Can we address climate change at the same time as maintaining positive economic growth? Discuss.

"When we think of the world's future, we always mean the destination it will reach if it keeps going in the direction we can see it going in now; it does not occur to us that its path is not a straight line but a curve, constantly changing direction." - Ludwig Wittgenstein

Introduction

As Herman Daly notes, "Growth is an idol of our times" (1993). Although the term "idol" carries negative connotations, there are good reasons as to why growth has come to command such reverence. Economic growth has freed billions from lives shaped by the struggle for subsistence, with extreme poverty falling from 8 in 10 people in 1820 to just 1 in 10 today (Susskind, 2024). The argument that it is growth which has underpinned the prosperity we currently enjoy is difficult to refute, given its close correlation with a plethora of indicators associated with human flourishing: from increased life expectancy and improved food security to greater access to healthcare and education.

Yet at what cost have these benefits come? For too long, the consequences - particularly environmental ones - of rising material prosperity have been marginalised in policy and public discourse. Only recently, in the face of climate change, have we begun to recognise that sustained economic growth is not the everlasting utopian ideal we once believed it to be. In response, a growing body of literature from economists and ecological scientists has sought to address this dilemma. Broadly, their responses fall into two schools of thought: one argues that 'green' economic growth can continue indefinitely through technological advancement and its decoupling from environmental harm; the other contends that such growth is insufficient in mitigating the escalating costs of climate change and practically unfeasible, suggesting that the only viable path is to reduce or even abandon the growth that has driven the crises we now face. Drawing on insights from both perspectives, this essay argues that while positive economic growth remains worth pursuing, how we pursue it, and the weight we place on it as a measure of progress, must fundamentally change. The case for green growth is compelling, yet achieving decoupling at the scale and pace required to remain within planetary boundaries cannot be achieved through free-market technological solutions alone. Effective, government-led policies are essential, and those explored throughout this essay can drive an environmental transition that delivers equitable economic and ecological gains across societies.

The Growth Dilemma

There is no doubt that economic growth has served humanity well. Its pursuit has lifted billions out of poverty, significantly improved living standards, and continues to provide a foundation for society through outcomes such as employment generation and wealth creation. It has also emerged as a central tenet of political strategy.

Governments orient their policies toward fostering growth, seeking to rally individuals around the vision of a flourishing society for all. However, captivated by the benefits growth has delivered over time, we have largely ignored its costs. Most notably, the profound impact on the environment and health of our planet. There is increasing empirical evidence to suggest that human activities are affecting the functioning of our planet to a degree that its ability to withstand further human pressures and shocks without degrading, or worse, collapsing completely, is threatened (Steffen et al., 2015). One aspect of this is the exponential rise in greenhouse gas emissions, specifically carbon dioxide. Global annual CO_2 emissions have increased by 537% since 1950, largely driven by rapid growth in production and resource use to facilitate economic expansion. This trend is mirrored by a 396% rise in GDP per capita, a key indicator of economic growth, over the same period. Figures 1 and 2 illustrate this parallel development side by side.

Global Annual CO2 Emissions

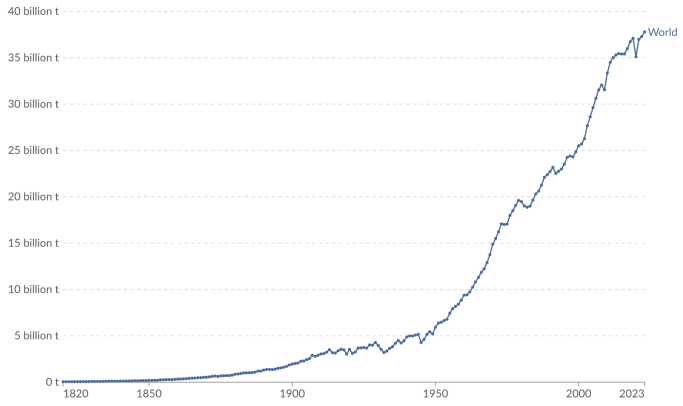

Figure 1, showing change in global annual CO2 emissions over time. Source: Our World in Data, 2024. Data from Global Carbon Budget, 2024.

Global GDP per Capita

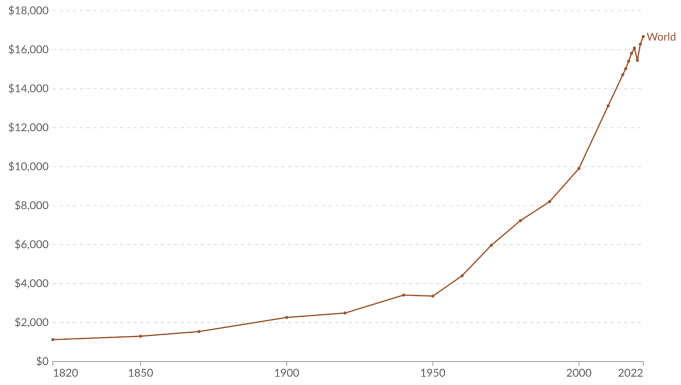

Figure 2, showing change in GDP per capita over time, adjusted for inflation and purchasing power parity.
Source: Our World in Data. Data from Bolt and van Zanden, Maddison Project Database, 2023.

High atmospheric CO2 levels intensify the greenhouse effect, trapping heat and warming the Earth's surface and oceans. This excessive warming disrupts the climate system, driving events like droughts, floods, and rising sea levels. Such global warming is evident in the rise of annual temperature anomalies relative to the pre-industrial period, increasing from 0.14°C in 1950 to 1.55°C in 2025. Although this rise may appear small, it has significant impacts on environmental systems. As the IPCC (2021) notes, "every additional 0.1°C of global warming causes clearly discernible increases in the intensity and frequency of temperature and precipitation extremes, as well as agricultural and ecological droughts in some regions."

Numerous studies have attempted to define a 'planetary boundaries framework' to suggest a safe operating space for humanity based on the biophysical processes that regulate our planet's stability. Given the data aforementioned,

it is unsurprising that we have surpassed these boundaries. One study demonstrates that we have already transgressed six of the nine boundaries laid out, illustrated in figure 3.

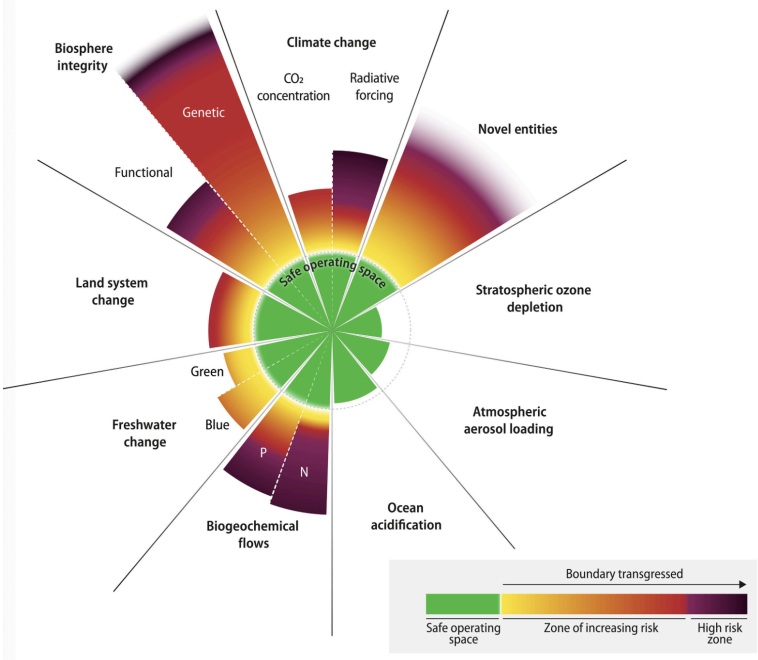

Figure 3, showing the current status of control variables for all nine planetary boundaries. Source: Richardson et al., 2023.

Given the current state of our planet's health, it is evident that we cannot continue along the same path of economic growth we have pursued for so long. The expansion in human activity that has driven this growth has undeniably contributed to the degradation of the natural world. Moreover, environmental damage is not the only cost of growth; it has also deepened inequality, driven technological unemployment, and disrupted industries and communities through globalisation, among other challenges. Yet our economies rely on growth to function. David Fleming describes this dilemma as "the growth enigma", a paradoxical act of meeting "the needs of a stable economy and a stable environment… at the same time" (Fleming, 1992). Without output growth, economies cannot absorb rising labour productivity and technological advancements, leading to unemployment as fewer workers are needed. Governments would need to support the displaced through social transfers, yet stagnant growth would undermine the tax revenues needed to fund them. Falling incomes would further reduce demand, triggering additional job losses and reinforcing a downward spiral solvable only through renewed economic growth. As we have seen, however, pursuing further growth under current models comes at the cost of accelerating ecological destruction. How could we possibly coincide the needs for a stable economy and stable environment?

Degrowth or Green Growth?

Among the proposed solutions to this dilemma is 'degrowth'. While interpretations vary, its core principle advocates for a "planned, equitable downscaling of production and consumption in wealthy countries to reduce

ecological impact, improve wellbeing, and enable global justice" (Edwards, 2021). Some proponents call for an outright contraction of developed economies, while others favour stabilising growth rates, but all share a commitment to reducing material throughput and transforming the capitalist dependence on growth and consumerist culture.

A seminal work that brought the movement to light is the Club of Rome's 'The Limits to Growth', published in 1972. At the heart of the report was their global computer model, 'World3', designed to capture the interactions and consequences of five key factors that, through their interplay, determine and ultimately limit growth on our planet. These were population growth, industrialisation, malnutrition, environmental destruction and natural resource depletion. The model's apocalyptic conclusion, that continued exponential economic and population growth would culminate in an ecological catastrophe in the 21st century, is one that is embraced by the degrowth movement. To avoid such an outcome, they argue that we must proactively change course and limit economic and population growth ourselves, before ecological disaster forces us to.

One common criticism of degrowth is that it overlooks technological advancements and increasing resource efficiency, which proponents of 'green growth' argue can sustain positive economic growth within environmental limits. However, degrowth advocates counter this by highlighting the slow pace of absolute decoupling (where GDP rises while emissions decline in absolute terms) and deem it unfeasible. While relative decoupling (where emissions grow more slowly than GDP) is widespread, it remains insufficient to address the climate crisis. As degrowth proponents often emphasise, "infinite growth is not possible on a finite planet," making the reduction and limitation of growth the only viable path forward.

Yet I find this logic flawed for two reasons. Firstly, there is data to show that absolute decoupling is occurring, particularly in high-income countries. In the UK, GDP per capita rose by 54% from 1990 to 2022 while consumption based CO2 emissions per capita (which accounts for the off-shoring of emissions, as it adjusts for the carbon embedded in both imports and exports) fell by 39%. Over the same period, GDP per capita in Luxembourg rose by 66%, while consumption based CO2 emissions per capita fell by a considerable 57% (Ritchie, 2021, updated 2024). This trend aligns with the Environmental Kuznets Curve hypothesis, which posits an inverted U-shaped relationship between per capita income and environmental degradation: environmental damage initially increases as economies industrialise, but begins to decline once they transition beyond industrialisation into a post-industrial phase.

Secondly, implementing degrowth is far more unlikely from a practical perspective than achieving green growth is. Although degrowth supporters try to distance themselves as much as possible from the term, the movement is technically endorsing a widespread economic recession. Their claim that it is different because it is voluntary does not change the fact that a recession (defined as a fall in GDP throughout two consecutive quarters) and degrowth

are interlinked. Given the economic, social and psychological hardships people have had to endure as a result of recessions - think of the 2008 global financial crisis and COVID-19 pandemic - why would they support policies that literally promote such an outcome? Businesses, too, who rely on growth to expand and remain financially viable, would fervently reject the ideology. Yet not only would it be extremely difficult to convince firms and the general public, it is also highly improbable that governments (who would need to advocate for and instigate the change in the first place) would accept the movement in its entirety. Relinquishing low-income households from poverty under a degrowth society would require radical and pervasive wealth redistribution, effectively asking wealthier households to lower their levels of GDP per capita. This is essentially 'political suicide'; no government would implement such an unpopular and drastic measure. The alternative - allowing wealthier households to retain their wealth while poorer groups remain in poverty - would exacerbate inequality, provoking opposition on moral grounds.

This is not to say that we have nothing to learn from the degrowth movement. Its core message is sound: we must recognize the costs of economic growth and reshape economies to respect planetary limits. Their goals of reducing excessive consumption, inequality, and environmental harm are valid. Their skepticism about absolute decoupling and green growth is justified—recent research shows high-income countries would take over 220 years to cut emissions by 95% at current rates, vastly overshooting the 1.5°C target (Vogel & Hickel, 2023). However, just because something has not happened does not imply that it cannot happen. To assume that the current methods and scale of economic growth represent the best humanity can achieve is to underestimate our intellectual, innovative, and creative capacities. The rapid economic transformation that enabled unprecedented growth and prosperity within a remarkably short period demonstrates the extraordinary potential of human ingenuity. What is needed is a 'green revolution', a technological transformation that enables sustainable economic growth while achieving absolute decoupling at scale. Already we are seeing promises of this, from carbon capture and storage to the use of climate-smart agriculture. The following section examines the strategies that can be employed to facilitate this transition.

Facilitating Green Growth

Investing in decarbonisation technologies is undoubtedly crucial, but without tackling the underlying practices that drive environmental degradation, meaningful progress will remain elusive. A clear and necessary step is the removal of subsidies and permits for environmentally harmful activities. According to the International Energy Agency, governments, particularly in emerging economies, continued to heavily subsidise fossil fuel use in 2023, allocating $620 billion. This figure vastly exceeds the $70 billion devoted to consumer-focused clean energy initiatives, such as grants for electric vehicles and heat pumps (IEA, 2023).

Reforming Emissions Trading Schemes (ETS) - market-based systems that cap total emissions, allowing firms to buy and sell pollution permits - to ensure that carbon prices accurately reflect their true environmental costs, alongside implementing and standardising these schemes globally, is also essential. Numerous studies have found that the carbon prices implemented through ETS are too low and thus insufficient in reflecting the true social cost of carbon and stimulating technological development (Lundgren et al., 2015; Boyce, 2018). By raising carbon permit prices to reflect, or even be higher than, its social cost, production incentives can be steered much more effectively to low-carbon processes.

To address carbon pricing from a consumption perspective, countries should adopt a standardised environmental taxonomy. The EU taxonomy provides a recent example, offering financial and non-financial companies a common definition of what constitutes environmentally sustainable economic activities (European Commission, n.d.). This clarity helps scale up sustainable investment by making environmental impacts more transparent. However, beyond guiding investment, such a classification system could enable governments to levy differentiated tax rates based on the lifecycle environmental footprint (with measurements such as carbon intensity, resource use, and pollution metrics) of goods and services. This would establish clear tiers of environmental performance, with lower taxes on greener goods and services and higher taxes on those with greater environmental costs, internalising externalities typically ignored by the free market. In effect, the taxonomy would lay the groundwork for a ‘green VAT’ as a targeted consumption tax. Coupled with an effective emissions trading system, this approach would encourage both the production and consumption of environmentally sustainable goods and services.

Some may argue that existing environmental taxes are sufficient, negating the need for a comprehensive tax reform. However, the wide variety of environmental taxes across different goods, services, sectors, and countries creates confusion for both consumers and producers, also often leading to the offshoring of polluting production to regions with more lenient environmental regulations. By replacing existing environmental taxes (such as fuel levies and sector-specific excise duties) with a unified taxonomy-based tax system, policymakers could simplify compliance, reduce administrative burdens, and close loopholes that allow pollution to be shifted across borders. This approach would create clearer price signals across all sectors, aligning incentives for consumers and producers while maintaining environmental effectiveness.

These carbon pricing techniques frequently face criticism for their regressive nature, as they increase fuel and energy prices which take up a larger proportion of lower-income households’ budgets compared to wealthier households. One way to combat this is to distribute carbon dividends, equal per capita payments made to all citizens from part of the revenue collected through carbon pricing regimes (Boyce, 2018). Since all individuals receive equal payments, poorer households, who emit less emissions on average, often receive more in dividends than they pay in higher fuel prices, making the policy progressive. Not only could this help reduce inequality, but also build public acceptance for carbon pricing and environmental policies in general.

Yet, in the short term, such taxation and pricing reforms are likely to result in lower consumption growth and material goods production. This is where the government has a critical role to play: it must step in to provide more jobs directly involved in the green transition, especially for those displaced from previous employment, using funding generated from environmental tax revenue while adopting more flexible fiscal rules to enable productive investment in the green transition. By strategically investing in areas such as renewable energy infrastructure, public transport and ecosystem restoration, governments can create employment opportunities while accelerating decarbonisation.

What about developing countries that rely on material exports to advanced economies for growth? The solution is to encourage a shift from export-led, resource-intensive growth towards green innovation and technological advancement. In fact, much of the innovation necessary to drive a sustainable transition is best positioned to emerge within developing nations, which, unlike advanced economies, are less burdened by ageing populations. The integration of ETS and environmental consumption taxes will provide a strong economic incentive for governments in developing nations to shift funding from brown to green investments. However, they must also prioritise investing more in human rather than physical capital. Most underinvest in the former, despite the fact that a high level of human capital is key in attracting foreign direct investment (FDI) and hence delivering economic growth (Miyamoto, 2005). Some effective policies to address this underinvestment include incentivising multinational enterprises and investment promotion agencies to support formal education and vocational training, as well as aligning school curricula with post-school programmes. This ensures that people acquire skills that closely match labour market demands, making workplace training more efficient and strengthening the human capital base to attract FDI.

International aid can increase the scale and pace of green growth within emerging economies, simultaneously helping advanced countries decarbonise as new technologies and ideas are shared. Nevertheless, the majority of government revenue - for both developing and developed economies - must be used to stimulate more innovation. This is the pinnacle of the green transition: without the flow of new ideas, we stand little chance in tackling the current climate emergency. As Daniel Susskind puts it in his book ‘Growth: A Reckoning’, we must learn “to take up that pioneering spirit” we experienced with the first Industrial Revolution and “start a second industrial enlightenment with the same sense of possibility” (2024). He argues that the existing structures surrounding innovation actually prevent, rather than stimulate, research and discovery (R&D), exploring the flaws of our outdated Intellectual Property (IP) regime, which protects the status quo and past discoveries at the expense of those who want to use and reuse them for future inventions. Our IP regime must be able to balance the need to provide exclusivity so that creators are willing and able to invest in new ideas, as well as ensuring that the uses of these ideas are not overly restrictive. This reformation will also coincide well with stronger international relationships, ensuring that transformative discoveries are not bounded by their physical borders.

By adequately pricing environmental costs, developing human capital, directing more investment into R&D and placing a focus on green technological development, a new path of growth can be forged. In contrast to our current path, this approach recognises the limits of resource-intensive growth and prioritises long-term environmental sustainability and social wellbeing. Yet to fully realise this transition, it is essential to move beyond using GDP growth as the sole measure of success, embracing broader indicators that capture the quality, inclusivity, and sustainability of growth in a rapidly changing world. It is to this matter that I now turn.

Beyond GDP Growth

As discussed previously, degrowth challenges conventional neoliberal economics by arguing that continued growth in developed nations has become socially counterproductive and ecologically unsustainable. In many respects, this critique holds true: inequality has widened, environmental degradation is causing catastrophic impacts, and we overlook many valuable aspects of life simply because they are not reflected in GDP. This underscores the need to move away from focusing solely on GDP as the primary measure of a country's success. While it remains a useful and valid indicator, it should no longer be regarded as the predominant and only benchmark for societal progress.

One approach is to replace GDP with a more holistic measure of prosperity that encompasses the important dimensions that GDP overlooks. Several measurements already exist, such as the Human Development Index and Genuine Progress Indicator. However, the chance of any of these measures actually 'replacing' GDP is slim. Which factors would be incorporated, and at what weights? Would all countries agree on the same dimensions? These questions are inherently subjective, and despite the good intentions behind these indices, their adoption would likely prove politically complex and contentious.

GDP remains an invaluable tool for measuring a country's success. While it requires technical updates to account for the transition from goods-based to service-oriented (particularly digital) economies, ensuring that technological progress is accurately reflected, it continues to be a key indicator of economic performance. However, the pursuit of green growth should be accompanied by efforts to advance other aspects of societal wellbeing. Susskind calls this a 'dashboard approach', whereby a small set of measures (like pollution, inequality and unemployment levels) are selected to indicate a country's success, each reflecting something that is thought to be valuable to society (Susskind, 2024). The question that follows, then, is whether the indicators should be standardised internationally or tailored to individual countries. Both approaches offer distinct merits. International standardisation would allow countries to benchmark progress, reflect the global nature of today's challenges requiring coordinated responses, and enable easier cross-country data collection and analysis. Conversely, country-specific indicators would recognise cultural differences and diverse national priorities, recognising the unique challenges each country faces in its pursuit of sustainable prosperity. So rather than an either-or approach, a combination of the two could work

well: a core set of internationally standardised indicators (determined by a UN panel, for example) alongside a flexible set of country-specific indicators reflecting unique social, environmental and economic priorities. This ensures global comparability and cooperation in the most crucial areas, while respecting local contexts. These indicators should also remain adaptable, evolving in response to shifting social priorities, emerging challenges, and improvements in measurement methods to avoid tracking outdated or irrelevant measures.

Moving beyond a parochial focus on GDP growth to consider the broader factors that shape prosperity is paramount for an equitable and sustainable green transition. By reducing the imperative to pursue rising GDP figures at all costs, this approach can diminish the lobbying power of 'brown' industries, such as fossil fuel companies and heavy manufacturing, which governments often support to stimulate GDP growth. Moreover, a clear articulation of what society values most would provide explicit signals to consumers and producers, incentivising the adoption of behaviours and practices that align with societal wellbeing and environmental sustainability. In this way, shifting beyond GDP enables a more holistic pursuit of prosperity, aligning economic activity with the social and environmental priorities necessary for a just and lasting green transition.

Conclusion

It is easy to fall into the mindset that the current growth path is the only one available to us and that ecological catastrophe is inevitable. The election of Donald Trump, coupled with his renowned slogan "drill, baby, drill," does little to assuage these anxieties or the feeling that we are powerless in the face of change. Yet we should not underestimate the innovative capacity of humankind, nor dismiss the possibility of forging a new path of economic growth. This essay has explored the steps needed to facilitate this transition, demonstrating that it is possible to achieve lasting prosperity without the disastrous costs that growth has typically imposed on society and the environment. It is true that this will require effort, challenge people's ways of living, and may slow down growth in the short term. But time is running out. If we fail to act decisively, we risk transforming our planet into a place that is unlivable, plagued by social, ecological, and economic disaster. However, if we choose to care for the generations that will inherit this world and place our faith in what humanity can collectively achieve, a very different outcome is within reach. We can build a world where green economic growth and an equitable, flourishing society become the norm, where we live alongside nature rather than seek to destroy it.

The choice before us is stark but empowering: to surrender to the inertia of a destructive status quo, or to seize the opportunity to redefine and pursue prosperity in a way that allows both people and the planet to thrive. It is the latter that I hope you should choose.

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