

Assess the need for countries to sacrifice economic growth for the sake of the environment.

With increasing natural disasters and warnings of extended recessions, climate change is emerging at the centre of economic discussion. Extreme action must be taken to keep the rise in global temperatures 'well below 2°C'¹ and prevent the worst effects of the climate crisis. This also comes at a time when markets are particularly volatile, with a weak global economy from coronavirus havoc. This essay will look at whether countries need to sacrifice economic growth for the sake of the environment through 3 ways: the costs of inaction, policies used to reduce environmental degradation, expected innovation in green technology.

Before assessing this trade-off in detail, the existing relationship between growth and environmental degradation should be established. For decades, economic growth has thrived on low commodity prices, suggesting a positive correlation between growth and environmental degradation (A, Fig. 1). The hockey stick of growth is a testament to the capacity-changing innovations that sparked the industrial revolution, a transition that allowed for unprecedented growth rates. Models from ecological economics, such as Herman Daly's Empty World to Full World Model (Fig. 2) display the influence of the economy on nature in the age of the Anthropocene, where humans become the main driver of environmental change.

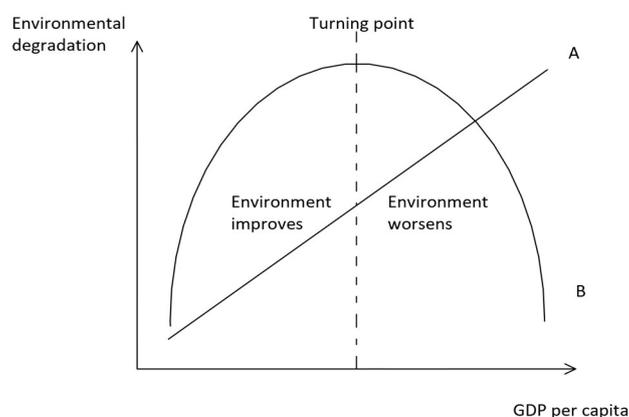


Figure 1: The relationship between environmental degradation and GDP per capita.

¹ United Nations Climate Change (2015), 'The Paris Agreement'

Available at:

<https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement>

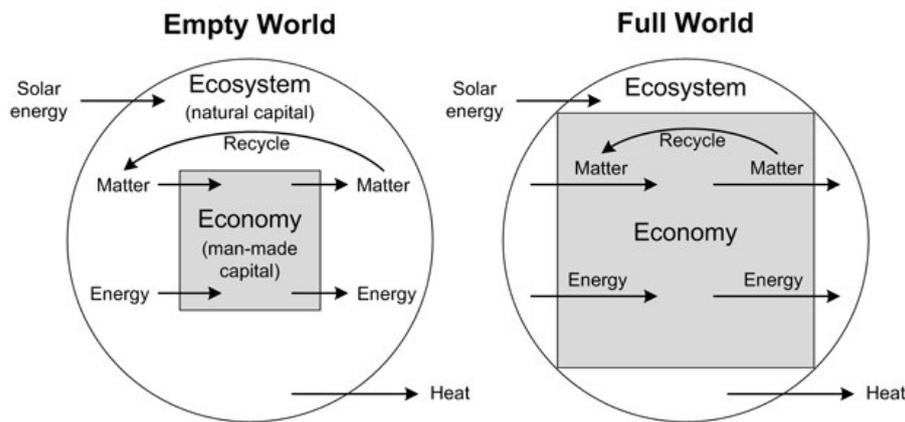


Figure 2: Daly's Empty World to Full World Model

However, there is evidence to suggest the decoupling of economic growth from the destruction of the environment. The Environmental Kuznets Curve (B, Fig. 1) suggests a dynamic relationship between emissions and GDP as countries develop, with an initial rise in environmental damage as industrialisation occurs, followed by a fall in emissions as the service sector expands. Similarly, during deindustrialisation, between 1985 and 2016, GDP per capita in the UK grew by 70.7%, accompanied by a 34.2% fall in carbon emissions². Despite this, the model may not be true on a global scale as countries outsource resource-intensive products from developing countries. Care should also be taken when interpreting the curve – while highlighting correlation, the model does not imply that a certain level of growth causes a decrease in environmental degradation.

The damage caused by climate change is forecasted to cost 20% of global GDP due to increasing natural disasters, loss of biodiversity and reduced agricultural output. This is compared to an annual loss of 1% in global GDP if action is taken to limit emissions³. We have witnessed the destructivity of coronavirus, which is predicted to cost the world economy \$2 trillion⁴. Vulnerability to such public health crises will increase as temperatures escalate, with a 2-3 °C increase in temperatures placing several hundred million more people at risk of malaria as areas exposed to the vector

² Office for National Statistics (2019), **'The decoupling of economic growth from carbon emissions: UK evidence'**

Available at:

<https://www.ons.gov.uk/economy/nationalaccounts/uksectoraccounts/compendium/economicreview/october2019/thedecouplingofeconomicgrowthfromcarbonemissionsukevidence>

³ Stern, N. (2006) **'The Economics of Climate Change: The Stern Review'**, vi-ix

Available at:

http://mudancasclimaticas.cptec.inpe.br/~rmclima/pdfs/destaques/sternreview_report_complete.pdf

⁴ United Nations Conference on Trade and Development (2020), **'Coronavirus: Can policymakers avert a trillion-dollar crisis?'**

Available at:

<https://unctad.org/en/pages/newsdetails.aspx?OriginalVersionID=2300>

expand⁵. A transition to a low emission economy is therefore needed to prevent future economic damage.

Despite this, the environmental impacts of climate change may not reduce growth in developed nations since costs accrue disproportionately to poorer countries which rely on primary industries and lack the infrastructure needed to respond to the accelerated occurrence of natural disasters⁶. However, historically, developed nations are most responsible for the level of emissions, with the UK placed sixth when ranked by carbon footprint per person⁷. Therefore, the UK may have a moral obligation to reduce further contribution to the climate crisis, despite policies harming short-term growth.

The policies used to reduce emissions are likely to have the largest impact on short-term growth. At the core of overcoming the climate crisis, is the need to correct market failure, with the 'greenhouse gases externality' being the largest externality humanity has seen⁸. Allowing external costs to be factored into prices through a carbon tax, a policy the UK has proposed in the event of a no-deal Brexit⁹, raises the marginal private cost, shifting output to Q_2 (Fig. 3), the socially optimum level. However, in the short run, this Pigouvian tax increases production costs for firms in carbon-intensive industries and producers who are unable to adapt may see declining profits. This could disincentivise investment and reduce incomes of those employed in the sector. Furthermore, in a globalised world, carbon taxation could create incentives for carbon-producing firms to move abroad. Therefore, threats made by lobbyists against carbon taxes do seem credible due to the hostile business

⁵ WHO (2003), '**Climate change and human health - risks and responses**'

Available at:

<https://www.who.int/globalchange/publications/cchhsummary/en/>

⁶ Stern, N. (2006) '**The Economics of Climate Change: The Stern Review**', vi-ix

Available at:

http://mudancasclimaticas.cptec.inpe.br/~rmclima/pdfs/destaques/sternreview_report_complete.pdf

⁷ Glen P. Peters, Jan C. Minx, Christopher L. Weber, Edenhofer (2011), '**Growth in emission transfers via international trade from 1990 to 2008**'

Available at:

<https://www.pnas.org/content/108/21/8903>

⁸ Stern, N. (2006) '**The Economics of Climate Change: The Stern Review**', vi-ix

Available at:

http://mudancasclimaticas.cptec.inpe.br/~rmclima/pdfs/destaques/sternreview_report_complete.pdf

⁹ HM Revenue & Customs (2018), '**Carbon Emissions Tax**'

Available at:

<https://www.gov.uk/government/publications/carbon-emissions-tax/carbon-emissions-tax>

environment created by Brexit, which has led to the international relocation of 16% of firms in the decreasing domestic production.

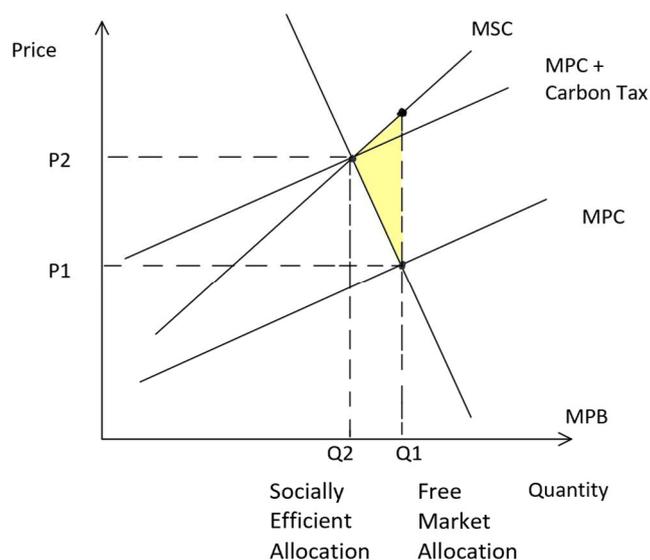


Figure 3: The effect of a carbon tax

However, the extent of the economic impacts depends on government strategies. For example, policies to promoting use of low-carbon power will require investment into new energy infrastructure. These injections could create a Keynesian multiplier effect and aid growth, with the Labour Party proposing a green recovery¹⁰ post-coronavirus, after a forecasted 35% contraction in GDP¹¹. Indeed, investment into green technologies was used as stimulus after the 2008 financial crisis, with \$90 billion investment in low-carbon energy in USA as part of Obama’s 2009 Recovery Act¹² tripling use of wind power. Tax revenue could create a “double dividend” of environmental and economic efficiency as other existing taxes can be lowered, reducing market distortions. Furthermore, as “The Economists’ Statement on Carbon Dividends” suggests, paying an equal rebate to each citizen to offset a rise in energy prices would also improve the feasibility of carbon taxation.

¹⁰ Walker, P., Taylor, M. (2020), ‘Labour to plan green economic rescue from coronavirus crisis’ <https://www.theguardian.com/environment/2020/may/17/labour-to-plan-green-economic-rescue-from-coronavirus-crisis>

¹¹ Office for Budget Responsibility (2020) ‘Coronavirus Analysis’ Available at: <https://obr.uk/coronavirus-analysis/>

¹² White House Council of Economic Advisors (2016), ‘A Retrospective Assessment of Clean Energy Investments’ Available at: https://obamawhitehouse.archives.gov/sites/default/files/page/files/20160225_cea_final_clean_energy_report.pdf

Although some policies may have significant negative economic implications, they could simultaneously have positive long-term impacts. Productivity may increase as firms innovate to overcome obstacles caused by the policy of taxing carbon. These technologies will create new markets and employment opportunities, triggering Schumpeter's idea of creative destruction, with exports from the low carbon economy forecasted to grow to £170 billion per year by 2030, aiding the UK's trade balance¹³. This may spark the transition to a technology-centred, green economy as further structural change occurs, through a 'fourth industrial revolution'. A notable example is Sweden, which maintained a 78% increase in GDP while reducing emissions by 26% compared to industrial levels, through one of the highest carbon taxes in the world¹⁴. Furthermore, this improvement in technology is the type which allows for sustainable, long-run growth in the Solow Growth Model. An improvement in long run growth and productivity has the potential to lead to a much-needed increase in real wage growth which has fallen into stagnation since 2008.

However, time is needed for innovations to develop, with the average timescale for important innovations in the energy sector to develop from invention to widespread commercialisation being 32 years¹⁵. The recent plunge in oil prices may slow down this process through a surge in demand, but with volatile markets and low confidence, investors will be less likely to invest in petroleum, possibly accelerating the energy transition.

The efficacy of such policies is also dependant on other economies and whether a global green deal can be achieved. Game theory suggests difficulty in cooperation as due to the free rider problem creating an incentive for countries to follow their self-interest, resulting in a sub-optimal Nash equilibrium. Trump's fuel economy rollback and decision to withdraw from the 2017 Paris Agreement provides additional political complexity. Another concern is the extent to which Government initiatives, such as the UK's net zero emissions target, will decrease environmental degradation. The UK target will decrease global emissions as 46% of the UK's carbon footprint is

¹³ Committee on Climate Change (2017) '**UK business opportunities of moving to a low-carbon economy**'

Available at:

<https://www.theccc.org.uk/publication/uk-energy-prices-and-bills-2017-report-supporting-research/>

¹⁴ Government Offices of Sweden (2020), '**Sweden's carbon tax**'

Available at:

<https://www.government.se/government-policy/taxes-and-tariffs/swedens-carbon-tax/>

¹⁵ Gross, R., Hanna, R.F., Gambhir, A., Heptonstall, P. and, Speirs, J. (2018), '**How long does innovation and commercialisation in the energy sectors take?**', Energy Policy, 685-699

Available at:

<https://spiral.imperial.ac.uk/handle/10044/1/63940>

from overseas, which are not included in the targets¹⁶. Therefore, the impacts of policies depend heavily on whether a global pro-climate strategy can be achieved.

The necessity of growth in this ‘new green age’ should also be considered. Since the Industrial Revolution, we have built the economic structure around short-term growth. For world leaders, it is politically important to force growth in their tenure at the expense of the next, with US presidential approval rates coinciding with fluctuations in the stock market¹⁷. However, in a nation that has developed beyond the peak of Rostow’s model, growth may no longer be a necessity. The focus should perhaps shift towards achieving a balance between standards of living and planetary boundaries, within Kate Raworth’s concept of the ‘doughnut’ (Fig. 4). Amsterdam has recently used the model to strategize its coronavirus recovery. The change involves the reuse of resources - structural change from a linear economy to a circular economy, and redistribution of resources as a means of improving standards of living. This suggests that GDP growth is not necessarily the primary objective of advanced economies.

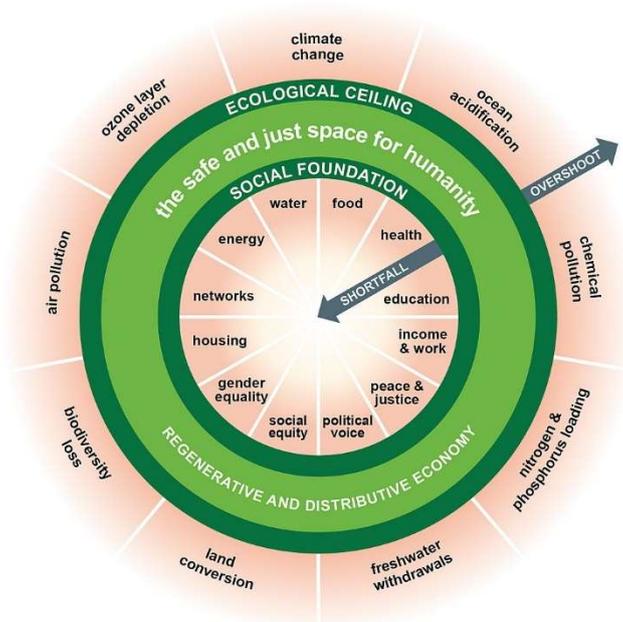


Figure 4: Raworth’s ‘Doughnut’ Model

¹⁶ WWF (2020), ‘Carbon Footprint: Exploring the UK’s Contribution to Climate Change’ Available at: [https://www.wwf.org.uk/sites/default/files/2020-04/FINAL-WWF-UK Carbon Footprint Analysis Report March 2020%20%28003%29.pdf](https://www.wwf.org.uk/sites/default/files/2020-04/FINAL-WWF-UK%20Carbon%20Footprint%20Analysis%20Report%20March%202020%28003%29.pdf)

¹⁷ Fauvelle-Aymar, C. & Stegmaier, M. (2013). ‘The stock market and U.S. presidential approval’, *Electoral Studies*. 32, 411–417 Available at: https://www.researchgate.net/publication/259121940_The_stock_market_and_US_presidential_approval

Overall, while attempts to reduce harm to the environment may lead to a fall in short term economic growth, there are also many positive long-run implications, due to innovation and the wider costs of climate change being averted. However, this does not necessarily mean that all countries should, at this point, sacrifice growth completely, but instead, we should be taking steps to reduce environmental degradation and transition to a green economy despite possible short-run reductions in the economic growth rate it may cause. The wider economic impacts lie heavily on the policies used to correct market failure and whether global coordination is achieved. Economic pluralism may provide a useful basis for policies, which COVID-19 may help make more politically practical, with the public demanding more intervention.

As public and political attention to climate change increases, with 'Stakeholders for a Cohesive and Sustainable World' being the theme of 2020 World Economic Forum, I am increasingly optimistic about our capacity to grow sustainably. Nonetheless, I am hopeful that, ultimately, economic pluralism can play an important role in the transition to a more distributive and regenerative economy of Tim Jackson's idea of 'prosperity without growth'.