

Summer School Course
at University of Cagliari

Dynamic Models of the Family

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Overview: This course provides an overview on models of the family that can be used in dynamic economic environments. It is well-known that the family is an important provider of services and insurance: Families provide the lion's share of child and elderly care; monetary transfers (both inter-vivos transfers and bequests) and other in-kind transfers (such as co-residence) are an important source of insurance for individuals. For many policy questions, it is important to take into account the response of the family in order to correctly estimate the welfare consequences of a policy. This course aims to give an overview of the modeling techniques that are currently used to capture altruistic behavior in families. Furthermore, we will discuss for which questions which technique is most appropriate.

Prerequisites: Students are expected to be familiar with standard economic tools at the level of a first-year Ph.D. program, such as Lagrangians, dynamic programming, and basic game theory. Knowledge of continuous-time dynamic programming is helpful, but I will make an effort to accommodate students who are not familiar with such techniques.

Topic 1: Altruistic preferences

We first review a set of preference specifications that are used to model altruistic behavior. We discuss differences in observable implications and see how these preferences can be accommodated in dynamic models. We study how altruistic preferences are related to the polar assumptions of selfishness and perfect altruism in dynasties, which are commonly made in the macroeconomic literature. We also discuss when it makes sense to depart from the polar assumptions.

1. True altruism: Becker-type preferences
 - (a) separable utility function
 - (b) non-separable utility function
 - (c) Adding dynamics: Hall-of-mirror effects, recursive specification
 - (d) The polar cases: selfishness and perfect altruism in dynasties – and what the data say
2. Fake altruism 1: Joy of giving
 - (a) Comparison to true altruism
 - (b) Modeling bequests
3. Fake altruism 2: Paternalistic altruism
4. Exchange and reciprocity
5. Fairness

Literature:

- Laferrere & Wolff: “Microeconomic models of family transfers” (2006), in: *Handbook of the Economics of Giving, Altruism, and Reciprocity, Volume 2*.
- Fehr & Schmidt: “The Economics of Fairness, Reciprocity and Altruism - Experimental Evidence and New Theories”, in: *Handbook of the Economics of Giving, Altruism, and Reciprocity, Volume 2*.
- Barczyk (2016): “Ricardian Equivalence Revised: Deficits, Gifts and Bequests”, *Journal of Economic Dynamics and Control*, 63, pp. 1-24.

Topic 2: Commitment models

Assuming that that family members can commit to future actions lead to an especially tractable class of models, that has been widely used in the literature. It is shown how these models can be embedded in standard solution methods in macro. We study the advantages and disadvantages of commitment models and discuss when they should best be used.

1. The Unitary Model
2. The Collective Model
3. Indeterminacy of transfers
4. When does the commitment assumption make sense?
 - Browning, Chiappori & Weiss (2014): “Family Economics”, *Cambridge University Press (book)*.
 - Fuster, Imrohoroglu & Imrohoroglu (2007): “Elimination of social security in a dynastic framework”, *Review of Economic Studies* 74 (1), 113-145.
 - Laitner (1988): “Bequests, gifts, and social security”, *Review of Economic Studies* 55, 275-299.

Topic 3: Relaxing commitment

We study the Samaritan’s Dilemma, which says that savings of a transfer recipient who counts on the benevolence of an altruistic donor are inefficiently low. This result hinges on the assumption that an altruistic donor cannot commit to withhold transfers, even when the recipient misbehaves. We then turn to empirical evidence on commitment and study a way of modeling partial (*limited*) commitment.

1. The Samaritan’s dilemma in the 2-period model
2. Comparison to commitment models
3. Multiple equilibria: Why it’s hard to go beyond 2 periods
4. Testing commitment in the data
5. Limited-commitment model
 - Lindbeck & Weibull (1988): “Altruism and time consistency: The economics of fait accompli”. *Journal of Political Economy* 96, 1165-1182.

- Mazzocco (2007): “Household intertemporal behaviour: A collective characterization and a test of commitment”, *Review of Economic Studies* 74 (3), 857-895.

Topic 4: Dynamic no-commitment models

In the final part of the course, we study the implications of fully relaxing the commitment assumption a non-cooperative dynamic game with altruism. We show how technical challenges can be overcome by the use of continuous time. We discuss how lack of commitment removes the indeterminacy in the timing of transfers, leading to predictions on transfer and bequests that are empirically plausible.

1. The deterministic case
 - (a) Setting up the game
 - (b) Mass versus flow transfers
 - (c) Hamilton-Jacobi-Bellman and Euler Equations for the best response
 - (d) Back to the polar cases: selfish and perfectly-altruistic equilibria
 - (e) A tragedy-of-the-commons-type equilibrium
 - (f) The Prodigal-Son Dilemma
 - (g) Introducing noise: an empirically-plausible equilibrium
2. Adding income uncertainty: a Bewley-Aiyagari-Huggett model with altruism
 - (a) Poisson uncertainty over earnings
 - (b) Using the Hamiltonian-Jacobi-Bellman Equation to characterize the best response
 - (c) Over- versus under-consumption
 - (d) Sketch of numerical algorithm
 - (e) How much noise do we need?
3. Outlook: Which problems are tractable?

- Barczyk & Kredler (2014): “A Dynamic Model of Altruistically-Motivated Transfers”, *Review of Economic Dynamics*, 17(2): 303-328.
- Barczyk & Kredler (2014): “Altruistically-Motivated Transfers under Uncertainty”, *Quantitative Economics*, 5(3): 705-749.
- Kredler (2012): Lecture notes on deterministic on stochastic dynamic programming in continuous time, <http://www.eco.uc3m.es/mkredler/Teaching.html>.