Household Behaviour and Optimal Property Division upon Divorce

Árpád Ábrahám
EUI

Sarolta Laczó
University of Surrey and IAE-CSIC

REDg DGEM Barcelona

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Motivation

- Two-sided limited commitment with long-run contracts is a popular framework to study risk sharing.
- Applications: marriage, partnerships, economic unions.
- Most of the relevant theoretical literature does not feature neither separations along the optimal path, nor asset accumulation by the partnership.
- For empirical applications these features are relevant.

Motivation

- Two-sided limited commitment with long-run contracts is a popular framework to study risk sharing.
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- Most of the relevant theoretical literature does not feature neither separations along the optimal path, nor asset accumulation by the partnership.
- For empirical applications these features are relevant.
- The possibility of efficient separations makes the role of asset division rules less trivial.
  - More assets upon default make default more attractive. $\Rightarrow$ Less assets should be provided for agents initiating separation.
  - More assets upon default may help consumption smoothing. $\Rightarrow$ Asset should be provided for those agents who would have low consumption after separation.

What we do in this paper

- For now: Characterising some key properties of the allocation.
- First paper to study formally jointly two-sided lack of commitment, efficient separations, and asset accumulation.
- Based on Ábrahám and Laczó (2014).

  Two key differences:

  - Efficient separations through shocks to match value.
  - Study asset division rules upon default.

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  - Study asset division rules upon default.

- Questions:

  - How efficient separations and asset division rules affect risk sharing?
  - How asset accumulation incentives change with these new features?

Some Results

- If there are no separations along the equilibrium path, no asset provision for the party 'filing for divorce' maximises both risk sharing and asset accumulation.
  - Intuition: Asset provision increases the value of autarky and hence reduces the benefits of asset accumulation.

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  - Intuition: Asset provision increases the value of autarky and hence reduces the benefits of asset accumulation.
- If there is separation along the equilibrium path, and no asset provision for the party 'filing for divorce,' then asset accumulation incentives are likely to increase.
  - Intuition: Risk sharing is increased. Asset accumulation helps to smooth the consumption of the other agent after divorce (who tends to have low income). But 'inefficient' marriages may last longer.

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- If there is separation along the equilibrium path, and no asset provision for the party 'filing for divorce,' then asset accumulation incentives are likely to increase.
  - Intuition: Risk sharing is increased. Asset accumulation helps to smooth the consumption of the other agent after divorce (who tends to have low income). But 'inefficient' marriages may last longer.
- Asset provision for the filing agent still may improve welfare.
  - Intuition: Some of the filing agents will have low consumption (negative love shock). Asset provision will help their consumption smoothing.

Literature

- Lack of commitment models with or without storage: Kocherlakota (1996), Krueger and Uhlig (2006), Ábrahám and Laczó (2014)
- Limited commitment models of couples: Mazzocco (2007), Voena (2015).
- Chiappori and Mazzocco (2015) claim that the set-up in this paper should be the workhorse model of within household allocation and risk sharing but do not provide characterisation.

Setup

Our starting point is the two-sided lack of commitment framework of Kocherlakota (REStud, 1996) extended for storage by Ábrahám and Laczó (2014).

- Two (types of) infinitely-lived, risk-averse, ex-ante identical agents.
- Income y has discrete support, is i.i.d. over time, and is perfectly negatively correlated across the two agents, i.e., there is no aggregate risk in the sense that the aggregate endowment, Y is constant.
- Agents also face 'love' shocks $\alpha \sim N\left(0, \sigma^2\right)$. For simplicity, we assume that love shocks are perfectly negatively correlated. $\phi()$ and $\Phi()$ are the density and cumulative distribution functions, respectively.
- We consider a storage/saving technology with exogenous return $-1 \leq r \leq 1/\beta - 1$. Borrowing is not allowed.
- Storage is decided (constrained) efficiently by the couple.

Divorce

- Agents can leave the relationship at any time if they find it optimal.
- They live in autarky permanently after divorce, where they can use the storage technology.
- Upon divorce the accumulated assets of the couple are distributed as follows:
  - γ share is given to the agent who files for divorce (the one with $\alpha < 0$ when divorce happens).
  - $(1 - \gamma)$ share is given to the other party.

Preliminary characterisation

- For each income y and asset level B, there exists a threshold $\alpha^*(B, y) > 0$ such that if an agent's love shock is $\alpha < -\alpha^*(B, y)$, then he files for divorce.
- For the same agent if $\alpha > \alpha^*(B, Y - y)$, then the other agent files for divorce.
- Below we define these thresholds formally.

Intuition

- For negative love shocks agents need to be compensated by current consumption and future utility.
- Future utility is limited by participation constraints and increasing current consumption reduces the consumption of the partner.
- For α high enough in absolute value, both participation constraints cannot be satisfied simultaneously.
- The capacity to compensate agents for adverse love shocks depends on aggregate assets.

Recursive formulation

$$V\left(U,B,y,\alpha\right)=\max_{w(y',\alpha'),B',c}u\left(c\right)+\alpha$$
$$+\beta\sum_{y'}\pi\left(y'\right)\left[\int_{-\alpha^{*}(B',y')}^{\alpha^{*}\left(B',Y-y'\right)}\phi\left(\alpha'\right)V\left(w\left(y',\alpha'\right),B',y',\alpha'\right)d\alpha'\right.$$
$$\left.+V^{D}\left(\gamma B',y'\right)\Phi(-\alpha^{*}\left(B',y'\right))+V^{D}\left(\left(1-\gamma\right)B',y'\right))(1-\Phi(\alpha^{*}\left(B',Y-y'\right)))\right].$$

Recursive formulation

$$V(U,B,y,\alpha) = \max_{w(y',\alpha'),B',c} u(c) + \alpha$$
$$+\beta \sum_{y'} \pi(y') \left[\int_{-\alpha^*(B',y')}^{\alpha^*(B',Y-y')} \phi(\alpha') V(w(y',\alpha'),B',y',\alpha') d\alpha' \right.$$
$$\left. +V^D(\gamma B',y') \Phi(-\alpha^*(B',y')) + V^D((1-\gamma)B',y'))(1-\Phi(\alpha^*(B',Y-y'))) \right].$$

Promise-keeping constraint:

$$U \leq u(Y-c+(1+r)B-B') - \alpha + \beta \sum_{y'} \pi(y') \left[\int_{-\alpha^*(B',y')}^{\alpha^*(B',Y-y')} \phi(\alpha') w(y',\alpha') d\alpha' \right.$$
$$\left. +V^D((1-\gamma)B',Y-y') \Phi(-\alpha^*(B',y')) + V^D(\gamma B',Y-y')(1-\Phi(\alpha^*(B',Y-y'))) \right]$$

Recursive formulation (cont.)

Participation constraints:

$$w\left(y',\alpha'\right) \geq V^{D}\left(\gamma B', Y - y'\right) \quad \text{and} \quad V\left(w\left(y',\alpha'\right), B', y', \alpha'\right) \geq V^{D}\left(\gamma B', y'\right)$$
$$\forall\left(y',\alpha'\right) : -\alpha^{*}\left(B', y'\right) \leq \alpha' \leq \alpha^{*}\left(B', Y - y'\right)$$

Definition of outside option:

$$V^{D}\left(b, y\right) = \max_{b'} u\left(y + \left(1 + r\right) b - b'\right) + \beta \sum_{y'} \Pr\left(y'\right) V^{D}\left(b', y'\right).$$

Definition of thresholds:

$$\alpha^{*}\left(B, y\right) : V\left(V^{D}\left(\gamma B, Y - y\right), B, y, -\alpha^{*}\left(B, y\right)\right) = V^{D}\left(\gamma B, y\right)$$

Special case 1: No storage ($r \leq r^*$)

- Kocherlakota (1996) with efficient separations.
- For (y', α') such that $\alpha^*(y') \leq \alpha' \leq \alpha^*(Y - y')$, the characterisation is similar to the benchmark model.
  - Consumption is as smooth as possible given participation constraints.
  - Consumption responds only to 'large' swings in income and love shocks (persistence).
  - History is erased when consumption changes (amnesia).
- The thresholds are getting tighter as income is increasing.
  - Smaller negative love shocks trigger divorce for richer agents.

Special case 2: Storage, no separations ($\sigma = 0$), and $\gamma = 0$

- Ábrahám and Laczó (2014).
- For sufficiently high return on storage ($\beta(1+r) \leq 1$), storage takes positive values in equilibrium.
- Similar results for risk sharing as above, but as long as assets change over time persistence and amnesia do not hold.
- Euler equation for asset accumulation:

$$u'(c_i) \geq \beta(1+r) \sum_{y'} \pi(y') (1 + \mu_i(B', y')) u'(c_i'(B', y')).$$

- Here $\mu_i(B', y')$ is the Lagrange multiplier on agent i's participation constraint.
- The couple will accumulate assets because
  - it allows for better consumption smoothing, and
  - it reduces future default incentives.

Special case 3: Storage, no separations ($\sigma = 0$), $\gamma \geq 0$

- Now default incentives are higher as V^D increases.
- Less risk sharing is implementable.
- Euler equation for asset accumulation:

$$u'(c_i) \geq \beta(1+r)\sum_{y'}\pi(y')\left[\left(1+\mu_i(B',y')\right)u'\left(c_i'(B',y')\right)\right.$$
$$\left.-\gamma\left(\mu_1(B',y')\,u'\left(c_{au}'(\gamma B',y')\right)+\mu_2(B',y')\,u'\left(c_{au}'(\gamma B',Y-y')\right)\right)\right].$$

- Asset accumulation incentives are reduced.
- Risk sharing is further reduced (in the long run).
- In this environment $\gamma = 0$ maximises ex-ante welfare.

Special case 4: Storage, efficient separations, $\gamma = 0$

- Now, asset accumulation affects consumption after separation.

Euler equation for asset accumulation:

$$u'(c_2) \geq \beta(1+r)\sum_{y'}\pi(y')$$
$$\left[\int_{-\alpha^*(B',y')}^{\alpha^*(B',Y-y')}\phi(\alpha')\left(1+\mu_2\left(y',B',\alpha'\right)\right)u'\left(c_2'\left(y',B',\alpha'\right)\right)d\alpha'\right.$$
$$+\frac{1}{\lambda}u'\left(c_{au}'\left(B',y'\right)\right)\left(1-\Phi(\alpha^*\left(B',Y-y'\right))\right)+u'\left(c_{au}'\left(B',Y-y'\right)\right)\Phi(-\alpha^*\left(B',y'\right))$$
$$+\frac{1}{\lambda}\frac{\partial\alpha^*\left(B',Y-y'\right)}{\partial B'}\phi\left(\alpha^*\left(B',Y-y'\right)\right)\left(V^D\left(0,y'\right)-V^D\left(B',y'\right)\right)$$
$$\left.+\frac{\partial\alpha^*\left(B',y'\right)}{\partial B'}\phi\left(-\alpha^*\left(B',y'\right)\right)\left(V^D\left(0,Y-y'\right)-V^D\left(B',Y-y'\right)\right)\right].$$

Here λ is the temporary Pareto weight of agent 2.

Special case 4: Storage, efficient separations, $\gamma = 0$

- The previous asset accumulation incentives are valid only for the space of shocks where divorce does not happen.
- Asset accumulation increases consumption of those whose partner filed for divorce. They tend to have low consumption, hence asset accumulation incentives increase.
- Asset accumulation increases the divorce threshold for love shocks ($\partial \alpha^*(B,y)/\partial B > 0$), hence it reduces divorce.
- This makes inefficient marriages last longer, which lowers asset accumulation incentives.
- Overall effect is a quantitative question.

Storage, efficient separations, $\gamma \geq 0$

- Increasing asset provisions for the partner filing for divorce increases default incentives, reduces risk sharing, and increases divorce.
- Asset accumulation incentives are likely to be reduced.
- At the same time, it provides more consumption smoothing for those who file for divorce.
- Some agents will file for divorce with low income and 'very' low α.
- It also reduces the incidence of inefficient marriages. (e.g. $\lambda = 0.5$ eliminates this inefficiency).
- Optimal level of γ may be strictly positive.

Summary and Future Research

Summary

- Characterisation of limited commitment, storage, efficient separations, and property division rules.
- In the presence of asset accumulation, there is a trade-off between risk sharing within the match and consumption smoothing through 'marital statuses.'
- Property division rules need to balance these two effects.

Future Research

- Extend the model for empirically-more-plausible shock processes and outside options.
- Work out a quantitative application considering changes in UK divorce law or cross-state legal differences in the US.
- Extend the theory for property division rules based upon other factors.
- Consider the issue of private (hidden) savings.