

The Impact of Climate Change on the Balanced-Growth-Equivalent: An Application of *FUND*

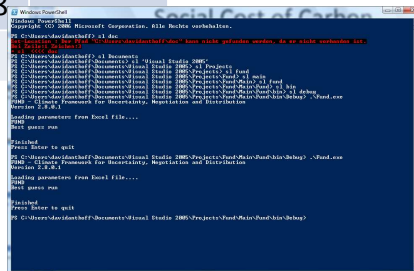
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FUND 2.9

Scenario without climate change

	USA	West EU	...
2005	\$36.000	\$34.000	...
2006	\$36.080	\$34.034	...
2007	\$36.160	\$34.068	...
...	...	...	...



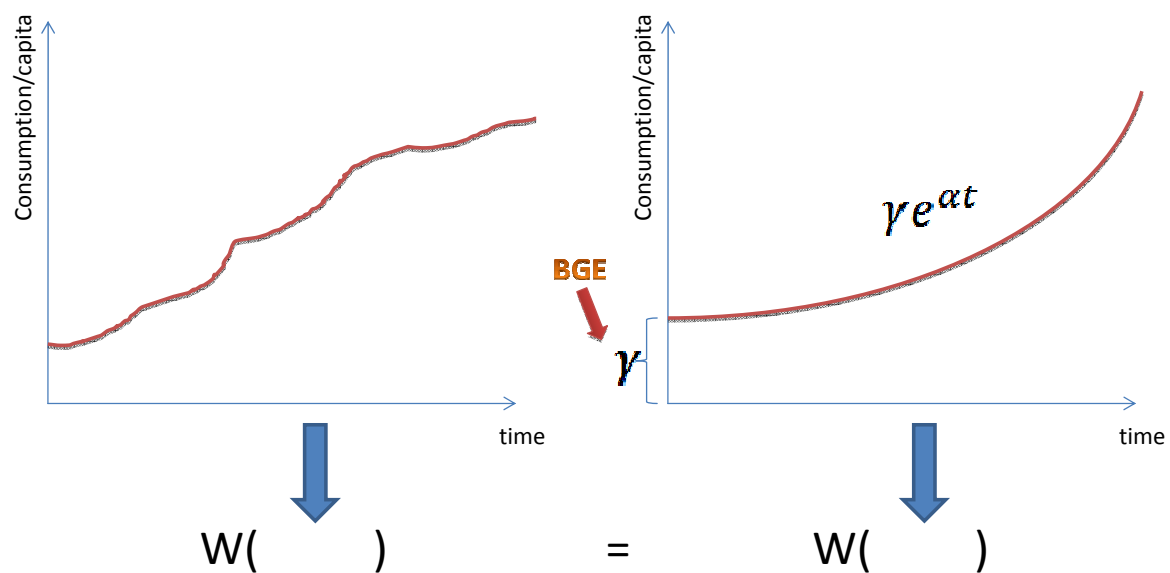
With climate change impacts

	USA	West EU	...
2005	\$35.000	\$33.000	...
2006	\$35.080	\$33.034	...
2007	\$35.160	\$33.068	...
...	...	...	...

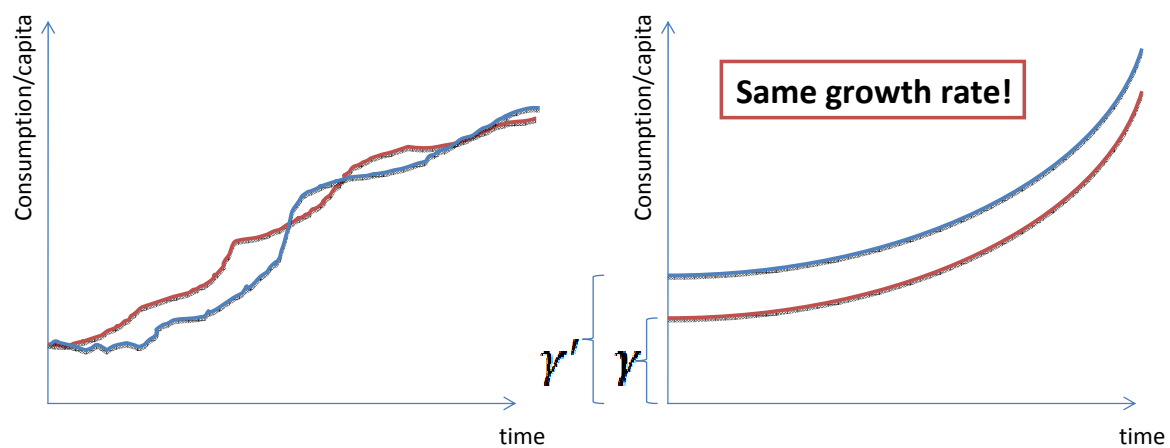


per capita consumption

Balanced Growth Equivalent

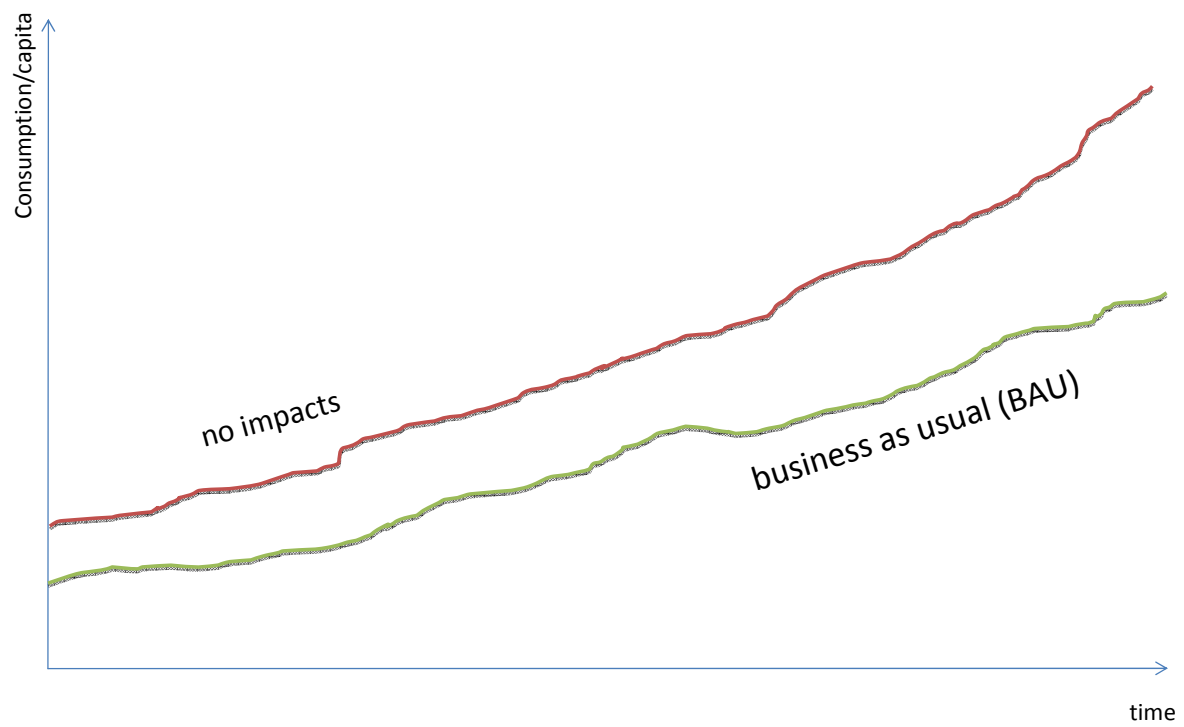


Balanced Growth Equivalent

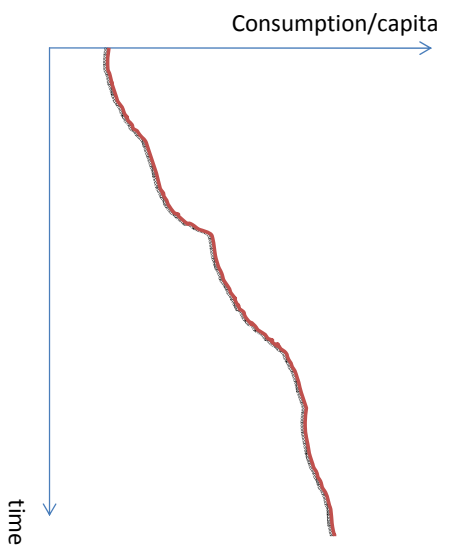


$$\Delta BGE = \frac{\gamma' - \gamma}{\gamma}$$

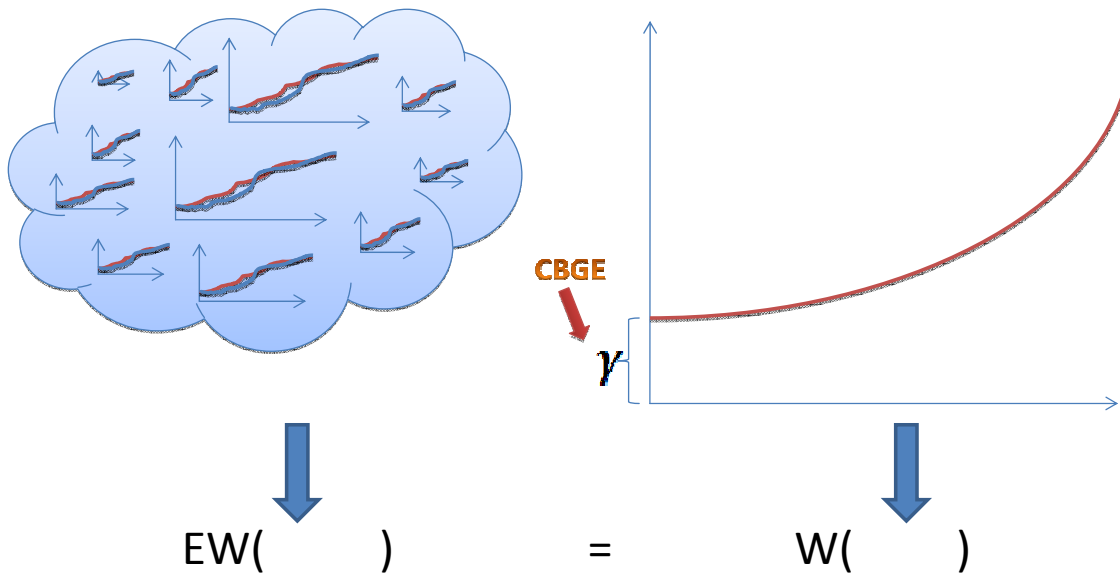
What to compare?



Uncertainty



Uncertainty



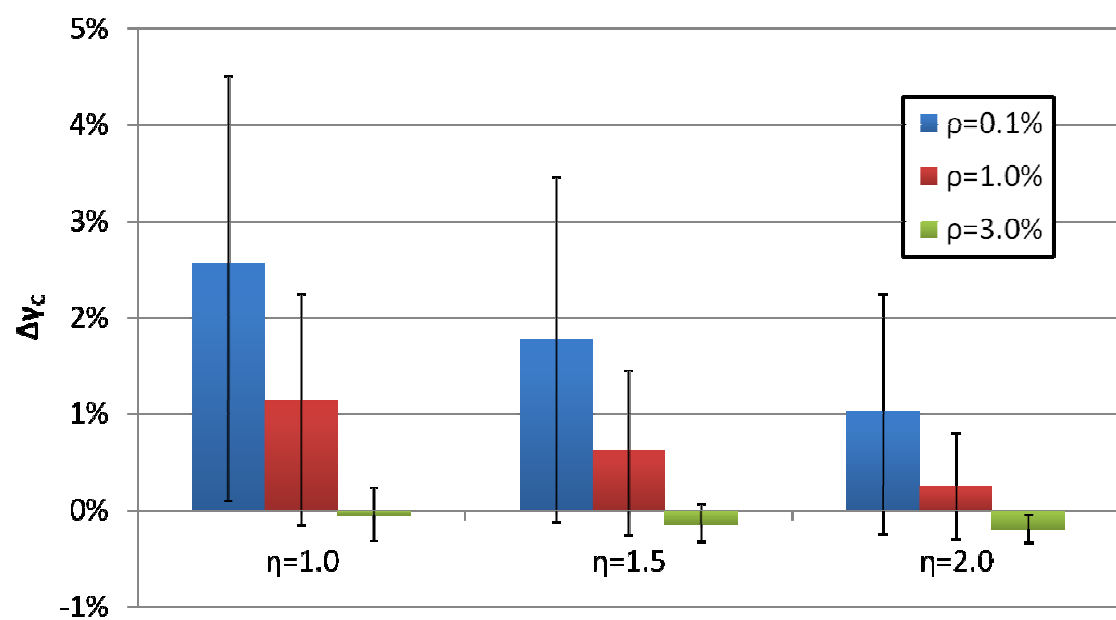
Welfare and Utility Function

$$W = \sum_{t=0}^{300} \sum_a U(c_{t,a})(1 + \rho)^{-t}$$

$$W = \sum_{t=0}^{300} P_t U(\bar{c}_t)(1 + \rho)^{-t}$$

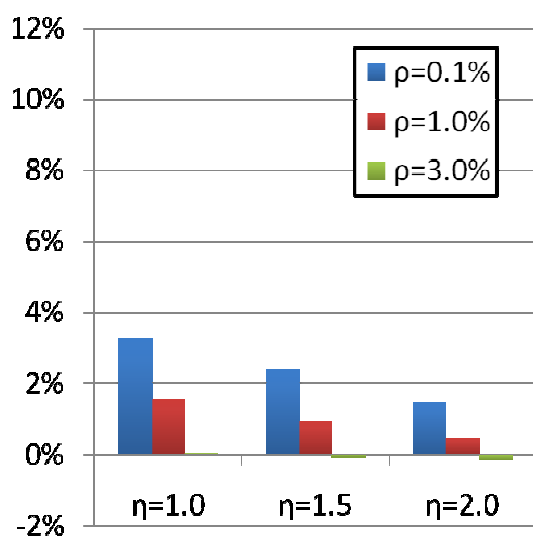
$$U(c) = \begin{cases} \ln c & \text{for } \eta = 1 \\ c^{1-\eta}/(1-\eta) & \text{for } \eta \neq 1 \end{cases}$$

Total Impacts, all Scenarios

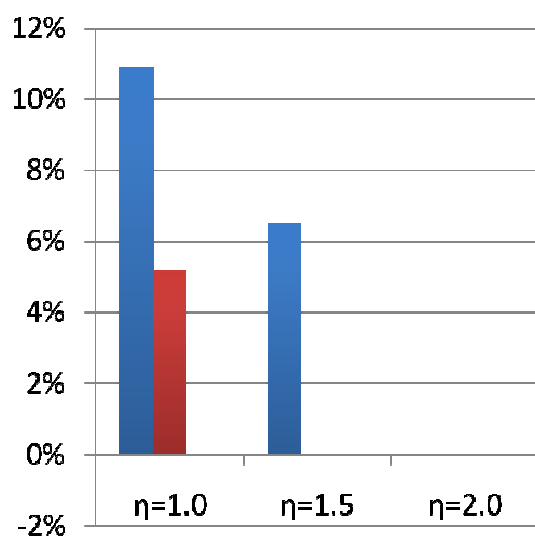


SRES A2, CBGE

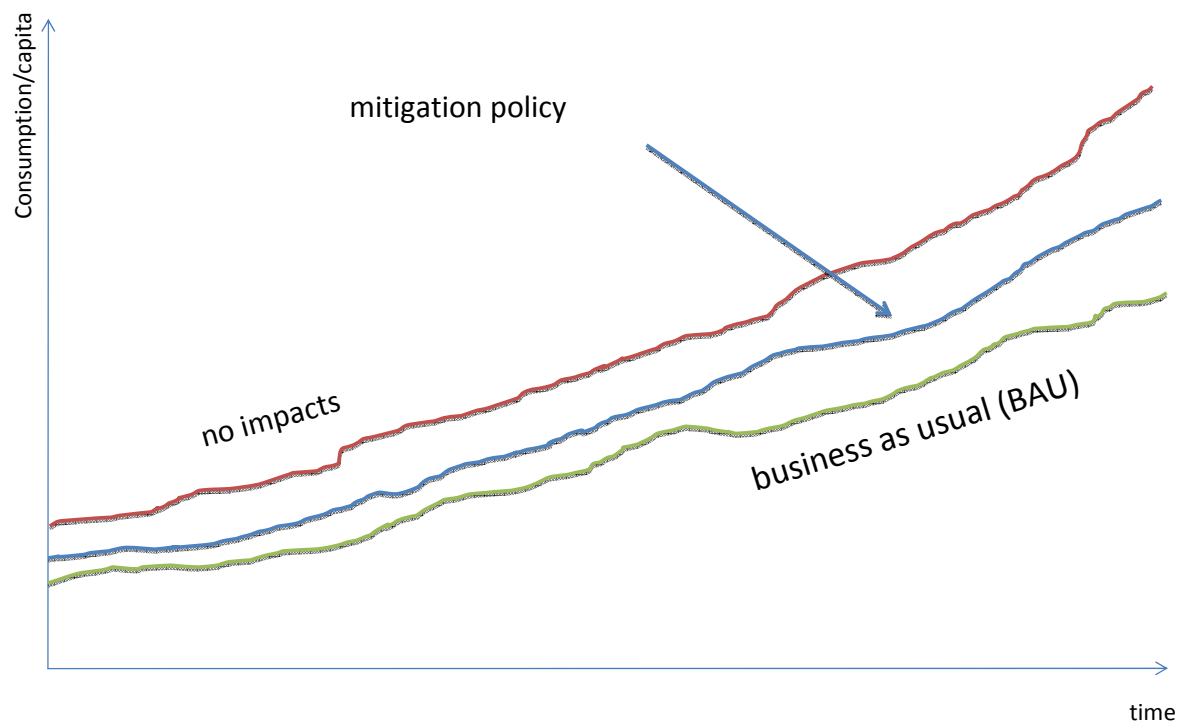
FUND total impacts



Stern total impacts

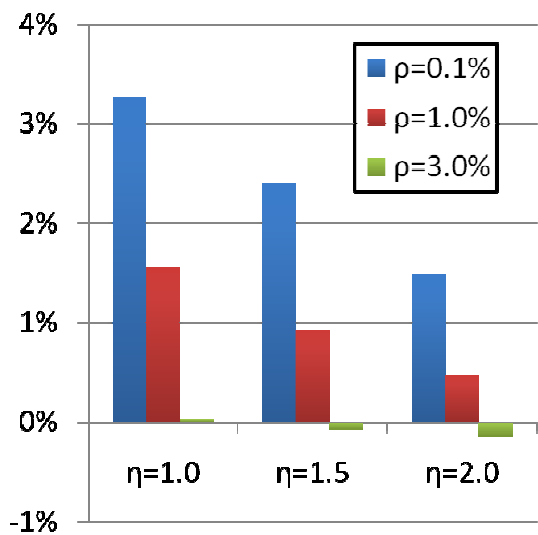


What to compare?

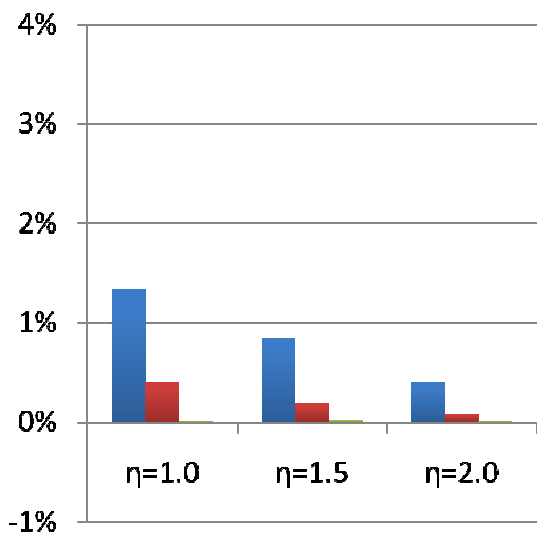


SRES A2, CBGE

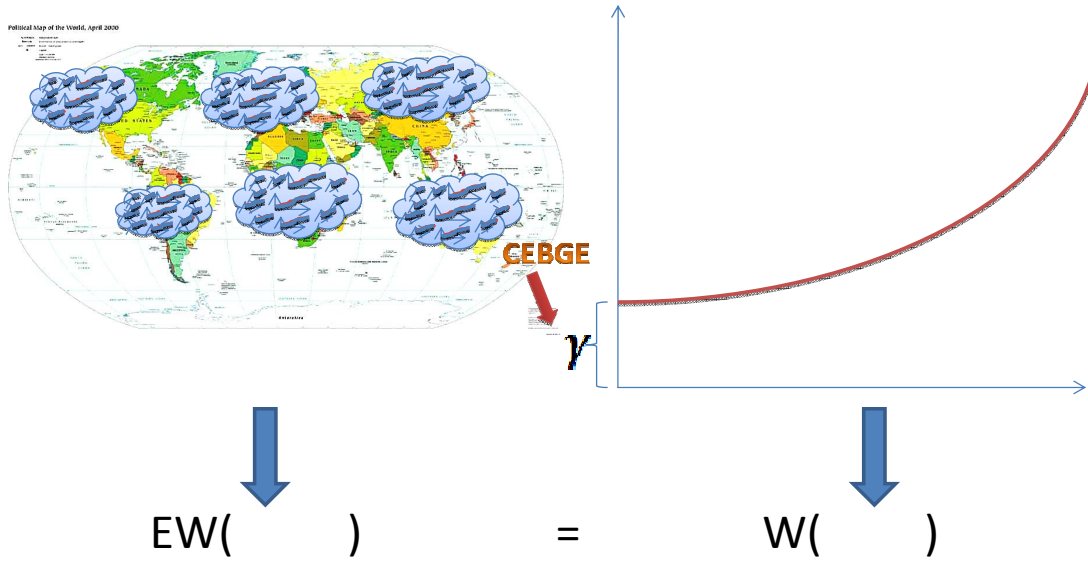
Total impacts



Impacts & policy cost



Equity

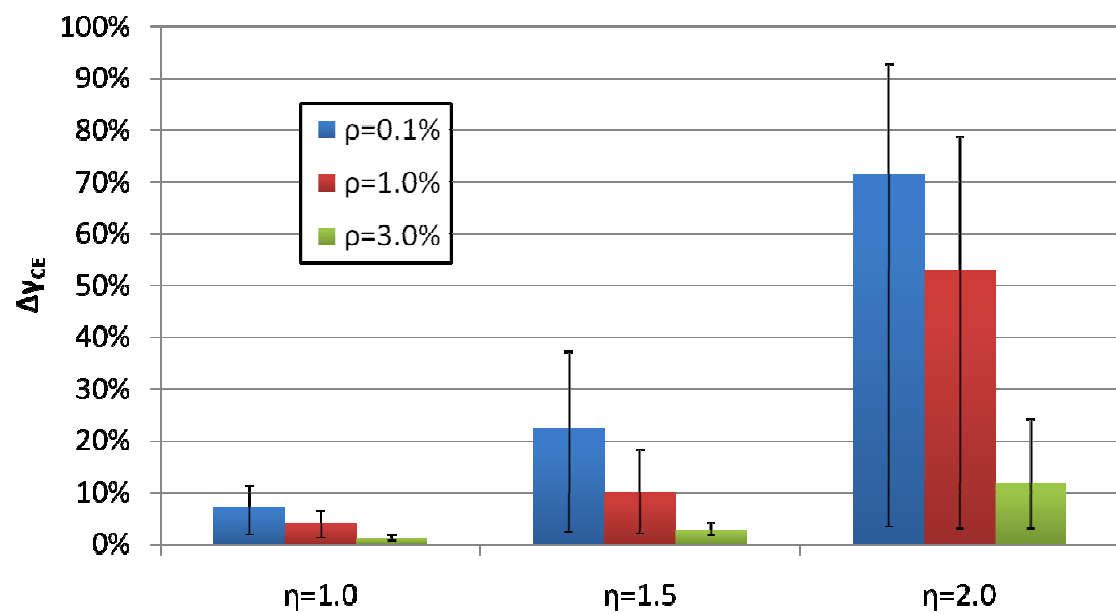


$$W = \sum_t P_t U(\mathbf{C}_t)(1 + \rho)^{-t}$$

vs

$$W = \sum_t \sum_r P_{t,r} U(\mathbf{C}_{t,r})(1 + \rho)^{-t}$$

Total Impacts with Equity



Conclusion

- Three key issues:
 - Time discounting
 - Uncertainty
 - Equity
- Replicating Stern → Less dramatic
- BUT: Overall, much larger range of results, including upwards
- Focus on policy choices instead of totals

Thank you!

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