Women's career choices, social norms and child policies: Online Appendix

A.1 Couples' optimization

A.1.1 Only the mother enters the high-career path (couple ℓh)

If the couple adopts the "anti-norm" in that the mother chooses the full-time job while the father enters the flexible job market, the mother's psychological costs amount to $\gamma(\max\{0; c_f^{M,t-1} - 0\}) = \gamma c_f^{M,t-1}$. Noting that $p = y$ and $c_m + c_p = 1$, the couple's optimization problem can be written as:

$$\max_{c_m} \quad W_{\ell h} = y + \alpha q + v(c_m) + \beta v(1 - c_m) - \gamma c_f^{M,t-1}. \tag{A.1}$$

The first order condition with respect to c_m is given by:

$$c_{\ell h}^* \equiv c_m^* : \quad v'(c_{\ell h}^*) = \beta v'(1 - c_{\ell h}^*).$$

In words, the marginal utility from home child care equals the marginal benefit from private care. Inserting $c_{\ell h}^*$ back into (A.1) yields:

$$W_{\ell h}^* = y + \alpha q + v(c_{\ell h}^*) + \beta v(1 - c_{\ell h}^*) - \gamma c_f^{M,t-1}, \tag{A.2}$$

where the couple's optimal consumption is $y + \alpha q$.

A.1.2 Both parents enter the low-career path (couple $\ell\ell$)

If both parents choose the low-career path, the costs of the social norm are zero for the mother. Again, noting that $c_p = 1 - c_m - c_f$ and $p = y$ the couple's optimization problem reads as:

$$\max_{c_m, c_f} \quad W_{\ell\ell} = y + v(c_f + c_m) + \beta v(1 - c_f - c_m).$$

The father's and mother's optimal child care provisions are implicitly given by:

$$v'(c_f^* + c_m^*) - \beta v'(1 - c_f^* - c_m^*) \leq 0, \text{ if either } c_f^* \text{ or } c_m^* \text{ are zero} \tag{A.3}$$

$$v'(c_f^* + c_m^*) - \beta v'(1 - c_f^* - c_m^*) = 0, \text{ if } c_f^*, c_m^* > 0 \tag{A.4}$$

These first-order conditions show that from the couple's perspective, it is of no importance who takes care of the children, and all combinations of c_f and c_m, such that:

$$c_{\ell\ell}^* \equiv c_f^* + c_m^* : \quad v'(c_{\ell\ell}^*) - \beta v'(1 - c_{\ell\ell}^*) = 0, \tag{A.5}$$

are optimal. The couple's optimal consumption is y and welfare is given by:

$$W_{\ell\ell}^* = y + v(c_{\ell\ell}^*) + \beta v(1 - c_{\ell\ell}^*). \tag{A.6}$$

A.2 Parental leave

The formal proof proceeds in four steps.

(i) First consider low-career couples. Given that, with PL, workers can keep their labor income y and remain at home with their child, all mothers in the low-career path will opt into PL: $W_\ell^{PL} > W_\ell^* \; \forall q$. In addition, given that with PL informal child care has no opportunity cost in the low-career path, traditional mothers will provide more informal care with PL than in the $LF (c_\ell^{PL} > c_\ell^*)$.

(ii) Now compare the welfare of $\ell-$couples and $h-$couples when they opt into PL. Entering the high-career path assures the mother the future prospect $\alpha k q$; as a consequence being a high-career couple and opting in PL is a dominant strategy: $W_h^{PL} > W_\ell^{PL} \; \forall \; q$. Moreover, traditional and career mothers face the same tradeoff when choosing child care under PL so that they provide the same amount of informal care ($c_\ell^{PL} = c_h^{PL} > c_\ell^*$).

(iii) Consider now high-career couples deciding whether to opt in PL or not. The opportunity cost of PL, $\alpha k q$, is increasing in q. Assume that there exists a marginal couple $\tilde{q}^{PL} < \bar{q}$ such that $W_h^{PL} > W_h^*$ for $q < \tilde{q}^{PL}$ and $W_h^{PL} \leq W_h^*$ for $q \geq \tilde{q}^{PL}$.[1] So far we know that, when PL is an option, all couples enter the high-career path and that:

$$W_h^{PL} > W_\ell^{PL} > W_\ell^*, \quad \forall q \in [0, \bar{q}] \,. \tag{A.7}$$

Hence, labor income is larger with PL than without. However, we must also consider how PL affects the social cost of the norm. We see that those couples with q lower than the threshold $\tilde{q}^{PL}$ opting into PL provide more informal care than in the LF. This implies that the cost of the social norm imposed on mothers not providing informal care is higher than in LF.

(iv) To evaluate the net welfare gain from PL we now have to check whether the share of mothers providing informal care is higher under PL or in the LF. This amounts to examining whether $\tilde{q}^{PL}$ is lower or larger than $\hat{q}^*$. From (A.7) it must be true that:

$$W_h^{PL} > W_\ell^{PL} > W_h^* = W_\ell^* \text{ for } q = \hat{q}^*. \tag{A.8}$$

Given that $W_h^{PL} > W_h^*$ for $q < \tilde{q}^{PL}$, (A.8) implies that $\hat{q}^* < \tilde{q}^{PL}$. In addition, we know from Assumption 1 that the norm is binding in LF, hence $q^M < \hat{q}^* < \tilde{q}^{PL}$ and the norm is binding under PL as well. We thus conclude that the share of couples where mothers work full time and provide no informal care is lower when PL is an option. Moreover, full-time working mothers suffer a higher norm cost because informal child care is now larger $\left(c_h^{PL} > c_\ell^*\right)$.

A.3 General norm

Assume that the norm cost is given by $\gamma(\max\{0; c^T - c_\ell\})$, where the "target level" is given by:

$$c^T = K(G(\widehat{q}))c_\ell.$$

when $K(G) = G$, c^T is the average level of informal care. When $K(G) = 0$ for $G \leq 1/2$ and $K(G) = 1$ when $G > 1/2$, c^T is the median.

[1] Our argument goes through with some minor amendments when $\tilde{q}^{PL} > \bar{q}$.

Social welfare is given by:

$$\max_{c_\ell,\hat{q}} \quad SW = \int_0^{\hat{q}} [y+q]g(q)\mathrm{d}q + G(\hat{q})\left[v(c_\ell)+\beta v(1-c_\ell)\right]$$
$$+\int_{\hat{q}}^{\bar{q}} [y+q(1+\alpha)]g(q)\mathrm{d}q + (1-G(\hat{q}))\left[\beta v(1)-\gamma c^T\right],$$

Differentiating wrt. c_ℓ yields:

$$G(\hat{q})\left[v'(c_\ell)-\beta v'(1-c_\ell)\right]-(1-G(\hat{q}))\,K(G(\hat{q}))\gamma=0,$$

or

$$v'(c_\ell)=\beta v'(1-c_\ell)+\gamma\frac{(1-G(\hat{q}))\,K(G(\hat{q}))}{G(\hat{q})}.$$

Then the Pigouvian subsidy is equal to:

$$s^P=\gamma\frac{(1-G(\hat{q}))\,K(G(\hat{q}))}{G(\hat{q})},$$

which can be rewritten as:

$$\gamma\frac{(1-G(\hat{q}))}{G(\hat{q})},$$

for the median when $G\geq 1/2$ (the norm is binding) and to

$$\gamma\,(1-G(\hat{q}))\,,$$

for the mean. Differentiating welfare wrt. $\hat{q}$ yields:

$$-\alpha\hat{q}g(\hat{q})+g(\hat{q})\left[v(c_\ell)+\beta v(1-c_\ell)\right]-g(\hat{q})\beta v(1)+g(\hat{q})\gamma c^T-\gamma\,(1-G(\hat{q}))\,\frac{\partial c^T}{\partial\hat{q}}=0$$
$$-\alpha\hat{q}+\left[v(c_\ell)+\beta v(1-c_\ell)\right]-\beta v(1)+\gamma c^T-\gamma\frac{(1-G(\hat{q}))}{g(\hat{q})}\frac{\partial c^T}{\partial\hat{q}}=0. \tag{A.9}$$

With a general norm, Equation (21) which defines the marginal couple with a uniform subsidy can be written as:

$$-\alpha\hat{q}+v(c_\ell)+\beta\left[v(1-c_\ell)-v\,(1)\right]+\gamma c^T-sc_\ell=0, \tag{A.10}$$

where $\hat{q}$ and c_ℓ in (A.9)–(A.10) are the same, namely the FB levels (to be implemented). And c^T is computed using the FB level of informal. It then follows that s^P decentralizes the $\hat{q}^{FB}$ when:

$$s^P c_\ell=\gamma\frac{(1-G(\hat{q}))}{g(\hat{q})}\frac{\partial c^T}{\partial\hat{q}}, \tag{A.11}$$

where $c_p=1-c_\ell$ for traditional couples.

For the mean we have:

$$\gamma\frac{(1-G(\hat{q}))}{g(\hat{q})}\frac{\partial c^T}{\partial\hat{q}}=\gamma\,(1-G(\hat{q}))\,c_\ell,$$

so that Condition (A.11) is satisfied.

In general we have

$$\gamma \frac{(1-G(\hat{q}))}{g(\hat{q})} \frac{\partial c^T}{\partial \widehat{q}} = \gamma \frac{(1-G(\hat{q}))}{g(\hat{q})} K'(G(\hat{q})) g(\hat{q}) c_\ell = \gamma (1-G(\hat{q})) K'(G(\hat{q})) c_\ell,$$

which means that (A.11) is satisfied when:

$$\gamma (1-G(\hat{q})) K'(G(\hat{q})) c_\ell = \gamma \frac{(1-G(\hat{q})) K(G(\hat{q}))}{G(\hat{q})} c_\ell \tag{A.12}$$

$$K'(G(\hat{q})) = \frac{K(G(\hat{q}))}{G(\hat{q})},$$

which is true only when K is linear.

Now we show that when:

$$K'(G(\hat{q})) < \frac{K(G(\hat{q}))}{G(\hat{q})}, \tag{A.13}$$

as in (23), the Pigouvian subsidy is too large in the sense that it yield too many h couples. To see this substitutes (A.9) and (A.13) in the LHS of (A.10) which shows that when $\widehat{q}$ is at the FB level we have:

$$-\alpha \hat{q} + [v(c_\ell) + \beta v(1-c_\ell)] - \beta v(1) + \gamma c^T - s^P c_\ell < 0,$$

so that the FB marginal couple now prefers to be h. This is what we have for the median where $K' = 0$. This also explains why the SB level of s is smaller than s^P.

In general this is true when K is (strictly) concave (which is true for the median, when the norm binds). When K is a logistic function, it is first convex and then concave. The inequality is then true when $\hat{q}$ is sufficiently large (on the upper part of the curve), but it would be reversed otherwise.