Ecology and economic growth

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THE INDUSTRIAL ECONOMIES OF THE WORLD HAVE BEEN BASED ON MANY VARIETIES OF CAPITALISM AND SOCIALISM, BUT THEY HAVE A FUNDAMENTAL FAITH IN COMMON.

This is the conviction that their primary measure of progress is the growth of the economy: growth in production, in gross domestic product (GDP) per capita, in incomes and in consumption. If growth comes to a halt or goes into reverse – the definition of recession in the modern economy – then there is no higher task than to 'restore the conditions for growth'. In policymaking circles, the idea of questioning growth as a fundamental goal and measure of progress is taboo. Yet we live in an age when the ecological and social implications of indefinite growth in the economy are becoming ever more serious. It has been pointed out for decades that indefinite growth in production and consumption on a planet with finite resources simply cannot be maintained in the long run – that current models of development, in short, are *unsustainable*. Endless growth in material extraction and consumption within a bounded system (the Earth) is physically impossible; and the attempt to realise it is ethically indefensible, as a riot of unsustainable growth would diminish or obliterate the life-chances of generations to come. This critique remains, however, utterly marginal to policymaking in the West and beyond, and it is an article of faith for politicians, policymakers and business leaders that growth into an indefinitely distant future is essential, desirable and possible.

The case for the growth model of the economy

The obsession of policymakers with growth is relatively recent, coinciding with development of adequate measures of activity in the economy in the form of indicators of GDP, standard of living, inflation, etc. But the desire for growth in production and consumption goes back far beyond to pre-industrial times. Human societies, once transition to the agricultural mode of production has taken place, seek 'improvement' in their means of generating surplus, defending themselves and enjoying the fruits of their labour. Surplus could support growth in population and thus capacity for expansion in development, but in pre-industrial times population was always liable to drastic decline in the face of famine and disease, and of the effects of warfare. When economic development and technical advances in Europe in the early modern period allowed population growth to surge, the risk of outstripping food resources and being vulnerable to famine and crop failures had not been overcome. This was the key point in Thomas Malthus's 'dismal science' analysis in his *Essay on Population*.[1] Malthus offered an argument based in what we now call ecology: if a population grows so that it overshoots the carrying capacity of a given habitat and has no means to increase that capacity, it will crash. Eventually, population booms end in bust as the means of subsistence are over-consumed.

Developments over the past 200 years have been one long refutation of Malthus. Population has expanded vastly – over six times since his day – and, as Tim Jackson notes, the global economy is now *68 times* bigger than it was in Malthus's time. Productivity gains through technical advances have

allowed humanity to escape from the Malthusian trap and (apparently) from the laws of ecological overshoot.[2] How has this happened?

The reasons go to the heart of the faith that policymakers place in growth. The technical advances from the Industrial Revolutions (which continue, of course) of the eighteenth and nineteenth centuries meant that production of food, shelter and other essentials more than outpaced population growth, which was further facilitated by gains in productivity and improved 'means of subsistence'. Advances are cumulative: gains in one domain of science and technology feed into another; rising population brings more ingenious minds to bear on the problems of development; improved communications spread lessons for development and invention swiftly around the world. Above all, productive capacity was hugely boosted over the past 150 years by the use of fossil fuels as inputs for extractive power, manufacturing, transport and farming. This allowed the exponential growth in production and consumption that we have experienced in the West and that is now being replicated in developing countries.

Many generations have experienced more or less continuous economic growth. There have been no interruptions of any significance in this process: not even world wars or economic depressions have brought it to a halt. Growth is associated with a continuous flow of advances in technology and living standards and ability of billions to consume more than their predecessors did. It creates *real* material progress and gains in reported well-being, for the poor especially. It has thus been associated with a massive gain in security and affluence. 'A rising tide lifts all boats', as the cliché goes: if everyone is getting better off relative to their previous position, inequalities lose their political and social sting. The rich can feel more secure and legitimate in a growing economy, not least because they can claim to be the engines of growth via their enterprises and competitive spirit; the poor can feel that they are getting somewhere, even if growth is such that the gap between them and the richest is actually widening. And it is a fact that economic growth has brought billions of people out of deep poverty over the generations, and has been associated with a massive gain in security and affluence. Growth seems impervious to any shocks; we seem, thanks to growth, to have escaped constraints on development and transcended our environment definitively.

Growth appears to be essential to keep the capitalist show on the road. Only growth can create new sources of employment and income and thus of consumption and meet rising expectations, which are of course inflated by the very experience of what past growth has enabled.

It is no wonder that competition between parties in democracies has been, for at least six decades, in essence, about who can promise most growth in the economy and in capacity for more consumption. Malthus appears to have been refuted definitively over two centuries. What can spoil the party?

Modern critiques of growth

There are two main critiques of growth. The first is a modern variant of the Romantic critique of the cultural and social damage done by industrialism. The other is a variant on Malthus, focusing this time not only on population but also on limits to resource extraction.

The former attack considers the self-defeating nature of growth in consumption and the limits to growth in GDP as a proxy measure for general progress.[3] The argument is based on the fact that GDP growth is

routinely used as a master indicator and proxy for progress, but in reality is simply a measure of activity in the economy. GDP wraps up in one measure not only activity that is genuinely a sign of well-being but also activity that harms us. However, it is not a comprehensive measure. For example, the 'love economy' of domestic care is not taken into account; and the costs of environmental and social damage are not measured.

The critique goes further: beyond a certain point, which varies from country to country, there seems to be only a weak, or even no, connection between GDP growth and reported well-being.[4] Growth is associated with real gains in well-being for the poor, but past a given level of satisfaction of basic needs for material goods, growth is subject to diminishing returns. Gains in well-being are linked not to growth but to social and environmental goods – family, friends, work, peace, love, purposefulness. Growth can create conditions for 'positional competition' that generates social frictions and does not increase quality of life even if it offers ever-more material plenty. Numerous economists have made systematic analyses of these issues and connected them to the ecological case against indefinite growth in a finite system, the Earth.[5]

The two lines of attack come together in the case against GDP as anything more than a measure of activity. GDP in its current form simply ignores environmental costs and benefits of growth: it has no means of counting them, and therefore, given the sacred role assigned to GDP as a proxy for progress, they are overlooked. Yet the growth economy, so the critique goes, depends on ecological systems and key resources. Modern societies have forgotten this dependence because they have transcended their rural origins and embarked on the 200-year adventure of growth. GDP symbolises this great forgetting. What if our growth economy was undermining its own ecological foundations? We would not know it from our measures of growth.

The Club of Rome's *Limits to Growth* report,[6] was the most famous and influential eco-critique in the wave of arguments against the growth economy in the 1960s and 70s. It argued that resource consumption could not continue in the way economists assumed it could. Extraction of minerals and fossil fuels could not go on increasing indefinitely: commodity prices would soar and eventually the resource base would not support either growth or the now huge human population. Malthus was right in the end, in other words: humans could not transcend the Earth's base of resources, which must be finite.

This argument was vigorously attacked.[7] Pro-growth economists argued that the Club of Rome grossly underestimated human ingenuity and capacity to (a) extract more resources than seemed to be available, and (b) substitute new resources when scarcities threatened. Trends in commodity prices seemed to support this. However, the Club of Rome case could not be dismissed, as it rested on the point that infinitely extended growth could not be squared with the existence of finite resources, no matter how many could be eked out or substituted. The issue is one of timing – how long have we got? – rather than one of principle – growth can be indefinitely sustained.

Ecological limits: Sinks and services

The past two decades have seen a renewal of concerns over growth. These extend the Club of Rome argument to cover not just *sources* of key materials but also *ecological sinks and services*. The issue of extraction of resources has certainly not gone away: it has been highlighted by the concerns about how long we have (if any time at all) before the supply of oil peaks, and by anxieties about availability and

security of supply of other materials (groundwater, gas, rare earth minerals, etc.) essential to modern economies, especially in the light of vast and growing demand from China.

But the core of the new case against indefinite growth is that it threatens to breach limits of *capacity in ecological sinks and services*. Sinks are the parts of the environment that absorb our waste emissions – atmosphere, soils, oceans, forests; services are the 'life support' systems provided by these sinks and by habitats and creatures (such as flood absorption, pollination, etc.). Earlier critiques failed to take into full account the risks from the failure of sinks (most plain and urgent, climate disruption and ocean acidification from waste greenhouse gases) and of ecosystem services (loss of flood defences from deforestation, etc.). On a global scale, growth puts sinks and services at grave risk, even if sources of materials were secure (which they cannot be indefinitely). Here the pro-growth argument that we can find substitutes for depleted resources fails: we cannot create artificial ecosystem services to replace collapsing habitats and climate stability. The 'new limits to growth' are set by the 'critical ecological capital' represented by ecosystem services and the sink capacity of, for example, the atmosphere and oceans to absorb our wastes without loss of function and quality. These limits must be respected. The question is, what growth models, if any, can work within them?

The argument is summed up in the point that at present rates of consumption, for all humans to live as Westerners do would require at least two Earths. If this is the case, then either we sustain growth by keeping the poor in poverty indefinitely; by allowing nature to solve the population problem in Malthusian fashion; by attempting to commandeer the entire biosphere for human needs and hoping we can manage the grave ecological consequences; or by changing radically the nature of growth and consumption. Only the latter is ethically acceptable. How can it be done?

Escape routes from the dilemma of growth

Pro-growth economists argue that the problem of sinks and services can be overcome in the same way as we overcome the sources issue. Growth itself will create the wealth, technologies and ingenuity to solve the problems. But this is, in the face of the problems, above all of climate disruption, becoming unbelievable. There is no doubt that we need new technologies to avert the worst ecological problems and manage transition to new low-impact economies. Many are available or emerging: for example, renewable energy systems, bio-mimicry in materials, indefinite recycling of product components, low-input farming systems, etc. The goal is to achieve 'absolute de-coupling' between gains in well-being and input of fossil fuels and other resources subject to scarcity and/or major ecological impact.

But the maintenance of a growth economy as we have known it seems to demand invention of 'rescue technologies' on a timetable and scale that is incredible.[8] We will not be able to mine the Moon and other planets for spare resources in the next half-century; we seem unlikely to develop nuclear fusion in time or at scale; we seem very unlikely to replace fossil fuels as the engine of growth in the next 50 years and so will depend not only on renewables and nuclear fission but also on (so far unproven) carbon capture and storage technologies and adaptation to face climate disruption. All this will have to take place in conditions of growing ecological damage, rising population (heading for nine billion people worldwide by mid-century) and competition for resources – maintaining the growth economy will be ever harder to do.

Yet if there are few or no credible escape routes for pro-growth proponents, there are few compelling accounts from sustainable development proponents of how we can make a transition to a low-impact economy that can still supply the employment, welfare gains and hope for the poor that growth models have brought. As Jackson notes, we seem unable to live with the growth model ecologically but unable to live without it in terms of what it provides for welfare and work.[9] There is no more urgent task for economists and environmentalists now than to work out feasible transitions to a sustainable economy where growth is contained within ecological limits. Jackson sketches some of the essential ingredients: (a) radical revision of accounting systems to take account of ecological goods and services; (b) investment in low-carbon and low-throughput, highly resource-efficient production technologies, buildings, energy and water infrastructures and assets; (c) investment in labour-intensive services and in reduced working hours per job; (d) tackling the 'social logic' of growth and consumerism – strengthening social capital, reducing inequalities and 'dismantling the culture of consumerism'.

The final point here is crucial. If there is no technological rescue for the growth model, then a coordinated 'descent' from current high-impact and high-carbon modes of consumption is crucial, and it must be led by the 'haves' globally so that the poor can have growth in consumption and living standards without breaching ecological limits. Jackson and other critics of growth economics all converge on the need for a rediscovery by the West of frugality, conviviality, cultural restraints on consumption, sharing, empathy and mutuality. All have been eroded as social forces in the West (and beyond) as scarcities have been overcome and growth has enabled a culture of materialism and consumerism. Sustainable economies, it seems, cannot be built with new technologies and accounting systems alone: they need an ethos of generosity and need to find deep satisfactions in social and environmental goods, rather than in material goods alone.

This should be the cue for religious traditions and communities, who have known all this for millennia, to offer insights, tools and cooperation in the development of sustainable models of livelihood and wellbeing.[10] For man does not live by bread alone, and neither can he be sustained any longer by growth alone. Working out the escape routes from the old growth model to new economies that combine wellbeing, justice and respect for ecological limits is one of the greatest tasks of the century, and far too important to be left to economists. n

Notes

1. Malthus wrote as the Industrial Revolutions were underway that would transform society and the economy in the West in the nineteenth century.

2. The ready availability of fossil fuel inputs and the stream of new technologies that have allowed us to take to the air, explore the sea bed, split the atom, compute at near-incredible speeds, feed billions more people, converse electronically across the globe, manipulate the genome and land on the Moon.

3. This critique is most articulately advanced by the UK think-tank the New Economics Foundation (NEF). See www.neweconomics.org. NEF projects include the 'Happy Planet Index', which aims to measure genuine progress in well-being and the ecological impacts and rate of resource use linked to it.

4. See NEF, The Unhappy Planet Index (London: NEF, 2009); T Jackson, Prosperity Without Growth (London: Earthscan, 2009), ch 3.

5. See, e.g., F Hirsch, Social Limits to Growth (London: Duckworth, 1977); EJ Mishan, The Costs of Economic Growth (revd edn, Santa Barbara, CA: Greenwood Press, 1993); H Daly, Steady-State Economics (London: Earthscan, 1992); H Daly and J Cobb, For the Common Good (London: Greenprint, 1989).

6. See D Meadows et al., The Limits to Growth (New York: Universe Books, 1972). The report was updated 30 years on, arguing that the basic analysis was correct and the main mistake was in the estimate of the timing of the onset of crises of unsustainability. See D Meadows et al, Limits to Growth: The 30-year update (London: Earthscan, 2004).

7. See, e.g., J Simon, The Ultimate Resource (Princeton: Princeton University Press, 1981). Simon's 'cornucopian' case is that human ingenuity will continue indefinitely to find substitutes for depleting resources and that therefore resources are effectively 'infinite' and growth can always continue. Daly provides a thorough critique of Simon (See Steady-State Economics, ch 14).

8. See Jackson, Prosperity, ch 5. Jackson shows that on modest assumptions about continuing growth in population and consumption a staggering degree and rate of 'de-carbonisation' of the entire economy is needed to contain carbon emissions within levels probably compatible with climate stability. By the end of the century 'nothing less than a complete decarbonisation of every single dollar will do to achieve carbon targets'. In the next 40 years we would need to reduce the carbon demand of economic output by some seven per cent per year, nearly ten times faster than is being done. By 2050 a 21-fold improvement on the current global average of carbon content of economic output is needed. On assumptions that offer much more fairness and thus more income growth and consumption to the poor world, the projected need for reductions in carbon content of economic output is a 55-fold improvement on current performance. Perhaps this is all possible; if it is, we are a long way from achieving it and the economy required will be radically different from the one we know, in consumption patterns as well as in production systems.

9. Jackson, Prosperity, chs 11 and 12.

10. There is a growing movement urging action within the world's religious traditions and communities on ecologically sustainable development. See, e.g., the Seven Year Generational Plans for climate and environmental action produced under the auspices of the UN and Alliance for Religion and Conservation (ARC) and launched in November 2009 at a UN conference in Windsor. More material is available from ARC: www.arcworld.org. The Church of England's Plan is Church and Earth 2009–2016, downloadable from www.shrinkingthefootprint.cofe.anglican.org.