

# Altruism and Egoism: Measurable by Utility Discount Rates?

by Stefan Bayer, Tübingen

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Altruism, Egoism, Utility Discount Rate, Welfare Function.

## Summary

We analyze the role of "the" utility discount rate and its implications to generation-specific and societal altruism and egoism, respectively, in a neoclassical framework. It is worked out clearly, that two different utility discount rates have to be distinguished: An (inverse) altruism-parameter and a social discount rate. High levels of the altruism-parameter depict relatively weak altruistic behavior. However, high levels of the social discount rate are in general introduced to argue within egoism-models. The often found conjecture that the level of "the" discount rate determines whether we argue altruistically or egoistically can, therefore, not be confirmed. It is stated that rather the assumed utility/welfare function is decisive for egoistic and altruistic analyses. Connecting our considerations with the utilitarian requirement for equal treatment of all affected individuals (generations) we conclude that the social discount rate has to be set to zero in egoism- as well as altruism-models and, additionally, the altruism-parameter has to be infinitely high. This shows clearly that the level of "the" discount rate is insufficient for decisions whether a specific analysis is altruistic or egoistic. At the end of our analysis we draw some conclusions applying our considerations to simulation models with respect to global warming.

## 1 Introduction

Cost-benefit-analyses are undertaken either in the framework of optimal growth theory or in overlapping-generations-models (OLG-models). To judge projects concerning generations living in the (far) future, we have to take into account adequately their project-induced effects in the planning decision today. Generally, traditional cost-benefit-analyses include future effects in a diminished extent due to the usage of positive utility discount rates.<sup>1</sup> The same is valid if there is positive utility discounting in optimal growth theory<sup>2</sup> as well as in OLG-models where a societal decision-maker discounts generation-specific present value welfare levels once again to the planning period.<sup>3</sup> Current living generations are favored at the expense of future living

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<sup>1</sup> See among others *Brown* (1998).

<sup>2</sup> See *Nordhaus* (1994).

<sup>3</sup> See *Blanchard/Fischer* (1989).

ones. Therefore, we want to label such types of models "egoism-models" because of the inherent assumption that today's living generations act on their own behalf.

In contrast, to avoid systematic underevaluations of future generations, some authors argue in model-types explicitly considering interests of future generations.<sup>4</sup> Generations living today act - at least partially - on behalf of future generations because increasing utilities in the future augment today's living generations' utilities as well. Such analyses can be labeled "altruism-models". Thereby, the degree of altruism can be measured by the level of the utility discount rate of each generation with respect to altruistic utility units: If it is set to zero, perfect altruism is depicted in altruistic OLG-models (see below). The higher it is set, the less pronounced altruistic behavior of specific generations is given.<sup>5</sup> The usage of "low" utility discount rates in general depicts "altruistic behavior" due to relatively higher "weights" for future occurring effects.

Our analysis keeps in mind that the argumentation so far is completely independent of the assumed utility and welfare functions, respectively. Integrating them in our analysis, we will show, that the level of the utility discount rate can neither be used as main indicator for intergenerational altruism nor for egoism when we analyze its level. Thus, a positive utility discount rate depicts altruistic as well as egoistic behavior to a lesser or higher extent - dependent mainly on the assumed utility and welfare function and the method of aggregation of generation-specific utility present values.

## 2 Utility Discounting in Different Model Frameworks

Mathematically, an altruistic welfare function can be given analogic to Bernheim/Ray as follows:<sup>6</sup>

$$(1) \quad W^t = U^t \left( {}^1c(t), {}^2c(t+1) \right) + \sum_{s>t} (1+\delta)^{-s+t} \cdot \left[ U^s \left( {}^1c(s), {}^2c(s+1) \right) \right].$$

We assume a simple OLG-model where two generations are alive simultaneously. The cardinal welfare level of generation  $t$ ,  $W^t$ , is measurable for each generation. Welfare consists of an "original" utility level  $U^t$  - which is given as combination of physical available consumption units  ${}^1c(t)$  (first period of lifetime, "young") and  ${}^2c(t+1)$  (second period of lifetime, "old") during the lifetime of generation  $t$  - and the sum of the discounted utility levels of all subsequent

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<sup>4</sup> See *Stephan/Müller-Fürstenberger* (1998).

<sup>5</sup> See *Stephan/Müller-Fürstenberger* (1998), p. 333.

<sup>6</sup> See *Bernheim/Ray* (1987). An application is given in *Stephan/Müller-Fürstenberger* (1998).

generations  $U^s$ ,  $s > t$  ("altruistic utilities"). The welfare level of generation two ( $W^2$ ), for example, is given by:<sup>7</sup>

$$(2) \quad W^2 = U^2(c^1(2), c^2(3)) + (1+\delta)^{-1} \cdot U^3(c^1(3), c^2(4)) + (1+\delta)^{-2} \cdot U^4(c^1(4), c^2(5)) + \dots \\ + (1+\delta)^{-(T-1)} \cdot U^{T+1}(c^1(T+1), c^2(T+2))$$

Generations take into account all future project-induced utility as well as consumption effects due to altruistic behavior. However, with growing time distances - indicated by increasing  $s$  and constant  $t$  - altruism of earlier living generations decreases according to the utility discount factor  $(1+\delta)^{-s+t}$ . The more distant future generations are, the less weight is put on their utility effects in today's planning decisions and the less do they influence the efficiency of today's projects. Each generation behaves perfectly altruistic if the utility discount rate  $\delta$  (the "(inverse) altruism parameter") is set to zero. This implies that today living generations consider future generations' utilities according to their current level. Obviously, the higher the discount rate is set, the less distinct altruism is given.<sup>8</sup>

The assumption of an OLG-utility function according to Bernheim/Ray (1987) implies that additional welfare effects of future generations are explicitly taken into account by today's living generations. Reference for welfare considerations of generation 3 ( $W^3$ ), for instance, is the second period of the planning horizon  $t_2$ .<sup>9</sup> The original (i.e. generation-specific, reflex of physically available consumption units) and the altruistic (i.e. future generations' available consumption units) utilities have to be referred to  $t_2$ , in which the original utility of generation three has been taken into account as (discounted) altruistic utility of generation two. This is valid for the whole planning horizon and all generations. To calculate an aggregate welfare level of all individuals living within the planning horizon, a societal decision-maker has to sum up all generation-specific welfare levels as they are given at the beginning of each respective lifetime. Table 1 illustrates our considerations:

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<sup>7</sup> We keep in mind that each living generation usually discounts utilities in their second lifetime-period to the beginning of their respective lives. This is not explicitly depicted in our mathematical formulation but implicitly taken into account.

<sup>8</sup> In this kind of utility function, the degree of altruism can be lowered by using high discount rates but it never completely disappears because of its exponential form.

<sup>9</sup> See table 1.

Generation	$t_1$	$t_2$	$t_3$	$t_4$	$t_5$	$t_6$	...	$W$
1	$U({}^2c_{t1})$	$\theta^{-1}U({}^1c_{t2}, {}^2c_{t3})$	$\theta^{-2}U({}^1c_{t3}, {}^2c_{t4})$	$\theta^{-3}U({}^1c_{t4}, {}^2c_{t5})$	$\theta^{-4}U({}^1c_{t5}, {}^2c_{t6})$	$\theta^{-5}U({}^1c_{t6}, {}^2c_{t7})$	...	$W^1$
2	$U({}^1c_{t1}, {}^2c_{t2})$	$\theta^{-1}U({}^1c_{t2}, {}^2c_{t3})$	$\theta^{-2}U({}^1c_{t3}, {}^2c_{t4})$	$\theta^{-3}U({}^1c_{t4}, {}^2c_{t5})$	$\theta^{-4}U({}^1c_{t5}, {}^2c_{t6})$	$\theta^{-5}U({}^1c_{t6}, {}^2c_{t7})$	...	$W^2$
3		$U({}^1c_{t2}, {}^2c_{t3})$	$\theta^{-1}U({}^1c_{t3}, {}^2c_{t4})$	$\theta^{-2}U({}^1c_{t4}, {}^2c_{t5})$	$\theta^{-3}U({}^1c_{t5}, {}^2c_{t6})$	$\theta^{-4}U({}^1c_{t6}, {}^2c_{t7})$	...	$W^3$
4			$U({}^1c_{t3}, {}^2c_{t4})$	$\theta^{-1}U({}^1c_{t4}, {}^2c_{t5})$	$\theta^{-2}U({}^1c_{t5}, {}^2c_{t6})$	$\theta^{-3}U({}^1c_{t6}, {}^2c_{t7})$	...	$W^4$
5				$U({}^1c_{t4}, {}^2c_{t5})$	$\theta^{-1}U({}^1c_{t5}, {}^2c_{t6})$	$\theta^{-2}U({}^1c_{t6}, {}^2c_{t7})$	...	$W^5$
6					$U({}^1c_{t5}, {}^2c_{t6})$	$\theta^{-1}U({}^1c_{t6}, {}^2c_{t7})$	...	$W^6$
7						$U({}^1c_{t6}, {}^2c_{t7})$	...	$W^7$
⋮							⋮	⋮

*Table 1:*  $\theta \equiv (1+\delta)$  denotes the (inverse) discount factor. The utility function  $U$  represents the combined generation-specific lifetime utility of each affected generation. Obviously,  $c_{ti}$  (the complete consumption effect in period  $t_i$ ) is split up into  ${}^1c_{ti}$  (young generation's consumption in  $t_i$ ) and  ${}^2c_{ti}$  (old generation's consumption in  $t_i$ ). Consumption effects of the old generation living in  $t_1$  is given in line 1. It considers all utilities of the subsequent generations although it only lives for one more period. The last column denotes the total generation-specific (original and altruistic) welfare effect  $W^k$  of any project that is given by summing up all effects during the planning horizon. The dark shaded area shows these time-periods, where a societal decision maker discounts generation specific present value utilities to the beginning of the planning horizon. In contrast to the assumed OLG-settings, considerations according to optimal growth models in the Barro/Sala-i-Martin (1995)-sense can be undertaken as follows: In each time-period one single consumption effect  $c_t$  is available which leads to a generation specific utility-level  $U(c_t)$ . Aggregating all individual effects can then be interpreted as to sum up all "original" utility effects in the main diagonal in table 1. Thereby, future living generations utilities' are discounted by a societal decision-maker using a positive utility discount rate ("egoism-model").

The longer the planning horizon is extended, the more often altruistic utility effects of future generations are taken into account. This means that future consumption effects are taken into consideration in multiple ways. For example, the consumption amount  ${}^1c_{t3}$  of generation 4 in period  $t_3$ , when its members are young, is physically feasible for them at this time-period. Additionally, generations 1, 2 and 3 take these consumption units into account altruistically and discounted in their respective utility function. Multiple considerations are the more pronounced, the longer the planning horizon is extending (see the columns (time-periods) of table 1). The more distinct the respective altruistic behavior of all generations is given ("small"  $\delta$ ), the more weight is put on altruistic utility effects in societal evaluations. If the altruism-parameter is set to zero, we argue in a world of perfect altruism. In contrast, the higher the altruism-parameter is set, the more the degree of altruism decreases. This shows, that in *altruism-models* the level of "the" utility discount rate represents the degree of altruistic behavior of all generations living within the planning horizon.

In almost all OLG-models (see e.g. Bernheim/Ray (1987) and Stephan/Müller-Fürstenberger (1998)) the aggregation of generation-specific utility levels of a societal decision-maker is done

by discounting them once again to the beginning of the planning horizon (in table 1: time-period  $t_1$ ).<sup>10</sup> The social welfare or aggregation function is given as follows:

$$(3) \quad W_{\text{societal}} = \sum_{j=1}^T (1 + \rho)^{-j} \cdot W^j ,$$

where  $\rho$  can be labeled as "aggregation" or "social" discount rate. In contrast to the utility discount rate  $\delta$ ,  $\rho$  always has an egoistic effect in societal decision-making. In this model-framework, aggregating generation-specific utility levels for societal welfare statements mixes altruistic (welfare-function) and egoistic (utility discounting of future generations' lifetime present value utilities) elements (see below).

Compared to altruistic OLG-models, societal welfare functions in egoism-models are completely different. Taking optimal growth theory as an example, a representative infinitely-living agent maximizes his present value of all periodical utility units until the end of the planning horizon. He/She receives all effects which occur within the planning horizon. During the whole lifetime of the representative agent, consumption units increase its utility level at the time-period of occurrence: Utility depends solely on physically available consumption units. No altruistic utility units do occur at all. This has two reasons: Firstly, due to the existence of just one single person, nobody is able to get any altruistic utilities simply because he/she is not in existence. Secondly, if we interpret an optimal growth model according to Barro/Sala-i-Martin (1995) as a sequence of successively living generations with one time-period lifetime, we are able to roughly approach OLG-settings. Consumption effects always lead to original (i.e. generation-specific) utilities at the time-period of occurrence.<sup>11</sup> For present value calculations, they once again are related to the beginning of the planning horizon by discounting future utilities using the "social discount rate"  $\rho$ . This reflects egoistic behavior in two different ways: (1) Generations which are alive relatively close to the planning horizon get higher "weights" in intertemporal decisions even if the same consumption effect occurs throughout the whole planning horizon (see below). (2) Altruistic utility units do not occur at all because there are no recipients of such utility units. The second term in equation (1) is assumed to be zero either due to explicit setting or because of discounting altruistic utility units by very high discount rates.

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<sup>10</sup> See e.g. *Gerlagh* (1999), pp. 36, for an application and *Blanchard/Fischer* (1989), pp. 98, for more fundamental work.

<sup>11</sup> For one period lifetimes of each generation we can interpret all "original" utility effects in table 1 as the relevant ones for this very special kind of OLG-setting.

### 3 "The" Utility Discount Rate as Main Indicator of Altruism and/or Egoism?

Within our two concepts, two different utility discount rates have been identified. The first one -  $\delta$  - (altruism-parameter) is relevant within the lifetime of altruistic generations. The second one -  $\rho$  - (social discount rate) has to be used by a societal decision-maker to aggregate generation specific lifetime utilities to the beginning of the planning horizon.<sup>12</sup> Discounting utilities leads to distortions in both model-types. It can be stated in egoism-models that the higher the social discount rate is set, the more pronounced egoistic behaviour is depicted and vice versa. This tallies with the conventional neoclassical methodology of equal treatment of all affected generations. However, if we discount generation-specific utility present values in altruism-models, it can only be interpreted as a belated attempt to implement egoistic behavior in these kinds of models. Altruism is (at least partially) compensated by introducing a societal accoun-ter. Principally, three cases exist: (1) overall altruism (egoism effects are dominated by altruism, which should be the most common case for altruism-models), (2) overall egoism (altruism effects are dominated by egoism), and (3) neutrality (the model-inherent altruism is exactly compensated by a societal accoun-ter). However, neutrality can be attained in a much simpler way by using the discounting method of Bayer/Cansier (1998), Bayer/Cansier (1999) and Bayer (2000) ("Generation Adjusted Discounting", GAD).<sup>13</sup> Additionally, the compensation of distortions by mixing altruism and egoism is dubious: A decision maker who uses altruism-models for intergenerational decision making and combines them with egoistic behavior by discounting future generations' lifetime-utilities acts schizophrenically.

Cost-benefit-analyses which are carried out in altruism-models are biased in favor of projects with (high) future consumption effects due to multiple considerations of altruistic utility units. It is completely unimportant, whether the determined generation-specific welfare effects (at the beginning of each respective life) are taken into account either in an undiscounted way or if they will be discounted to the planning time period by a societal decision-maker once again. From a societal viewpoint generational distortions are the more distinct (1) the lower the altruism parameter is set and (2) the longer the planning horizon is assumed and the occurrence of consumption effects extends.

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<sup>12</sup> It is meaningful to distinguish both types of discount rates by using different symbols, although both rates can be assumed to be of identical levels.

<sup>13</sup> This discounting method explicitly differentiates between utility and consumption discounting in intra- as well as intergenerational decision-making.

This is completely different in egoism-models. Discounting utilities while aggregating them implies that equal consumption effects lead to unequal utility present values. Intertemporal decisions are mainly determined by consumption effects which mostly occur within current living "generations". Cost-benefit-analyses are biased in favor of projects with (high) consumption effects which mainly occur contemporarily. The higher the social discount rate is set, the more pronounced egoistic behavior is given.

However, arguing in a neoclassical model framework with the inherent assumption of equal treatment of all affected individuals, we have to conclude that this requirement ("equal treatment") is not fulfilled in both approaches. Furthermore, they have to be interpreted differently in our two different approaches with respect to the level of "the" utility discount rate: Using egoism-models, a zero social discount rate leads to the fulfillment of generational "equal treatment". Each generation will be ranked equally. However, in altruism-models the same physical consumption units are repeatedly taken into account. The longer the planning horizon is assumed, the more generations are taken into account in the altruistic utility function and the more weight will be placed upon them. Equal treatment can only be fulfilled if we heavily discount future altruistic effects. Perfect equal treatment is only feasible if we use an infinitely high utility discount rate (altruism-parameter). Solely in this case each utility unit (consumption unit) is taken into account just once. Obviously, this is completely unrealistic. In general, the higher the altruism-parameter during each generations lifetime is set, the less pronounced altruistic behavior is modeled.

In other words: Each project-induced utility effect has to be considered according to its physical availability in egoism- as well as altruism-models. If an effect occurs in period  $t_i$ , it is physically available only for the one (egoism) or two (altruism) generations living in this certain period. Multiple considerations in altruism-models have to be avoided for judging societal profitability of projects by a social planner as well as underratings in egoism-models. Thus, the utilization of different types of utility discount rates and intergenerational neutrality according to utilitarianism has to be carefully analyzed: In altruism-models one has to use high altruism parameters to realize equal treatment between generations. To obtain neutrality between generations in egoism-models, however, we have to set the social discount rate to zero. Thus, to state whether egoistic or altruistic behavior is depicted it is insufficient to concentrate the argumentation on the level of the utility discount rate. In egoism-models, pronounced egoism is modeled by using high social discount rates. The utilitarian requirement of equal treatment is not fulfilled in this case. The same level of the utility discount rate in altruism-models, however,

generally describes the attempt to comply with the utilitarian necessity. In this case, altruism is modeled weakly.<sup>14</sup>

Both model types show methodological deficiencies because of their arbitrary discrimination of certain generations. This especially contradicts neoclassical efficiency criteria which are based on utilitarianism and require equal treatment of each affected individual. However, the reason for the arbitrariness is not the level of "the" utility discount rate. Altruistic or egoistic behavior is determined by the use of an intertemporal welfare function including the treatment of future utility effects. Non-schizophrenic intertemporal decision-making supposes, that the level of the discount rate only slightly changes the assumed altruism and egoism, respectively, but it never changes the basic model structure. If we want to argue in altruism-models, it is meaningless to use (very) high social discount rates to change the model structure into an egoism-model. However, only the renunciation of social discounting leads in egoism-models to the fulfillment of generational equal treatment.<sup>15</sup>

In summary, discrimination against certain generations in intertemporal decision making is realized principally by the fundamental decision of using a special type of model and does not primarily depend on the level of different utility discount rates.

#### **4 Some Applications and Consequences with respect to Global Warming**

In light of these considerations, results of some simulations with respect to global warming done e.g. by Stephan/Müller-Fürstenberger (1998) ("altruistic" OLG-Model) or Nordhaus (1994) (optimal growth model) are not surprising.<sup>16</sup> In his famous study using the DICE-Model Nordhaus concludes that the best strategy for climate change policy is to wait and see. Future damages are discounted with a social utility discount rate of 3% p.a. until the end of the planning horizon. Immediate abatement induces sharp consumption decreases, which lead to diminishing consumption units (increasing investment units) and, therefore, utilities for currently living generations. The returns are available for later living individuals, their con-

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<sup>14</sup> The argumentation is analogic for low levels of the utility discount rates in both model types.

<sup>15</sup> Introducing negative social discount rates in egoism-models - which is completely unusual in all kinds of models of this type - we are able to depict altruistic behavior of a societal decision-maker. Future utility units are of higher present values in comparison to earlier occurring ones. Obviously, the requirement for equal treatment is not fulfilled in this case as well.

<sup>16</sup> See *Stephan/Müller-Fürstenberger* (1998) and *Nordhaus* (1994).

sumption units increase, but these positive effects are (heavily) discounted. Using a relatively high social discount rate depicts pronounced egoism in his analysis.<sup>17</sup>

In contrast, Stephan/Müller-Fürstenberger (1998) show that the Greenhouse-Gas-abatement-policy (GHG) is too expensive in consumption units for today's living generations when using an altruistic utility function. In comparison to extrinsically motivated agents, GHG-abatement leads to drastic per capita consumption losses and capital overaccumulation. However, this is only an incomplete representation. The underlying altruistic welfare function takes consumption utilities of future generations into account in today's utility maximizing decisions. Positive saving units today imply a reduction of original utility of today's living generations but increase the welfare level of future generations according to the internal rate of return of additional investments. Altruistic utilities do not demand physical consumption units, only the expectation of positive future utilities increases the generation-specific welfare today. In spite of physical consumption losses because of GHG-abatement activities, today's living generations can be better off because of (drastic) increasing altruistic utilities. Stephan/Müller-Fürstenberger (1998) assume - applying a welfare function according to equation (1) - that drastic per capita losses of nowadays living generations imply welfare losses for them. This is unreasonable if we concentrate on welfare levels. If they use a welfare function in accordance with equation (1) multiple (altruistic) considerations of original utility units increase current living generations *welfare*-levels. Therefore, a welfare comparison has to be undertaken. Despite drastic diminishing per capita consumption units of today's living generations, it is highly uncertain whether a welfare comparison leads to the same results as those in the analysis of Stephan/Müller-Fürstenberger (1998). In other words: If Stephan/Müller-Fürstenberger (1998) argue, that GHG-abatement causes economic costs (losses in consumption units per head), then the only possibility to get this result is to set the social discount rate so high, that altruism vanishes completely. Although they explicitly employ an ex-ante altruistic welfare function, they argue ex-post egoistically because of diminished (neglected) considerations of altruistic utility units.<sup>18</sup> This explains the similarities to the results of Nordhaus' ex-ante egoism approach (DICE-model). Therefore, the analysis undertaken by Stephan/Müller-Fürstenberger (1998) can in fact be interpreted as an ex-post egoism analysis using an ex-ante altruistic welfare function.

A more appropriate approach in intertemporal decision making which takes into account efficiency aspects, distributional ones, and equal treatment of all affected generations from a so-

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<sup>17</sup> See Bayer (2000), p. 54, for some calculations with the DICE-model and varying utility discount rates. The original social discount rate of 3% implies an emissions reduction rate of 8.8%. However, abatement increases to 38.8% when a social discount rate of 0% is used.

<sup>18</sup> One could say that they argue in case 2 (chapter 3).

cietal viewpoint is given in the GAD:<sup>19</sup> An adequate assignment to intra- as well as intergenerational (project-induced) effects is possible without assuming egoistic or altruistic behavior. Most important for this approach is an exact registration of all project-induced consumption effects at the time period of their occurrence. Utility effects are taken into account in an OLG-model generation-adequately. This means that generation-specific consumption effects are valued according to the respective welfare level of each generation. During its respective life, each generation is allowed to discount future consumption units in accordance with their own utility discount rate. To determine social present values, we (usually) have to discount intergenerationally. Therefore, it is forbidden to discount utility units to the planning time period, but necessary to discount consumption units according to the growth discount rate. If cost-benefit-analyses are carried out in utility units, we have to consider that the diminishing marginal utility of consumption is already taken into account. In case that a social planner discounts generation-specific utility effects to the planning time period once again, discounting will be undertaken twice ("double discounting"). This allows today's living generations to act egoistically and altruistically, respectively, according to their individual preferences.<sup>20</sup> Overrating of future generations' utility effects according to an altruistic utility function will be prevented because of the exact registration of all occurring effects. Arbitrary discrimination of future generations, which occurs in egoism-models, is avoided as well.

## 5 Conclusions

Our analysis has worked out that we have to distinguish between two different "utility discount rates": Firstly, the altruism-parameter which is used by each generation to discount their altruistic utility units. Secondly, in aggregating generation specific lifetime-utilities a societal decision-maker discounts them to the beginning of the planning-horizon by using a social discount rate. This intuitively shows that "the" utility discount rate as an altruism- or egoism-parameter does not exist. In more detail, a zero altruism-parameter ("renunciation of utility discounting") depicts complete altruism of each generation in altruism-models. However, using zero social discount rates in egoism-models implies equal treatment of all affected generations, respectively. On the other hand, complete altruism implies multiple considerations of project-induced utility effects to a large extent from a societal viewpoint. Future generations dominate today's

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<sup>19</sup> See Bayer/Cansier (1998), Bayer/Cansier (1999) and Bayer (2000).

<sup>20</sup> These considerations can be found in risk theory as well. The subjective risk attitude is taken into account in each individual's expected utility function. If an additional societal risk evaluation is undertaken, for example, by a social planner with objective societal risk attitudes, the risk effect is considered twice. This leads to an overrating of the risk component analogic to our discounting problem (see e.g. Siebert (1998)).

decisions on the efficiency of certain projects. Multiple considerations have to be prevented due to their arbitrary distortions in favor of future generations. The more altruistic the behavior of today's living generations is, the more distorted are intertemporal decisions in altruism-models at the expense of today's living generations.

Arguing in a neoclassical model-framework, equal treatment of generations has to be taken into account as reference for intertemporal comparisons. In altruism-models, therefore, the altruism-parameter has to be set to high values. On the other hand, the use of high values for social discount rates depicts pronounced egoistic behavior. Thus, the level of "the" discount rate is not sufficient to decide whether a specific model argues altruistically and egoistically, respectively: Only in egoism-models the fulfillment of intergenerational neutrality from a societal viewpoint is guaranteed by neglecting social discounting. However, setting the altruism-parameter to zero in altruism-models, equal treatment can never be reached. We conclude that there are inherent inefficiencies in egoism- as well as altruism-models. This is mainly not due to the choice of the utility discount rate because varying positive discount rates cannot reverse an existing egoism(altruism)-model into an altruism(egoism)-one. It is rather the choice of the respective welfare function which induces these distortions.

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