Social time preference

Giancarlo Marini¹, Pasquale Scaramozzino²

¹ Dipartimento di Economia e Istituzioni, Università di Roma «Tor Vergata», via di Tor Vergata s.n.c., 00133 Roma, Italy.
(Fax: +39-06-2020-500; e-mail: Giancarlo.Marini@UniRoma2.It)
² Centre for Financial and Management Studies, SOAS, University of London, Thornhaugh Street, London WC1H 0XG, UK. (Fax: +44-20-7637-7075; e-mail: PS6@soas.ac.uk)

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Abstract. The observed practice of discounting the future should not be rationalised on the grounds of myopia or selfishness. A positive rate of pure time preference is necessary to ensure that heterogeneous generations are treated in an egalitarian fashion. A zero social discount rate would yield intertemporal allocations which are biased against the current generations. Endogenous productivity growth requires that the social discount rate be set above the subjective rate of pure time preference. Positive social time preference, far from discriminating against future generations, is essential for a fairer intertemporal allocation of resources.

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1. Introduction

A positive rate of time preference has often been rationalised on the basis of either myopic behaviour or deliberate selfishness of current generations. A popular argument is that future generations ought to be given exactly the same weight as the currently alive ones: in other words, there should be no discounting of future relative to present utility. The debate on the ethical motives prescribing a zero discounting of future utilities dates back at least to the seminal work by Pigou (1920) and Ramsey (1928). Positive discounting

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has, on the other hand, been proved to be necessary for a well-defined representation of preferences over an infinite horizon (see Koopmans 1960; Diamond 1965). A sufficiently high social discount rate is also essential to prevent present generations from being unfairly treated. As argued by Mirrlees (1967), the generations currently alive could have an exceedingly low consumption per capita under zero discounting (see also Chakravarty 1969). A positive discount rate could thus act as a compensating device against the built-in bias in favour of future generations, which occurs when technology changes over time. Dasgupta and Heal (1979, chapter 9) also argue that, in order to assess the validity of discounting future utilities, it is necessary to consider the implications of alternative social discount rates about future growth paths.

In the present paper, we find the optimal social discount rate by following the approach originally suggested by Calvo and Obstfeld (1988) where utilities of different generations are discounted back to their birth date. We are able logically to distinguish between the social and the private discount rates. With exogenous technical progress, the optimal value for the social discount rate is the instantaneous rate of productivity growth, augmented by the rate of growth of population. With endogenous productivity growth, the social discount rate must be equal to the marginal social product of capital.

The scheme of the paper is as follows. Section 2 briefly reviews the issue of discounting the future and sets forth our model. The time-consistent utilitarian criterion is described in detail and the optimal value of the discount rate is explicitly derived under exogenous productivity growth. Section 3 extends the analysis to the case of endogenous productivity growth. Section 4 sums up the main results.

2. Overlapping generations and discounting

Optimum growth theory has largely concentrated on the maximisation of a utility function over an infinite time horizon, where a benevolent social planner typically discounts future utilities at a positive rate. Pigou (1920, p. 29) and Ramsey (1928) are strongly opposed to discounting, on the grounds that it is not ethical to attach a lower weight to the welfare of future generations.

In the literature there are however also arguments in favour of discounting future utilities. For example, when the discount rate is set equal to zero in the objective function of the social planner, the resulting inter-temporal consumption allocation is biased against the current generations and excessively favours the future ones (see Mirrlees 1967, p. 112; Chakravarty 1969; Sect. 3.4). The use of a positive discount rate in the social objective function is also consistent with Koopmans’ (1960) preference ordering over the set of well-being paths.

The literature has mainly concentrated on the representative agent framework, thus neglecting the heterogeneity of agents. Heterogeneity across generations at each moment in time can be modelled by employing the continuous-time model originally developed by Yaari (1965) and Blanchard (1985), and later extended by Weil (1989) and Buijter (1988) to allow for a more flexible demographic structure.

The instantaneous population growth rate is denoted by \( n = \beta - \lambda \), where \( \beta \) and \( \lambda \) are, respectively, instantaneous birth and death rates. The private subjective rate of pure time preference is \( \rho > 0 \). The individual consumer