



# Optimal contracting with dynastic altruism: Family size and per capita consumption <sup>☆</sup>

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## Abstract

We use a Barro–Becker model of endogenous fertility, in which parents are subject to idiosyncratic shocks that are private information (either to labor productivity or taste for leisure), to study the efficient degree of consumption inequality in the long run. The planner uses the trade-off between family size and future consumption and leisure, to provide incentives for workers to reveal their shocks. We show that in this environment, the optimal dynamic contract no longer features immiseration in consumption. We also discuss the implications of the model on the long run properties of family size in the optimal contract and show that the long run trend in dynasty size can be either positive or negative depending on parameters.

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## 1. Introduction

A common feature of efficient contracts in dynamic settings with private information is the presence of a negative drift in consumption of the agent over time as the contract evolves – immiseration (see [16,25,3,22] as examples). This arises due to the desire, by both parties, to use future payoffs as a means to provide current incentives. Having a downward drift on average also makes it cheaper to provide incentives in the future and hence, allows for the provision of better insurance in the short run.

This creates a problem for trying to use these models to study some questions of interest in welfare economics. For example: What is the optimal amount of consumption inequality to balance incentives and social insurance? When the contracting problem features immiseration as a feature of the optimal contract, this question has no well-defined answer – inequality should grow without bound as time goes on and almost every member of society should have a time path of utility that is declining over time.

One solution to this dilemma has been provided in [23,11,12] (and implicitly earlier in [4]) where different periods in the contracting problem correspond to successive generations in a dynastic model. In that setting, these authors show that if the social planner puts higher weight on subsequent generations than parents' themselves do, the optimal contract features mean reversion and hence, there is a non-degenerate stationary distribution over consumption. Implicit in this formulation is the assumption that family size is fixed – each agent is 'replaced' in the subsequent period by exactly one agent – no population growth (or shrinkage) is allowed.

In this paper, we study the form of the optimal incentive contract in a dynamic setting when fertility choice is added to the problem through dynastic altruism. This is a natural extension of the standard model when a period is a generation. There are two, complementary, reasons for making this change. First, as de la Croix and Doepke [9] have shown, including family size in overlapping generations models is crucial to match the empirical relationship between income inequality and mean output growth. Second, it is of interest to know how this extra margin for incentive provision affects the long run features of the optimal contract – e.g., consumption and labor supply.

We show that in this case, the optimal dynamic contract no longer features immiseration even when private and social weights on children are aligned. Indeed, with Barro and Becker's style of dynastic preferences ([5] and [6]) and *i.i.d.* shocks, we show that there is a stationary distribution over consumption, continuation utilities, etc., under a variety of assumptions about the nature of private information and the costs of children.

In some cases – when the cost of children is purely in terms of consumption goods – the result is particularly stark: there is a unique continuation utility that is given to all children independent of the history of shocks in the family. Further, consumption, labor supply and family size are all *i.i.d.* That is, all future incentives for parents are provided through family size and none through children's utility.

In our model, we get an extreme version of the [11] mean reversion result: When the cost of raising children is in terms of consumption goods continuation utility is *i.i.d.* even when social and private discounting factors are identical. The reason for this is that the planner has two instruments to vary future promised utility to parents: the number of children and the promised utility to each child. Because of a homotheticity property of the Barro and Becker dynastic formulation, it turns out that per child future utility is held fixed while the number of children is moved up and down only as a function of the parent's shock to provide incentives. Equivalently, under a natural implementation of the optimal contract, total bequests for the next generation and the number

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