Family Job Search and Consumption:

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Abstract.- In this paper we find out the determinants of consumption variations depending on the employment transitions experienced by household members. We set up a utility-maximizing household search model in which consumption and job search decisions are made jointly. Families determine a level of consumption, who has to work, and what is the minimum acceptable wage for each family member. This interaction implies that each member's reservation wage is highly dependent not only on the partner's labor market status but also on his/her wage. In this model, not only wealth but also the employment status of the partner allows agents to be more selective and search longer. Using the Survey of Income and Program Participation (SIPP), we estimate the behavioral parameters of the theoretical model. With the results of this estimation, we simulate some policy experiments. In particular we are interested on how the Unemployment Benefits system affects intra-household decisions.

Keywords: Job search, asset accumulation, household economics, consumption, unemployment, estimation of dynamic structural models.

JEL Classification: C33, E21, E24, J64.

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- The analysis of labor supply offers an attractive framework to analyze participation decisions.
- These issues has to be considered in a contex where there are more than one supplier of labor in the household.
- Most of the research on household consumption and employment decisions is made using a labor supply framework. (Blundell and MaCurdy 1999)
  - Krueger and Perri (2004)
  - Del Boca and Flinn (2004)
- But the existence of search frictions introduce restrictions to the appli-

cability of the neoclassical labor supply framework.

  – Dey and Flinn (2001), Guler, Guveneny, and Violante (2011).

- We developed a family job search model where:

  – A household looks for jobs in two markets.

  – The household maximize a unique utility function depending on consumption (the members consume jointly).

- Motivation:

  – Unemployment transfers when both members are unemployed (UK).

  – The participation decision within the household is highly depending on search frictions.

- Our family search model is able to explain:
  - Consumption variations during employment transitions
  - The existence of intrahousehold transfer between family members
  - The decision of accepting offers is highly depending on the labor market status of the partner.
  - Moreover, it is also highly depending on the wage of the partner: the "new added worker effect".

The Model

- Independent job markets (independent wage offer distributions, independent arrival rates);
- On-the-job search;
- No marital transitions;
- Infinite horizon;
- Borrowing constraints.

Four value functions for four employment states:

$$
\begin{aligned}
V(A,0,0) &= \max_{A'\geq 0}\left\{U\left(A+b_1+b_2-\frac{A'}{1+r}\right)+\beta W(A',0,0)\right\}\\
V(A,w_1,0) &= \max_{A'\geq 0}\left\{U\left(A+w_1+b_2-\frac{A'}{1+r}\right)+\beta W(A',w_1,0)\right\}\\
V(A,0,w_2) &= \max_{A'\geq 0}\left\{U\left(A+b_1+w_2-\frac{A'}{1+r}\right)+\beta W(A',0,w_2)\right\}\\
V(A,w_1,w_2) &= \max_{A'\geq 0}\left\{U\left(A+w_1+w_2-\frac{A'}{1+r}\right)+\beta W(A',w_1,w_2)\right\}
\end{aligned}
$$

Arrival rates for household member i:

- If unemployed,
  - probability of wage offer: λ_i,
  - probability of no offer: $1 - \lambda_i$.
- If employed,
  - probability of wage offer π_i
  - probability of being laid off θ_i
  - probability of no offer no layoff: $1 - \theta_i - \pi_i$
- Wage offer distribution for household member i: F_i

Expected value when both members are unemployed:

$$
\begin{aligned}
W(A,0,0) = \lambda_1\lambda_2 \int\int \max\left[V(A,x_1,x_2), V(A,x_1,0), V(A,0,x_2), V(A,0,0)\right] dF_2(x
\\ + \lambda_1\left(1-\lambda_2\right) \int \max[V(A,x_1,0), V(A,0,0)] dF_1(x_1)
\\ + \left(1-\lambda_1\right)\lambda_2 \int \max[V(A,0,x_2), V(A,0,0)] dF_2(x_2)
\\ + \left(1-\lambda_1\right)\left(1-\lambda_2\right) V(A,0,0)]
\end{aligned}
$$

Expected value when one of the members is unemployed:

$$
\begin{aligned}
W(A, w_1, 0) = \pi_1 \lambda_2 \int \int \max [V(A, \max(w_1, x_1), x_2), V(A, \max(w_1, x_1), 0), \\
V(A, 0, x_2), V(A, 0, 0)] \, dF_2(x_2) dF_1(x_1) \\
+ \pi_1 (1 - \lambda_2) \int \max [V(A, \max(w_1, x_1), 0), V(A, 0, 0)] \, dF_1(x_1) \\
+ (1 - \pi_1 - \theta_1) \lambda_2 \int \max [V(A, w_1, x_2), V(A, 0, 0), V(A, w_1, 0), V(A, 0 \\
+ (1 - \pi_1 - \theta_1)(1 - \lambda_2) \max [V(A, w_1, 0), V(A, 0, 0)] \\
+ \theta_1 \lambda_2 \int \max [V(A, 0, x_2), V_{uu}(A, 0, 0)] \, dF_2(x_2) \\
+ \theta_1 (1 - \lambda_2) V(A, 0, 0)
\end{aligned}
$$

(Expected value of $V(A, 0, w_2)$ is defined in a similar way).

Expected value when both members are employed:

$$
\begin{aligned}
W\left(A,w_1,w_2\right) \;=\; & \pi_1\pi_2 \iint \max\left[V(A,\max\left(w_1,x_1\right),\max\left(w_2,x_2\right)),\right. \\
& \qquad V(A,\max\left(w_1,x_1\right),0), \\
& \qquad \left. V(A,0,\max\left(w_2,x_2\right)),V(A,0,0)\right] dF_2\left(x_2\right) dF_1\left(x_1\right) \\
& +\pi_1\left(1-\pi_2-\theta_2\right) \int \max\left[V(A,\max\left(w_1,x_1\right),w_2),\right. \\
& \qquad \left. V(A,0,w_2),V(A,\max\left(w_1,x_1\right),0),V(A,0,0)\right] dF_1(x_1) \\
& +\pi_1\theta_2 \iint \max\left[V(A,\max\left(w_1,x_1\right),x_2),V(A,0,x_2),\right. \\
& \qquad \left. V(A,\max\left(w_1,x_1\right),0),V(A,0,0)\right] dF_2(x_2)dF_1(x_1) \\
& +\left(1-\pi_1-\theta_1\right)\pi_2 \int \max\left[V(A,w_1,\max\left(w_2,x_2\right)),\right. \\
& \qquad \left. V(A,w_1,0),V(A,0,\max\left(w_2,x_2\right)),V(A,0,0)\right] dF_2(x_2)
\end{aligned}
$$

$$+ (1 - \pi_1 - \theta_1)(1 - \pi_2 - \theta_2) \max [V(A, w_1, w_2), V(A, w_1, 0), V(A, 0, w_2), V(A, 0,$$

$$+ (1 - \pi_1 - \theta_1)\theta_2 \max [V(A, w_1, 0), V(A, 0, 0)]$$

$$+\theta_1\pi_2 \max [V(A, 0, \max (w_2, x_2)), V(A, 0, 0)]\, dF_2(x_2)$$

$$+\theta_1 (1 - \pi_2 - \theta_2) \max [V(A, 0, w_2), V(A, 0, 0)]$$

$$+\theta_1\theta_2 V(A, 0, 0)$$

Solution : four policy rules for asset accumulation :

$$\begin{aligned} A_{ee} &= A\left(A, w_1, w_2\right), \\ A_{eu} &= A\left(A, w_1, 0\right), \\ A_{ue} &= A\left(A, 0, w_2\right), \\ A_{uu} &= A\left(A, 0, 0\right). \end{aligned}$$

Consumption functions are defined as:

$$\begin{aligned} C_{ee} &= C\left(A, w_1, w_2\right), \\ C_{eu} &= C\left(A, w_1, 0\right), \\ C_{ue} &= C\left(A, 0, w_2\right), \\ C_{uu} &= A\left(A, 0, 0\right). \end{aligned}$$

and reservation wages:

I. Partner Unemployed:

$$w_1^*(A,0) = \{w_1 | V(A,w_1,0) = V(A,0,0)\}$$
$$w_2^*(A,0) = \{w_2 | V(A,0,w_2) = V(A,0,0)\}$$

II. Partner Employed:

$$w_1^*(A,w_2) = \{w_1 | V(A,w_1,w_2) = V(A,0,w_2)\}$$
$$w_2^*(A,w_1) = \{w_2 | V(A,w_1,w_2) = V(A,w_1,0)\}$$

III. Work-assignment:

$$w_1^a(A, w_2) = \{w_1 | V(A, w_1, 0) = V(A, 0, w_2)\}$$

$$w_2^a(A, w_1) = \{w_2 | V(A, w_1, 0) = V(A, 0, w_2)\}$$

Numerical Solution

Utility Function:

$$U(C) = \begin{cases} \frac{C^{1-\gamma}-1}{1-\gamma}, & if\ \gamma \neq 1, \\ \ln(C), & if\ \gamma = 1 \end{cases}$$

Truncated lognormal wage offer distribution

$$\ln x \sim N(\mu, \sigma^2 | \ln \underline{w}, \ln \overline{w})$$

Parameter values for the simulation exercises

β	0.98	
r	0.015	
γ	1.8	
	husband	wife
b	600	400
λ	0.32	0.18
π	0.08	0.04
θ	0.01	0.03
$\bar{w}$	7.79	7.48
σ_w	0.33	0.33

Discretize state and choice space

Discretization of variables		
	Assets	Wages
Original variable	A	ω
Discretized variable	$A(i)$	$\omega(j)$
Gridpoints	$i = 1, ..., N_A$	$j = 1, ..., N_w$
Number of gridpoints	$N_A = 51$	$N_w = 51$
Lower Bound	$\underline{A} = 0$	$\underline{w} = 700$
Upper Bound	$\overline{A} = 50.000$	$\overline{w} = 10\,000$
Gridsize	$\Delta_A = \frac{\overline{A} - \underline{A}}{N_A}$	$\Delta_w = \frac{\ln \overline{w} - \ln \overline{w}}{N_w}$

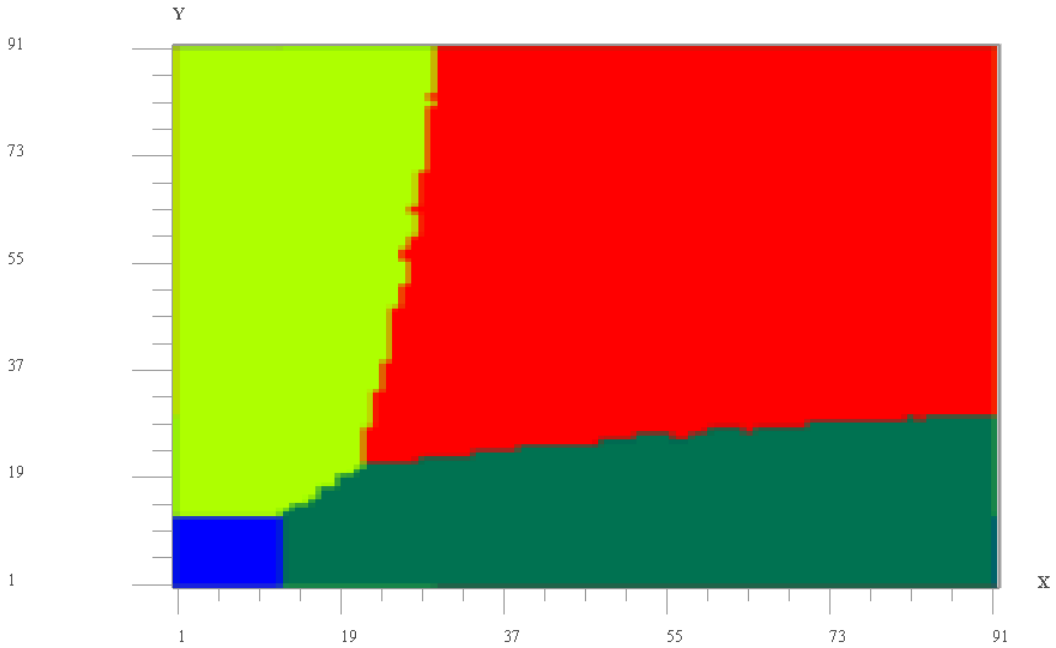
Discretized value functions

$$\begin{aligned}
\widehat{V}_{uu}[i] &= V_{uu}(A(i)), \\
\widehat{V}_{eu}[i, j_1] &= V_{eu}(A(i), w_1(j_1)), \\
\widehat{V}_{ue}[i, j_1] &= V_{ue}(A(i), w_2(j_2)), \text{ and} \\
\widehat{V}_{ee}[i, j_1, j_2] &= V_{ee}(A(i), w_1(j_1), w_2(j_2)).
\end{aligned}$$

Convergence:

$$\max \left| \widehat{V}^n[i, j_1, j_2] - \widehat{V}^{n-1}[i, j_1, j_2] \right| \leq \omega$$

Solution



Acceptance areas as a function of wages of the husband and the wife

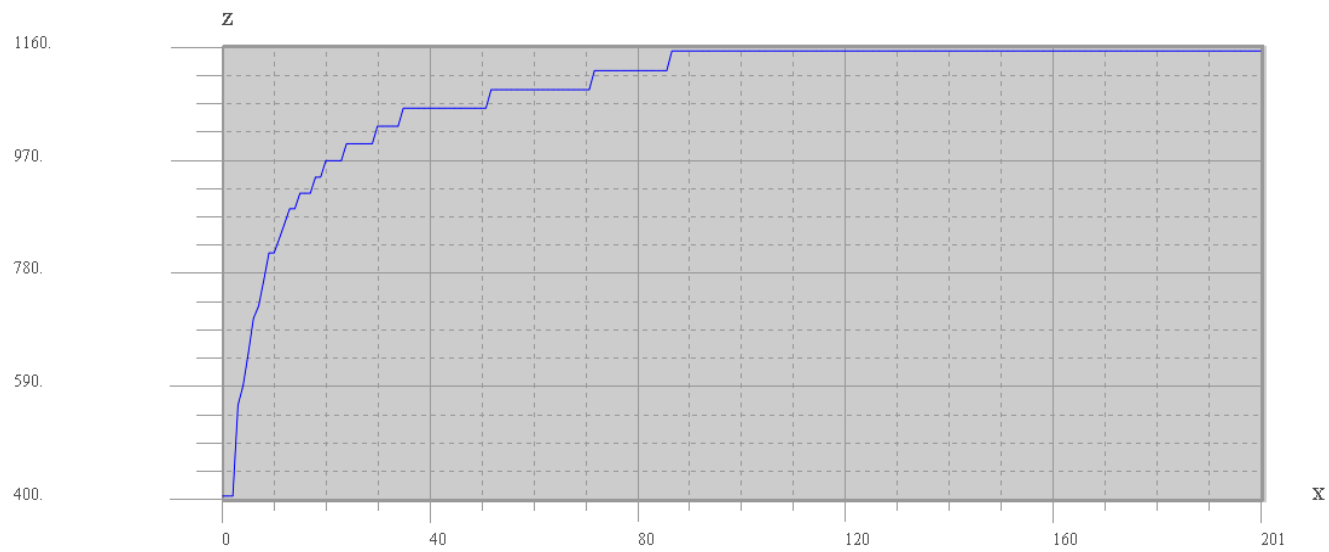


Figure: Reservation wage of the husband as a function of assets when the wife is unemployed

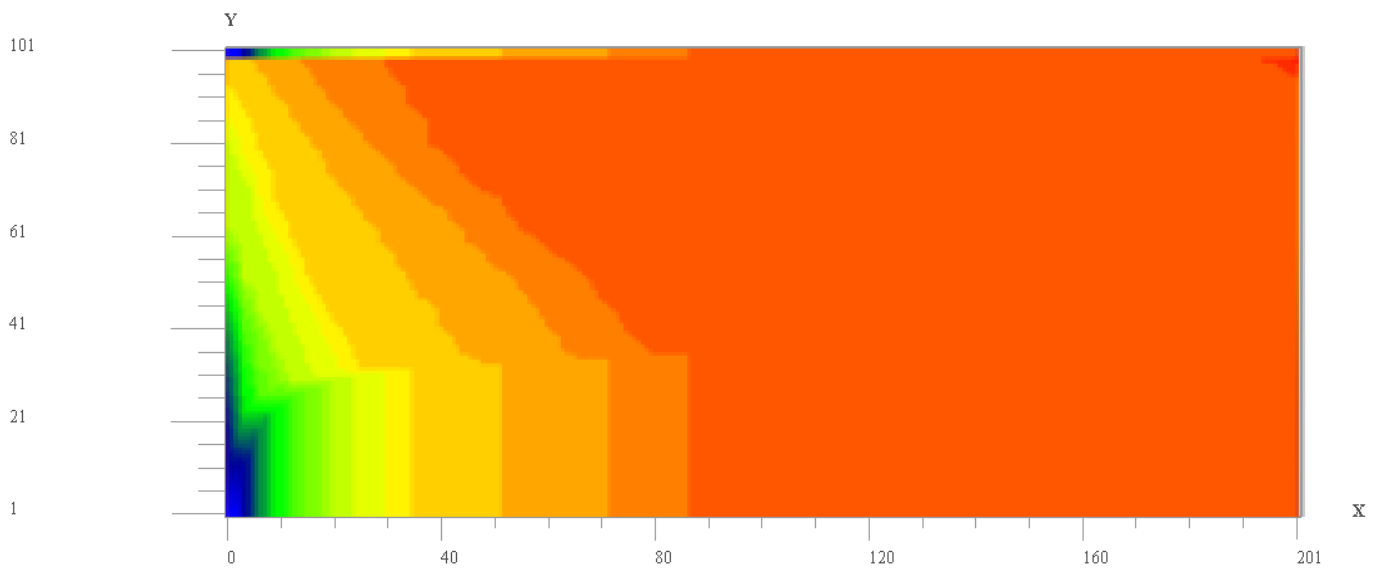


Figure: Reservation wage of the husband as a function of assets and wages of the wife.

The data set:

Survey of Income and Program Participation (SIPP)

sample of couples

Variables: income, labor force and public programs participation.

Purpose of the sample: to provide improved statistics on the distribution of income and measures of economic well-being in the country.

Approximately 36,700 interviewed households.

We use the 4-year 1996 panel which covers the period 1996-1999.

The survey is based on a monthly interviewing and uses a 4-month recall period, with approximately the same number of interviews being conducted in each month of the 4-month period for each wave. Hence we have three

observations per year during the 1996-1999 span, that is, twelve waves.

As we are interested only in households with both members being present, we select households where both spouses are present and meet certain requirements regarding age and education.

Thus, we restrict our sample to those aged between 26 and 50 and with a level of education at least equal to High School.

Our final sample includes information regarding 10.627 married couples.

Descriptive statistics

Table 1. Employment Status

Husband	Wife		Total
	U	E	T
U	0.28	2.19	2.47
E	20.31	77.22	97.53
T	20.59	79.41	100.00

Table 2. Employment Status. Wage Husband

Husband	Wife		Total
	U	E	T
U	0.00	0.00	0.00
	0.00	0.00	0.00
E	3874.61	3328.56	3442.27
	2389.74	1972.90	2078.50
T	3821.99	3236.91	3357.38
	2415.46	2020.35	2121.00

Table 3. Employment Status. Wage Wife

Husband	Wife		Total
	U	E	T
U	0.00	2123.34	1882.57
	0.00	1332.96	1424.28
E	0.00	2136.50	1691.59
	0.00	1490.77	1585.00
T	0.00	2136.14	1696.30
	0.00	1486.65	1581.51

Table 4. Employment Status. Assets

Husband	Wife		Total
	U	E	T
U	47214.76	81727.07	77690.54
	89461.65	117347.94	114974.06
E	113803.04	117165.28	116469.11
	138950.09	133545.15	134688.97
T	112922.63	116253.25	115570.58
	138620.07	133271.19	134391.62

Table 8. Employment Transitions

t	$t+1$				Total
	UU	UE	EU	EE	T
UU	0.15	0.02	0.09	0.01	0.28
UE	0.02	1.77	0.01	0.38	2.18
EU	0.09	0.01	19.31	0.92	20.32
EE	0.02	0.37	0.91	75.93	77.23
T	0.27	2.16	20.32	77.25	100.00

Table 4. Wage bracket. Consumption

Husband	Wife						Total
	U	W1	W2	W3	W4	W5	T
U	2239.19	2305.58	3503.91	3011.71	2705.75	0.00	2511.13
W1	1918.24	1930.81	4345.96	0.00	0.00	0.00	2263.82
W2	2896.72	2516.53	2871.55	3945.56	3950.88	4860.78	2856.70
W3	2897.67	3004.37	3791.50	3785.89	3941.30	2737.68	3322.31
W4	3177.28	3619.56	3818.05	4646.94	3420.41	0.00	3694.18
W5	3975.47	3910.55	4772.98	4407.23	4286.10	3950.88	4159.46
T	2823.94	2833.58	3575.43	3937.14	3651.57	3495.93	3162.86

Table 5. Employment Transitions

t	$t+1$				Total
	UU	UE	EU	EE	T
UU	53.70	12.96	23.15	10.19	100.00
UE	3.88	65.05	6.80	24.27	100.00
EU	5.03	0.92	73.23	20.82	100.00
EE	1.47	2.15	7.57	88.81	100.00
T	6.33	6.78	27.33	59.56	100.00

Table 11. Employment Transitions Asset ΔA

t	$t+1$				Total
	UU	UE	EU	EE	T
UU	0.00	-4687.67	3121.28	296.31	1643.77
	0.00	4884.95	10781.77	7551.34	9719.24
UE	-219.73	1522.71	581.74	1424.56	1428.39
	219.73	7438.83	8477.23	11045.02	9554.12
EU	-5597.45	-343.34	703.74	1033.45	734.15
	23237.00	2967.15	10521.38	8482.98	10239.64
EE	-2726.71	997.58	1164.13	1010.34	1015.90
	18891.54	7074.91	13347.85	10149.49	10348.61
T	-4144.99	1123.56	827.59	1016.52	968.48
	20813.24	7166.64	11230.72	10071.31	10311.21

CONCLUDING REMARKS

To be done.