Do constraints on market work hours change home production efforts?

by Geng Li

Summary
The study empirically analyses whether workers that face market work constraints spend a different amount of hours on housework than workers that do not feel constrained. For the analysis, data for 1968-1986 from the PSID is used, as well as HRS data for 1992-2006. Survey information determines whether workers are upward constrained (work less than they desire) or downward constrained (work more than they desire). Information about yearly working hours and yearly hours of housework is available.
The analysis starts with a small stylized model to gain theoretical insights. As outcomes it is found that upward constrained workers do not spend the entire deficit of market work with home production, but also increase leisure, and the downward constrained do allocate their lack of nonmarket time not only to a reduction in housework but also to a reduction in leisure.
Regressions are run for three outcome variables: housework time, food-out ratios (ratio food expenditures eating out versus total food expenditures, including home produced food), and vacation time (=time off work). Dummy indicators for being upward constrained and downward constrained are included among a range of other regressors, like race, education, income, wage rates, age marital status, and children by age. Regressions (both linear and pooled) are run for pooled data (basically identifying the dummies for constraints by comparing constrained workers with unconstrained workers) and fixed and random effects specification (which also take into account changes in constraint status within households over time).
The results show that the upward constrained workers spend more time on housework than the unconstrained workers (the effects get smaller but remain once controlled for random or fixed effects), their food-out ratio is lower, whereas effect on vacation time is ambiguous, depending on marital status and the inclusion of fixed or random effects (it gets positive in the latter case). For downward constrained workers we see no differences with the unconstrained (only the married spouses seem to spend more time on housework, an effect that disappears once fixed effects are controlled for), also no effects on food-out time and vacation.

Comments
The theoretical issue is based on comparing the same worker in the situation he is constrained and in the situation he is not. If we consider the adding up constraint for time, and assume that total time is the aggregate of work time, housework time, and leisure, then if someone who works less than desired, the sum of housework time and leisure is larger than desired. Then the question is: is it housework time that is larger than in the desired situation, is it leisure time, both, or could it even be possible that one of them is smaller than in the desired situation? Someone feeling upward constrained has a high valuation of consumption relative to the valuation of leisure, in a situation where utility is derived from consumption and leisure only.

To increase consumption if income is not sufficient due to working hours constraints, he can 'produce' consumption at home, so it is likely that he will spend more time on housework compared to the situation he could work his desired amount of market hours. Without further assumptions, the amount of leisure could even be smaller for the upward constrained worker than for the unconstrained worker, but the stylized theoretical model predicts that leisure will be larger as well. What also matters for the quantitative outcome is how much weight the worker attaches to consumption relative to leisure: what is the shape of the marginal utility functions? In other words, are the upward constrained workers more income constrained or are they more like workaholics? So far I have started my comments by writing down some intuitive economic arguments about the problem, because that is what I am missing in the exposition of this paper. Theoretical predictions are in this paper very much based on this stylized model, but without this model we can come very far. I am missing the story behind the model, telling us what which economic mechanisms play a role here.

Next, an explanation about the origin of constraints on market hours is missing. It seems as if the constraints are exogenously imposed. But even for two workers facing the same labor market environment, the one may feel constrained, while the other does not. Being constrained is a mixture of restrictions stemming from the demand side of the labor market, someone's abilities (determining productivity and wages), and someone's own mix of preferences for consumption and leisure. That means that heterogeneity of workers and selectivity issues play a potentially very important role. In that light it is questionable whether it makes much sense (from an empirical point of view) to present a theoretical model analysis that compares the same worker in the situation where he is constrained and where he is unconstrained. Also, it is questionable whether we can address the issue empirically simply by including a dummy variable for being constrained as a regressor in the analysis.

My detailed comments follow.

1. In section 3 a simple and quite restrictive model is chosen to derive some theoretical predictions. I am certainly not against using simple and restrictive models for this purpose, as we usually can gain many insights from such analysis. But it is very important to discuss how the model restricts behavior and in which direction outcomes are affected if alternatives are chosen. Equation (1) assumes that market consumption goods can always, in a more or less perfect way, be substituted by home produced goods. It precludes, for instance, that home produced goods are inferior and market goods are normal (as, for instance, could be the case for cleaning jobs) or the other way around (as, for instance, in the case of childcare). Utility function (2) precludes complementarity of consumption goods and leisure as the marginal utility of consumption does not depend on leisure. It also precludes that some housework production time may generate utility by itself (positively or negatively). Equation (1) precludes that some market goods can simply not be produced at home, or workers lack the skills for home production. The issues mentioned here are not just academic details, but will affect the behavioral outcomes.

2. Throughout it is ignored that someone who is downward restricted also have the choice to quit.
3. The whole analysis from the second half page 6 on through the end of section 3 is unnecessarily complicated and therefore redundant. We can interpret the equation (1) as a production function for the composite consumption good *C*, which, after substituting for $C_M = N$ and $C_H = g(H)$ shows how *C* can be generated with market time inputs *N* and household time *H* (as shown in equation (4)). Since the function *g* is concave, *N* has a linear marginal effect before it is raised to the power ρ whereas the marginal effect of *H* is always decreasing. In the unconstrained case, by (5) and (6) marginal effects on utility are equal. If, from that point on, we decrease *N* (to show the effects of upward constraints), increasing *H* by the same amount cannot recover the consumption level. The lower productivity of *H* makes it less attractive to use it and the increase in *H* will be smaller than the decrease in *N*. As a consequence, leisure will increase. Only if *N* and *H* are perfect substitutes ($\rho = 1, \alpha = 0.5$) we get 1 on 1 replacement of market time by housework time and leisure not change (this latter result is implicitly also addressed by the author, just below equation (12), in a much less concise way. Two conclusions: 1). The exposition can be simplified a lot; 2). The 'qualitative' theoretical conclusion by the author very much depend on the functional form assumption (1).
4. Nowadays the household production model is often considered an important framework for the simultaneous analysis of time choices of spouses. Therefore it is somewhat disappointing that the analysis in this paper is done on individual basis only. In the empirical specifications, spouses' variables are exogenously added, whereas the theoretical exposition does not address the spouses' impacts. I can understand that data limitations play a role here, but nevertheless it limits the scope of the analysis.
5. Page 11, half way: "The changes occurred … the same employer". That needs not be true. If the head becomes upside constrained, the wife may want to work more to increase household income, and at that point she may discover herself constrained as well, even if she works for a different employer.
6. Section 5, the econometrics. For being upside and downside constrained, dummy variables *UC* and *DC* are included at the right hand side. But doing this assumes that first there is an exogenous constraint and next on the basis of that the number of housework hours is chosen. In fact, the worker solves his time allocation problem, including the determination of market hours, housework hours, and leisure, and comparing the outcome with the available working hours determines whether he is constrained or not. Being constrained or not largely depends on the same parameters as the choice of housework hours. Therefore, equations (16) and (17) cannot be interpreted as structural economic equations and the parameter estimates of *UC* and *DC* do not measure causal effects of these variables. The mechanism explaining how *UC* and *DC* are determined is not modeled here whereas in fact they are endogenous. See, for instance, Stewart and

Swaffield (1997, EJ) or Bloemen (2008, JOLE) for approaches that econometrically incorporate the constraints.

7. It is striking that the author, for the 'more quantitative analysis' uses different and additional underlying regression approaches than before. Is this an implicit recognition that the earlier approach is not sufficient?
8. The variable income is included in the regressions. This probably also includes earnings, which, for given wage rates, are higher the higher are working hours, so the variable is potentially endogenous as well.
9. In the theoretical model, the wage rate was normalized to one. In labor supply theory, the wage rate plays an important role in determining the desired working hours, and therefore in determining whether someone is constrained. Search theory suggests that workers have higher reservation wages for jobs with hours further away from the desired level.
10. In table 2 we see that the summary statistics of the downside constrained are much more similar to those of the not constrained than the upside constrained. We also find that result back in the regressions: being downside constrained hardly matters for the outcome variables, whereas being upside constrained does. This, together with the earlier doubts about the causal interpretation of the regression equations, makes me wonder how far the results are driven by heterogeneity between the upside constrained at the one hand and the other groups at the other hand. Apparently there are observed characteristics that determine selection into the state of being upside constrained. This selection process, though, is not modeled here, as has already been mentioned before.