



Perpetual youth and endogenous labor supply: A problem and a possible solution

Guido Ascari ^{a,*}, Neil Rankin ^b

^a *Dipartimento di economia politica e metodi quantitativi, Faculty of Economics,
University of Pavia, Via San Felice, 7, I-27100 Pavia, Italy*

^b *Department of Economics, University of Warwick, Coventry CV4 7AL, United Kingdom*

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Abstract

In the “perpetual youth” overlapping-generations model of Blanchard and Yaari, if leisure is a “normal” good then some agents will have negative labor supply. We suggest a solution to this problem by using a modified version of Greenwood, Hercowitz and Huffman’s utility function. The modification incorporates real money balances, so that the model may be used to analyze monetary as well as fiscal policy. In a Walrasian version of the economy, we show that increased government debt and increased government spending raise the interest rate and lower output, while an open-market operation to increase the money supply lowers the interest rate and raises output.

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1. Introduction

The Blanchard (1985)–Yaari (1965) model of overlapping generations (OLG) has become a standard tool of macroeconomic analysis. The advantages of Blanchard’s

* Corresponding author. Tel.: +39 0382 986211; fax: +39 0382 304226.

E-mail addresses: gascari@eco.unipv.it (G. Ascari), N.Rankin@warwick.ac.uk (N. Rankin).

framework over other models of overlapping generations, such as that of Diamond (1965), are that the average length of life of a typical agent can be parameterized and that the special case of infinite lives is nested within it. This is achieved while retaining elegance and simplicity at the aggregate level. A key assumption is that an agent has a constant probability of death, independent of age. This has caused the model sometimes to be referred to as one of “perpetual youth” (e.g. by Blanchard and Fischer, 1989). The perpetual youth framework has found many useful applications. Most obviously, and like other OLG models, it implies that “Ricardian Equivalence” does not hold, and so it provides a fruitful structure for analyzing fiscal policy, in particular the effects of government debt and deficits.

Most of the applications to date (as in Blanchard’s original (1985) paper itself) have been in the “long-run” context of growth and capital accumulation, assuming exogenous labor supply. The Blanchard–Yaari structure is however also very relevant for studying the “short-run” effect of fiscal policy in models of business cycle fluctuations, including the question of the interaction between monetary and fiscal policy. Over a period of 5 years or less, changes in labor inputs are typically at least as important as changes in capital inputs in explaining output movements, and hence it becomes desirable to model the labor market, and as part of this, the labor supply. Hence in short-run models it is usually assumed that households obtain utility from leisure, so that their optimal labor supply decision is then in general a function of current and future real wages, interest rates, and wealth levels.

In this paper, we point out a potential problem with making the labor supply decision endogenous in a perpetual youth model: namely, some agents’ labor supply is likely then to be negative. The intuitive explanation for why there is a “negative labor supply” problem is as follows. With most specifications of agents’ preferences, leisure is a “normal” good, i.e. the wealthier the agent is, the more leisure he demands, and therefore the less labor he supplies. In the perpetual youth model, the older the agent is, the more financial wealth he has. Moreover, the age distribution is such that there is no upper bound on age: there are always some arbitrarily old agents alive at any point in time. Therefore, at any point in time there are always some very wealthy agents in the population, and, if leisure is a normal good, these agents will want to consume more leisure than is feasible given their time endowment. Otherwise stated, such agents will want to supply negative amounts of labor. This problem is particular to the perpetual youth model because of the lack of an upper bound on age. In a Diamond-type model with n -period lives, on the other hand, while there *may* still be a question of negative labor supply, it is not *guaranteed* that there are agents for whom the preferred labor supply is negative.

Given the importance of the Blanchard–Yaari model as a central tool for macroeconomists, the main part of the present paper is devoted to suggesting a solution to this problem. In doing this, it needs to be remembered that, first, a number of restrictions are already placed on agents’ preferences to permit us to derive the aggregate equivalents of individual demand functions. In particular, agents’ demand functions for goods and leisure need to be linear in wealth. This ensures that aggregate demands for consumption and leisure can be written as functions only of aggregate wealth (and of relative prices), and that they are independent of the wealth distribution across agents of different ages. Such a condition rules out preferences which would make labor supply tend asymptotically to zero, since labor supply would then be non-linear in wealth. Second, simply to take proper account of the non-negativity condition on labor supply, without changing

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