This PhD thesis examines the optimal macroeconomic policy response to the uncertainties associated with natural resources and climate change. Both areas require explicit government intervention, which is subject to fundamental normative assumptions affecting the valuation of costs and benefits occurring in an uncertain future. If a decision maker is prudent, that is, less risk averse at higher income levels, uncertainty about future income leads to additional saving and postponing of consumption. For natural resource uncertainty, prudent policy takes the form of additional, precautionary, saving of resource revenues, often in the form of a sovereign wealth fund, which should be optimally allocated in financial markets to minimize exposure to uncertainty. For climate uncertainty, prudent policy generally leads to a higher optimal carbon tax, reflecting a higher social cost of emitting $CO_2$. Starting from a continuous-time, time-separable, dynamic stochastic welfare optimisation framework with recursive preferences, this thesis uses perturbation methods to develop leading-order estimates of the effects of economic and climatic uncertainty on this optimal tax. The result is a simple analytical rule for the optimal carbon tax, which allows for uncertain economic growth prospects, uncertainty in climate damages and uncertain climate sensitivity whose distribution is skew and time dependent, as well as for correlation between the uncertainties. Finally, this thesis provides quantitative estimates of the savings policy and carbon tax that maximize welfare in an uncertain world.

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