Classical Labor Supply: Blundell, Duncan and Meghir (1998)

ECON 34430: Topics in Labor Markets

T. Lamadon (U of Chicago)

Winter 2016

Remember

- We start with the following expression:

$$h_{it} = \alpha + \alpha_w \log(w_{it}) + \alpha_r R_{it} + \epsilon_{it}$$

  and $\eta_H = \alpha_w - \alpha_R wh$

- if $\mathbb{E}[\epsilon_{it}|w_{it}, R_{it}] = 0$, then all good, just run OLS
- but many reasons to believe that ϵ_{it} is correlated with both w_{it} and R_{it}
  - hours and wages might depend positively on taste for work
  - selection into work

A group estimator

- Blundell, Duncan, Meghir (1998) proposes a group estimator
- Consider case without income effect, and assume g denotes the group of the individual, P_{it} is participation

$$h_{it} = \alpha + \alpha_w \log(w_{it}) + \epsilon_{it}$$

$$\mathbb{E}[u_{it}|g, t, P_{it}] = a_g + m_t$$

- the exogeneity restriction is at the group level (not $\mathbb{E}[u_{it}|w_{it}] = 0$)
- the additivity imposes common trends
- the choice of groups is central

Diff and Diff interpretation

- 2 groups, 2 time periods we get:

$$\Delta_t \mathbb{E}[h_{it}|P_{it}, g_1, t] = \alpha_w \Delta_t \mathbb{E}[\log(w_{it})|P_{it}, g_1, t] + \Delta_t m_t \quad (1)$$
$$\Delta_t \mathbb{E}[h_{it}|P_{it}, g_2, t] = \alpha_w \Delta_t \mathbb{E}[\log(w_{it})|P_{it}, g_2, t] + \Delta_t m_t \quad (2)$$

- and so we have that:

$$\alpha_w = \frac{\Delta_t \mathbb{E}[h_{it}|P_{it}, g_1, t] - \Delta_t \mathbb{E}[h_{it}|P_{it}, g_2, t]}{\Delta_t \mathbb{E}[\log(w_{it})|P_{it}, g_1, t] - \Delta_t \mathbb{E}[\log(w_{it})|P_{it}, g_2, t]}$$

- as long as the denominator is $\neq 0$ we can recover α_w.
- it requires for the post-tax wage growth to be different in different groups

What did we gain?

- We exchange $\mathbb{E}[u_{it}|P_{it}, w_{it}]=0$ with $\mathbb{E}[u_{it}|P_{it}, g, t] = a_g + m_t$
- this allows for taste heterogeneity as long as the difference across group remains fixed over time.
- it also allows for common time shocks
- In diff-in-diff you can test the common trend assumption using pre-trends (not clear they did it here)

Extensions from the simple model

1. control for participation
2. introduce non labor income
3. control for effect of discontinuity in tax schedule

Ext 1 : Control for participation

- They use a selection correction
- Following Heckman (74,79), if you have a participation decision and joint normality you can
  1. estimate participation decision using probit $P_{it} \sim \gamma Z_i t$
  2. then add the inverse Mills ratio λ_{it} as regressors to main equation
  3. here this is done at the group level
- They assume $\mathbb{E}[u_{it}|P_{it}, g, t] = a_g + m_t + \delta\lambda_{gt}$
- where λ_{gt} is derived using a participation equation

Ext 2 : Non earned income

- Recall original equation with income effect, we need to control for non-earned income
- Supplement regressors with $\mu_{it} = c_{it} - w_{it} h_{it}$
- dealing with saving decisions?

Ext 3 : Discontinuity in tax schedule

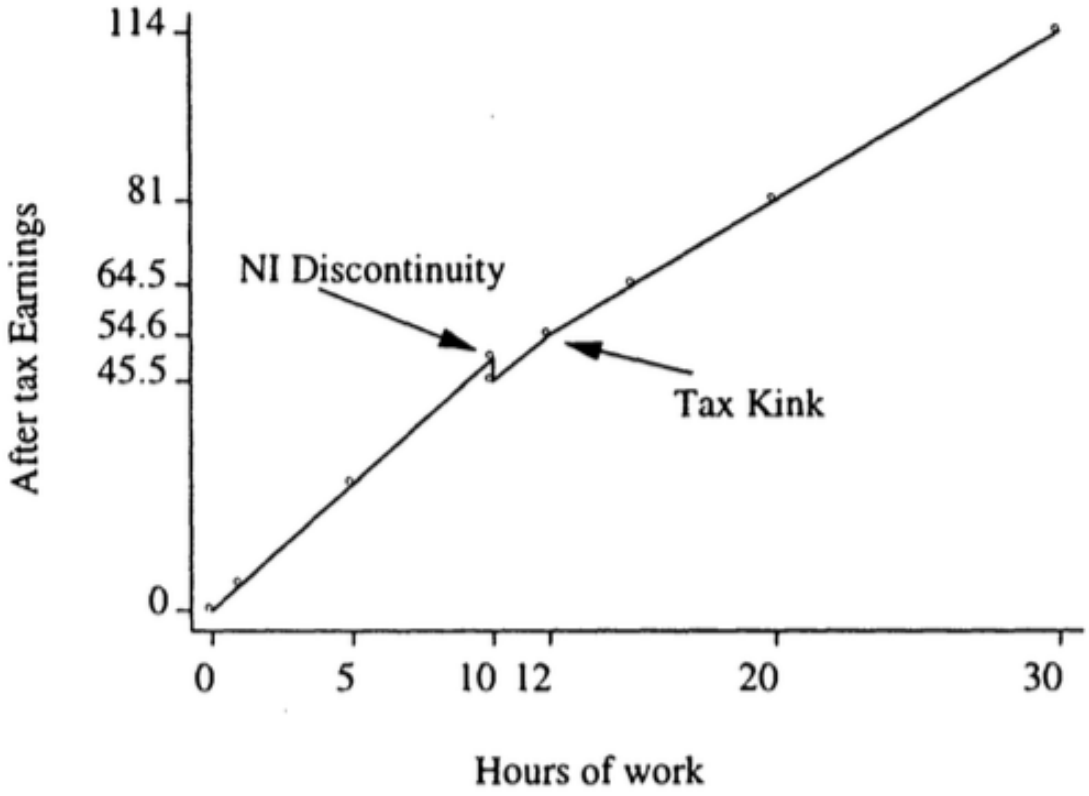

FIGURE 1.—The budget constraint (illustrated for NI rate 9%, tax rate 25%, pre-tax wage £5).

- this is another selection problem
- estimate another selection equation with another Mills ratio
- or, exclude individuals around the kink

Data

- UK Family expenditure survey (1978-1992)
- married or cohabiting women with employed partners
- 16781 women
- repeated cross-section, no panel, so group approach is important
- groups are cohort decade interacted with education
- differential variation in wage growth is due to
  - differential tax changes across groups
  - differential wage gains across groups

TABLE I

TAX REFORMS FOR THE YEARS 1978 TO 1992

Year	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92
Basic rate	33	30	30	30	30	30	30	30	29	27	25	25	25	25	25
Top rate	83	60	60	60	60	60	60	60	60	60	40	40	40	40	40
Tax All. (%Δ)	0	8	0	−10	0	8	2	2	0	0	2	0	0	−3	−2
NI	6.50	6.50	6.75	7.75	8.75	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
VAT	8	15	15	15	15	15	15	15	15	15	15	15	15	17.5	17.5

Note: "Tax All. (%Δ)" denotes real percentage change in the tax allowance. The basic rate, the top rate, NI, and VAT are in percentage terms. The top rate is the maximal applicable income tax marginal rate. From 1988 the top rate was the only rate higher than the basic rate.

Results 1

- it appears that selection into participation is not very important
- however selection at the kink might be, and selection on wages as well

Other Income						
No Children	0.000	0.000	0.013	−0.008	0.018	0.018
	0.015	*0.015*	*0.013*	*0.001*	*0.015*	*0.013*
DK02	−0.028	−0.028	−0.016	−0.037	−0.004	−0.004
	0.016	*0.016*	*0.014*	*0.005*	*0.016*	*0.014*
DK34	−0.022	−0.021	−0.008	−0.030	0.002	0.002
	0.017	*0.017*	*0.016*	*0.009*	*0.016*	*0.015*
DK510	−0.014	−0.014	−0.001	−0.023	0.010	0.011
	0.015	*0.015*	*0.013*	*0.003*	*0.015*	*0.013*
DK11 +	−0.011	−0.010	0.002	−0.019	0.009	0.009
	0.014	*0.014*	*0.012*	*0.003*	*0.014*	*0.012*
Residuals						
Wage	−6.699	−6.758	−5.246		−7.435	−7.405
	2.482	*2.455*	*2.204*		*2.820*	*2.426*
Other Income	−0.008	−0.009	−0.021		−0.029	−0.029
	0.015	*0.015*	*0.013*		*0.015*	*0.013*
Tax Kink	0.336	0.321				
	0.082	*0.083*				
Participation	0.258				−0.071	
	0.450				*0.347*	

Results 2

TABLE IV

ELASTICITIES: GROUPING INSTRUMENTS: COHORT AND EDUCATION

	Wage	Compensated Wage	Other Income	Group Means: Hours	Wage	Income
No Children	0.140	0.140	0.000	32	2.97	88.63
	(0.075)	(0.088)	(0.041)			
Youngest Child 0–2	0.205	0.301	−0.185	20	3.36	129.69
	(0.128)	(0.144)	(0.104)			
Youngest Child 3–4	0.371	0.439	−0.173	18	3.10	143.64
	(0.150)	(0.159)	(0.139)			
Youngest Child 5–10	0.132	0.173	−0.102	21	2.86	151.13
	(0.117)	(0.127)	(0.109)			
Youngest Child 11 +	0.130	0.160	−0.063	25	2.83	147.31
	(0.107)	(0.117)	(0.084)			

- all income effect are negative, consistent with theory
- strongest effect is for mother with 3-4 children

References