

Modeling the allocation of time under rationing:

A structural model of time allocation behavior

Supplementary appendix

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Wage equation with correction for selectivity

	Wage equation		Selection equation	
	Coefficient	Standard error	Coefficient	Standard error
Age	0.025	0.012	0.133	0.027
Age ²	-0.030	0.011	-0.180	0.030
High educ.	0.193	0.049	0.396	0.120
Medium educ.	0.039	0.044	0.206	0.096
Upper non-manual	0.579	0.074	0.812	0.261
Lower non-manual	0.353	0.050	0.471	0.124
Skilled manual	0.299	0.044	0.318	0.098
White	-0.002	0.109	0.319	0.212
Unemployment rate	0.002	0.005	-0.040	0.011
North	0.046	0.088	-0.108	0.216
Midlands	0.090	0.091	0.027	0.223
Eastern	0.174	0.099	-0.129	0.244
South-east	0.151	0.090	-0.193	0.220
South-west	-0.032	0.097	-0.223	0.235
Scotland	0.083	0.098	-0.327	0.232
Young children	-	-	-0.792	0.077
Old children	-	-	-0.289	0.045
Intercept	0.733	0.270	-1.259	0.588
ρ	0.11	0.09		
LR test of $\rho = 0$	1.15	p=0.2841		

Table 1: Wage equation for women with Heckman correction for selectivity.

Parameter estimates

Parameter	Single women		Single men	
	Coefficient	Standard error	Coefficient	Standard error
$\gamma_{Vol. work}$	-17.44	7.06	-16.74	8.06
$\gamma_{Social act.}$	-2.07	0.40	-2.27	0.59
γ_{Sports}	-6.35	1.51	-4.85	1.60
$\gamma_{Home prod.}$	-1.73	0.36	-1.20	0.20
$\gamma_{Media act.}$	-4.40	0.79	-4.33	0.91
γ_{Other}	-0.45	0.14	-0.41	0.15
γ_{Sleep}	-1.37	0.52	0.85	0.41
γ_q	-2.08	1.92	-2.98	1.42

Table 2: Estimates of the γ s for single men and women.

	Vol. work	Social act.	Sports	Home prod.	Media act.	Other	q
Intercept	-0.17 (0.41)	-1.31 (0.16)	-1.01 (0.31)	-1.54 (0.16)	-0.70 (0.15)	-1.95 (0.14)	-1.18 (0.24)
Age/10	0.70 (0.16)	-0.06 (0.19)	0.40 (0.15)	1.38 (0.23)	0.38 (0.12)	-0.02 (0.24)	-0.58 (0.40)
High educ.	-0.04 (0.04)	0.08 (0.06)	0.09 (0.05)	-0.11 (0.06)	-0.07 (0.04)	0.13 (0.07)	0.34 (0.14)
Med. educ.	0.01 (0.05)	-0.05 (0.06)	0.00 (0.05)	-0.07 (0.06)	-0.04 (0.04)	-0.03 (0.09)	0.31 (0.14)
Car	0.05 (0.04)	-0.03 (0.05)	0.04 (0.04)	-0.05 (0.05)	-0.02 (0.03)	0.11 (0.07)	0.44 (0.13)
Saturday	0.07 (0.05)	0.20 (0.06)	-0.01 (0.05)	0.11 (0.06)	-0.01 (0.04)	0.06 (0.07)	-0.63 (0.14)
Sunday	-0.09 (0.04)	0.06 (0.06)	-0.13 (0.04)	-0.05 (0.05)	-0.05 (0.04)	-0.29 (0.07)	-1.12 (0.15)

Table 3: Estimates of β_j for single women. Standard errors in parenthesis.

	Vol. work	Social act.	Sports	Home prod.	Media act.	Other	q
Intercept	-0.09 (0.57)	-1.22 (0.25)	-1.00 (0.34)	-1.88 (0.20)	-0.46 (0.15)	-1.78 (0.17)	-0.56 (0.28)
Age/10	0.76 (0.28)	0.17 (0.28)	0.07 (0.26)	1.87 (0.30)	0.42 (0.18)	0.22 (0.31)	-0.35 (0.54)
High educ.	0.12 (0.07)	0.09 (0.07)	0.26 (0.08)	-0.06 (0.07)	-0.08 (0.05)	0.28 (0.09)	0.28 (0.15)
Med. educ.	-0.03 (0.08)	-0.03 (0.08)	0.18 (0.08)	-0.16 (0.08)	-0.02 (0.05)	0.16 (0.09)	0.01 (0.17)
Car	0.01 (0.07)	0.09 (0.07)	-0.02 (0.07)	-0.11 (0.07)	-0.16 (0.05)	0.01 (0.08)	0.43 (0.14)
Saturday	-0.04 (0.07)	0.20 (0.08)	0.06 (0.08)	0.25 (0.08)	0.08 (0.05)	-0.02 (0.09)	-0.77 (0.15)
Sunday	-0.13 (0.07)	0.07 (0.08)	-0.02 (0.08)	-0.02 (0.07)	0.04 (0.05)	-0.20 (0.08)	-1.07 (0.16)

Table 4: Estimates of β_j for single men. Standard errors in parenthesis.

	$\sigma_{Vol. work}$	$\sigma_{Social act.}$	σ_{Sports}	$\sigma_{Home prod.}$	$\sigma_{Media act.}$	σ_{Other}	σ_q
$\sigma_{Vol. work}$	0.09 (0.03)	.	.	.	.	.	.
$\sigma_{Social act.}$	0.03 (0.01)	0.29 (0.05)	.	.	.	.	.
σ_{Sports}	0.05 (0.01)	0.02 (0.01)	0.14 (0.04)	.	.	.	.
$\sigma_{Home prod.}$	0.05 (0.01)	0.01 (0.01)	0.04 (0.01)	0.27 (0.05)	.	.	.
$\sigma_{Media act.}$	0.04 (0.01)	-0.02 (0.01)	0.03 (0.01)	0.06 (0.01)	0.13 (0.02)	.	.
σ_{Other}	0.08 (0.02)	0.07 (0.02)	0.05 (0.01)	0.00 (0.02)	0.00 (0.01)	0.45 (0.07)	.
σ_q	0.07 (0.02)	-0.01 (0.03)	0.10 (0.03)	-0.11 (0.04)	0.00 (0.02)	0.14 (0.04)	1.03 (0.11)

Table 5: Covariance matrix of unobservables for single women. Standard errors in parenthesis.

	$\sigma_{Vol. work}$	$\sigma_{Social act.}$	σ_{Sports}	$\sigma_{Home prod.}$	$\sigma_{Media act.}$	σ_{Other}	σ_q
$\sigma_{Vol. work}$	0.16 (0.07)	.	.	.	.	.	.
$\sigma_{Social act.}$	0.14 (0.03)	0.42 (0.12)	.	.	.	.	.
σ_{Sports}	0.05 (0.02)	0.05 (0.02)	0.30 (0.09)	.	.	.	.
$\sigma_{Home prod.}$	0.04 (0.02)	0.06 (0.03)	0.04 (0.02)	0.38 (0.06)	.	.	.
$\sigma_{Media act.}$	0.04 (0.01)	0.01 (0.02)	0.06 (0.01)	0.06 (0.01)	0.18 (0.04)	.	.
σ_{Other}	0.12 (0.03)	0.15 (0.03)	0.06 (0.02)	0.01 (0.02)	0.01 (0.02)	0.58 (0.09)	.
σ_q	0.06 (0.04)	0.09 (0.05)	-0.02 (0.06)	-0.10 (0.05)	0.04 (0.03)	0.19 (0.05)	1.28 (0.10)

Table 6: Covariance matrix of unobservables for single men. Standard errors in parenthesis.

Parameter	Estimate	Standard error
$\gamma_{Vol. work f}$	-3.04	0.70
$\gamma_{Social act. f}$	-1.14	0.12
$\gamma_{Sports f}$	-2.22	0.41
$\gamma_{Home prod. f}$	-1.74	0.17
$\gamma_{Media act. f}$	-1.52	0.14
$\gamma_{Other f}$	-0.37	0.05
$\gamma_{Sleep f}$	3.32	0.06
$\gamma_{Vol. work m}$	-2.98	0.85
$\gamma_{Social act. m}$	-1.34	0.12
$\gamma_{Sports work m}$	-2.95	0.49
$\gamma_{Home prod. work m}$	-1.30	0.11
$\gamma_{Media act. work m}$	-1.77	0.15
$\gamma_{Other work m}$	-0.34	0.04
$\gamma_{Sleep work m}$	1.68	0.07
γ_q	3.43	0.31

Table 7: Estimates of the γ s for couples.

	Vol. work _f	Social act. _f	Sports _f	Home prod. _f	Media act. _f	Other _f	Sleep _f	Vol. work _m	Social act. _m	Sports _m	Home prod. _m	Media act. _m	Other _m	q
Intercept	-2.61 (0.49)	-1.80 (0.24)	-2.21 (0.36)	-0.89 (0.22)	-0.92 (0.22)	-1.65 (0.22)	-0.09 (0.20)	-3.19 (0.64)	-1.89 (0.15)	-1.62 (0.24)	-1.63 (0.12)	-0.76 (0.09)	-1.75 (0.11)	-0.24 (0.15)
Female age/10	1.84 (0.99)	-0.54 (0.80)	0.83 (0.85)	0.63 (0.77)	0.65 (0.75)	-0.71 (0.75)	0.13 (0.71)	1.68 (0.96)	-0.79 (0.42)	0.88 (0.50)	-0.38 (0.36)	0.18 (0.30)	-0.18 (0.39)	0.53 (0.56)
Female high educ.	-0.01 (0.10)	0.06 (0.09)	0.20 (0.10)	-0.04 (0.09)	-0.14 (0.08)	0.17 (0.08)	-0.01 (0.08)	-0.06 (0.09)	0.01 (0.05)	0.09 (0.05)	0.00 (0.04)	-0.09 (0.03)	0.10 (0.05)	0.03 (0.06)
Female med. educ.	0.01 (0.09)	0.00 (0.08)	0.10 (0.09)	0.00 (0.08)	-0.07 (0.08)	0.05 (0.08)	-0.01 (0.08)	-0.06 (0.08)	0.01 (0.04)	0.01 (0.05)	-0.02 (0.04)	-0.03 (0.03)	0.05 (0.04)	-0.01 (0.06)
Male age/10	-0.04 (0.97)	0.86 (0.80)	-0.15 (0.84)	0.31 (0.77)	-0.13 (0.75)	0.54 (0.74)	-0.29 (0.71)	-0.19 (0.85)	1.13 (0.42)	-0.46 (0.48)	1.08 (0.34)	0.34 (0.30)	0.20 (0.38)	-0.76 (0.55)
Male high educ.	-0.06 (0.10)	-0.15 (0.09)	-0.11 (0.09)	-0.23 (0.09)	-0.20 (0.08)	-0.17 (0.08)	-0.20 (0.08)	0.21 (0.09)	0.12 (0.05)	0.21 (0.05)	0.09 (0.04)	-0.04 (0.03)	0.12 (0.05)	-0.01 (0.06)
Male med. educ.	-0.14 (0.10)	-0.07 (0.08)	-0.04 (0.09)	-0.13 (0.08)	-0.08 (0.08)	-0.15 (0.08)	-0.11 (0.07)	0.04 (0.09)	0.05 (0.04)	0.12 (0.05)	0.09 (0.04)	0.02 (0.03)	0.02 (0.04)	-0.02 (0.06)
Young children	0.05 (0.16)	0.11 (0.14)	0.04 (0.14)	0.00 (0.13)	-0.12 (0.13)	0.14 (0.13)	0.02 (0.12)	0.25 (0.16)	0.02 (0.07)	-0.06 (0.08)	0.11 (0.06)	-0.15 (0.05)	0.10 (0.07)	0.46 (0.09)
Old children	0.40 (0.09)	0.36 (0.08)	0.32 (0.08)	0.69 (0.07)	0.37 (0.07)	0.36 (0.07)	0.32 (0.07)	0.03 (0.08)	0.03 (0.03)	-0.02 (0.04)	0.10 (0.03)	-0.05 (0.02)	0.01 (0.03)	-0.08 (0.05)
Car	0.04 (0.04)	-0.02 (0.03)	-0.02 (0.04)	0.09 (0.03)	-0.03 (0.03)	0.04 (0.03)	-0.02 (0.02)	0.05 (0.03)	0.02 (0.02)	0.04 (0.02)	0.05 (0.02)	0.00 (0.01)	0.04 (0.02)	-0.07 (0.02)
Saturday	0.01 (0.10)	0.35 (0.08)	0.10 (0.09)	0.08 (0.08)	0.02 (0.08)	-0.05 (0.08)	0.10 (0.08)	0.05 (0.09)	0.37 (0.05)	0.00 (0.05)	0.22 (0.04)	0.03 (0.03)	-0.08 (0.04)	-0.68 (0.06)
Sunday	-0.08 (0.10)	-0.03 (0.09)	-0.06 (0.10)	-0.07 (0.09)	-0.03 (0.09)	-0.49 (0.09)	0.00 (0.08)	0.16 (0.10)	0.10 (0.05)	0.07 (0.05)	0.19 (0.04)	-0.01 (0.03)	-0.33 (0.04)	-1.04 (0.06)

Table 8: Estimates of β_j for couples. Standard errors in parenthesis.

	$\sigma_{Vol. work f}$	$\sigma_{Social act. f}$	$\sigma_{Sports f}$	$\sigma_{Home prod. f}$	$\sigma_{Media act. f}$	$\sigma_{Other f}$	$\sigma_{Sleep f}$	$\sigma_{Vol. work m}$	$\sigma_{Social act. m}$	$\sigma_{Sports m}$	$\sigma_{Home prod. m}$	$\sigma_{Media act. m}$	$\sigma_{Other m}$	σ_q
$\sigma_{Vol. work f}$	0.65 (0.18)													
$\sigma_{Social act. f}$	0.16 (0.05)	0.56 (0.03)												
$\sigma_{Sports f}$	0.13 (0.03)	0.07 (0.01)	0.57 (0.14)											
$\sigma_{Home prod. f}$	0.05 (0.01)	0.07 (0.01)	0.04 (0.01)	0.27 (0.02)										
$\sigma_{Media act. f}$	0.02 (0.02)	-0.01 (0.01)	0.05 (0.01)	0.07 (0.01)	0.33 (0.03)									
$\sigma_{Other f}$	0.15 (0.03)	0.15 (0.01)	0.11 (0.02)	0.01 (0.01)	0.01 (0.01)	0.56 (0.04)								
$\sigma_{Sleep f}$	0.40 (0.09)	0.06 (0.02)	0.03 (0.03)	-0.02 (0.02)	-0.01 (0.02)	0.02 (0.03)	0.87 (0.38)							
$\sigma_{Vol. work m}$	0.07 (0.02)	0.24 (0.02)	0.01 (0.02)	0.01 (0.01)	-0.04 (0.01)	0.06 (0.01)	0.14 (0.03)	0.57 (0.05)						
$\sigma_{Social act. m}$	0.03 (0.02)	0.01 (0.01)	0.17 (0.03)	0.00 (0.01)	0.04 (0.01)	0.00 (0.01)	0.05 (0.03)	0.05 (0.01)	0.51 (0.11)					
$\sigma_{Sports m}$	-0.03 (0.02)	-0.01 (0.01)	0.00 (0.01)	0.04 (0.01)	0.00 (0.01)	-0.02 (0.01)	0.07 (0.02)	0.05 (0.01)	0.02 (0.02)	0.44 (0.03)				
$\sigma_{Home prod. m}$	0.00 (0.02)	-0.04 (0.01)	0.00 (0.01)	0.01 (0.01)	0.12 (0.01)	-0.03 (0.01)	0.03 (0.02)	-0.02 (0.01)	0.06 (0.01)	0.07 (0.01)	0.30 (0.02)			
$\sigma_{Media act. m}$	0.05 (0.02)	0.08 (0.01)	0.03 (0.02)	0.00 (0.01)	0.00 (0.01)	0.19 (0.01)	0.16 (0.03)	0.16 (0.01)	0.09 (0.02)	0.02 (0.01)	0.01 (0.01)	0.59 (0.03)		
$\sigma_{Other m}$	0.00 (0.03)	0.01 (0.02)	0.01 (0.02)	0.03 (0.01)	0.02 (0.01)	0.02 (0.02)	0.03 (0.04)	0.05 (0.02)	0.01 (0.03)	-0.02 (0.02)	0.07 (0.01)	0.13 (0.02)	0.83 (0.03)	
σ_q	0.07 (0.03)	0.05 (0.02)	0.06 (0.03)	-0.02 (0.01)	0.05 (0.02)	0.21 (0.03)	0.01 (0.05)	0.01 (0.02)	0.02 (0.03)	0.01 (0.02)	0.02 (0.02)	0.05 (0.02)	0.35 (0.03)	1.00 (0.04)

Table 9: Covariance matrix of unobservables for couples. Standard errors in parenthesis.

Predicted time allocation behavior

Activity	Single women			Single men		
	Weekday	Saturday	Sunday	Weekday	Saturday	Sunday
Volunteer work	0.29 (0.16)[0.04,0.01]	0.56 (0.31)[0.19,0.06]	0.37 (0.21)[0.06,0.03]	0.28 (0.12)[0.12,0.04]	0.34 (0.16)[0.27,0.08]	0.30 (0.14)[0.12,0.05]
Social activities	1.17 (0.72)[0.05,0.02]	1.96 (0.89)[0.12,0.02]	1.95 (0.85)[0.09,0.01]	1.00 (0.54)[0.08,0.03]	1.81 (0.76)[0.21,0.04]	1.72 (0.72)[0.14,0.03]
Sports	0.49 (0.33)[0.06,0.02]	0.69 (0.43)[0.10,0.04]	0.55 (0.39)[0.05,0.03]	0.75 (0.35)[0.09,0.02]	1.06 (0.46)[0.10,0.03]	1.14 (0.51)[0.12,0.04]
Home production	2.71 (0.89)[0.13,0.02]	3.51 (0.96)[0.15,0.01]	3.22 (0.96)[0.16,0.01]	1.57 (0.80)[0.06,0.02]	2.72 (0.93)[0.18,0.01]	2.14 (0.89)[0.16,0.02]
Media activities	2.25 (0.78)[0.11,0.01]	2.91 (0.90)[0.23,0.02]	3.20 (0.93)[0.19,0.01]	2.52 (0.79)[0.13,0.01]	3.51 (0.90)[0.30,0.02]	3.96 (0.93)[0.30,0.01]
Other time use	1.70 (0.98)[0.06,0.01]	2.01 (0.99)[0.12,0.01]	1.57 (0.97)[0.11,0.02]	1.69 (0.96)[0.06,0.02]	1.93 (0.97)[0.15,0.01]	1.88 (0.98)[0.16,0.01]
Sleep	9.97 (1.00)[0.16,-]	11.07 (1.00)[0.22,-]	12.26 (1.00)[0.19,-]	9.55 (1.00)[0.18,-]	10.53 (1.00)[0.21,-]	11.70 (1.00)[0.25,-]
Market work	5.42 (0.73)[0.24,0.01]	1.30 (0.31)[0.17,0.02]	0.88 (0.22)[0.09,0.01]	6.65 (0.82)[0.30,0.01]	2.10 (0.44)[0.32,0.03]	1.17 (0.27)[0.16,0.02]

Table 10: Predicted time allocation behavior of single men and women: average hours per day. Predicted proportion of non-zero observations shown in parenthesis. Standard errors of predicted times and predicted proportion of non-zero observations are given in square brackets.

Activity	Cohabiting women			Cohabiting men		
	Weekday	Saturday	Sunday	Weekday	Saturday	Sunday
Volunteer work	0.13 (0.13)[0.03,0.01]	0.15 (0.21)[0.03,0.03]	0.22 (0.30)[0.03,0.03]	0.13 (0.10)[0.21,0.05]	0.19 (0.32)[0.22,0.06]	0.26 (0.45)[0.27,0.05]
Social activities	1.06 (0.68)[0.05,0.03]	1.79 (0.81)[0.09,0.03]	1.39 (0.76)[0.06,0.03]	0.76 (0.54)[0.11,0.01]	1.64 (0.74)[0.07,0.02]	1.26 (0.69)[0.11,0.03]
Sports	0.37 (0.25)[0.04,0.01]	0.34 (0.34)[0.04,0.02]	0.48 (0.41)[0.04,0.02]	0.44 (0.27)[0.10,0.02]	0.51 (0.37)[0.07,0.03]	0.63 (0.48)[0.05,0.03]
Home production	3.95 (0.91)[0.16,0.03]	4.32 (0.90)[0.15,0.03]	4.31 (0.88)[0.11,0.03]	1.64 (0.82)[0.06,0.02]	2.43 (0.83)[0.08,0.01]	2.53 (0.83)[0.06,0.02]
Media activities	2.03 (0.82)[0.07,0.03]	2.22 (0.82)[0.06,0.04]	2.35 (0.83)[0.10,0.04]	2.49 (0.80)[0.10,0.02]	2.78 (0.76)[0.09,0.02]	2.81 (0.78)[0.07,0.02]
Other time use	1.77 (0.95)[0.05,0.01]	1.79 (0.93)[0.07,0.01]	1.48 (0.91)[0.06,0.02]	1.87 (0.96)[0.06,0.01]	2.02 (0.91)[0.06,0.02]	1.63 (0.90)[0.08,0.01]
Sleep	10.99 (1.00)[0.27,-]	12.05 (1.00)[0.14,-]	12.44 (1.00)[0.13,-]	9.64 (1.00)[0.11,-]	11.97 (1.00)[0.16,-]	12.71 (1.00)[0.17,-]
Market work	3.69 (0.52)[0.20,0.02]	1.34 (0.40)[0.14,0.04]	1.34 (0.45)[0.09,0.04]	7.03 (0.83)[0.21,0.01]	2.45 (0.62)[0.21,0.06]	2.17 (0.57)[0.18,0.05]

Table 11: Predicted time allocation behavior of couples: average hours per day. Predicted proportion of non-zero observations shown in parenthesis. Standard errors of predicted times and predicted proportion of non-zero observations are given in square brackets.