Problem Set #1-Key

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Economics 421- Seminar in Labor Economics

Introduction to the Labor-Leisure Model I: Labor Supply

Theoretic Analysis

(1) A wage increase will induce both an income and substitution effect on the hours worked of a utility maximizing consumer.
- (i) Explain the substitution effect of a wage increase on hours worked.
- (ii) Explain the income effect of a wage increase on hours worked.
- (iii) Using the labor leisure model, show the effect of a wage increase on hours worked if the substitution effect dominates the income effect. Explain fully and show graphically.
- (iv) Using the labor leisure model, show the effect of a wage increase on hours worked if the income effect dominates the substitution effect. Explain fully and show graphically.
- (v) Using the labor leisure model, show the effect of a wage increase on hours worked if the income effect and the substitution effect are of equal size. Explain fully and show graphically.
- (vi) What are the implications of your answers in c-e on the shape of the labor supply curve?

Empirical Analysis

The following questions all relate to the data set CPS-10.dta.

Note: For all estimated labor supply regressions include only prime age workers for whom usual weekly hours, weeks worked per year, non-labor income and wages are all positive.

(2) (i) Estimate the following equation: $h_i = \beta_0 + \beta_1 \log(\text{wage})_i + \beta_2 \log(\text{non-labor income})_i + \beta_3 Z_i$ where Z is vector of personal characteristics of individual i.
In Z include years of schooling, age, the number of children under 6, number of children between age 18 and 6.

(ii) Interpret your regression coefficients: Are they the expected sign, are they significant, how well does the model explain labor supply?

(3) (i) Run a separate regression for men. Describe your results.

(ii) Prior empirical research indicates the presence of a backward bending supply curve at upper wage rates. Run a regression for men with a wage below $25 per hour. Describe your results.

(iii) Run a regression for men with a wage above $25 per hour. Describe your results.

(iv) How could you account for the both the positively sloped and the backward bending portion of the labor supply function in your regression equation? Run this regression and describe your results.

(4) (i) Run a separate regression for women. Describe your results.

(ii) Run a regression for women with a wage below $25 per hour. Describe your results.

(iii) Run a regression for women with a wage above $25 per hour. Describe your results.

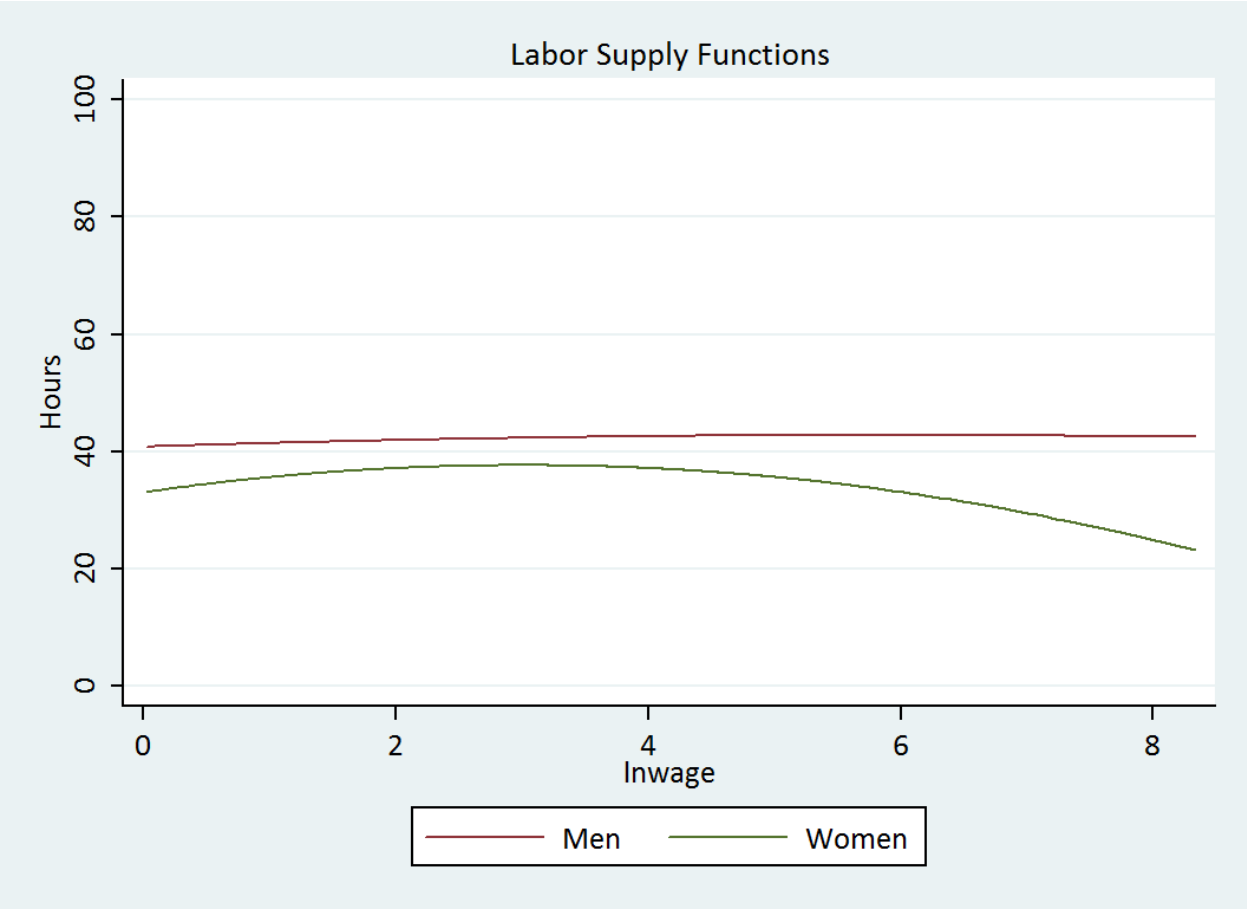
(iv) How could you account for the both the positively sloped and the backward bending portion of the labor supply function in your regression equation? Run this regression and describe your results.

(5) (i) Run separate double log regressions for men and women and obtain their respective wage elasticities of supply. Describe your results.

Table 1-Estimated Labor Supply Functions for Problem Set #1

	(2)	(3i)	(3ii)	(3iii)	(3iv)	(5)	(4i)	(4ii)	(4iii)	(4iv)	(5)
	All	Men	Men Under $25	Men Over $25	Men Quadratic	Men	Women	Women Under $25	Women Over $25	Women Quadratic	Women
VARIABLES	Hours	Hours	Hours	Hours	Hours	lnHours	Hours	Hours	Hours	Hours	lnHours
lnwage	0.244***	-0.932***	-0.0511	-2.155***	0.242	0.0383***	-0.334***	1.537***	-5.392***	2.579***	0.151***
	[0.0631]	[0.0831]	[0.136]	[0.189]	[0.182]	[0.00502]	[0.0923]	[0.127]	[0.291]	[0.233]	[0.00901]
lnwage2					-0.218***	-0.0128***				-0.565***	-0.0351***
					[0.0302]	[0.000830]				[0.0415]	[0.00161]
lnNLI	-0.539***	-0.256***	-0.241***	-0.268***	-0.253***	-0.00645***	-0.438***	-0.442***	-0.357***	-0.426***	-0.0164***
	[0.0225]	[0.0281]	[0.0386]	[0.0412]	[0.0281]	[0.000773]	[0.0342]	[0.0395]	[0.0666]	[0.0341]	[0.00132]
school	0.436***	0.631***	0.572***	0.771***	0.653***	0.0170***	0.478***	0.269***	1.134***	0.520***	0.0170***
	[0.0170]	[0.0217]	[0.0289]	[0.0343]	[0.0219]	[0.000603]	[0.0250]	[0.0282]	[0.0541]	[0.0251]	[0.000972]
age	0.0738***	0.109***	0.113***	0.106***	0.112***	0.00310***	0.0207***	-0.00760	0.116***	0.0248***	0.000745***
	[0.00516]	[0.00675]	[0.00854]	[0.0113]	[0.00675]	[0.000186]	[0.00734]	[0.00809]	[0.0164]	[0.00732]	[0.000283]
_child6	0.0924	0.818***	0.909***	0.666***	0.831***	0.0222***	-1.357***	-1.189***	-1.611***	-1.315***	-0.0514***
	[0.0719]	[0.0879]	[0.120]	[0.132]	[0.0878]	[0.00242]	[0.110]	[0.126]	[0.223]	[0.110]	[0.00425]
child6to18	-0.179***	0.693***	0.680***	0.718***	0.705***	0.0196***	-0.993***	-1.002***	-0.901***	-0.972***	-0.0353***
	[0.0432]	[0.0564]	[0.0776]	[0.0831]	[0.0564]	[0.00155]	[0.0616]	[0.0684]	[0.134]	[0.0614]	[0.00238]
Constant	35.50***	33.78***	32.00***	36.39***	31.87***	3.410***	36.23***	35.59***	39.08***	31.89***	3.377***
	[0.376]	[0.474]	[0.696]	[0.939]	[0.542]	[0.0149]	[0.550]	[0.668]	[1.544]	[0.634]	[0.0246]
Observations	52,515	26,217	15,402	10,534	26,217	26,217	26,298	19,395	6,639	26,298	26,298
Adjusted R-squared	0.031	0.052	0.045	0.066	0.053	0.052	0.037	0.039	0.119	0.044	0.048

Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1


Labor Supply Functions
Hours
0
20
40
60
80
100
0
2
4
6
8
lnwage
Men
Women