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ETHICAL ASSET VALUATION AND THE GOOD SOCIETY



The crucial role of finance in decentralized economies

- Valuation and allocation of scarce capital.
- Asset prices (interest rates and risk premia) drive individual and corporate decisions.
 - They determine what creates/destroys social value (NPV);
 - They dictate what is good and what is bad for Society: savings, investments, risk-taking, development, energy transition, Infrastructures,....
 - They fix the degree of short/long-termism in our Society.
- Is this fair / desirable / efficient?
- Do finance align private interests with the common good?

Objective of the book

- Modern theory of finance: Try to find a model that can explain observed asset prices. Positive approach.
- My book: Normative approach.
 - What social goals should govern our collective actions?
 - What asset prices decentralize these actions at the individual and corporate levels?
- Hopefully, the two approaches generate similar results...
- Preview: Risk-free rates too small; risk premia too large.

Why using Cost-Benefit Analysis?

- The notion of opportunity cost is crucial: If I invest in energy transition, I must disinvest elsewhere.
- Comparing costs and benefits is ethic-free. The values that are used to estimate them are not.
- Refusing CBA just lead to inefficient and non-transparent decisions in Society.
 - Example 1: Climate change.
 - Example 2: Internal price of carbon in Microsoft, Total,...
- If we don't use prices, how could we measure economic performances?



MORE AND MORE VOICES ARE REJECTING BUSINESS AS USUAL, AND THE PURSUIT OF PROFIT ABOVE ALL. WE MEASURE OUR SUCCESS AS A COMPANY BY HOW WELL WE ACHIEVE OUR MISSION, NOT BY THE SIZE OF OUR PROFITS.

**DANCEY STRICKLER
KICKSTARTER**

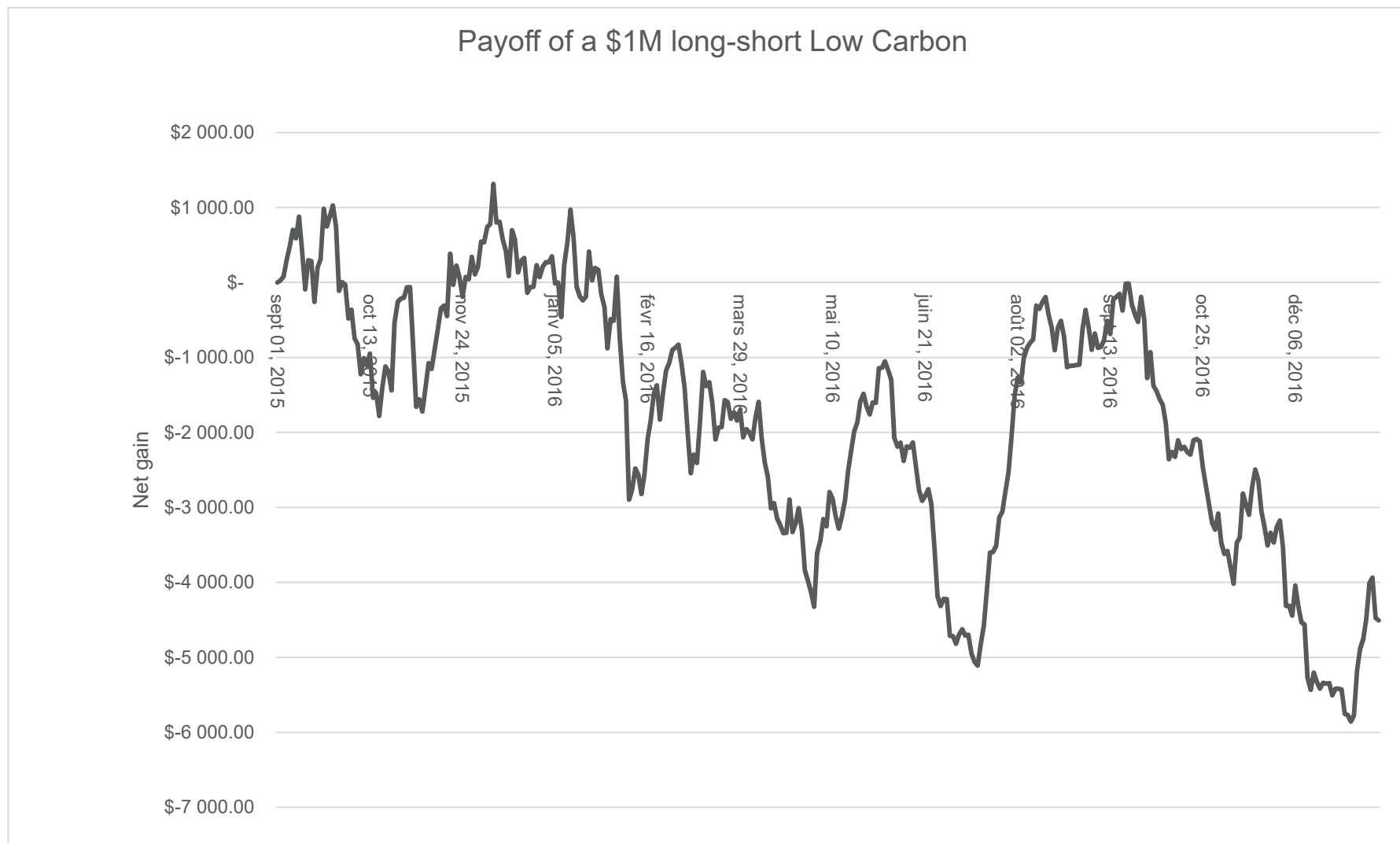
Not all effects are valued by stakeholders

- Firms don't take account of the consequences of many of their actions:
 - Health effects to workers and customers in the absence of an efficient liability system;
 - Climate change;
 - Social consequences of layoffs, or of inequalities;
 - Positive externalities of research, or of infrastructures;...
- Profit and shareholder value are imperfect measure of social performance.
- Actions are necessary to restore efficiency: Pricing externalities.

- Some values are easily observable, for goods with a liquid, frictionless market with free entry.
- Other values are more difficult to estimate:
 - Social cost of carbon;
 - Value of life/health;
 - Value of natural capital (biodiversity, boreal forest,...);
 - Value of creating employment;
 - Value of reducing inequalities;...

- Market prices does not reveal the true social value of assets.
- Proposal for a SR-Markowitz and for a SR-CAPM.
 - Redress dividends to include the net externality per share generated by the company;
 - Estimate mean “real dividend” and “real beta”.
- Whether the SR-optimal portfolio will beat the market will depend upon the emergence (or not) of efficient public policies.

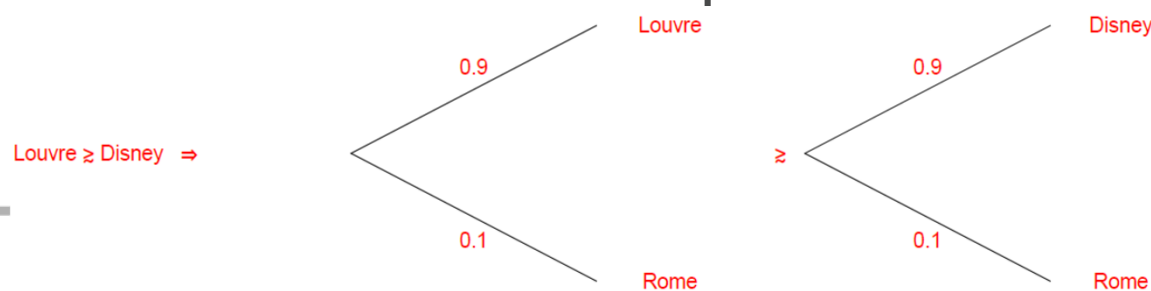
Do we anticipate carbon to be priced in the future?



Moral principles used in this book

How to measure our collective aspirations?

1. Sovereignty of the citizens. Collective preferences are subordinated to individual preferences.
2. Kant/Rousseau/Rawls: The veil of ignorance to impose neutrality.
 - Bonnefon, Shariff and Rahwan (2016).
 - The veil of ignorance implies that inequality means risk.
3. Bernoulli/von Neumann: The independence axiom.



Discounted expected utility

- Veil of ignorance + independence axiom \Rightarrow DEU.
- Welfare: The social goal should be measured by the (discounted) sum of the expected utility of all people who (will) live on this planet.
- An action is socially desirable if it increases this SWF.
- Opponents to this approach: Kahneman-Tversky, ambiguity aversion, behavioural economists, Epstein-Zin, ...
 - Many critiques are positivists rather than ethicists.

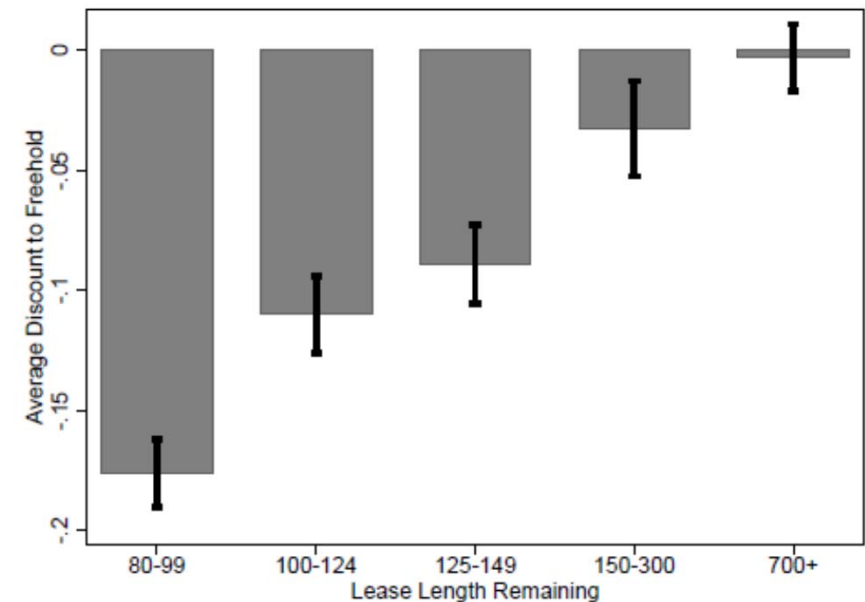
Are we short-termist?

- Do we care enough about future generations? Is the interest rate too large? Is our growth sustainable?
- To evaluate investment projects, entrepreneurs use the risk-adjusted cost of capital as the rate at which cash-flow should be discounted.
- Is that discount rate compatible with the Common Good?
- Why do we penalize the future when performing an investment evaluation?

Very LT discount rate

Giglio-Maggiori-Stroebeel 2015

- Utilisation de données sur les valeurs de contrats (UK et Singapour) « leasehold » de maturités comprises entre 50 ans et 999 ans.
- Les rendements réels “ownership strips” dans l’immobilier ont une structure par terme fortement décroissante.
 - Au-delà de 100 ans, il est de 2.6% seulement.



(A) Leasehold Discounts - U.K.

Why do we discount the future?

- In a growing economy, investing for the future raises intergenerational inequalities.
- Under inequality aversion, this reduces intergenerational welfare.
- Under the veil of ignorance, inequality is risk, and inequality aversion is risk aversion.
- The discount rate can be interpreted as the minimum IRR that compensates for the adverse effect of the investment on intertemporal inequalities.
- Ramsey (1928): $r_f = \gamma g$

Measuring risk aversion

risk aversion	certainty equivalent
0.5	0.93
0.67	0.91
1	0.87
2	0.75
10	0.54
20	0.52

Table: Certainty equivalent consumption of a 50-50 chance of consuming either 0.5 forever, or 1.5 forever, as a function of relative risk aversion.

Experts' view

author	inequality aversion	growth rate	discount rate
Stern (1977)	2		
Cline (1992)	1.5	1%	1.5%
IPCC (1995)	1.5-2	1.6%-8%	2.4% - 16%
Arrow (1995)	2	2%	4%
UK: Green Book (2003)	1	2%	2%
Stern (2007)	1	1.3%	1.3%
Arrow (2007)	2-3		
Dasgupta (2007)	2-4		
Weitzman (2007)	2	2%	4%
Nordhaus (2008)	2	2%	4%

- Uncertainty should affect the discount rate.
 - Introspection: impact of future uncertain income on saving.
- If macro uncertainties are represented by a Brownian motion for consumption, no much effect on the DR.
- But if one recognizes that the destiny of our civilization is more uncertain than that (catastrophes, deep uncertainties,...), then the DR should be much smaller than as predicted by the Ramsey rule.
 - It should have a decreasing term structure.

- Because of risk aversion, we should penalize actions that raise the macroeconomic risk.
- This is done by adjusting the DR upward by a risk premium.
- This risk premium is proportional to the beta of the project.
- Beta= elasticity of the social benefit to changes in aggregate consumption.

Calibration with an unknown trend

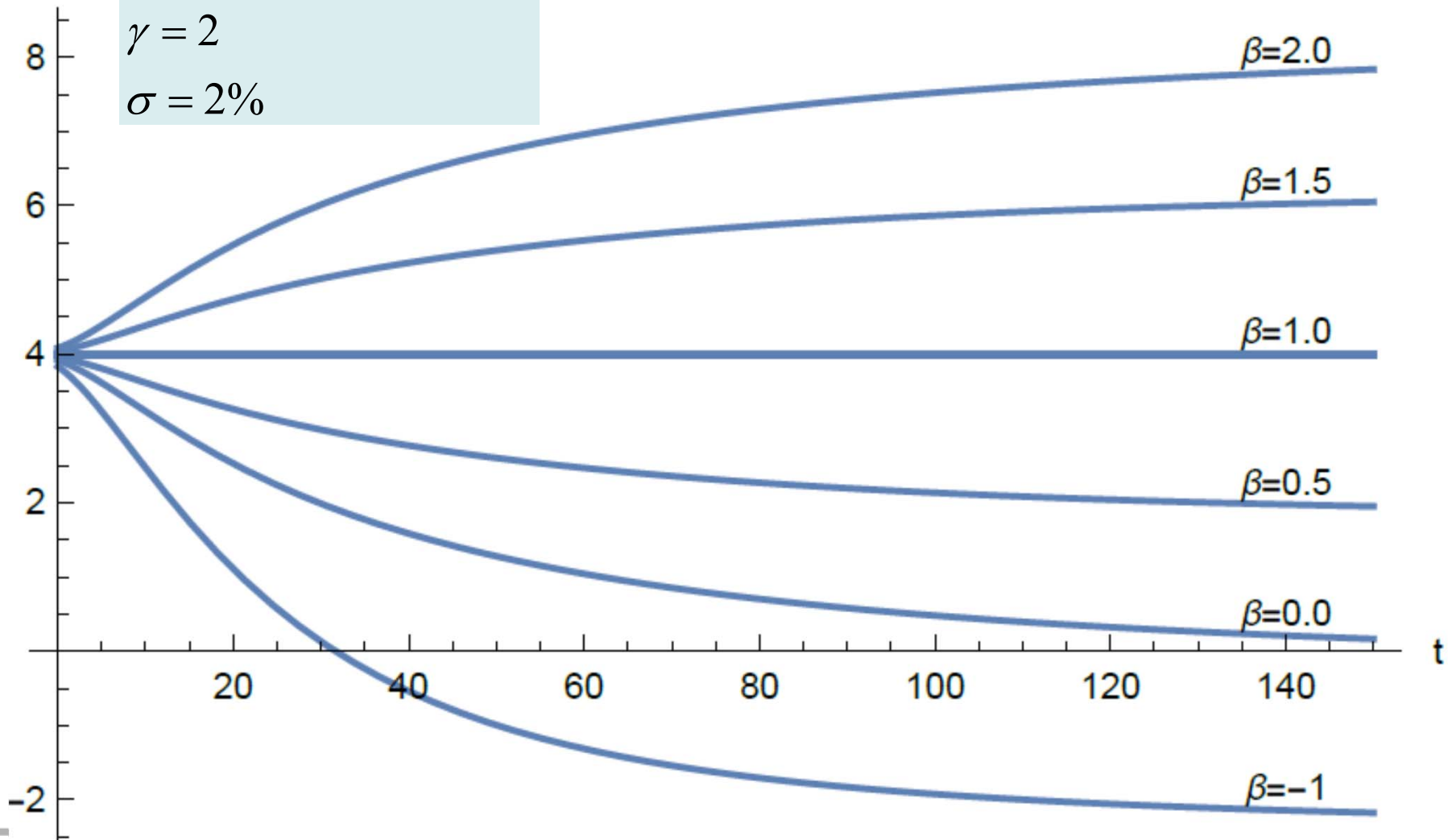
$$\mu \sim (0.8, 1/2; 3.2, 1/2)$$

ρ_t

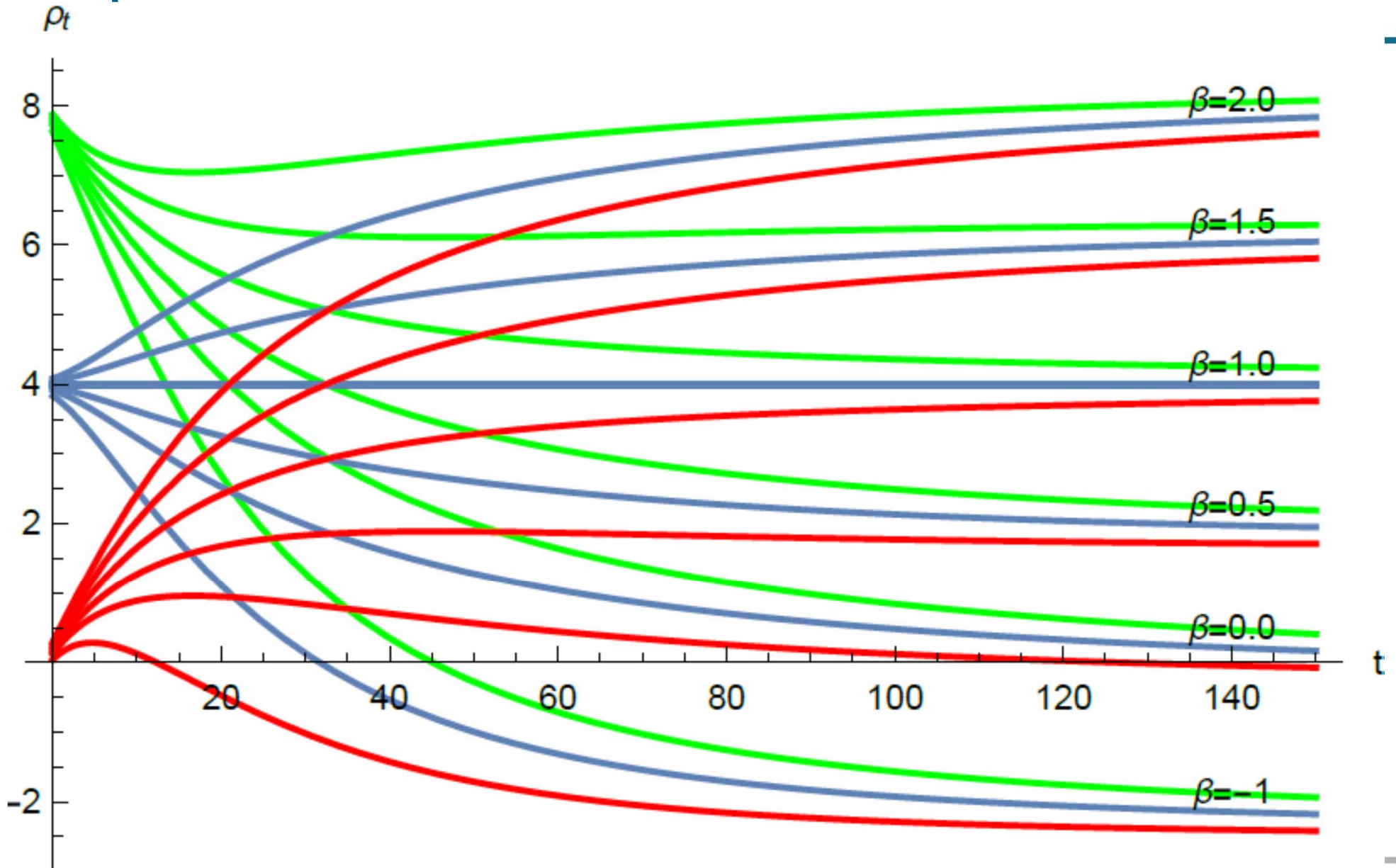
$$\delta = 0$$

$$\gamma = 2$$

$$\sigma = 2\%$$



Term structures as a function of short-term expectations

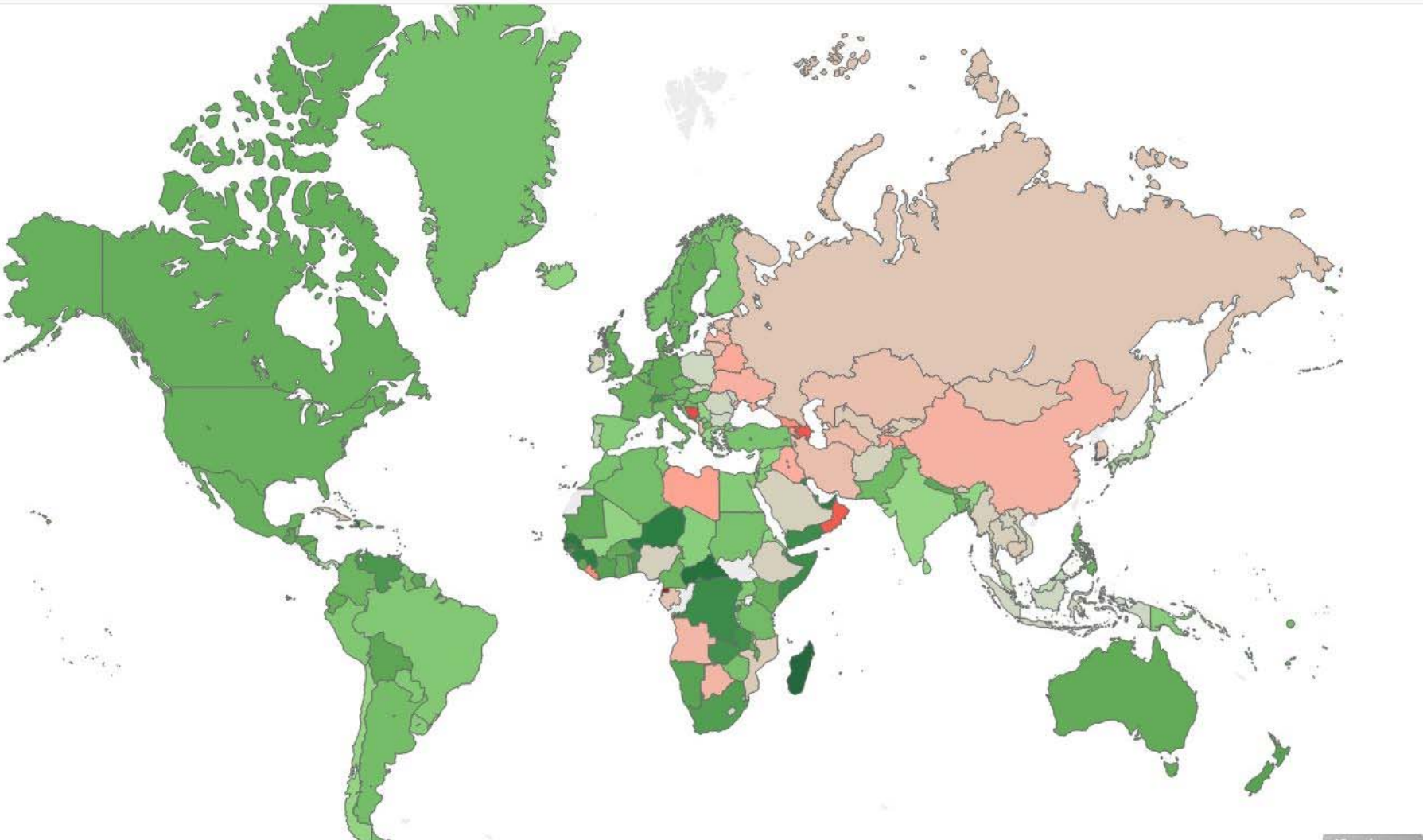


Calibration for 248 countries with Epstein-Zin preferences

Country	μ	σ	k	$\bar{r}_{0,1}^f$	$\bar{r}_{0,20}^f$	$\pi_{0,1}$	$\pi_{0,20}$
China	7.48	4.37	0.37	3.27	2.17	2.99	4.74
European Union	2.25	1.54	0.48	2.08	1.83	0.44	0.83
France	2.11	1.55	0.57	1.85	1.43	0.53	1.20
Latin America	1.73	2.10	0.40	1.49	1.20	0.72	1.19
ME & North Africa	1.76	3.20	0.46	0.43	-0.54	1.83	3.37
Nicaragua	0.47	5.49	0.36	-2.76	-4.32	4.53	7.00
Sub-Saharan Africa	0.86	2.42	0.49	0.52	-0.11	1.09	2.08
United Kingdom	2.01	1.92	0.37	1.83	1.62	0.57	0.89
United States	2.08	1.89	0.31	1.94	1.80	0.51	0.73
World	1.85	1.35	0.37	1.98	1.88	0.28	0.45
Zimbabwe	0.02	6.08	0.40	-4.40	-6.82	5.91	9.75

DR map

Risk Based Rate 20 Years



Climate beta

- ▶ What is the beta of investments whose aim is to reduce emission of CO_2 ?
- ▶ Two opposite stories:
 - ▶ Positive beta: A growth rate larger than expected raises CO_2 concentration and the marginal damage. There is a positive correlation between future consumption and the future benefit of mitigation.
 - ▶ Negative beta (Daniel, Litterman and Wagner (2015)): A larger climate sensitivity raises the marginal damages and reduces consumption.
- ▶ Dietz, Gollier and Kessler (2015): $\beta \simeq 1$.
- ▶ Because there is a consensus for a normative γ around 2, the term structure of the risk-adjusted discount rate for climate change should be flat ($\beta \simeq \gamma/2$).

Take-home messages

- Financial accounting has a strong ethical foundation, if the vector of prices is supported by our pre-defined social aspirations.
- Estimating these prices raise strong moral concerns, but this should not be a reason to escape the challenge.
- Discounting is necessary to take account of the fact that investing raises intertemporal inequalities.
- They are reasons to use a smaller discount rate for longer maturities.