Comments on "An Analysis of Women's Fertility and Labor Supply: Implications for Family Policies" by Yonnyoung Cho

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The model captures the critical relationship between female labor supply and fertility, observed in Korean and also in Japan. Korean female labor supply, when labor participation rate is plotted against age, is "M shaped", meaning there are two peaks, one before child bearing and one after. In fact, the number of child births plotted against age is single peaked, at the ages 20-40, where the labor supply curve dips. Working and child bearing are substitutes for women. This is demonstrated very clearly in the paper.

The paper makes two very important contributions to the economic analysis of female labor supply and fertility. First, it is the first model, to the best of my knowledge in which the female agent makes labor participation and fertility decisions simultaneously. Previous papers have only considered choice of one of the two, assuming the other choice is exogenous. Secondly, the paper provides a multi-dimensional evaluation of public policies aimed at increasing fertility. That is, not only the extent of achieving a policy goal (typically in terms of number of children or hours worked), but associated costs and tax revenue are also considered. It is shown that taking costs factors in to account, conditional childcare subsidy is the most effective policy in achieving the same increase in number of children. The other polices considered are, child allowances, prenatal tax credits, and maternal or childcare leaves.

(1) The effect of number of children on utility[1]

Utility depends on number and quality of children. They enter the utility function separately meaning there is no substitution between the two as there would be if they were in the utility function as a product. Extra child increases fixed cost of raising children, z, shifting the budget constraint while it does not effect production of quality, $q = f(g, m)$, where q is quality, g is quantity of goods, and m is maternal time. There is only implicit cost of increasing quality of children, through the budget constraint. Thus more children leaves less maternal time and labor to buy goods in the budget constraint through z.

This formulation makes conditional childcare subsidy very effective. The policy provides goods G *. per child*. While the marginal cost of raising child quality increased only implicitly, now there is direct benefit to quality from one extra child. There is no doubt that this is model correctly as an in-kind subsidy but it seems to create extra benefit from having extra children, not originally present in the utility function.

[1] Comments in this section have been changed from those of the conference, taking into account my misunderstanding and the authors reply.

(2) Wage profile is independent of age

As stated in footnote 7, wages are independent of time. The current model thus assumes the opportunity cost of not working is the same at age 20 as it is at age 30. Thus there is no effect of "establishing a career" meaning uninterrupted work history results in a wage profile that is increasing on average. The assumption also fails to capture the long term cost of interrupted work where not only does the wage profit not increase but it decreases because there is only part time or low skilled work available once a woman has been out of the work force to raise children.

(3) Timing of child bearing

This is a very rich model and there are other features of equilibrium behavior that should be explored.

a. The relationship between hours worked, age and timing of child bearing in equilibrium should be calculated. In particular, it should be verified if the labor supply is M shaped in if child bearing age graph is single peaked (Figure II in the paper). The precision of the model has already been demonstrated to be very good (Table 4) . Reproduction of the M curve would give even a stronger endorsement. The trade off between hours worked and quality and time to improve children should generate the M curve. However there is also the fixed cost of children which shifts the income curve. This might mean a woman needs to work more when there are more children.
b. Find the timing of first births. It has been great concern in East and Southeast Asian countries that marriage age is increasing, delaying birth of first child. Given probability of conception decreases with age, a policy that shortens the time between marriage and first child would be attractive. This could be another dimension that a policy could be evaluated by.

(4) Introduction of uncertainty

The outcome of decision to have a child is in reality probabilistic. There is a positive probability that this decision results in no child. As mentioned above, probability of conception changing with age affects fertility when people marry later. It would be interesting to see how this knowledge effects decision to bear children. One predicts that this would hasten decision to have children and would offset the effect of "career" effect of a wage profile. Calculating the timing with both birth uncertainty and a non-constant wage profile will provide more interesting comparisons among different policies.

(5) Effect of bundled work

As the author states in the conclusion, "If part time jobs as well as maternal leaves are available, greater number of women would work and benefit from maternal leaves". If wage profiles were independent of work history, it would make decision to interrupt work less costly. If 48 hours per week could be distributed over all 7days of the week and 24

hours of the day, it would make working full time more compatible with child rearing. The model could be extended in the future to include bundled and unbundled (or constrained work, integer problem) of working so that more policies can be compared. There could be policies that are not that costly but turn out to be quite effective in increasing fertility while not reducing female labor participation when this aspect of work is incorporated into the model.