Conspicuous consumption and generation replacement in a model of perpetual youth

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ABSTRACT

This paper investigates household decisions in an overlapping generations model in which individual utility depends on a weighted average of consumption of one's peers. In contrast to representative agent economies, the consumption externality *generally* affects savings and growth rates. The effects critically depend on the rate at which labor productivity changes with age. For a high (low) rate, the externality *lowers* (*raises*) the steady state propensity to consume out of total wealth. The optimal allocation can be decentralized by a (reverse) unfunded social security system if the rate of labor productivity decline is high (low). In contrast to discrete time OLG models, the *optimal* steady state capital income tax is zero, in spite of the externality.

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1. Introduction

Psychologists have often pointed to the fact that individuals experience happiness by doing well *relative to some reference group*. In economic terms, this observation refers to what is called *conspicuous consumption* or the desire to keep up with the Joneses.[1] The effects of the desire to keep up with the Joneses for household behavior in a market economy and for distortions are considered in this paper.

Economists have frequently argued that conspicuous consumption is one source of the low savings rates observed in developed countries. As everyone aims at keeping up with the Joneses, there is "overconsumption," and the savings rate is lower than optimal. But is this a valid argument? This paper will conclude that, in general, this is *not* a valid argument.

The phenomenon of conspicuous consumption is not a new one. In the past, many classical economists assumed that conspicuous consumption or the quest for status – a consumption externality, in modern terms – is an important component of the pursuit of self-interest (Kern, 2001). In *The Theory of Moral Sentiments*, Adam Smith

notes: Though it is in order to supply the necessities and conveniences of the body, that the advantages of external fortune are originally recommended to us, yet we cannot live long in the world without perceiving that the respect of our equals, our credit and rank in the society we live in, depend very much upon the degree in which we possess, or are supposed to possess, those advantages. The desire of becoming the proper objects of this respect… is, perhaps, the strongest of all our desires (Smith, 1991, pp. 212-213). More recently, the previous literature offers strong evidence of the *existence* of conspicuous consumption. Important contributions include Brekke and Howarth (2002), Frank (1985, 1999), Johansson-Stenman et al. (2002), Johansson-Stenman and Martinsson (2006), Luttmer (2005), and Solnick and Hemenway (1998, 2005). The existence of consumption externalities has been successful in explaining a number of stylized facts. Conspicuous consumption sheds important light on, for example, happiness (Easterlin, 1995; Frank, 1985, 1999; Scitovsky, 1992), asset pricing (Abel, 1999; Campbell and Cochrane, 1999; Dupor and Liu, 2003), optimal tax policy over the business cycle (Ljungqvist and Uhlig, 2000), optimal redistributive taxation (Boskin and Sheshinski, 1978), and the marginal excess burden (Wendner and Goulder, 2008).

This evidence motivates the analysis of the theoretical effects of conspicuous consumption on consumption and savings decisions. As the framework for analysis, we employ a continuous time overlapping generations (OLG) model with exogenous labor supply, in which

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individual labor productivity decreases with age. The representative agent model emerges as a special case of the employed framework.[2]

This paper offers three main contributions with respect to the prior literature related to conspicuous consumption. First, conspicuous consumption generally changes the steady state propensity to consume, consumption (growth) and capital accumulation. The nature of the effects, however, critically depends on the rate at which labor productivity declines with age. If the rate of decline of labor productivity is small, conspicuous consumption raises the steady state propensity to consume, and it lowers steady state consumption and capital levels. The opposite is true when the rate of decline of labor productivity is high. This result differs from what was shown for representative agent economies. Rauscher (1997), Brekke and Howarth (2002), Liu and Turnovsky (2005), and Turnovsky and Monteiro (2007) demonstrate that in a representative agent economy with exogenous labor supply, a consumption externality has *no impact* on the steady state equilibrium. In their settings, the steady state capital stock is fully determined by the Keynes–Ramsey rule, independently of a consumption externality. In this paper, we show that a consumption externality always has effects on the steady state equilibrium *in an overlapping generations framework*. This has been observed already by Wendner (2007) and Fisher and Heijdra (2009). What has not been observed, however, is the fact that conspicuous consumption may either raise or lower the propensity to consume (the consumption and capital levels), depending on the rate at which labor productivity declines with age. In an overlapping generations model individual consumption levels change with age. As a consequence of the continuous inflow of new generations, individual and average consumption levels generally differ from each other. This opens a channel for the externality to have an impact on consumption and capital, as the steady state capital stock is not determined anymore by the Keynes–Ramsey rule. The rate at which labor productivity declines with age affects the differences between individual and average consumption growth rates, and thereby, the effects of conspicuous consumption.

Second, the socially optimal allocation can be decentralized by a tax on capital income and an unfunded social security system. In contrast to the results of Abel (2005), however, the optimal *steady state* capital income tax rate equals zero, in spite of the presence of a consumption externality. The difference in the results is caused by the fact that the propensity to consume is age-dependent in the two-period OLG model, while it is independent of age in the continuous time OLG model. Implementation of an optimal social security system affects a household's propensity to consume – thereby the intergenerational consumption growth rate – in the two-period OLG model. This effect, which is corrected for by a tax on capital income, is not seen in the continuous time OLG model. Therefore, the results do not present a mere extension from a two-period OLG framework to a multi-period OLG framework. Rather, the results show that the optimal tax policy in a two-period OLG model generally differs from that in a continuous time OLG model.

Third, conspicuous consumption always introduces a distortion in the continuous time OLG model. If the rate at which labor productivity declines is high (low) an unfunded social security system (a reverse unfunded social security system) is capable of decentralizing the optimal allocation. With a high (low) rate of labor productivity decline, conspicuous consumption causes steady state overconsumption (underconsumption) which requires the optimal transfer scheme to increase (decrease) with age.

The results emphasize the significance of the rate at which labor productivity declines with age for the effects of conspicuous consumption. One direct implication of the above results is the following. Conspicuous consumption *either* raises the propensity to consume (in case of a low rate of labor productivity decline), *or* it yields overconsumption (in case of a high rate of labor productivity decline). But it cannot imply both effects at the same time.

Section 2 of the paper presents the economy's structure. Section 3 considers the steady state effects of conspicuous consumption in a market economy. Section 4 sets up a command optimum and shows that the optimal allocation can be decentralized by a (reverse) unfunded social security system. It discusses the impact of conspicuous consumption on the optimal social security system. Section 5 concludes the paper. A number of derivations and proofs are provided in Appendix A.

2. The economy's structure

In this section, we augment a simple continuous time overlapping generations model (with CD production and CRRA utility) by a "keeping up with the Joneses" consumption externality (conspicuous consumption). Individual utility not only depends on own consumption but also on a weighted average of consumption by others.

2.1. Population

An individual born at time v ("vintage") is uncertain about the length of his or her life. As in Blanchard (1985) and Buiter (1988), the instantaneous probability of death (the death rate, d) of a cohort is age-independent and constant over time. Also, the ratio of the expected number of births per time unit to the size of the population – the birth rate (b) – is assumed to be age-independent, constant over time.

At time t, the population size is $L(t)$. At each instant of time, a new cohort is born, the size of which is $bL(t)$. Also, at time t, the mass of people who die is $dL(t)$. Accordingly, for a large population size, the rate of population growth is $n = b - d$. Population at some date t_1 is given by: $L(t_1) = L(t_0)e^{n(t_1 - t_0)}$. Without loss of generality, $L(0) = 1$. Consequently, $L(t) = e^{nt}$.

Denote the size of a vintage-v cohort at time t by $L(v,t)$. Under this population structure $L(v,t) = L(v,v)e^{-d(t-v)} = bL(v)e^{-d(t-v)} = be^{nv}e^{-d(t-v)} = be^{bv-dt}$. Similarly, the share of a vintage-v cohort in total population at time t is:

$$l(v,t) \equiv L(v,t)/L(t) = \left[be^{bv}e^{-dt} \right] / e^{(b-d)t} = be^{-b(t-v)}. \tag{1}$$

The expected remaining lifetime of any agent is: d^{-1}.[3] In the following, we focus on the case without population growth:

$$n = 0, \quad L(t) = 1. \tag{2}$$

As we conceptually distinguish the birth rate from the death rate, we will clarify which of the results are driven by the perpetual inflow of cohorts ($b>0$) and which are driven by the finiteness of lifetime ($d>0$).

2.2. Production

There is a large number of competitive, identical firms. The representative firm produces a homogeneous output, Y, according to the Cobb–Douglas function:

$$Y(t) = AK(t)^{\alpha}N(t)^{1-\alpha}, \quad A > 0, \quad 0 < \alpha < 1, \tag{3}$$

where K and N are capital and *effective* labor services, and A is total factor productivity. Any *individual* laborer's productivity depends on

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[2] Frequently, the continuous time OLG model is referred to as model of perpetual youth. Here, we use the terms continuous time OLG model and model of perpetual youth interchangeably.

[3] As a special case, the representative-agent model emerges from the perpetual youth model by setting $b=0$, and $d=-n$.