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Time horizons and discount rates in Swedish environmental policy: Who decides and on what grounds?



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ABSTRACT

Interviews with Swedish authorities reveal large variations in the time horizons and discount rates used in their policy decisions. The time horizon, i.e. the future time period for which effects are included in the analysis, is seldom longer than 40–50 years, and nuclear waste is the only area in which a time horizon longer than 100 years is used regularly. Discount rates for non-commercial purposes vary between 2 per cent and 4 per cent, with 4 per cent as the most common rate. The differences between policy areas appear to be unsystematic and insufficiently justified. We suggest that there may be a need for co-ordination and, possibly, harmonization, of the choices of time horizons and discount rates.

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1. Introduction

Some policy issues concern effects far off in the future. This applies notably to nuclear waste management and climate change, both of which tend to be discussed in a longer time perspective than most other policy issues. However, in many other policy areas with potential long term effects the time horizons of policy makers are much shorter.¹ This is particularly conspicuous in environmental policies. Species that have become extinct for instance due to deforestation are lost forever, and it could take several hundreds of thousands of years, perhaps millions, before evolution has set in place an equally rich diversity. Non-degradable chemical substances that are released into the environment will remain there for thousands of years ahead. The consequences of overfishing are also often long-term, as are environmental damages caused by a nuclear war or a severe accident in the nuclear industry.

Long-term policy decisions are based on the assumption that we can make meaningful predictions of (uncertain) effects that occur far off in the future and compare them with effects that occur today. A range of different anticipatory systems have been developed to aid decision-making about the future. One frequently used such tool is discounting. It has been developed with the purpose of facilitating the weighing of consequences that are anticipated to take place at different future points in time.² In

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¹ We use the word “time horizon” as a technical term to denote a period of time such that policy effects are taken into account if and only if they occur during that period. A time horizon can be identified either in terms of its duration or its endpoint, i.e. the point in time at which it ends.

² Discounting requires that assumptions are made about the anticipated consequences.

addition, there is another seldom suggested but commonly applied method, namely to limit decision analysis to a specified time horizon. This means that consequences occurring after a certain point in time are not considered. The two methods can be applied simultaneously.

Although much has been written on the normative foundations of discounting, relatively little research has been devoted to cross-examination of the time horizons and discount rates actually used by national agencies (although exceptions exist, see for example [Henderson & Bateman, 1995](#) and the references therein). In this study, we critically analyse the time horizons and discount rates used in Swedish environmental policy. We have conducted semi-structured interviews with nine Swedish authorities and one private company, all charged with the responsibility of either making policies affecting the environment many years in the future or providing decision support to authorities that make such decisions. Based on these interviews we identify the time horizons and discount rates used in Swedish environmental policy and explore the justifications given for their adoption.

Sweden is an interesting case for studies of long-term policy design, because the Swedish public sector has a well-established tradition of working with management-by-objectives in the medium and long term ([Lundqvist, 2004](#); [Sundström, 2001](#)). This is particularly noticeable in environmental policy, where a set of national environmental quality objectives (henceforth referred to as ‘the EQOs’) have been adopted. They are intended to coordinate Sweden’s progress towards the ecological dimension of sustainable development. However, our arguments and conclusions are general enough to inform academic discussions of other policy areas as well as other national contexts.

Our data reveal large differences in the discount rates and time horizons used. Discount rates range between 2 per cent and 12 per cent, with 4 per cent used as the standard rate. Time horizons vary between a few years and hundreds of thousands of years. Among the stated reasons for limiting the time horizon to a comparatively short period are various gaps in knowledge of natural science, technology or social issues and explicitly set limits, including regulations and government instructions. While some of the differences between the time horizons and discount rates of different environmental policy areas may be justified, the differences appear to be unsystematic and in many cases insufficiently justified.

In Section 2 we provide a conceptual background to the study. Section 3 describes the methods used when selecting interview subjects and conducting the interviews. Section 4 presents the results of the interviews. In Section 5 we discuss the findings, using concepts and ideas presented in Section 2. In Section 6 we address the further issues whether the lack of consistency in the use of time horizons and discount rates presents a problem to environmental decision-making and whether one could justifiably ask for greater coordination and, possibly, harmonization, of the choices of time horizons and discount rates. Section 7 contains our conclusions and recommendations.

2. Long-term policy design and the treatment of future effects

As noted by [Voss, Smith, and Grin \(2009\)](#) long-term policy design is experiencing a renaissance in the public sector. Part of the reason for this reborn interest is the realization that many of the challenges we face today might appear to require long-term transformations of our current socio-technical systems ([Hildén, 2009](#)). This is perhaps most evident in relation to the environment. Many environmental changes occur gradually over long periods of time, and the effects of some measures are only visible after several decades. Climate change and climate mitigation are perhaps the most prominent examples.

However, long-term policy design is not without difficulties. One difficulty relates to the prediction and evaluation of policy outcomes over time.³ The consequentialist idea that decisions should be made by weighing the pros and cons of alternative courses of action plays a central role in public decision-making. This idea is most extensively developed in cost-benefit analysis, where costs and benefits are compared and the alternative that has the highest net benefit or the highest benefit–cost ratio is recommended.

Cost–benefit analysis is frequently used to inform public policy. In the US, for instance, the executive branch of the federal government has for more than 20 years required regulatory agencies to estimate the costs and benefits of regulation to make sure that the benefits outweigh, or at least justify, the costs.⁴ In Sweden, the Regulatory Impact Assessment Ordinance ([SFS, 2007:1244](#)) states that “before a governmental agency issues directions or general advice, the agency should evaluate and document the monetary and other consequences of these measures in a social cost–benefit analysis”. There is, however, at present little practical guidance available on how these social cost–benefit analyses should be performed or what they should include.

Since policy decisions could give rise to an almost infinite number of consequences, for practical purposes the decision maker has to decide where to draw the line between aspects to include in the analysis and aspects to exclude. Furthermore, a decision has to be made on how much weight should be attached to future generations’ welfare compared to that of the present generation, and also on how to handle the epistemic uncertainties involved.

³ Time inconsistency, short-termism, the temptation to free ride, and a decentralized governmental structure are other factors that have been highlighted as contributing to the difficulties of establishing and maintaining long term political action ([Sprinz, 2009](#)). See [Bühns \(2012\)](#), [Hovi et al. \(2009\)](#) and [Steinberg \(2009\)](#) for discussions of what institutional means should be employed to bring the future into policy-making.

⁴ Cost–benefit balancing is now the guiding principle in national regulation in the USA, although compliance varies. Particularly interesting to note is the fundamental commitment to cost–benefit balancing disregarding political representation ([Hahn and Sunstein, 2002](#)).

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