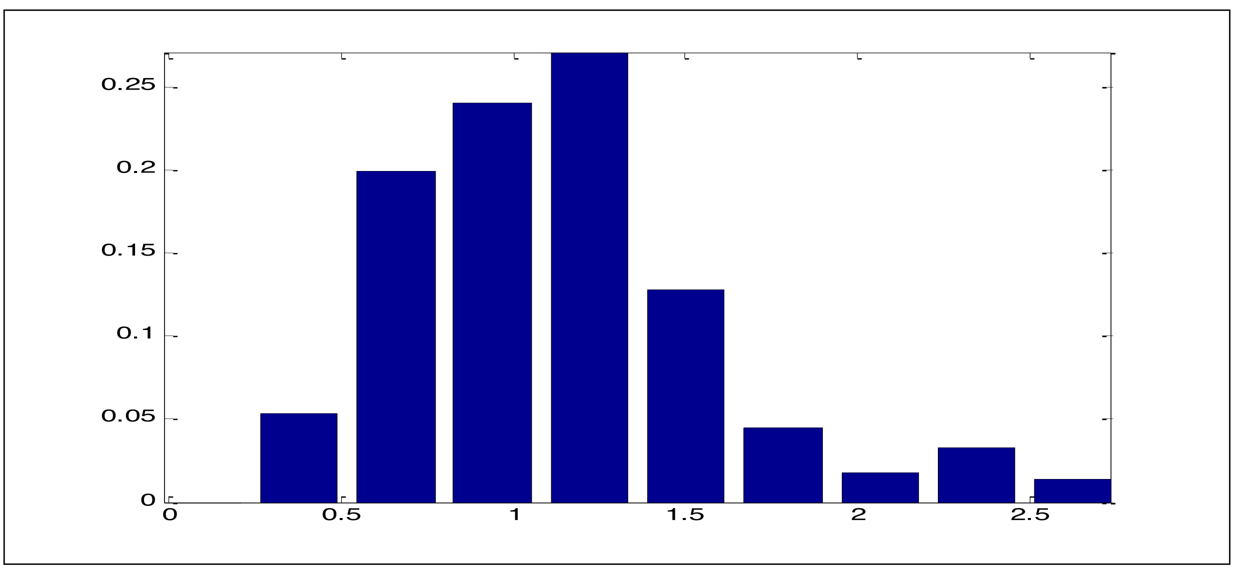

Figure A3 (b): *Husband-Wife Ratios of Non-working time*. Based on computations from the survey, *Americans' Use of Time, 1985*

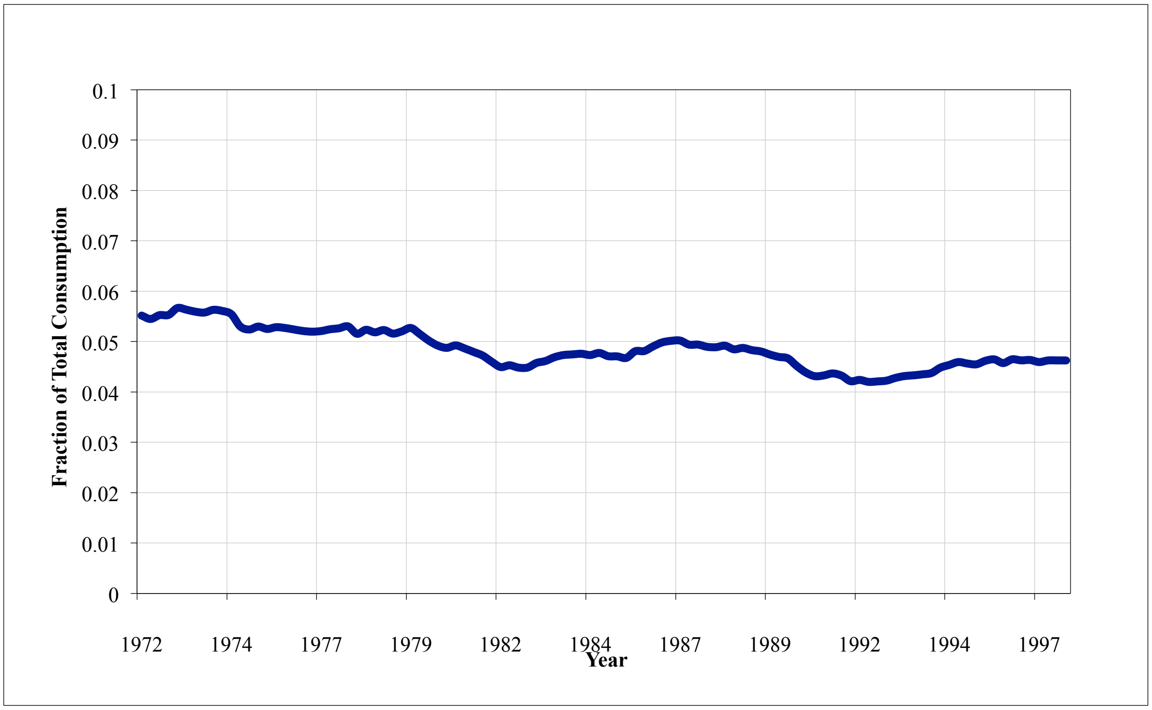

Figure A4(a): *Spending share of Home Equipment in the NIPA*, 1972-1997. Source: BEA Table 2.3.3. Real Personal Consumption Expenditures by Major Type of Product, Quantity Indexes

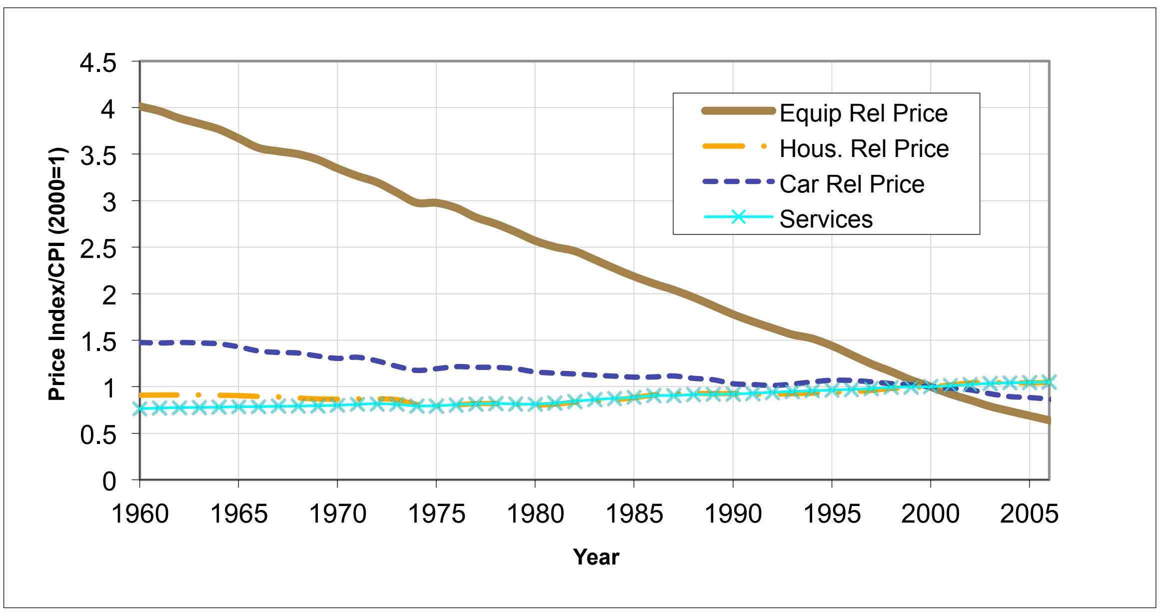

Figure A4(b): *Relative Price of Home Equipment and Furniture. Source:* BEA Table 2.3.4. Price Indexes for Personal Consumption Expenditures by Major Type of Product . http://www.bea.gov/bea/dn/nipaweb

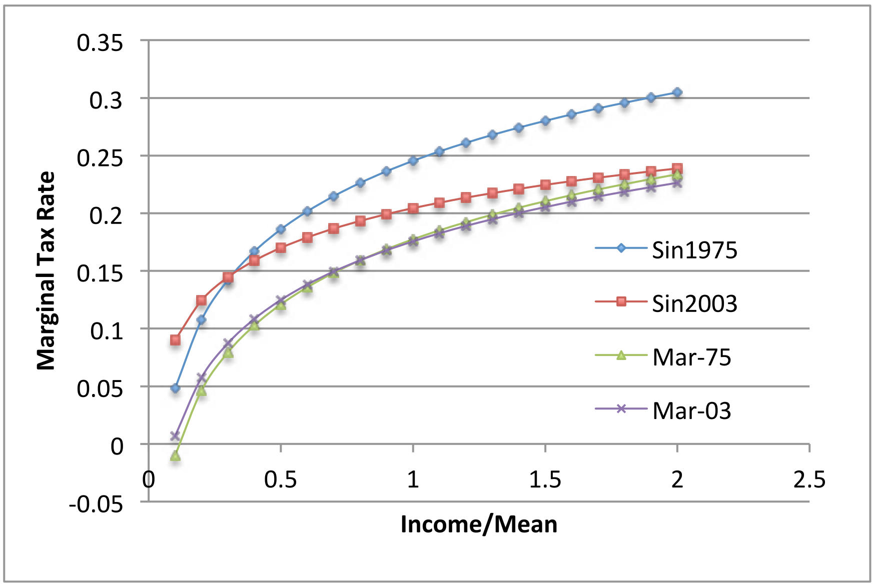

Figure A6: *Marginal Tax Rates*. Imputed from IRS Summary Data.