

An illustration of a landscape with a brown ground surface, a green tree on the right, and a stylized orange figure in the center. A large, light-colored, curved shape resembling a cloud or smoke plume is positioned above the ground. The text "Sustainable Development" is written in white on a brown background at the bottom.

Sustainable Development

An identical illustration to the one on the left, featuring a brown ground surface, a green tree, a stylized orange figure, and a light-colored curved shape above. The text "Sustainable Development" is written in white on a brown background at the bottom.

Sustainable Development

Part 9

Policy for sustainable development

Is unsustainability sustainable?

- Options
- Lessons from historical adaptation
- Financial and other crises
- Distribution
- Uncertainty and future crises

The no-growth paradigm

Epilogue: Get prices right

Is unsustainability sustainable?

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Assume that the following statement is true.

- We are getting richer and healthier, but trashing the planet.

Given the above, consider the following two hypotheses.

1.
 - We rely on services provided by the planet, and by trashing the planet we are destroying the planet's ability to provide these services in the future.
 - Therefore, if we carry on trashing the planet the loss of these services will lead to us getting poorer and sicker.
2.
 - We are adaptable and ingenious.
 - Therefore we can carry on both trashing the planet and getting richer and healthier, indefinitely.

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Now assume that you care about the planet, and would like to help redress the balance between the pursuit of material wealth and care of the planet. What to do? Consider the following two strategies.

1. Find evidence for hypothesis 1, or try to convince others of its veracity.
2. Persuade others to care too: either more about the planet, or less about material wealth!

There are of course other strategies. For instance:

3. Demonstrate that the system (e.g. 'global capitalism') is going to crash anyway. So we might as well slow it down gently and save the planet at the same time.

The first strategy is fine as long as hypothesis 1 holds. But what if it doesn't?

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The planetary boundaries framework defines a safe operating space for humanity based on the intrinsic biophysical processes that regulate the stability of the Earth System.

For the first time in human history, we need to relate to the risk of destabilising the entire planet. Just because we are not seeing a collapse today doesn't mean we are not subjecting humanity to a process that could lead to catastrophic outcomes over the next century.

Strategy? Author?

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Steffen, Richardson, Rockström *et al's* article in *Science*, 2015.

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We take it for granted, the world that we love—and we're destroying it so quickly. The light of dawn on the prairie. The silvery flash of fish in a stream. The cry of a hawk over a forest. Everybody has their own idea of the beautiful, and we'll surely miss it when it's gone.

People are persuaded to spend money we don't have, on things we don't need, to create impressions that won't last, on people we don't care about.

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Big World, Small Planet. Rockström and Klum, 2015.

Lessons from historical adaptation

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The regulated market economy has shown a remarkable ability to adapt and react to crises when they arise, including environmental crises.

On the other hand, we know that environmental crises may often have far-reaching consequences for nature, and sometimes for human welfare. And when the consequences are *only* for nature, not a lot tends to get done. Consider for instance the Baltic Sea, or bird populations in Europe.

Finally, there are examples of civilizations that have collapsed, apparently due to environmental collapse. E.g. Easter Island. What lessons are there here? E.g. ?.

Financial and other crises

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We know that financial crises—especially large-scale ones across many countries—typically have severe and long-lasting effects.

But such a crisis does not signal the death-throes of capitalism, the collapse of the system under the weight of contradictions.

We know why the recent global financial crisis occurred, and we know why recovery from it is so slow. The reason is the lack of confidence in the future which is widespread among agents, a lack of confidence which is rational for each individual in the knowledge that everyone else lacks confidence. It is a gigantic coordination problem, the solution to which is either some massive shock (such as WW2 in 1939) or gradual, inch-by-inch progress.

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Who suffers from environmental crises?

And who pulls the strings?

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So the global economy will very likely be able to keep going as it has up to now, for decades or even centuries to come. Growing, triggering environmental problems and even catastrophes, and then solving them. All the while, the space for the non-human or 'natural' world is likely to be circumscribed ever-more by our thirst for consumption, consumption of everything from food to wilderness experiences.

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- 'Green' consumerism
- Conspicuous consumption, labour, and leisure

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Green consumerism is a tricky business. The key problem is rebound. If you don't consume one thing, but your income is unchanged, you will consume something else instead, or invest in capital which may be just as bad. It is an impossible task for individual consumers to weigh up the environmental effects of their actions.

We need consumers to elect politicians who enact laws which (a) lead to external effects being internalized in the prices of goods (in borderline cases), and (b) lead to highly damaging or unnecessary practices being banned (in black-and-white cases). A recent example of the latter is the ban on incandescent light bulbs in both the US and the EU.

Conspicuous consumption, labour, and leisure

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What is conspicuous consumption, and why might it be a problem?

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Assume

$$u_i = c_i^{\alpha_1} r_i^{1-\alpha_1-\alpha_2} (c_i/\bar{c})^{\alpha_2},$$

where c_i is consumption, r_i is leisure, and \bar{c} is average consumption across all households. Flat-rate income tax τ , proceeds $\bar{l}\tau$ (\bar{l} is average production) transferred back as public goods:

$$c_i = l_i(1 - \tau) + \bar{l}\tau.$$

Leisure r (for *recreation*) is equal to total time R minus labour time, i.e.

$$r_i = R - l_i.$$

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Define $\alpha = \alpha_1 + \alpha_2$. Take the tax as exogenous and work out how much each household chooses to work. To do so, substitute into the utility function to yield

$$u = [l_i(1 - \tau) + \bar{l}\tau]^\alpha (R - l_i)^{1-\alpha} / \bar{c}^{\alpha_2}.$$

Take the FOC in l_i and solve to show that

$$l_i = \alpha R - (1 - \alpha)\bar{l}\tau / (1 - \tau).$$

So when income tax is zero $l_i = \alpha R$: as labour income dominates the utility function (α high) households devote more of their time to labour and less to leisure.

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Now assume a symmetric equilibrium such that average labour \bar{l} is equal to the labour supplied by household i , l_i . Insert this into $l_i = \alpha R - (1 - \alpha)\bar{l}\tau/(1 - \tau)$:

$$l_i = \bar{l} = \frac{\alpha R}{1 + (1 - \alpha)\tau/(1 - \tau)}.$$

Now the question for a regulator is, what level of tax τ maximizes utility for households? Economic theory tells us that if markets are perfect then the optimal tax should be zero, hence $l_i = \alpha R$. But if there is a consumption externality—i.e. if $\alpha_2 > 0$ —then this no longer holds.

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To solve the problem, we insert the expression for l_i as a function of τ into the utility function—noting that in symmetric equilibrium $c_i = \bar{c}$ and (as already stated) $l_i = \bar{l}$ —to obtain

$$u = \left[\frac{\alpha R}{1 + (1 - \alpha)\tau / (1 - \tau)} \right]^{\alpha_1} \left[R - \frac{\alpha R}{1 + (1 - \alpha)\tau / (1 - \tau)} \right]^{1 - \alpha}.$$

Simplify to obtain

$$u = R^{1 - \alpha_2} \alpha^{\alpha_1} \omega^{-(1 - \alpha_2)} (\omega - \alpha)^{1 - \alpha},$$

where $\omega = 1 + (1 - \alpha)\tau / (1 - \tau).$

Take the first-order condition in ω to solve for the optimal ω , and then use the definition of ω to solve for the optimal tax:

$$\tau = \alpha_2 / (\alpha_1 + \alpha_2).$$

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$$\tau = \alpha_2 / (\alpha_1 + \alpha_2).$$

So, the stronger the weight of 'conspicuous consumption' in utility, the more labour income should be taxed.

How big is the effect? Assuming conspicuous consumption has equal weight to consumption in utility then labour income should be taxed at 50 percent. The effect of the tax is to reduce labour supply by a factor ω . And if leisure has 50 percent weight in utility (implying that $\alpha = 0.5$ so in laissez-faire the individuals would work 8 hours and have 8 hours of leisure time, assuming that 8 hours are needed for sleep) then $\omega = 1.5$, so labour supply is reduced by one third.

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The above model should not be taken too seriously: it is based on assumptions which are plucked more-or-less out of thin air rather than backed by careful argument and empirical evidence.

Nevertheless, it demonstrates that there may exist sound economic arguments for governments to discourage labour and encourage leisure even in the absence of environmental damage from production.

If *international* consumption externalities are important then it is only rational for national governments to impose such policies if their neighbours do the same. Perhaps this is why European economies have (collectively) been able to hold down or even reduce working hours over recent decades, whereas the US has lurched dramatically in the opposite direction. (Network externalities.)

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- Mainstream economics and radical alternatives

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The mainstream economic mantra is to 'get prices right'.

We have discussed (for instance) taxes on flying contra subsidies to clean technology. In the first-best optimum, the regulator would simply correct all externalities by 'getting prices right'. This might be both through taxing emissions and subsidizing research.

But in reality it may be hard to tax emissions (leakage) and hard to know what the correct price of knowledge is. Then we need to understand the system to find the best policy.

And in reality externalities are all-pervasive. (See <https://goo.gl/PmD53c>.) Maybe externalities are leading us to work too hard, consume (and produce) too much?