Pijoan-Mas (2006): Precautionary Savings or Working Longer Hours?

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Model

Here I present a brief description of the model in [Pijoan-Mas, 2006]. Households face the following problem:

$$V(a,\varepsilon) = \max_{c,a',h} \left\{ \frac{c^{1-\sigma}}{1-\sigma} + \lambda \frac{(1-h)^{1-\nu}}{1-\nu} + \beta \sum_{\varepsilon'} \Gamma_{\varepsilon,\varepsilon'} V(a',\varepsilon') \right\}$$

subject to

$$c + a' = w\varepsilon h + (1+r)a$$

$$c \geq 0, \quad 0 \leq h \leq 1, \quad a' \geq 0.$$

The individual state variables are asset holdings a (endogenous) and the idiosyncratic shock ε (exogenous, denoted z in the toolkit notation). $\Gamma_{\varepsilon,\varepsilon'}$ denotes the transition matrix of the Markov chain over ε, with $\sum_{\varepsilon'} \Gamma_{\varepsilon,\varepsilon'} = 1$ for all ε.

Households choose consumption c, hours of work h, and next-period assets a'. The policy functions are denoted as $c = g_c(a,\varepsilon)$, $h = g_h(a,\varepsilon)$, and $a' = g_a(a,\varepsilon)$.

Factor prices r and w are pinned down by the first-order conditions of the representative firm:

$$r = (1-\theta)\left(\frac{K}{L}\right)^{-\theta} - \delta$$
$$w = \theta\left(\frac{K}{L}\right)^{1-\theta}$$

The aggregate production function is:

$$Y = K^{1-\theta}L^{\theta}$$

The market clearing conditions are:

$$K = \int g_a(a,\varepsilon)\, d\mu(a,\varepsilon)$$
$$L = \int \varepsilon g_h(a,\varepsilon)\, d\mu(a,\varepsilon)$$

where μ is the stationary distribution. Then, by Walras' Law, the aggregate resource constraint of the economy is automatically satisfied:

$$C + \delta K = K^{1-\theta}L^{\theta}$$

Replication results

Table 1
Calibration targets and model parameters

Parameter	Target	Value
σ	$corr(h,\varepsilon) = 0.02$	1.458
ν	$cv(h) = 0.22$	2.833
λ	$H = 0.33$	0.856
β	$K/Y = 3.00$	0.945
θ	$wL/Y = 0.64$	0.640
δ	$I/Y = 0.25$	0.083

Figure 1: Original Table 1 of Pijoan-Mas (2006)

Table 1: Calibration targets and model parameters

Parameter	Description	Target	Value
σ	Coeff. risk aversion	corr(h,eps)= 0.002	1.458
ν	Inverse elast. leisure	cv(h)= 0.202	2.833
λ	Weight of leisure	H= 0.357	0.856
β	Discount factor	K/Y= 2.944	0.945
θ	Labor share	wL/Y= 0.647	0.640
δ	Capital depreciation	I/Y= 0.244	0.083

Table 2
Distributional statistics

Variable	*cv*	Gini	q_1	q_2	q_3	q_4	q_5
Hours							
Model E_0	0.22	0.11	0.21	0.31	0.35	0.37	0.40
Data (CPS)	0.22	0.11	0.24	0.31	0.33	0.35	0.42
Earnings							
Model E_0	0.65	0.33	7.3%	12.4%	17.2%	23.0%	40.1%
Data (CPS)	0.56	0.29	7.9%	13.7%	18.0%	23.3%	37.1%
Data (SCF)	2.65	0.61	−0.2%	4.0%	13.0%	22.9%	60.2%
Wealth							
Model E_0	1.37	0.65	0.1%	2.2%	9.2%	23.1%	65.4%
Data (SCF)	6.53	0.80	−0.3%	1.3%	5.0%	12.2%	81.7%

Notes. cv refers to coefficient of variation. $q_1, \ldots, q_5$ refer, for earnings and wealth, to the share held by all people in the corresponding quintile with respect to the total. However, for hours it is the average number of hours worked by people in the corresponding quintile. Statistics from SCF correspond to the 1998 wave and are quoted from Budría et al. (2002). Statistics from SCF correspond to the 2002 wave.

Figure 2: Original Table 2 of Pijoan-Mas (2006)

Table 2: Distributional statistics

Variable	*cv*	Gini	q_1	q_2	q_3	q_4	q_5
Hours							
Model E_0	0.20	0.10	0.24	0.34	0.38	0.40	0.43
Earnings							
Model E_0	0.64	0.32	7.5	12.5	17.2	23.1	39.7
Wealth							
Model E_0	1.37	0.65	0.1	2.3	9.3	23.2	65.2

Notes. cv refers to coefficient of variation. $q_1, \ldots, q_5$ refer, for earnings and wealth, to the share held by all people in the corresponding quintile with respect to the total. However, for hours it is the average number of hours worked by people in the corresponding quintile.

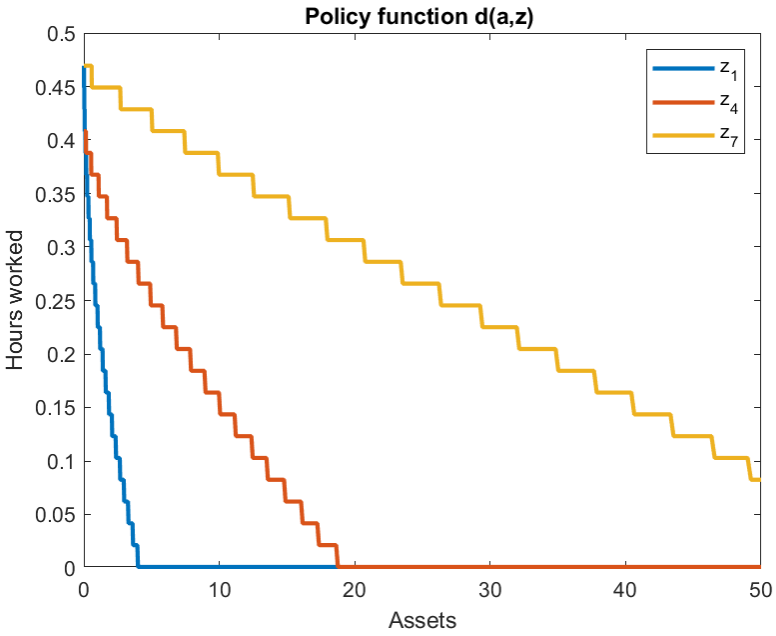

Figure 3: Policy function for hours worked

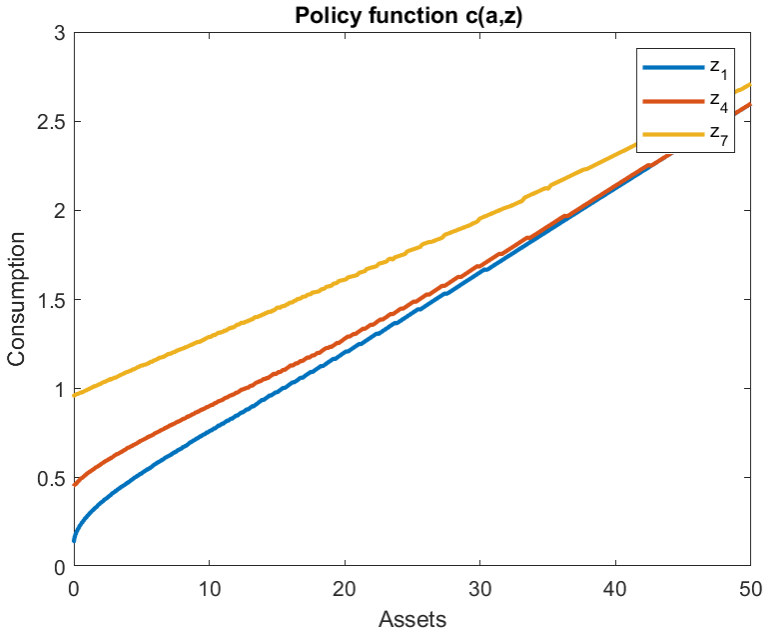

Figure 4: Policy function for consumption

References

[Pijoan-Mas, 2006] Pijoan-Mas, J. (2006). Precautionary savings or working longer hours? *Review of Economic Dynamics*, 9(2):326–352.