



Analysis

Do People Care About Future Generations? Derived Preferences from Happiness Data

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ABSTRACT

The main approaches for computing very long-term discount rates – revealed and stated preferences – have limitations. We overcome previous shortcomings using derived preferences, i.e. we retrieve information on very long-term time preferences from happiness data and people's expectations about the living conditions of future generations. We account for possible endogeneity between expectations about the future and current well-being using 2SLS. We find that negative (positive) expectations about future generations have a very large negative (positive) impact on subjective well-being. This finding suggests that the very long-term discount rate is lower than implied by most traditional economic analyses.

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1. Introduction

How much do people care about future generations? Very long-term time preferences are critical to assess the amount of resources that current generations are willing to allocate for the prevention or mitigation of future environmental problems. The debate raised by the Stern Review (Stern, 2007) represents a paradigmatic example. The authors' call for immediate action to reduce global warming is based on the assumption of a very low discount rate. Stern and collaborators argue that discounting the very long-term future involves an ethical consideration regarding future generations, which is not implied by discounting the future

over one's lifetime. Weitzman (2007) and Nordhaus (2006), among others, criticized Stern's claim based on their extreme assumption about time preference, which amplified the benefits of deep cuts of greenhouse gas emissions. Most criticism focus on high discount rates revealed by asset markets – often close to 6%, the private return to capital.

However, revealed preferences can hardly answer the opening question of this paper. While private markets provide reliable information about societal evaluation of time within a generation, no comparable private rates exist to evaluate events that will occur beyond our lifetimes. The few estimates of private market discount rates for very long horizons (100 or more years), conclude that they are much lower than implied by most economic analyses (Giglio et al., 2014).

Some researchers tried to overcome the limitations of market data by estimating the long-term discount rate through questionnaires. They ask people to state their preferences about the complex trade-off between current and future outcomes (Layton and Brown, 2000, Atkinson et al., 2009). The main limitation of

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the stated preferences approach is that survey answers may be driven by respondents' desire to buy 'moral satisfaction' (Kahneman and Knetsch, 1992). Moreover, respondents may find the complex present/future trade-offs cognitively demanding and therefore they may be reluctant to undertake the effort to provide answers that accurately reflect their preferences.

The approach that we propose overcomes the limitations of both revealed and stated preferences. We derive information on the degree of people's concern for the very long-term future by estimating the relationship between individuals' current well-being and their expectations about a future far enough to concern only future generations. If the long-term discount rate is high, we expect people's view of the future – whatever it may be – to have a weak or null influence on their current well-being. A high discount rate implies that current generations give limited importance to the living conditions of future generations. In this case, we expect that the SWB of current generations is not substantially affected by their view – either positive or negative – about something of little importance to them. In contrast, positive (negative) expectations about the living conditions of future generations have a sizable and positive (negative) impact on current SWB only if people care about future generations, i.e. the discount rate is low. Simply stated, positive expectations of the future are associated with greater current well-being, if and only if individuals have a low long-term discount rate.

To estimate this relationship we use survey data from several international and national databases. We proxy for current well-being with subjective well-being (SWB) and the expectations about the very long-term future with specific questions on the issue. We run SWB regressions using the standard controls and we include the perception of the future as our variable of interest. Our estimates indicate that the size of the coefficient on future perceptions is comparable to the most important correlates of SWB, such as being married or unemployed. We run Two-Stages Least Squares (2SLS) regressions to account for the possible endogeneity of expectations about the future. Our instrumental variables are trust in science and political trust. These variables are available at the same time only in one of our datasets, the American General Social Survey, whereas the World Values Survey and the European Social Survey only include political trust. The correlation of these two forms of trust with SWB is nil in our datasets, and we did not find any evidence of their correlation in the literature. Yet, both trust in science and in political institutions are good predictors of individuals' expectations about the future. Scientific progress can contribute to a better future in many respects, including sustainability. Scientific advancements are critical to sustainability, such as the development of renewable sources of energy. Moreover, a "bright future" requires effective political decisions. That is why, for instance, those who think that political institutions have short-term goals, are self-serving, or serve special interests, are less likely to expect a "bright future". For these reasons we expect our instrumental variables to be relevant, excludable, and their use will address potential bias from omitted variables, measurement error, and reverse causality.

We find that negative (positive) expectations about future generations have a very large negative (positive) impact on SWB. Results are consistent across different datasets, countries, years, and question wording. The necessary amount of income to compensate for the loss of well-being associated with gloomy expectations about the living conditions of future generations is large, both in relative and absolute terms. These results suggest that the intergenerational discount rate is low.

We use very different information than what is used by the revealed and stated preferences approaches. Similar to the latter approach, we rely on survey data. Yet, we do not use people's statements about their preferences for given hypothetical outcomes. We rely on questions that ask people about their current well-being

and their perceptions about the future. In other words, we derive our estimates of people's preferences from the impact of an expected outcome on people's current well-being. For this reason, we refer to this approach as derived preferences. Because the information we use does not concern the willingness of individuals and does not imply their awareness of the link between future scenarios and present well-being, our approach is not biased by the search for moral satisfaction and self-image enhancement that affects stated preferences. Additionally, the questions we use are not cognitively demanding, thus solving the main shortcomings associated with the stated preferences approach.

Our contribution is two-fold: on one hand our results suggest that the very long-term discount rate is low, on the other, they indicate a way to overcome the limitations of revealed and stated preferences in estimating the very long-term discount rate.

The paper is organized as follows: Section 2 summarizes the literature about long-term discount rates. Section 3 presents our data, while Section 4 discusses the methodological issues. Section 5 presents our findings and Section 6 concludes.

2. Background

Typically, the results from cost–benefit analyses of projects aimed at reducing the impact of biodiversity loss, groundwater pollution, fishery depletion, radioactive waste disposal, minerals depletion etc., crucially depend on the very long run discounting. These analyses are so sensitive to even tiny changes in the discount rate that almost any policy prescription can be supported by one choice of a discount rate or another.

The Stern Review led to a large discussion relating to the discount rate. Gollier and Weitzman (2010) defended Stern's decreasing term structure of discount rates, arguing that, since risks are magnified by time, future risk should induce prudent consumers to sacrifice more for the future. This means using a decreasing discount rate for greater periods of time. Dietz and Asheim (2012) criticized the ethical foundation of the Stern Review for being committed to undiscounted utilitarianism, which assigns zero relative weight to present utility. They propose to adopt a different ethical principle, sustainable discounted utilitarianism, which assigns zero weight to present utility if and only if present utility exceeds future welfare. Beckerman and Hepburn (2007) argued that the Stern Review considers a narrow range of plausible ethical approaches and adopts an 'impersonal consequentialist view', suggesting that the welfare of future generations ought to be valued equally with the welfare of people alive today. As an alternative, Beckerman and Hepburn propose to adopt 'agent-relative' ethics, which has a distinguished pedigree going back to David Hume and suggests positive discount rates. Weitzman (2007), Nordhaus (2007), and Anthoff et al. (2009) criticized the Stern Review on the empirical basis that "extreme values of the social cost of carbon are associated with positions that are at odds with revealed preferences on time preference" (Anthoff et al., 2009, p. 17). People are not observed to behave as if they have a zero discount rate.

The latter criticisms probably overstated the amount of empirical information available on how people discount the distant future. Revealed preferences are of little help because long-maturity assets providing information on individuals' valuation of very long run claims are rare. Giglio et al. (2014) estimate the very long run rate of time preference by exploiting a unique feature of residential housing markets in England, Wales, and Singapore, where residential property ownership takes the form of either leaseholds (temporary, tradable ownership contracts with maturities between 50 and 999 years) or freeholds (perpetual ownership contracts). They find a downward sloping term structure of discount rates, consistently with models including hyperbolic discounting

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