



Overconsumption, reference groups, and equilibrium efficiency

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Abstract

Economists argue that overconsumption and low savings rates in developed societies are mainly due to the negative effects of reference groups. We show that overconsumption behavior depends on the relative strength of the group effects but not on the sign.

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1. Introduction

Psychologists have often claimed (see [Helson, 1964](#)) that individuals apparently do not try to maximize utility in which consumption goods are the principal argument. Instead, individuals experience happiness by doing well relative to some reference group (consume more than others) or to a benchmark level (consume more than in the past). There is also a long tradition in economics that views individual preferences as interdependent, see [Veblen \(1899\)](#) and [Duesenberry \(1949\)](#). Recently, [Frank \(1999\)](#) has argued that the overconsumption phenomenon and the low savings rates in developed societies are mainly due to the negative effects of reference groups. He also argues in favor of a progressive consumption tax to solve the negative impact of reference groups in the consumer decisions.

In this paper, we explore the effects of reference groups in the savings decisions using a two-period overlapping generations growth model. We show that overconsumption behavior depends on the relative

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strength of the group effects but not on the sign. This finding differs from Dupor and Liu (2003), which shows that the existence of jealousy is sufficient to explain equilibrium overconsumption. In this economy, jealousy is not a sufficient condition to generate equilibrium overconsumption. We characterize optimal tax policies aimed to restore efficiency in the presence of overconsumption and we find that an increasing consumption tax might not be socially efficient. The government chooses to set a higher consumption tax on the cohorts whose consumption is largely affected by group effects, but not by the consumption level as suggested by Frank.

2. Economy

We consider a two-period overlapping generations economy. Within a given cohort, all individuals are homogeneous and we assume that each cohort has a measure one number of agents. The aggregate resource constraint is $F(K_t) = C_{1t} + C_{2t} + X_t$, where $F(\cdot)$ is a neoclassical production function, C_{1t} and C_{2t} denote aggregate consumption of the young and the old generations, respectively, and $X_t = K_{t+1} - (1 - \delta)K_t$ denotes gross investment.

During the first period of life, individuals work and carry out consumption savings decisions. When old, households consume the total returns of savings before dying. Old generations do not supply labor in the market. The newborn preferences over consumption are defined by a time separable utility function $U(c_{1t}, \bar{C}_{1t}) + \beta U(c_{2t+1}, \bar{C}_{2t+1})$,¹ where $\beta > 0$ is the time discount rate, and C_{it} , where $i = 1, 2$, denotes the cohort specific reference group for age i individuals at time t . The utility function satisfies $U_c > 0$, $U_{cc} < 0$, and we assume that the external effects are not very strong, that is $U_c + U_{\bar{C}} > 0$ and $U_{cc} + U_{\bar{C}\bar{C}} < 0$.

The newborn cohort maximizes her objective function subject to the intertemporal budget constraint $w_t = c_{1t} + c_{2t+1}/R_{t+1}$. In the choice problem, the consumer does not take into account the impact of his decisions in the average consumption that affect the level of utility. The first-order conditions of the consumer problem evaluated at the equilibrium consumption levels ($c_{1t} = \bar{C}_{1t}$ and $c_{2t+1} = \bar{C}_{2t+1}$) are

$$\frac{U_{c_{1t}}(\bar{C}_{1t}, \bar{C}_{1t})}{U_{c_{2t+1}}(\bar{C}_{2t+1}, \bar{C}_{2t+1})} = \beta(1 - \delta + F'(K_{t+1})), \quad \forall t, \quad (2.1)$$

Combining the first-order condition with the aggregate resource constraint, we can solve for the equilibrium allocations $\{C_{1t}^*, C_{2t}^*, k_{t+1}^*\}_{t=0}^{\infty}$. In the presence of external effects, the competitive equilibrium does not need to be Pareto efficient. One way to show the inefficiency of the allocation paths is to solve the associated social planning problem. The first-order condition of the social planner are characterized by

$$\frac{U_{c_{1t}}(c_{1t}, \bar{C}_{1t}) + U_{\bar{C}_{1t}}(c_{1t}, \bar{C}_{1t})}{U_{c_{2t+1}}(c_{2t+1}, \bar{C}_{2t+1}) + U_{\bar{C}_{2t+1}}(c_{2t+1}, \bar{C}_{2t+1})} = \beta(1 - \delta + F'(K_{t+1})), \quad \forall t, \quad (2.2)$$

¹ An important assumption in this formulation is that the reference group for each generation is determined by individuals within the same cohort or age. Developmental psychologists and sociologists have long acknowledged the importance of the peer group during early adolescence in shaping and supporting the behavior of its members, see Corsaro and Eder (1990). Much of the research in this area has documented that peer experiences during early adolescence are qualitatively different than those in the adulthood. These observations are also consistent with the empirical evidence reported by Frank (1985) where status concerns have an important effect on economic decisions.

together with a transversality condition for the capital stock. Combining (3.3) condition with the resource constraint, we can solve for the efficient allocations $\{\hat{C}_{1t}, \hat{C}_{2t}, k_{t+1}\}_{t=0}^{\infty}$. Thus, comparing (3.2) and (3.4), we see that the effect of reference groups will not cause over/underconsumption distortions if and only if preferences satisfy

$$\frac{U_{\bar{C}_{it}}(c_{it}, \bar{C}_{it})}{U_{c_{it}}(c_{it}, \bar{C}_{it})} \Big|_{c_{it}=C_{it}} = A \quad \forall i, t, \quad (2.3)$$

where A is a constant. We summarize the results in the next proposition.

Proposition 1. *If consumption externalities are generation-specific and the utility function satisfies (2.3), the allocations in a competitive equilibrium $\{C_{1t}^*, C_{2t}^*, k_{t+1}^*\}_{t=0}^{\infty}$ are Pareto efficient and do not exhibit overconsumption.*

A class of preferences commonly used in the consumption externalities literature satisfy this condition

$$U(c, \bar{C}) = \frac{1}{1-\sigma} \left[\left[\frac{c^\rho - \mu \bar{C}^\rho}{1-\alpha} \right]^{\frac{1}{\rho}} \right]^{1-\sigma},$$

as $\mu \rightarrow 0$ we have

$$u(c, \bar{C}) = \frac{[c\bar{C}^{-\mu}]^{1-\sigma}}{1-\sigma}.$$

where $-\infty < \rho < 1$, $\mu < 1$. In this case, the increase of private consumption has exactly the same effect on the marginal rate of substitution as the decrease in cohort aggregate consumption. These preferences imply a constant marginal rate of substitution between individual and the reference group consumption. It is important to remark that this result holds along the transition path and in the long run steady state, and it guarantees efficiency in an economy where generations live more than two periods. In a life-cycle model, reference groups can affect the steady state capital stock unless condition (2.3) is satisfied. This finding contrast with the infinite-lived consumer model where consumption externalities do not affect the steady state capital stock when labor is inelastically supplied (see Liu and Turnovsky, 2002).

Proposition 2. *If consumption externalities are generation-specific and the utility function satisfies*

$$\frac{U_{\bar{C}_1}(c_1, \bar{C}_1)}{U_{c_1}(c_1, \bar{C}_1)} \Big|_{c_1=C_1} > \frac{U_{\bar{C}_2}(c_2, \bar{C}_2)}{U_{c_2}(c_2, \bar{C}_2)} \Big|_{c_2=C_2}, \quad (2.4)$$

the presence of reference groups generates overconsumption.

Condition (2.4) implies that cohort reference group effects are more important for the young cohorts than for the old. Clearly, overconsumption behavior depends on the relative strength of the group effects not on the sign. An extreme formulation where the amount of under savings is maximized would be an environment in which the young generations compare themselves with their age group and the old

generations do not. This finding differs from Dupor and Liu (2003), which shows that the existence of jealousy is sufficient to explain equilibrium overconsumption. In our environments, jealousy is not a sufficient condition to generate equilibrium overconsumption.

Proposition 3. *The optimal capital income tax/subsidy to correct consumption externalities is*

$$\theta_{t+1} = \frac{U_{c_{2t+1}} U_{\bar{c}_{1t}} - U_{c_{1t}} U_{\bar{c}_{2t+1}}}{U_{c_{2t+1}} (U_{c_{2t+1}} + U_{\bar{c}_{2t+1}})}. \quad (2.5)$$

Given the assumption on preferences ($U_c > 0$ and $U_c + U_{\bar{c}} > 0$), the relative strength of the group effect between both generations determines the sign of the optimal policy. Formally, $\theta_{t+1} > 0$ if $U_{\bar{c}_{2t+1}} - U_{\bar{c}_{1t}} > 0$ and $\theta_{t+1} < 0$ if $U_{\bar{c}_{2t+1}} - U_{\bar{c}_{1t}} < 0$. The economic intuition is simple, when the reference groups generate under savings behavior, the capital income tax should be negative to increase the relative price of consumption for the young generations. At a higher interest rate, present consumption for the young generations is more expensive and they will save more. When the marginal rate of substitution between private consumption and the reference group consumption are equal over the life cycle, the optimal capital income tax is zero. If instead of using a capital income tax the government decides to implement a cohort-specific consumption tax, this policy would imply a higher consumption tax on the cohorts whose consumption is largely affected by the group effects, but not by the consumption level as suggested by Frank.

In an environment where individuals live N -periods, if the reference group effects get weaker over time, the optimal policy would prescribe a decreasing capital income subsidy, as long as the savings rate is below the efficient level for each generation. If the savings rate of the older generations is above the efficient level, then the capital income of these cohorts should be taxed. In an economy with multiple generations, the steady state capital income tax would take the form of $\theta_{i+1} = (U_{c_{i+1}} U_{\bar{c}_i} - U_{c_i} U_{\bar{c}_{i+1}}) / (U_{c_{i+1}} (U_{c_{i+1}} + U_{\bar{c}_{i+1}}))$, where i denotes the age of a particular cohort.

3. Conclusions

The overconsumption phenomenon and the low savings rates associated to the presence of reference groups has been often used as an argument in favor of government intervention. In contrast with previous research, we show that overconsumption behavior depends on the relative strength of the reference group effects but not on the sign. We characterize optimal tax policies aimed to restore efficiency in the presence of overconsumption.

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References

- Corsaro, W.A., Eder, D., 1990. Children's peer cultures. *Annual Review of Sociology* 16, 197–220.
- Dupor, B., Liu, W.F., 2003. Jealousy and equilibrium overconsumption. *American Economic Review* 93, 423–428.
- Duesenberry, J.S., 1949. *Income, Savings and the Theory of Consumer Behavior*. Harvard University Press, Cambridge.
- Frank, R., 1985. *Choosing the Right Pond*. Oxford University Press, New York.
- Frank, R., 1999. *Luxury Fever: Why Money Fails to Satisfy in an Era of Excess*. The Free Press, New York.
- Helson, 1964. *Adaptation-Level Theory*. Harper and Row, New York.
- Liu, W.F., Turnovsky, S.J., "Consumption Externalities, Production Externalities, and the Accumulation of Capital," Mimeo University of Washington, Seattle.
- Veblen, Thorsten, 1899. *The Theory of the Leisure Class*. Penguin, New York.