Twitter Thread by Paul Kelleher

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A rather long thread about newly minted Nobel laureate Bill Nordhaus's "debate" with Nicholas Stern over the vexed issue of discounting. tl;dr: Though very different from one another, I don't think their views on discounting are inconsistent.

As Robert Nozick wrote of his rival John Rawls's landmark book _A Theory of Justice_, "Political philosophers now must either work within Rawls' theory or explain why not." The same goes for Nordhaus and his pioneering work in climate economics.

For example, Nicholas Stern & Simon Dietz wrote in 2015: "'To slow or not to slow' by Nordhaus is a landmark in econ research. As the first analysis of the costs and benefits of policies to abate greenhouse gas emissions, it opened the profession to a new field of application."

Stern & Nordhaus are standardly treated as rivals, in the way Nozick & Rawls definitely were. The key issue that is supposed to divide them is discounting, which concerns the relative weight economic models give to future costs & benefits, compared to equivalent c's and b's today

Both Nordhaus & Stern work within the framework pioneered 90 years ago this year by Frank Ramsey (whom the Nobel committee bizarrely mis-cites as "A.S. Ramsey" in its Nordhaus background document). Their disagreement is about how to calibrate of a famous equation named for Ramsey

This so-called "Ramsey formula" is supposed to yield the rate by which you "discount" the value of a benefit arriving in the next time period. If the rate is 5%, a benefit arriving next year is only 95% as good as an equivalent benefit arriving today.

Over time, a 5% discount rate can make future benefits look paltry. Discounting is a bit like earning compound interest, but in reverse. Today is (unjustly) Columbus Day. In his most recent book, Nordhaus wrote that if Columbus had invested $100 in 1492 at 6% interest, …

…today he would have "a sum that is greater than the entire wealth of the world." One way to think about discounting is to flip that around: suppose we can produce a benefit in 526 years that is equal to today's global wealth. Using a 6% discount rate…

…we should pay no more than $100 today to secure that enormous future benefit. To many people, that seems crazy. And it's one reason why many preferred Stern's analysis to Nordhaus's, since Stern's discount rate was much lower than Nordhaus's.

But I don't think Nordhaus's and Stern's approaches to discounting are inconsistent. To see this, let's first solidify a fact about how discount rates are used. First you consider a possible benefit you might give to the future —the benefits of climate mitigation, say.

Then you discount that benefit by the discount rate: if the benefit will arrive in 526 years and the discount rate is 6% per year, you end up with a "present value" for that benefit of less than $100.

Then you subtract from that present value the cost you'd have to pay today to provide the future benefit. If the resulting amount is more than 0, then this climate mitigation project passes a cost-benefit test, and the project is judged a "good thing".

The key difference between Nordhaus and Stern is that they are focused on two different senses in which a project can be said to be a "good thing", and thus two different virtues that a cost-benefit test can be used to shed light on.

To see this, we return to the framework Ramsey pioneered 90 years ago. Ramsey's task was to provide a way of ranking all the possible ways an economy could unfold over time — that is, ranking possible "time paths" of the economy.

These time paths are time paths of "economic consumption", i.e. the enjoyment of commodities that are either already priced in the market place or which are unpriced (like clean air) and must be assigned prices using via various economic methods.

Ramsey assumed, as do most climate economists today, that two main considerations should drive any such time-path ranking exercise: first, the ranker will care to some degree about limiting inequality between the consumption enjoyed in any two given years.

Second, the ranker will care to some degree about moving consumption earlier in time — something called "pure time preference." Ramsey thought it was unethical to apply pure time preference, that it discriminates against future people. I'll come back to this.

Ramsey's genius was to use cutting-edge calculus to derive discount rates for every given time on any given time-path. Each rate reflects the ranker's aversion to inequality, preference for earlier consumption, & the growth rate of consumption on that time-path.

Using that formula, one can then perform a cost-benefit test (of the sort described above) that told you this: if the discounted future benefit of a given project are larger than today's costs, then in undergoing the project…

…one moves from the status quo time-path to a higher-ranked time-path of consumption. Remember that the ranking of time-paths is given by the degree of the ranker's aversion to consumption inequality and preference for earlier consumption. Different rankers will have…

…different preferences about these things, but the Ramsey formula can be used by any ranker to help them work out whether a given project moves the economy up or down the ranking as dictated by the ranker's own preferences concerning inequality-aversion and pure time preference.

The Ramsey formula is also related to another of Ramsey's findings. Ramsey explained that if you want to know whether you have reached the highest ranked feasible time-path of consumption, you should check to see if your discount rate — as given by the Ramsey formula—equals…

…the prevailing rate of return on investment in the economy. Here's why: if the prevailing rate of return is higher than the discount rate, then you can climb to a higher-ranked time-path by reducing your consumption today and investing it so that it can be consumed later.

You'll do this right up to the point at which the discount rate equals the rate of return on investment. Once there, you'll know that there's no economic change you can make to climb to a higher-ranked time-path of consumption. As climate economists put it:

…along an optimal time-path of consumption, the economy's rate of return on investment will equal the discount rate as given by the Ramsey formula. The real difference between Nordhaus and Stern traces to this finding of Ramsey's.

According to Stern, climate economists should do the following: they should use ethical reasoning to select morally defensible stances toward intertemporal consumption inequality and "pure time preference." Then they should determine the status quo time-path of consumption.

Then they should use the Ramsey formula to derive morally acceptable discount rates, and compare those to prevailing rates of return on investment, including environmental/climatic investments. If those rates of return are higher than the discount rate, then one should invest…

…a little more and consume a little less. Indeed, one should do that right up to the point where the real rate of return on investment equals the discount rate. And since Stern agrees with Ramsey that applying pure time preference to future benefits is unethical…

…Stern's rankings favor time-paths of consumption that involve securing future benefits even if they mean sizable costs today.

This is because those future benefits remained sizable themselves, since they are not discounted as heavily as they would be if the Ramsey formula is outfitted with high pure time preference to yield a high discount rate.

It is here where Nordhaus strenuously disagreed with Stern. He more or less said that Stern's low discount rate was moralistic utilitarian imperialism run amok, and that Stern should not appeal to ethics but instead to revealed behavior to calibrate the Ramsey formula.

But this disagreement has been misconstrued. It's not that Nordhaus insists one should look to actual behavior to calibrate the Ramsey formula when the economic task is to rank all possible time-paths of consumption relative to one another.

Instead, Nordhaus thinks that climate economics should not be focused on that task in the first place. So what's Nordhaus's preferred alternative? I'm glad you asked.

According to Nordhaus, the Ramsey framework can be used by the analyst not only to rank feasible time-paths of consumption, but (in a wholly different sort of analysis) also to *predict* what future rates of return on investment will be in the business-as-usual economy.

Here's how that works: Nordhaus wants to model real-world economic behavior (which he knows to be influenced by real-world social policies) in order to predict future real interest rates.

Nordhaus assumes that *societies* have policy preferences about which time-paths of consumption are to be preferred, and that social policy in fact aims to bring real rates of return on investment into line with the discount rates given by those social policy preferences.

So Nordhaus's aim is to figure out what those actual social policy preferences are, and to use them to predict what real rates of return on investment will prevail in the real-world economy. This is not an exercise in moral theory, and it's not the task Stern is focused on.

Instead, Nordhaus's task is one of economic sociology. As he puts it:

Why is Nordhaus focused on the task of predicting real interest rates, instead of constructing a grand overall ranking of time-paths of consumption? He's not entirely clear about this. Sometimes he says it's because actually existing governments are self-interested and…

…are not concerned with 'morally appropriate' investing but are instead concerned to place their scarce resources in whatever investments carry the highest real rate of return.

But there is another (not unrelated) explanation of why Nordhaus takes the approach he does. In environmental economics, two distinct policy goals are sometimes given the same name: "optimality." For those who take Stern's approach, optimality means identifying the…

…time-path of consumption that is ranked highest from a moral point of view, then determining what degree of greenhouse gas abatement would occur if we were on that time-path, and (finally) getting the world onto that abatement pathway.

A different conception of optimality is this: asking whether it would be possible to prevent climate damages without making anyone worse off than they were before any climate action, and then (if that is possible) engaging in climate action until it would no longer be possible…

...to make some people better off with climate action without making anyone else worse off. Economists dislike status quos in which it would be possible to improve some without harming anyone else. And environmental economists often wish to know which policies could…

...transform the status quo into one in which there are no more win/win policies available. And *that* is the sort of project for which one would want to know what the real-world interest rate will be in the future. An example:

Suppose future people would be willing to pays us $1000 to emit one less ton of CO2 into the atmosphere (since our doing so imposes risks of harm on those future people). If one discounts that $1000 using the interest rates that'll prevail between now & that point in the future,

and if that discounted value is greater than what it would cost us today to abate that marginal ton of CO2, then it should be economically possible to arrange a transfer whereby we are fully compensated for abating that ton of CO2. This makes future people better off without…

…making us worse off. And so if your focus is on making sure that such win/win trades are not just hanging out there unexploited, you will be interested in real world interest rates. And that is *precisely* why Nordhaus is interested in the Ramsey framework.

More to the point, that has *nothing at all* to do with why Stern is interested in the Ramsey framework. And *that* is why Nordhaus and Stern are not really disagreeing. The fact of the matter is that they are focused on very different economic tasks.

According to Google Scholar, Nordhaus's review of Stern has been cited 1654 times. But it is in a paper of his that has been cited just 75 times that he is the clearest about how his task differs from Stern's: https://t.co/LEl0mGWTx5

Since Nordhaus doesn't want to pass judgment on the fairness of the current distribution of income (whether intra- or inter-temporally) his "optimal" climate policies are merely ones that eliminate "win/win" climate policies (that is what it is to be "Pareto efficient").

So you see, Nordhaus and Stern need not disagree over discounting. This is b/c one can at the same time and perfectly consistently be interested in each of their tasks, which call for different approaches to discounting even as each employs the Ramsey formula for his ends. /end

oops, it was 53. Oh well, counting was never my strong suit. https://t.co/hhw6Iex5NB

> 44 tweet thread forthcoming.
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> — Paul Kelleher (@kelleher_) October 8, 2018