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The role of education for individual vulnerability to flood risks

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The rising number of hazardous catastrophes and natural disasters makes it increasingly important to correctly assess their effects on the population. Complementary, population characteristics like age, education, or income define the extent of damages after natural disasters.
We account for these two-way coupled feedbacks by introducing a theoretical framework that investigates household's consumption and investment decisions in the context of flood risk. Not all individuals and households are equally affected, so we suggest possible decision mechanisms at the individual level to explain the household's vulnerability with different educational background. Through this analysis of heterogeneous households we are able to make better predictions and estimations about the impacts and the effectiveness of various policy measures to decrease their flood risk vulnerability.
The presented economic model is based on a two-stage overlapping generation (OLG) model. Household's decisions take into account an uncertain flooding event affecting household's future consumption and we explicitly incorporate impacts of education on income, awareness and disaster mitigation potentials. We analytically obtain characteristics of the household behavior under explicitly stated cost functions and an intertemporal elasticity of substitution of consumption equal to 1. Furthermore numerical optimization techniques allow to isolate different impacts of education on optimal decisions, and also to simulate the long-run behavior of households exhibiting different educational levels. We allow for two flood risk coping strategies: resettling and implementing personal prevention measures. We find that these strategies are substitutable and that increased awareness or increased income lead to better application of both strategies. Higher educated households tend to settle in lower risk areas regardless of their initial situation and a potential poverty trap for the lowest educated households can exist. Thus, low educated households are forced to stay in high risk settlement areas, despite being fully aware of the apparent flood risk.