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Assessing the value of water quality improvements when time lags exist

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Abstract
It is more common than not, that policies targeting water quality improvements are characterized by significant time lags between implementation of measures and resulting water quality changes. In this paper we estimate how these time lags affect the economic value of water quality improvements, and compare the nature of people's time preferences with those suggested by standard economic theory and guidelines for policy evaluation.

Our analyses is based on data from a Discrete Choice Experiment addressing peoples' willingness to pay (WTP) for improvements in surface water quality as well as groundwater quality conducted across three different case areas, one in Canada, Denmark, and Portugal, respectively. This involves responses from more than 2500 respondents. The responses are analyzed using a random parameter error component logit (RPECL) model as well as the conditional distribution to arrive at household-specific WTP estimates.

Our results indicate that some respondents discount the value of future water quality improvements linearly, in contrast to what is often assumed when evaluating policy measures. Moreover, the discount rates implied by our model estimates are significantly lower than what is recommended in guidelines by national authorities. Based on the responses to a number of follow-up questions, we also find a large divergence in time preferences between the environmental and the financial domain. Hence, our estimates points to the importance of explicitly including the aspect of time lags in DCEs regarding water quality improvements.