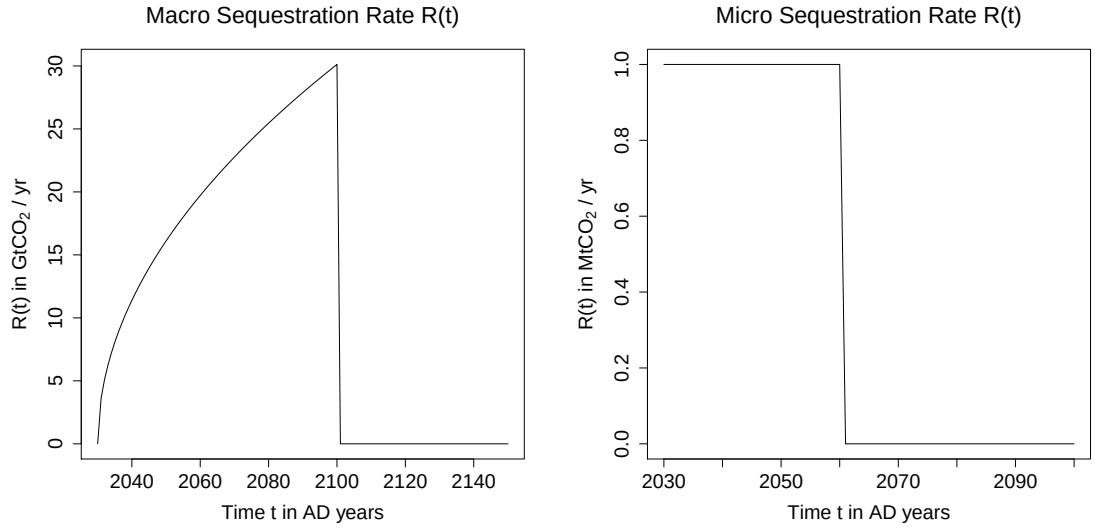
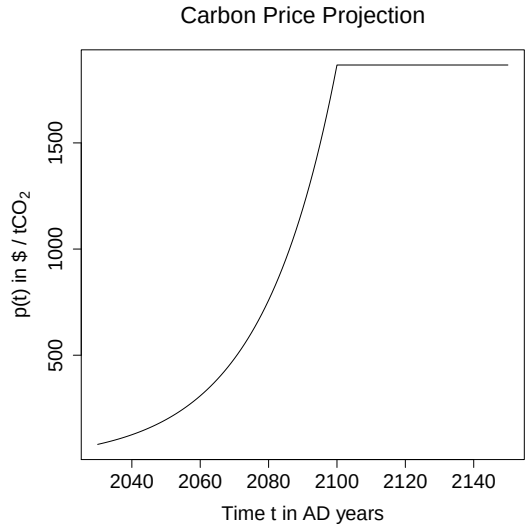
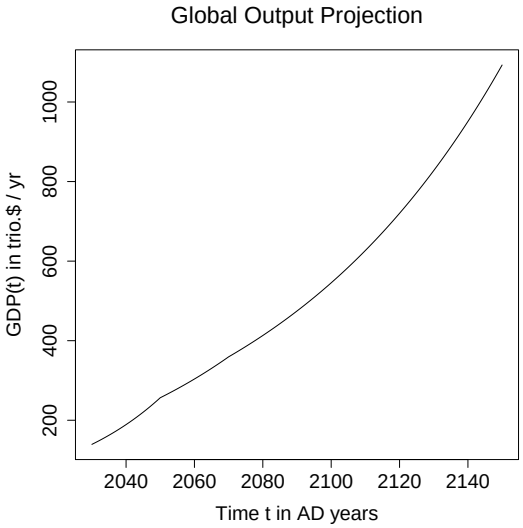


(a)

(b)

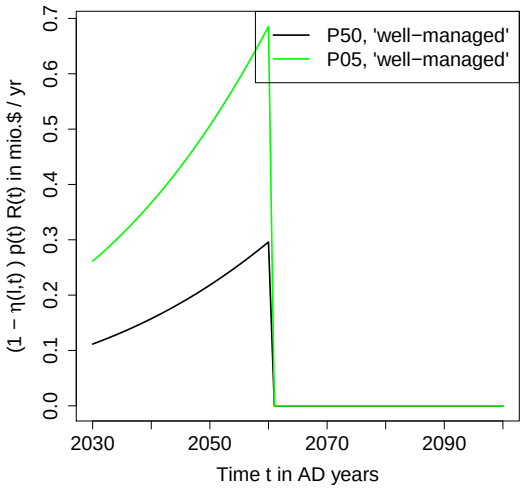


(c)

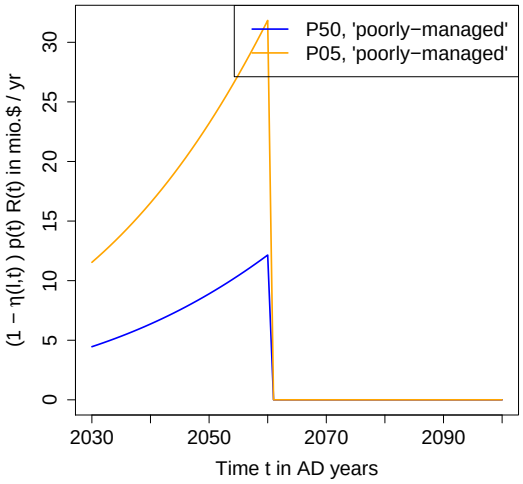


(d)

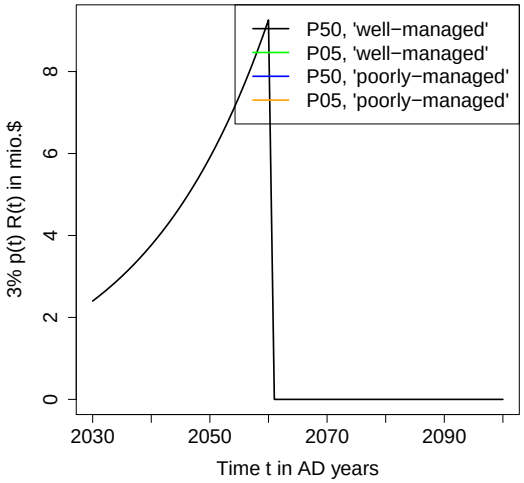
Figure 1: Modeling assumptions: approximation of the evolution of the Koelbl et al. (2014) sequestration rate compilations on the global scale (a) and a storage complex-based scale (b), of the IPCC (2014) TS.12, 2°C limiting carbon prices $p(t)$ (c), and the UN central scenario-based global gross domestic product projections (d).



(a)



(b)



(c)

Figure 2: Emissions-related payments into a compensation payment fund, fed on basis of the effectiveness of temporary CO_2 storage η and of a single well-managed (a) or poorly-managed (b) storage complex. Figure (c) projects financial precaution payments into a fund that is fed by 3% of the emissions-related revenues.

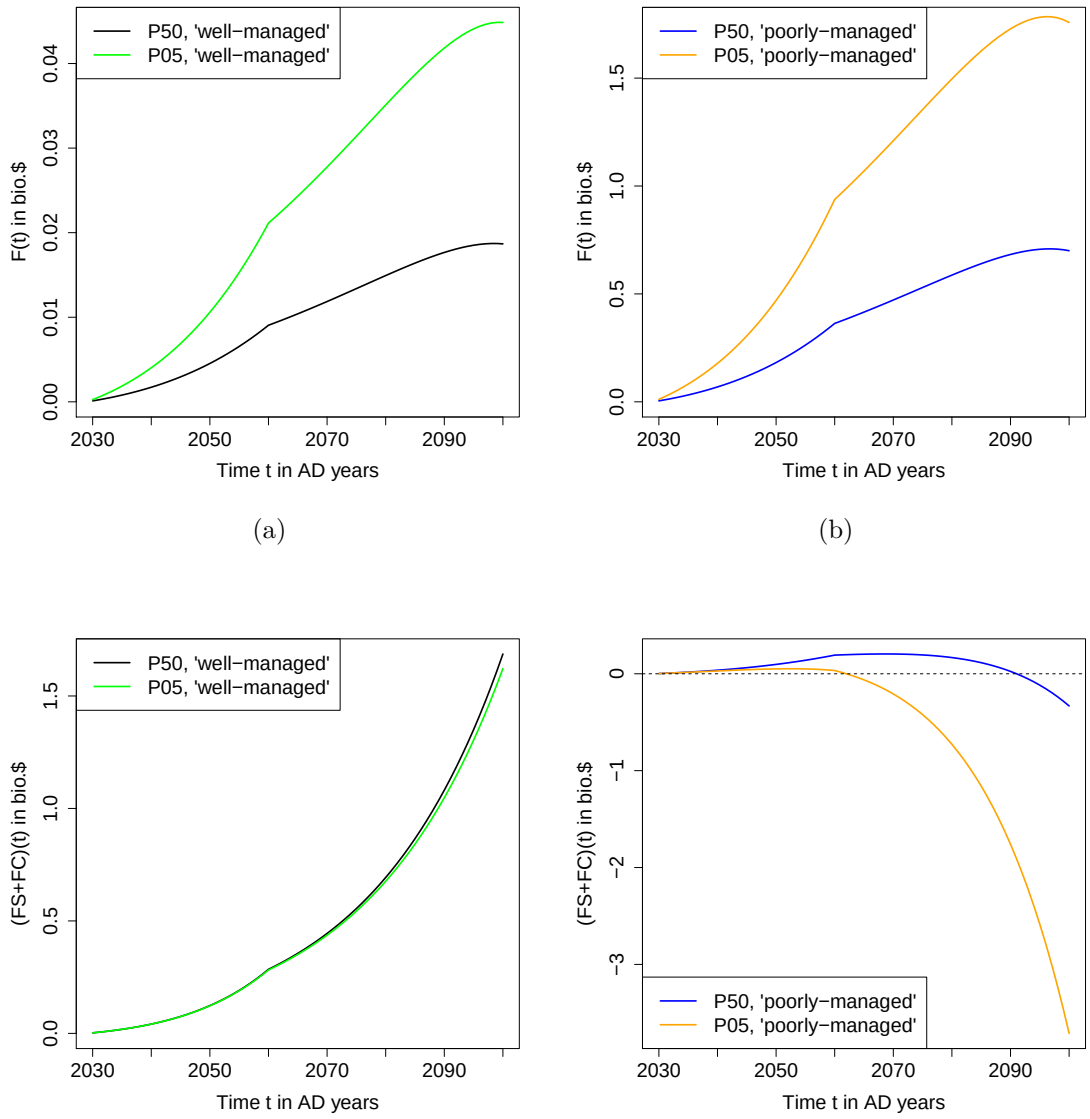


Figure 3: Single storage complex-based, micro scale evolution of the compensation payment fund – a fund dedicated to finance compensation of climate-related leakage costs. Amounts are given in 2010AD-based, real dollars. In figures (a) and (b), emissions-related installment payments that are based on the effectiveness of temporary CO_2 storage, i.e. $(1-\eta(t))p(t)R(t)$, are diverted into the fund. This ensures full compensation of all future climate-related leakage costs. In figures (c) and (d), a lump-sum 3% payment of emissions related revenues $p(t)R(t)$ are used to finance climate compensation measures.

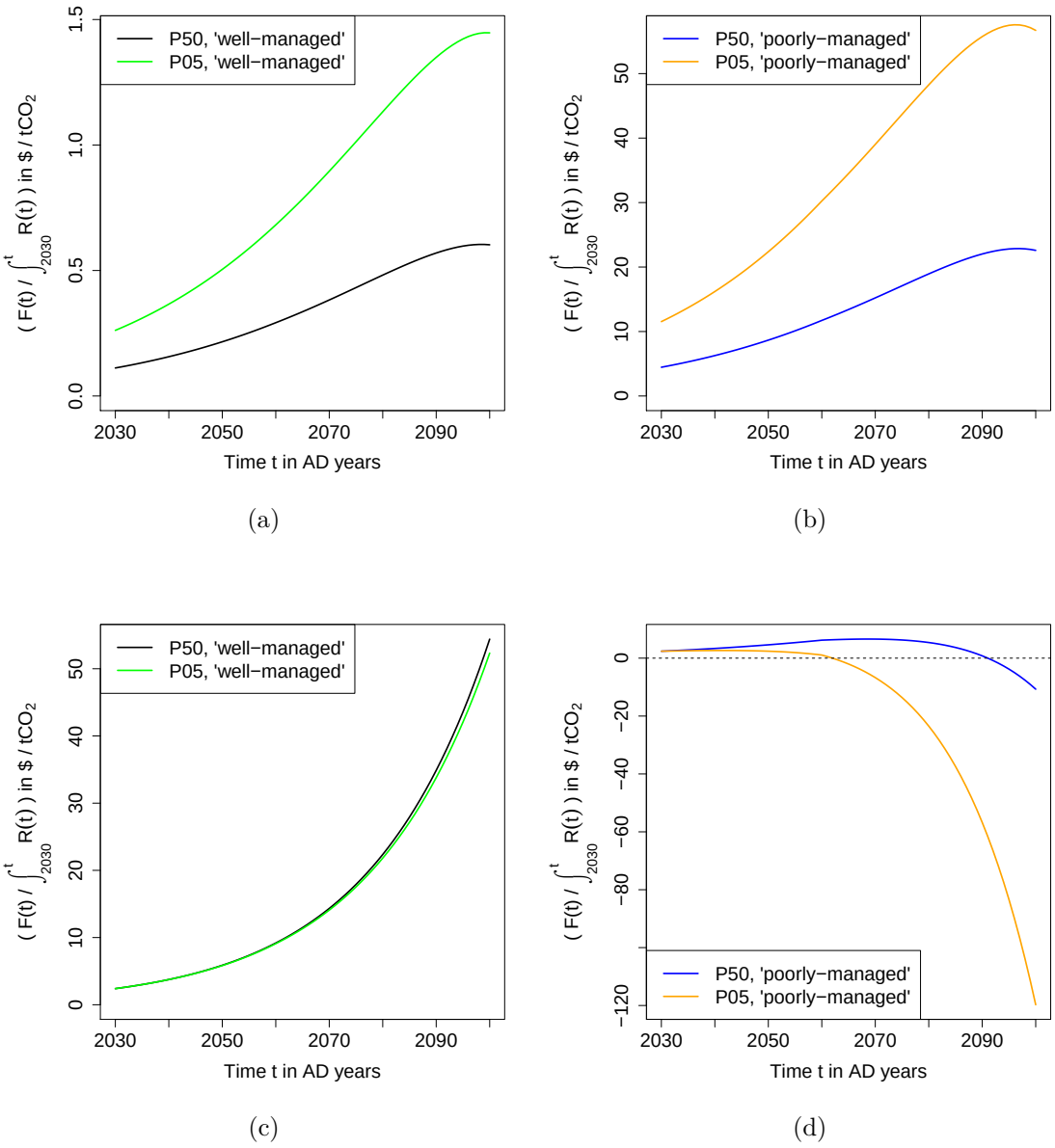
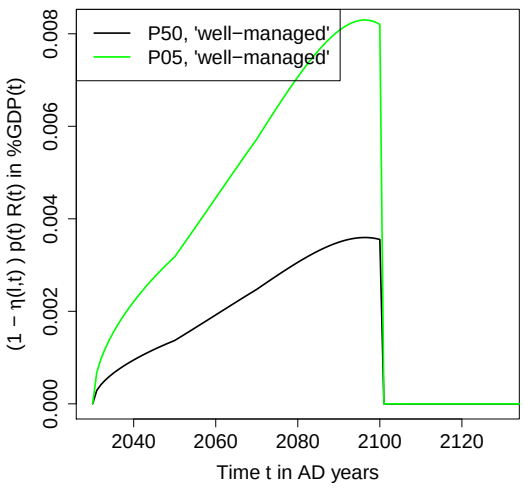
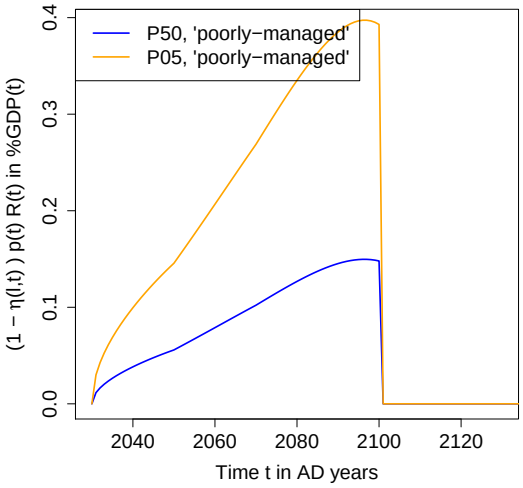


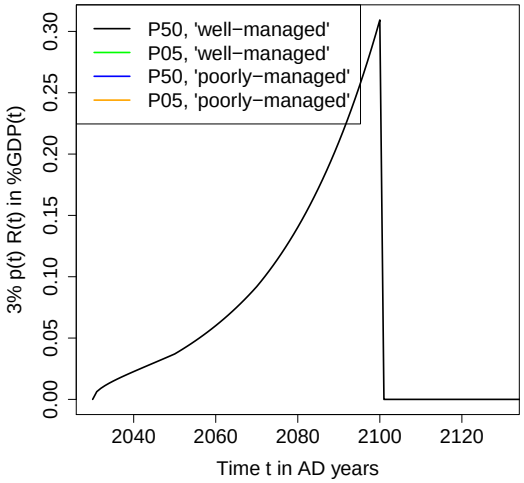
Figure 4: Single storage complex-based, micro scale evolution of the compensation payment fund – a fund dedicated to finance compensation of climate-related leakage costs. Amounts are given in 2010AD-based, real dollars. In figures (a) and (b), emissions-related installment payments that are based on the effectiveness of temporary CO_2 storage, i.e. $(1-\eta(t))p(t)R(t)$, are diverted into the fund. This ensures full compensation of all future climate-related leakage costs. In figures (c) and (d), a lump-sum 3% payment of emissions related revenues $p(t)R(t)$ are used to finance climate compensation measures.



(a)

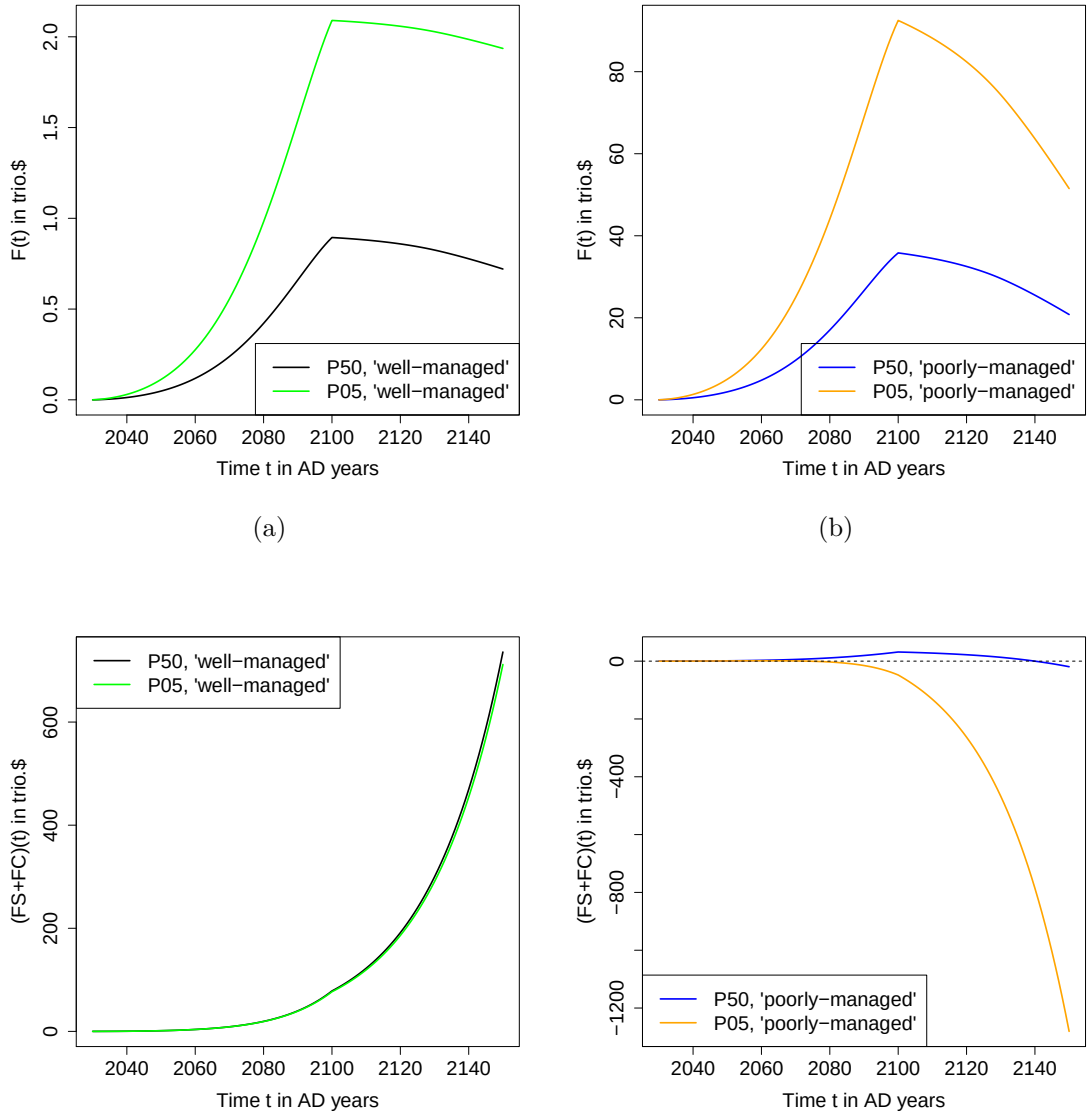


(b)



(c)

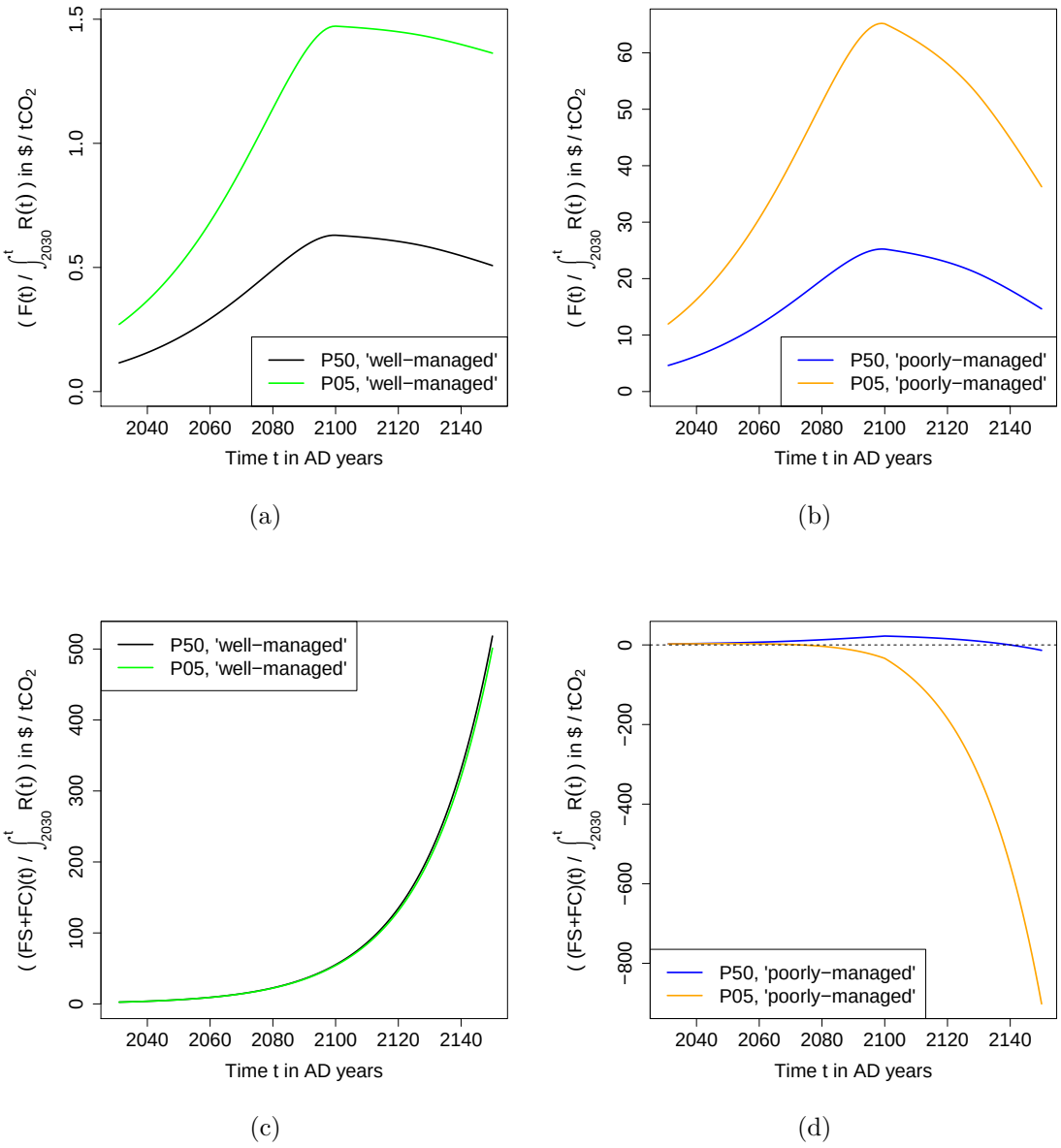
Figure 5: Emissions-related payments into a compensation payment fund, fed on basis of the effectiveness of temporary CO_2 storage η and of the sum over all global storage complexes, under the assumption that they are well-managed (a) or poorly-managed (b). Figure (c) projects financial precaution payments into a fund that is fed by 3% of the emissions-related revenues.



(a) (b)

(c) (d)

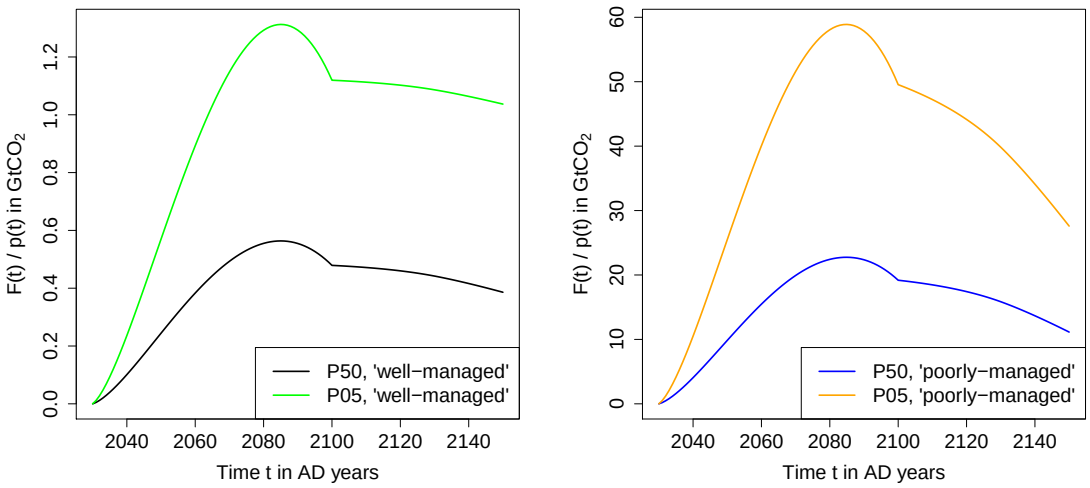
Figure 6: Global scale evolution of the compensation payment fund – a fund dedicated to finance compensation of climate-related leakage costs. Amounts are given in 2010AD-based, real dollars. In figures (a) and (b), emissions-related installment payments that are based on the effectiveness of temporary CO_2 storage, i.e. $(1-\eta(t))p(t)R(t)$, are diverted into the fund. This ensures full compensation of all future climate-related leakage costs. In figures (c) and (d), a lump-sum 3% payment of emissions related revenues $p(t)R(t)$ are used to finance climate compensation measures.



(a) (b)

(c) (d)

Figure 7: Global scale evolution of the compensation payment fund – a fund dedicated to finance compensation of climate-related leakage costs. Amounts are given in 2010AD-based, real dollars. In figures (a) and (b), emissions-related installment payments that are based on the effectiveness of temporary CO_2 storage, i.e. $(1-\eta(t))p(t)R(t)$, are diverted into the fund. This ensures full compensation of all future climate-related leakage costs. In figures (c) and (d), a lump-sum 3% payment of emissions related revenues $p(t)R(t)$ are used to finance climate compensation measures.



(a) (b)

Figure 8: Global scale evolution of the compensation payment fund. The graphs display how many $GtCO_2$ could be compensated at a single point in time if the fund was fully liquidized and carbon prices only marginally affected.

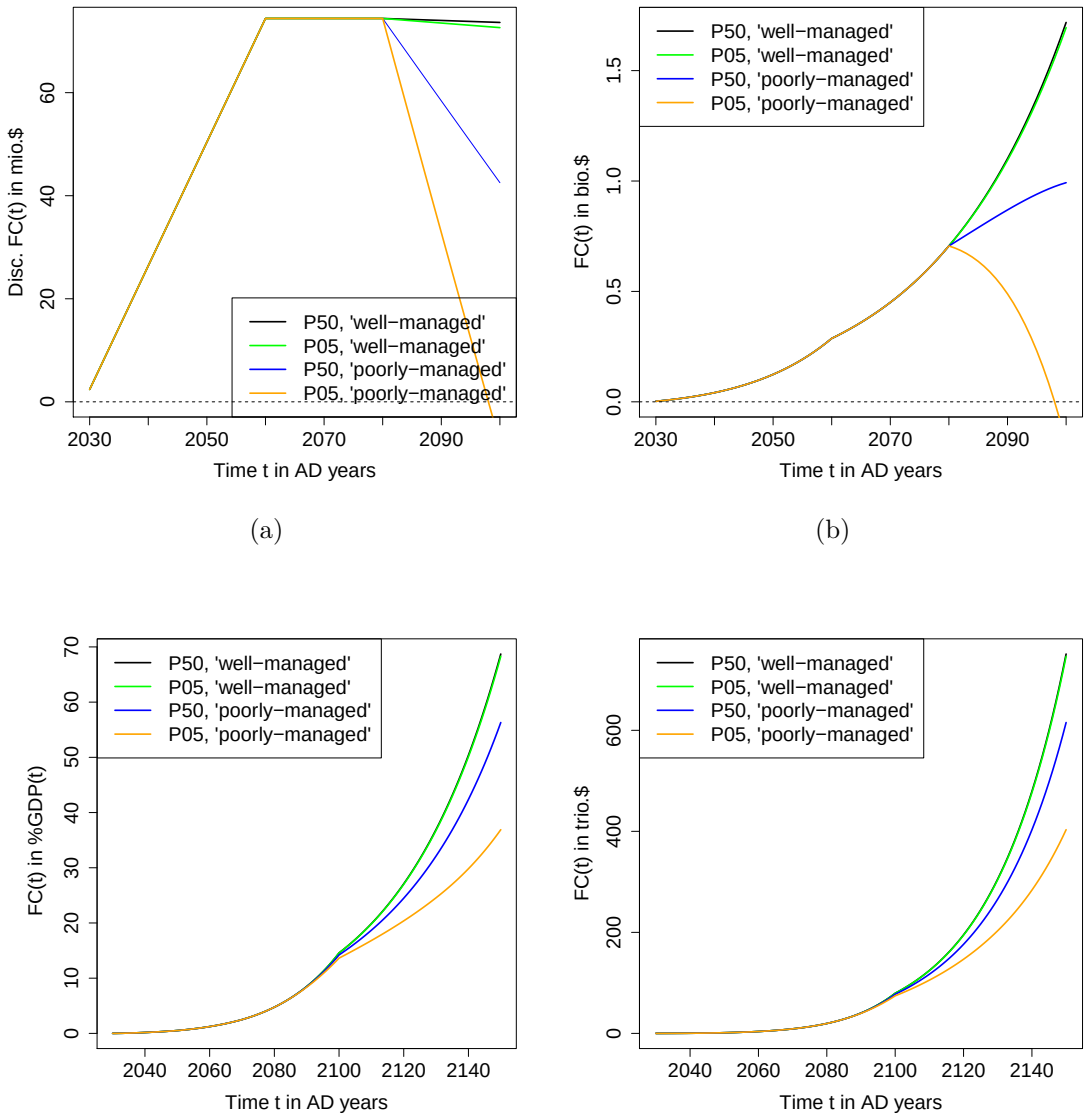


Figure 9: Micro (a) & (b) and macro (c) & (d) evolution of the German CCS Act's financial contribution (FC) amounts, under the assumption that the FC is used to finance climate-related leakage costs after the transfer of responsibility, which occurs at 2080AD in the micro setup and 50 years after a given CO_2 injection pulse in the macro setup.

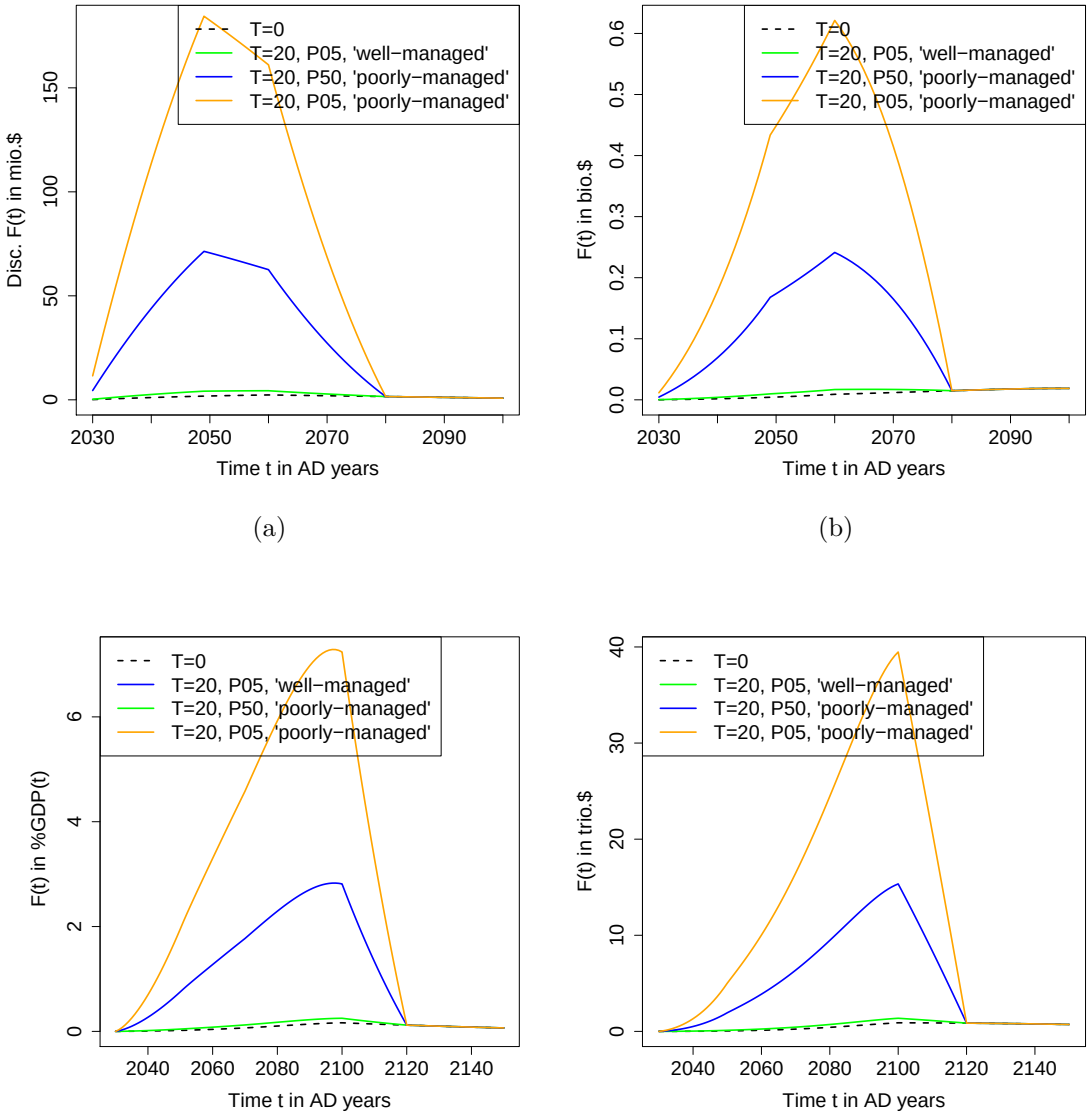


Figure 10: Micro (figures (a) and (b)) and macro (figures (c) and (d)) evolution of the climate fund. Each injection pulse is assumed to entail a period of uncertainty about leakages of 20 years. The fraction y_0 of emissions-related installment payments is chosen on basis of potentially inflicted climate costs, i.e. $y_0 = (1-\eta)$, with η being based on either the P05 leakage value of well-managed complexes (green line), or on the P50 or P05 value of poorly-managed complexes (blue and orange line). Furthermore, storage complexes are assumed as well-managed, and hence the contribution of each injection pulse to the fund is, after uncertainty reduction, associated to the P50 leakage value of well-managed storage complexes.