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Controversies, debates and future research

I do not need to tell you that degrowth is not part of mainstream discourse and that it has made no headway in market economics, for which questioning growth is anathema. Some ecological and political economists, though, have felt the need to engage with the degrowth (hypo)thesis, given its popularity within social and environmental movements. This chapter reviews the key debates that have taken place between critics or sceptics of degrowth and its advocates. Through these conversations I identify the weaker aspects of the theory of degrowth, as well as areas where more research would be most welcome.

Is degrowth necessary and is it feasible?

Green growth, a-growth and degrowth

For green growth advocates, degrowth is not only impossible, it is also unnecessary, since economic growth and technological progress can enable us both to have more stuff and to reduce resource use and carbon emissions. A few countries, mostly in Europe, have exhibited declining carbon emissions during the last two decades despite sustained growth (Aden 2016). Technological studies also project feasible scenarios for a world powered by renewable (Jakobson *et al.* 2010) or nuclear power. Expenditure on a large-scale energy transition may stimulate growth and create new jobs, so green growth advocates claim.

I engaged with these arguments in chapter 4 but let me recap the main responses to these ideas here.

1. Once trade effects have been taken into account, fewer countries have experienced an absolute decoupling of emissions than is typically reported. In terms of resources, there are almost no cases of absolute decoupling (Wiedman *et al.* 2014).
2. What is possible in one country is not necessarily generalizable to all others. Switzerland can be a bank economy and Luxembourg a service economy, but the whole world cannot consist of Switzerlands and Luxembourgs.
3. Declining carbon emissions are often the result of one-off changes, such as the substitution of coal with natural gas. It is harder to sustain these rates of reduction in emissions once the substitution has been completed, especially if energy use grows.
4. Even though the substitution of fossil fuels by cleaner forms of energy cannot (and should not) be ruled out, these sources of energy also have an impact. With perpetual economic growth and growth in energy use, these impacts will grow too.
5. To power a major energy transition, a lot of fossil fuel may have to be burnt. This would risk depleting the remaining carbon budget.
6. The energy return on investment (EROI) of alternative renewable or nuclear power is much lower than that of fossil fuels, so these sources of energy may not be capable of maintaining current growth rates.
7. Investing in an energy transition will divert resources from other parts of the economy and may lead to lower labour productivity and growth than would otherwise be the case.

Points 5–7 merit further research. To the best of my knowledge there are no good studies of the quantity of fossil fuel necessary to fuel a renewable energy transition. Perhaps the amount is not very different from what would be burnt anyway.

Studies of the EROI of different energy sources vary considerably, especially for solar panels and nuclear power (figure 3.8). The calculations depend on where one sets the boundaries of the system. (Should the energy spent on dealing with nuclear waste or a possible nuclear accident be accounted for? If so how does one calculate this?) It is plausible that technological progress will increase the EROI of alternative energies, but it could also be the case that it decreases, because the best locations for wind or solar power have been used first. Also as the production of

renewable energy increases, the need to build storage to smooth loads increases, and this incurs costs.

There are few systematic methods for calculating the EROI of whole energy systems, there is no good record of the change of system EROI over time, and there is no established relationship between EROI and productivity/growth. If Fizaine and Court's (2016) estimation of an 11:1 minimum EROI for growth is correct, current global growth rates could be maintained even with a global energy mix that had a much lower EROI than that of the fossil fuel era. But it is not clear whether a mix dominated by renewable energies could reach this EROI. More research will clarify these questions.

I argued that meeting the Paris agreement and other environmental standards would in any case be achieved more easily with less rather than more growth. Jakob and Edenhofer (2014) contest this. Halving GDP, they argue, would decrease the required improvement in carbon intensity by just 10 percentage points, from 90 per cent to 80 per cent. Efforts should concentrate on reducing carbon intensity, they claim, not on the scale of the economy, which is comparatively less important.

The same numbers can, though, be presented in a way that gives a very different impression (see Jackson 2007): halving GDP halves the required improvement in carbon intensity from a tenfold improvement to a fivefold one (that is, to 20 per cent of existing value rather than 10 per cent, which is the same as an 80 per cent versus 90 per cent reduction). Put another way, *not* halving requires a 100 per cent decrease in carbon intensity (from 20 per cent of its current value to 10 per cent): a decrease that is particularly difficult because it will require cuts in the use of fossil fuels that are the hardest and most expensive to achieve. Halving GDP is also not as big as it sounds: with 2 per cent annual growth, GDP doubles every 35 years, so halving GDP over 35 years would simply involve GDP staying at the level it is today: that is, a reduction in growth from 2 per cent to 0 per cent.

In the long run, the rate of change of carbon emissions is equal to the rate of change of output plus the rate of change of carbon intensity. The lower growth is, therefore, the better. Jakob and Edenhofer (2014) question this: a stagnant economy would be less likely to deliver the technological innovation required to achieve a carbon intensity reduction, they claim. For example, it might be easier to improve carbon intensity by 7 per cent each year in an economy that grows by 1.4 per cent annually than to reduce it by 5.6 per cent each year in a stagnant economy.

Critics have a point: because of the way in which the capitalist system works, technological change and investment in renewable energies are driven by profit, and become harder in a context of contraction. Any reasonable degrowth scenario will involve a formidable rate of improvement in carbon intensity. In theory, an increasing proportion of a diminishing output could be directed to a clean energy transition. But this would require a socialization of the economy, with governments taking greater control of the direction of investment. What do we know from past energy transitions? What is the effect of less growth on innovation and renewable energies, and how does the effect differ between different political regimes?

Jakob and Edenhofer agree with van den Bergh (2017) that we should pursue the necessary policies, investments and technological changes that will reduce carbon emissions, independent of their effect on growth (van den Bergh (2011) mainly argues for carbon pricing, but also for working time reductions and restrictions on advertising). If these policies increase output, we will have green growth; if not, and growth turns out to be negative, so be it.

Van den Bergh (2011) developed this “a-growth” proposal as a critique of degrowth. He criticized those of us who write about degrowth, saying that we are unclear on what it is that has to degrow. If it is GDP, why contract everything and not only polluting industries, he asked? Why reduce income if there are cheaper options for achieving the same goals (see also Jakob & Edenhofer 2014)? And why focus on GDP given that it is a bad indicator? If what needs degrowing is instead throughput (or carbon emissions), then there is nothing new: reducing environmental pressures is what everyone in the environmental field wants, including advocates of green growth.

I replied to this critique in Kallis (2011), and later we wrote together about our arguments (van den Bergh & Kallis 2012). First, degrowth is not a strategy for reducing income. It is a broader transformative process, the end effect of which is a reduction in throughput *and* probably output (*if*, that is, the diagnosis that throughput and output are by necessity coupled is correct). Degrowth will be selective and will involve increases in some things and decreases in others, together with many qualitative changes. GDP will decline as a result, but that is not the goal. Degrowth is not about a decrease in any single metric. It is about a decrease in environmental impact and an increase in well-being: something that can be measured by multiple indicators and accounts (see O’Neill 2012).

Second, a-growth is a normative posture. The final outcome, however, can be either degrowth or green growth – GDP will either increase or decrease, and this is independent of whether we measure it or not. It is hard to know what will happen or whether a reduction in throughput will decrease output or not. But we can be sure that only one of two outcomes is possible. If the diagnosis provided in this book is right, then GDP will decrease. If it is to decrease, then we should plan ahead and set in motion transformative processes that will make the contraction sustainable rather than catastrophic. Hence the call for “socially sustainable economic degrowth”.

Third, while we might want to ignore GDP, as I have explained in this book, GDP growth is the epiphenomenon of a broader process: capital accumulation. Neither the British nor the Americans measured GDP until well into the 1930s, but their economies grew, using ever more coal and oil. The problem is the growth process itself, not the GDP indicator. I agree with abolishing GDP (van den Bergh 2009; see also table 5.1), but this is not a policy choice that enlightened economists will one day convince policy-makers to take. If the history of GDP is any guide, then a change to what we value and what we measure can only come as part of broader political change.

Serge Latouche (2008) first, and before van den Bergh, argued that “a-growth” would be a more accurate term than degrowth, because from a degrowth perspective one does not care what happens to GDP. The degrowth goal is indeed social and environmental transformation, not a reduction in GDP. But Latouche’s a-growth was an active strategy of dethroning and abolishing growth, not just GDP, aware of the political struggles and institutional changes involved. This is different from van den Bergh, who assumes that abandoning GDP or pricing carbon is just a matter of getting policies right. It is hard to implement a serious carbon price precisely because it will put obstacles in the way of growth and capital accumulation (Kallis 2011). Setting a carbon price and other policies like it can only come as part of a broader process of social and political transformation.

Social feasibility

How much would output decrease in a degrowth scenario? It is hard to say.

One approach is to assume that rich countries will contract, converging with poor countries at a socially and ecologically sustainable income level.

Middle-income economies, like Costa Rica or Uruguay, have reasonable carbon emissions and satisfactory life expectancy (Steinberger *et al.* 2012). The carbon emissions of these countries are not, however, generalizable to the rest of the world without overshooting the 2 °C limit. And also, would the life expectancy and other well-being standards of, say, Costa Rica remain the same if the rich economies that lead technological change were to contract to such an extent?

Contraction and convergence to a (reduced) global average income does not make much sense because degrowth is about capping and sharing resources, not income (and definitely not value or well-being). Still, it is worth noting that a reduction in average income in the United States to, say, a third of its current level would bring it down to the average income level in Spain in 1985: not a low standard of living by any means. Victor (2012) simulates Canada's economy and finds that a reduction in carbon emissions of 80 per cent by 2035 would contract income to the levels enjoyed by Canadians in 1976 (with full employment maintained by reducing working hours).

How much income might decline by depends on how much carbon or material intensity improves and on how the relationship between well-being and income changes. Average income is not the same as median income – redistribution matters. And what income buys is relative: if income falls or if it becomes more equally distributed, prices may fall. The prices of many basic goods (e.g. housing, health, leisure) are much lower if they are available as common or public goods than if they are sold as commodities.

That Canadians or Spaniards lived well in the 1980s or 1970s does not mean that a decline to past income levels would be unproblematic. Greece has lost “only” 42 per cent of its GDP since 2008 (compared with the 27 per cent loss suffered by the United States during the Great Depression), bringing income back to the 2003 level, but the decline was harsh and life in Greece is very different in 2017 from how it was in 2003: unemployment is higher, wages are lower, public services have been cut down and poverty has increased (Varvaroussis & Kallis 2017). Qualitative changes are more important than the quantitative changes in GDP alone might indicate.

How contractions of the size implied in degrowth scenarios could be made socially sustainable is a huge research question. The issue has been approached tangentially through studies of the collapse of civilizations, shrinking cities and a few unique recent experiences, such as Cuba's Special

Period after the collapse of the Soviet Union (Kallis *et al.* 2018). The problem, however, might not be contraction per se, but how contractions take place within capitalism. If capitalist interests dominate, then austerity, redundancies and wage reductions are likely in order to sustain profits, but this need not be so if governments are powerful enough to put common interest first. Lack of growth within growth-based societies can be catastrophic. But it could be that a (slow and gradual) reduction in output could be sustainable if it is part of a broader transformative and redistributive project that prioritizes cuts in private and unnecessary profit-oriented expenditures and not in public services. Again, this is a hypothesis, and it requires models and empirical studies to be tested. Preliminary models show that steady-state economies might be more stable than growing economies (Barrett 2018). Conditions of stability under contraction and institutional transformation merit more research.

Is basic human development in poor nations compatible with degrowth on a global level? The energy required to satisfy basic needs in impoverished African and Asian regions, albeit achievable at lower levels of emissions than those associated with continued economic growth, may well consume a substantial share of the global carbon budget (Lamb & Rao 2015). If the minimum requirement of 3.5 kilowatts per capita associated with high human development (Smil 2008) was to be secured for 9 billion people, a global power capacity of 31.5 terawatts, or almost twice the present global capacity, would be needed (Schwartzman 2012).¹ O'Neill *et al.* (2018) examine the feasibility space for Kate Raworth's (2017) "doughnut economies": that is, economies that stay within their fair share of planetary boundaries while achieving minimum well-being standards. O'Neill and colleagues measure several well-being indicators (poverty, life expectancy, happiness, education, nutrition, equality) and find that satisfactory well-being can be achieved at levels of throughput and output considerably lower than those found in Western countries today – but these levels of throughput are not low enough in relation to planetary boundaries (also Gough 2017).

Degrowth is not only about rich countries moving to the left of the gamma-shaped throughput–well-being curve, then: it is also about moving the curve to the left. There is no reason why the path to well-being followed

1 That figure of 3.5 kilowatts might be an unwarrantedly high number since Cypriots, for example, currently consume 2.9 kilowatts and Uruguayans 1.6 kilowatts per capita per year. Then again, the global population may grow to more than 9 billion by 2050.

by rich Western countries is the only one possible. It is hard to know, for example, what share of current output and expenditure is really necessary for well-being (especially as far as qualitative indicators are concerned) and what part simply goes to service profit making. Part of current income is directed to unnecessary expenditures – such as, say, armament or advertising – that could be curtailed without any loss in people's well-being. Could well-being be secured at lower levels of energy and resource use than is currently the case? And if so, how?

This calls for a reconceptualization of well-being, opening up to different cosmovisions: the more one remains stuck on a Western, capitalist vision of well-being, the more likely it is that a Western, capitalist path of development will be needed to achieve it.

Metabolism and degrowth

Trainer (2016) argues that degrowth of output of the order of 80–90 per cent entails radical restructuring of economies. He envisages localized, self-sufficient townships living in a frugal, simple way. This vision of small, decentralized economies with limited trade, with artisanal production and with less professional specialization and more free time permeates the degrowth literature (see Latouche 2009). Sorman and Giampietro (2013) argue that it is metabolically unrealistic. Economies are complex systems with interrelated inputs and outputs – one cannot isolate parts, imagining that the way in which a frugal back-to-lander lives today is generalizable to everyone. Back-to-landers might appear to be self-sufficient – because they grow their own food – but their lifestyle might only be possible because of a social surplus that sustains the health, transport or knowledge infrastructures that they depend upon, and which could not be sustained if everyone lived the way they do.

Using a multiscale accounting system involving time, population, energy and output, Sorman and Giampietro show that increasing scarcity of fossil fuels leads to increasing demand for human labour. The degrowth vision, whereby we can both reduce fossil fuel use and work less, is therefore misplaced (Sorman & Giampietro 2013). Decentralized, despecialized economies without fossil fuels will be labour intensive and involve hard toil.

Life under a degrowth scenario will be much harsher than those who write about degrowth allow for – and this is why such a transition can never be intentionally organized, since few people would consent to such a decline in their material standards of living (Sorman & Giampietro 2013).

Life after oil and growth will be materially hard, without doubt. How hard, though, is not easy to foretell. It depends on how much net energy (or EROI) renewable energies can secure: the more energy that is generated, the smaller the effect on labour productivity will be. With less (net) energy, labour productivity will decline, but so will production and consumption. Whether the overall effect will be an increase or decrease in the amount of work remains to be seen. Hunter–gatherers were less productive than we are but they also worked less, because they wanted less (Sahlins 1971).

Lower throughput and output means a reduction in the *material* standard of living, but this is not the same as a reduction in well-being. How people experience reduced material and energy use depends partly on how remaining energy and materials are distributed, how people's values and perceptions change and adapt, or do not, to the new material conditions, and how much they appreciate what they do in the time liberated from paid work. Part of the time that is freed up might need to be channelled into subsistence or care work – whether this is experienced as a degradation of living standards or not depends on the form such work takes and its social value (Kallis 2013).

A degrowth transformation is not only about declining output and throughput: it is also about redistribution, sharing and a change of the imaginary – not only about less, but about less and different. The visual metaphor for degrowth is not that of a leaner and leaner elephant, but that of a snail: that is, a different society with a different and leaner metabolism, not the same society with a shrinking metabolism (Kallis *et al.* 2014).

This, as I have explained, is a vision that forms a hypothesis. Whether it is metabolically feasible to turn the elephant into a snail and what living like snails would entail are open questions. To answer them we need metabolic accounting, using tools such as multi-scale integrated analysis of societal and ecosystem metabolism (MuSIASEM), to investigate the feasibility and trade-offs involved in different degrowth scenarios (Kallis 2013), to explore how the metabolisms of different societies change under conditions of contraction, and to find out when well-being is secured and when it is not.

Degrowth: a slogan that misfires?

A second line of critique focuses not on the content of the term degrowth but on whether it can work as a slogan, mobilizing the social change it is aiming for. Critics charge that the word “degrowth” sounds unattractive (at least in English), does not signal a positive and motivating vision, stops at a negation and obfuscates conversation, attacking something that people hold dear, generating instinctive resistance (Raworth 2017b). Raworth proposes focusing on the positive changes that need to take place, independent of their effect on growth, mobilizing positive, aspirational concepts such as “prosperity” or “living well” (*buen vivir*) (see also Drews & Antal 2016).

Those who use the term degrowth instead consciously want a “missile slogan” (Aries 2005). If the growth imaginary is an obstacle to ecological sustainability and progressive social change, then confronting it is necessary. Avoiding talking about growth will not lead to abandoning it – atheists talk about God. For Latouche (2012b), that “degrowth is seen as negative, something unpardonable in a society where at all costs one must ‘think positively’” is symptomatic of a modern, Western obsession with improvement and betterment that is at the heart of the growth paradigm and our ecological predicament. To pierce this imaginary, one needs to unsettle certainties about what is positive and what is negative, and the word degrowth does that (Kallis & March 2015). It provokes reflection and debate on the desirability of growth, which is otherwise taken for granted. By exposing, rather than avoiding, conflict, it hopes to generate genuine, antagonistic political debate (Swyngedouw 2017), unlike feel-good slogans such as “prosperity”, “living well” or “sustainability”: terms that for precisely the reasons given can be, and have been, co-opted – emptied of any radical content they might have had (Kallis 2017). Feel-good slogans also underplay the scale of the challenge that is at hand. A reduction in throughput (and output) in rich countries to the levels of the 1970s or 1980s, social transformations to decommodify the economy and support alternative networks of provisioning – these are major changes. A term that is and sounds “radical” captures this better (Kallis 2017).

In *Don't Think of an Elephant*, linguist George Lakoff (2014) criticizes progressives for employing the vocabulary of conservatives when contesting their policies. Conservative framings prefigure conservative responses, and by repeating such framings, even when criticizing them, progressives

entrench them in the public mind. When we tell a person not to think of an elephant, we activate in her mind the circuits that think of an elephant, Lakoff argues. Ideas and metaphors like growth are embodied and reinforced in our neural circuitries with repetitive use over time (Dean 2014). We get repetitive positive messages about economic growth, we have an embodied experience of what lack of growth and crisis may mean, and we experience all sorts of positive types of growth in nature: the growth of a flower, of a tree, of an embryo, and so on. Speaking about degrowth, even when we distinguish it from recession or crisis, activates and strengthens, unintentionally, the dominant frame of growth that we want to avoid and supersede (Drews & Antal 2016).

This reasonable critique of the use of the term degrowth raises questions about how social and political change take place and about the role of language in that change. We know that the social and political meaning of words, such as the word economy, changes constantly over time. We know negative words, even insults such as the term “queer”, that have been mobilized by movements as signs of pride to change the very relations that classified them as negative. There are also many cases where “anti-elephants” contested elephants: atheism, anti-slavery or deregulation. The fact that these terms invoked a negation of the terms they were confronting did not work against them by reinforcing the reference frame. The success of the movement for deregulation (a lamentable one from our perspective) was that it managed to frame regulation – a process that until then was seen largely as positive – into something negative.²

An interesting research agenda would connect insights from linguistics and neurobiology together with social theories, such as that of Gramsci, to understand how common sense changes over time (sometimes quickly, sometimes slowly), what the role of performance and prefiguration in these changes is, how crisis unsettles meanings, and what the differences between processes of persuasion versus conflict are (and, relatedly, understand which terms have wide appeal and which terms signal conflict).

2 Antal and Drews make a claim that a further problem with the word “degrowth” is that it suggests a downward movement, whereas growth is an upward one. Upward is the direction of life and downward is death: senses that are deeply ingrained in humans, they argue. Degrowth therefore has an extra hurdle to climb compared with, say, “deregulation” or “decolonization”. On the other hand, one might counterargue that “down to earth” has a good connotation, and so does slowing “down”.

The context of communication matters too. Degrowth may indeed not be the best term if one wants to communicate the ideas behind it quickly or through corporate mass media. Fast communication mobilizes existing mental circuitries, where growth is rooted as a positive term. But could degrowth work instead as a strategy of slower communication, accompanied by embodied experiences that turn it into a positive signifier and, by extension, turn growth into an undesirable imaginary? Those of us involved in the degrowth community have developed, through repetitive use and embodied experiences (readings, conferences, conversations and meals with friends), an impassioned connection to the word, which we invariably perceive as positive. We are humans like everybody else; we do not have different brain circuitry or strange upbringings. It is not inconceivable to imagine a process of social acculturation and embodied experiences connected to the label of degrowth through which a greater share of the population may come to think the same way as we do (one survey suggests that 15 per cent of the general population in Spain is already in favour of degrowth (see Drews & van den Bergh 2016)).

As I argued in chapter 5, it is not necessary to pursue a degrowth vision in the name of degrowth (Kallis 2017). A political movement that shares similar principles but wants to win elections could understandably refrain from using the word, as it will not have the time and space needed to communicate and defend it adequately in corporate media. But this should not be confused with discounting the diagnosis, or remaining agnostic about the desirability or feasibility of further growth in order to appeal to different audiences. If anything, degrowth means a frontal attack on the imaginary of growth. If it does not do that, then it loses all relevant meaning.

Dean (2014) raises a reasonable critique: “degrowth” – taking as its reference economic growth, a term with a clear and established meaning – reinforces, even in its negation, the imaginary of a “national economy” and the set of ideas that come with it. Positioned within ecological economics, degrowth research often accepts the frames of reference of economics when it asks how an economy can be rendered sustainable without growth. However, as I have argued, there is a second, “culturalist” stream of degrowth research in the tradition of Serge Latouche that uses the term to signify an “escape from the economy” (Fournier 2008), a decolonization of the imaginary from economics and the economy. Does the term degrowth undermine this intention? Yes, in quick communication to someone unfamiliar

with the full argument; yes, for someone not immersed in the debates distinguishing the second approach from the first. But, no, not in terms of content.

There is a lot of speculation about how the term degrowth could travel, given what we know from linguistics, but to my knowledge there is no empirical research into how the term *actually* fares: whether or not it is persuasive and, if it is, to whom, under what conditions and in what contexts. We need to understand better how the idea of growth became hegemonic common sense among the population in different social and geographical contexts, and we need to learn the lessons this may hold for uprooting it. It is important to study the relationship between radical words, new imaginaries, prefigurative performance and transformative politics. How do new terms travel, when and how do they change the way we see the world, when are they effective and when are they not?

Is a transition in the direction of degrowth possible and what does it involve?

Critics argue that a “voluntary” transition towards degrowth is impossible, since people will not accede to the material losses involved (Sorman & Giampietro 2013; Milanovic 2017). Milanovic takes this as a given, based on his observations of capitalist societies; Sorman and Giampietro go further and attribute it to a trans-historic, biological imperative. Once a population finds a habitat or source of energy that it can exploit, they claim, it will exploit it to the end, passing from a period of growth in its numbers to a period of collapse. Human population and economy will grow until fossil fuels are exhausted, and then they will collapse. Rather than imagine that this trend could be inversed, or give advice for the aftermath, scientists should work with communities as the collapse unfolds, helping them to understand biophysical constraints and adapt society democratically (Sorman & Giampietro 2013).

Malthusian narratives of overshoot inspired the theory of “carrying capacity”: the idea that an ecosystem can sustain a maximum number of individuals of a species, above which the population collapses (Sayre 2008). Populations overshoot and collapse in controlled laboratory conditions but overshoots are rare in real life, where ecological interactions are more complex (Sayre 2008). Plants do not multiply to the point of occupying a whole

territory: in-built mechanisms control their reproduction in response to plant density. Animals generally manage their resources by controlling their numbers with mechanisms that are genetically inherited (Wynne-Edwards, 1986). Unlike animals or plants, humans reflect, learn and adapt to limited resources, aware of the consequences of not doing so. There are communities or civilizations that collapsed by overusing their resources, but there are also others that lived for a long time in equilibrium with their habitat.

In a social context, the definition of “collapse” demands specification. The collapse of the Roman empire and its elites (a historical example used by Sorman and Giampietro) brought liberation for Roman colonies and subjugated people (Kallis 2013). New formations emerged after Rome, with some people living better and others not. Rather than thinking of a limited environment with a carrying capacity that determines a generalized societal collapse, it is more instructive to think of coevolutionary arrangements between humans and their environments with different consequences distributed socially and geographically. We constantly transform our habitats and adapt to our transformations, for better or for worse (Kallis & Norgaard 2010).

A collapse is not waiting for us in the future after a supposed end of fossil fuels. It is already here. Many people in the world today live in the conditions of that pending collapse that so scares us in the West. Dystopian fears of the future might have something to do with our guilt over the disasters that we know are shifted costs for what we are already producing, from contaminated environments to refugee camps. Within the context of an ongoing disaster, degrowth offers a scientific narrative that synthesizes and organizes information in ways that provide adaptive and transformative solutions now. It is part of the democratic debate that Sorman and Giampietro advocate (Kallis 2013).

Sorman and Giampietro are right, though, that a degrowth transition cannot be smooth. Latouche’s (2009) “serene” degrowth through a “virtuous cycle of quiet contraction” and Pallante’s (2005) “happy degrowth” are unrealistic scenarios (Romano 2012). If history is any guide, the material and political changes involved in a degrowth scenario are unlikely to be easy. The end of fossil fuels will increase pressure for redistribution. We know that substantial redistribution seldom takes place without war or great destruction (Scheidel 2017). And wars in our era are more destructive than ever before. Trainer’s (2016) “simple way” transition predicts that as

growth comes to an end, and nation states fail to provide for their citizens, a spontaneous reorganization of political structures will take place, giving rise to loosely associated, self-sufficient townships. The birth of nation states involved convulsions and wars that lasted two centuries, killing millions of people during some of the worst atrocities of human history. To expect that nation states will dissolve serenely and quietly is unrealistic.

Romano (2012) points to a contradiction in the literature. On the one hand, degrowth scholars advocate a long-term strategy: a slow accumulation of alternative projects that, over the long term, construct a civil society and economy ready for a degrowth transition. On the other hand, the crises to which degrowth responds – such as climate change or inequality – are immediate. Their scale and urgency do not allow us to wait for a slow change of values and imaginaries through small-scale prefigurative projects.

Likewise, Engel Di-Mauro (2012) argues that degrowth posits changes in ideas prior to the struggles that will make these ideas real. Andreucci and McDonald (2014) criticize those who write about degrowth for promoting specific alternative projects and not large-scale, revolutionary struggles positioned against capitalism. Foster (2011) claims that degrowth as advocated by Latouche is a reformist political project, not sufficiently anti-capitalist. Growth is the outcome of capitalism, so unless there is an anti-capitalist “ecological revolution” (Foster 2011), there will not be degrowth.

I cannot speak for others but I hope that the way I discussed degrowth and transition in the previous chapter was more nuanced than that. Growth is part and parcel of capitalism: abandoning the pursuit of growth requires a transition beyond capitalism (the inverse though does not hold: a transition beyond capitalism does not necessarily bring the abandonment of growth, as we can see from the past (Kallis 2017)). This change is revolutionary: it requires a systemic overhaul of established institutions, imaginaries and modes of living.

Marxists critical of degrowth seldom specify what they mean by large-scale revolution or struggle. Surely, this must mean something more than strikes and street protests, elections or trade union mobilizations. If it means a violent replacement of existing political regimes in the vein of the French or Russian revolutions, the onus is on them to show that there is popular support for such insurrections in liberal democracies, in which a substantial (albeit shrinking) middle class may still have more to lose than its chains. Power constellations such as the control of the media and information by

corporations and the extremely powerful means of violence at the disposal of states make such revolution difficult. A new regime enforced by a minority baptized through violence is likely to use violence afterwards to silence dissidents and perpetuate its reign.

If, instead, we understand revolutionary change to mean fast, structural and significant, rather than violent, change, then this is indeed possible, since revolution is by definition an unpredictable event (Castoriadis 1997). The Gramscian model of coevolutionary (or corevolutionary) change sees different changes and struggles coming together as socio-environmental conditions create openings. This model overcomes counterproductive divisions between reform and revolution, grassroots economies and political organization, value change and political change, or everyday personal ethics and political struggles.

Here I am not making the trivial argument that social transformation must involve all of the above. I have shown that by following Gramsci's theory more precisely we can rethink the role of alternative projects and personal changes as incubators of new values and common senses that provide the roots for a political strategy of radical institutional–constitutional change. The fate of this strategy will be determined in a complex milieu of changing environmental and technological conditions, with the element of indeterminacy and surprise that is always present when dealing with human affairs.

It is hard to study what is yet to come, but we can learn from past systemic transitions, including revolutions and collapses, and understand better how ideas and imaginaries change, sometimes slowly, sometimes more quickly; how niche practices and thoughts accumulate to bring forth systemic change; and how openings are created by changing environmental conditions. Systemic changes in periods of collapse, economic contraction or stagnation are particularly interesting from a degrowth perspective.

Is degrowth compatible with capitalism?

Marxists and socialists have criticized degrowth for confusing cause and effect, reducing capital accumulation to growth when growth is in fact the effect of capital accumulation. Foster (2011) finds Latouche's references to a "growth society" misleading. Under capitalism, Foster argues, accumulation

is what drives growth. Rather than degrowth, we should be talking about “de-accumulation”. Likewise, Engel Di-Mauro (2012) claims that “capitalism comes first” and that accumulation is not just growth but appropriation and control that expands the ability to appropriate and control more – a process founded on the violent exclusion of the majority from the means of reproduction and production. Growth is the outcome of this process, not the logic that drives it.

I agree, but with a small caveat. As I showed in chapter 3, growth is the child of capitalism. But the child grew up and took over as head of the family. Growth is a hegemonic imaginary with real effects. The interest of capital for accumulation is promoted and legitimated through – and in the name of – growth, as when the United Kingdom’s Conservative government demands that all environmental and social regulation be subject to a duty to promote growth.³ Growth survived the abolition of capitalist relations in socialist countries. It survived the transition from Keynesianism to neoliberalism. Many self-declared socialists or communists today defend growth. A critique of growth over and above capitalist accumulation is not therefore redundant (Kallis 2017; Latouche 2012b).

While *the pursuit* of growth is inevitable under real-existing capitalism, it is harder to claim that capitalism *necessarily* produces economic growth (or even net capital accumulation). The growth record of capitalist economies is variable. Recessions, contractions and stagnation are common. Capital may de-accumulate in a capitalist economy while the economy continues to be dominated by the concerns and institutions of capital – witness Greece. The *pursuit* of accumulation may arguably be inevitable within capitalism, but its achievement at the level of the nation state is not.

Whether there is a growth imperative under capitalism has been debated extensively in the degrowth literature (Jackson 2007; Lawn 2011; Blawhof 2012; Foster 2011). The answer has political implications: if capitalism can do without growth, then sustainability and justice-oriented reforms within capitalism might be enough; if it cannot, then degrowth can only be part of a systemic change beyond capitalism. Those who argue the former often want to convince the public and decision-makers that degrowth is feasible

3 In the United Kingdom the Deregulation Act of 2015 has “a growth duty”. Regulatory agencies have to justify that any action they take – to protect the environment, say, or to safeguard social or labour standards – does not have a negative effect on growth.

and does not require a total overhaul of the current system; those who argue the latter tend to think such overhaul is necessary in and of itself.

The debate can be clarified by distinguishing between capitalism in the abstract (or in theory) and real-existing capitalism (that is, capitalism given what we know from historically observed capitalist economies) and distinguishing between an imperative to grow versus an imperative to *pursue* growth.

In the abstract, there are theoretical conditions under which capitalist economies could be stabilized without growth. In neoclassical or Keynesian models, for example, conditions such as reduced working hours or zero profits and zero net investments create stable non-growth paths (Lange 2018).⁴ Zero profits or zero net investment does not mean that an economy is not capitalistic. There might be some firms that make profits and invest and others that do not, and disinvest (Lawn 2011). A capitalist economy can then reach a steady state, with market competition taking place within social and environmental minima enforced by the government (Lawn 2011). It is also theoretically possible to have an economy with lending and positive interest rates that does not grow and is stable (Jackson & Victor 2015). The relevant conditions are that interest gains are spent and not accumulated or that the interest rate only serves to promote intergenerational redistribution.

If, however, we move from the abstract to the concrete capitalist economies that exist, we can observe that *the pursuit* of growth is a constant. We do not yet know of any capitalist economy that has voluntarily abandoned the pursuit of growth. Why is this so?

One hypothesis is that uneven political power and class relations make redistribution very difficult – without redistribution, exploitation increases in the absence of growth, if capitalists have more political power over the working class (Piketty 2014; Jackson & Victor 2015).⁵ In capitalism there is a systematic struggle for market actors to keep costs (whether for labour-power or other kinds of energy) lower than revenues (Hornborg 2017).

4 There is nothing in the neoclassical model per se to suggest that growth is necessary. Optimization refers to welfare and to people's preferences: if people preferred a degrowth lifestyle, then degrowth could be a neoclassically optimal outcome.

5 Jackson and Victor (2015) find that inequality can diminish even if growth declines, as long as the substitutability of labour by capital is low. Given that substitutability tends to be high, this basically translates to active policies in support of labour (reducing the elasticity of its substitution). And in the opposite direction, when political power accumulates in favour of capital, inequality will tend to increase without growth.

This means either growth, or underpayment of workers, or environmental damage. Even if some firms grow and others degrow, each firm and the productive sector as a whole have an interest in general growth as well as in a general suppression of wages and environmental regulation – and especially in the case where they cannot get one of those, they will push for the other. Industry and those with economic power will try to steer public opinion, support political parties and lobby government to get growth-friendly policies and remove limits to accumulation. Environmental, social and labour regulations are obstacles to profits and growth as they increase the costs of production. In turn, governments have to legitimate their actions in support of capital as part of a broader good – economic growth comes in handy here, as workers are promised that their sacrifice today will make everyone live better tomorrow. The theoretical social and environmental minima that Lawn (2011) sets as the conditions for a steady-state capitalist economy are therefore unlikely to withstand the political economy of capitalism.

To understand why the pursuit of growth has historically been a constant within capitalism, one has to analyse the *political* economy of capitalism, by bringing politics, institutions and the interests of different actors into the analysis. Politics is not an exogenous force in which we intervene independently. The economy is not separate from the political sphere: that is a myth that economic models, even those of the best kind, perpetuate.

A second hypothesis is related to interest rates. One can create hypothetical scenarios in which the demand to pay interest rates does not lead to growth. Again, in the real world rather than a modelled one, we know that given the scarcity of capital, and its unequal control, those who hold it will be likely to charge a rent over and above what is reasonable given risk or intergenerational redistribution. This has happened historically in different civilizations, where again and again the ruling classes charged the working classes unsustainably high interest, leading to peonage or unrest and revolution (Hartley 2018). The same dynamic plays out under capitalism as long as there is a capitalist class with greater economic and political power, which holds control of scarce capital and can lend on its terms.

A third hypothesis has to do with international dynamics that are missed by one-world models. Within a globalized world with (relative) free movement of capital and people, a country that stagnates sees its productivity decline compared with that of other countries. Production costs rise, and capital and population flow out of it. Sustaining the basic functions of a state

or running welfare services becomes increasingly costly. A single steady-state economy is therefore unstable unless there is coordination among nation states to limit competition. There is no global arrangement capable of doing this, nor is there any foreseeable geopolitical movement in this direction.

This does not mean that the pursuit of growth is inevitable in the abstract. It is not, and indeed, under certain conditions an economy can function well without growth. But these conditions require institutional changes that go against the political economy of capitalism. Their implementation requires radical changes in power and class relations. The system that will emerge as a result will in all likelihood no longer be recognisable as capitalist. This hypothesis is of course subject to refutation, and to further theoretical, conceptual and modelling work.

Independent of whether growth is an imperative under capitalism, there is little doubt that the degrowth *vision* presented in chapter 5 is incompatible with capitalism. Concrete degrowth utopias (figure 5.1), if they were to be realized, could not be described as “capitalist” in any meaningful sense of the term. Again, this does not mean that there is no space in this vision for markets for goods, or for trade, money-based exchange, firms or forms of non-collective property and private rights of use. But the overall structure and logic of a degrowth economy will be very different from that of a capitalist one. It will not be geared around the pursuit of profit, but around the satisfaction of human needs and collective expenditures with a limited amount of resources.

To understand the options and opportunities for moving in such a direction, one cannot be oblivious to the fact that we live in capitalist economies, with definite class relations, and that the need of capital to grow sets the tempo and contours of social change. If one wants to understand why and how investment takes place the way that it does, why certain resources are extracted where and when they are, why certain interests corner the democratic game and do not allow certain reforms, then one needs an understanding of capitalism and how it works in practice, and not in models. Likewise, the prospects for a degrowth transition have to be examined within the limits and possibilities of capitalism, as any transition will inevitably start from the system we already have.

Degrowth is not akin to recession, but as long as economies are organized in capitalist terms, degrowth is likely to be experienced as a recession. Within

capitalism, a decline in GDP leads to stock exchange crashes, devaluation of assets, redistribution, and often revaluation and relaunch of growth (Tokic 2012). Whereas theoretical research on whether or not degrowth is compatible with capitalism (or, more generally, under what institutional conditions could degrowth be stable) is interesting, the question of whether and how a degrowth transition could start and evolve within the existing capitalist economies in which the majority of people live is more important.

Is degrowth compatible with liberal democracy?

According to Fotopoulos (2009), capitalism, the nation state and liberal democracies emerged and evolved together, and each depends on the others. A function of the liberal state is to facilitate accumulation for national capital. Representative democracy was the means by which the capitalist class secured its powers in the struggle against landed aristocracy – it is inherently conservative and controllable by those with economic power (Fotopoulos 2009). Fotopoulos criticizes Latouche because he sees a degrowth project as being compatible with parliamentary politics. For Fotopoulos, parliamentary democracy must be substituted by a new governance model: “inclusive democracy”. This involves direct democracy in the political realm (with demotic, citizen assemblies of a maximum of 30,000 people, organized into a confederation) as well as economic democracy (worker-run producing entities, and a moneyless economy based on vouchers and credits).

Konrad Ott (2012), a liberal political philosopher, takes issue with such radical views, which he considers risky given the experience with twentieth-century revolutionary projects. For Ott, the postwar achievements of “decent liberal European democracies” (he mentions France and Germany), such as the welfare state and the enlargement of the middle class, should not be taken lightly. He calls for further democratization, a Habermasian “deliberative democracy” complementing a hard core of the representative political system (parliament, elections, etc.) with the soft communicative power of deliberating civil society, and intermediate zones (peripheries) in which non-governmental organizations (NGOs), policy advisors, academics, concerned scientists, pressure groups and others propose policy ideas. Ott accepts non-violent civil disobedience to keep democratization alive for “specific non-trivial occasions”. In his view, a deliberative

liberal democratic system is adequate for bringing about the cultural and institutional changes implicated by degrowth. Proof is the better environmental and social record of social democracies.

Zinn (2016), on the other hand, notes an authoritarian turn in liberal democracies: governments have stopped legitimating austerity and inequality with the promise of growth and increasingly use brute force to quiet dissent. Others point to a shift in the West to Russian-style plutocracies, with token elections, economic powers controlling governments through the funding of political parties and the ownership of mass media (Kempf 2008). Concentration of wealth undermines democracy.

These changes come in a context of what some political theorists had described as “post-politics”: the consensus since the fall of the Berlin Wall that the capitalist market and the liberal state are the unquestionable foundations of society, with the reduction of political problems to questions of technical management (Swyngedouw 2014). The bipartisan consensus on the pursuit of growth through neoliberal, market-friendly policies is one manifestation of post-politics (Kallis *et al.* 2014). The rise of populism may in turn be explained as an expression of the frustration with the limits of consensus politics. Populist politics may take a progressive direction, as when a “we, the 99 per cent” is constructed to challenge class society and rising inequality; but it can also take a reactionary turn when “we, the people” is mobilized against a common threat, enemy or “the other” (foreigners, immigrants), justifying the suspension of democracy.

How “democracies” can be democratized and how we can have a transition towards more direct and inclusive rule are important research questions. Some scholars have looked into the recent Occupy/Indignados social movement, its articulation with alternative economies and its evolution into new political formations, speculating on how this may be creating openings for degrowth and direct democracy (Asara 2015; Varvarousis & Kallis 2017).

There is a need for more research of this sort – for studies that look at concrete social and political processes, or innovative city, regional or national administrations and the ways in which they are reconfiguring governance and decision structures, how they understand or rethink “the economic”, and how they adopt, if and when they do, critiques to endless growth. Beyond good cases, we also need to understand dominant trends (the rise of populism or oligarchy, the depoliticization of liberal democracies) and position such developments within economic processes (crisis, stagnation or

the relentless efforts to relaunch growth). The relationship between growthmanship and populist or post-political politics merits more attention. So does Zinn's proposition that the use of growth as a social pacifier is coming to an end. Is growthmanship over, or is it mutating into something new?

Can value grow without growth in throughput?⁶

If by value we understand what we have previously called “values” (or “use values”), then the answer to the question in the heading is yes. The attributes and the things that people in a society value can increase even if throughput, or output, decreases. If a society holds frugality and simple living dear, then a reduction in material throughput will satisfy this value. Values, however, are difficult, if not impossible, to measure and commensurate. The very notion of growth loses its meaning, since with incommensurable values there is no aggregate that can grow (Kallis 2017). To be more precise, then: there is no reason why the values of a society could not be *satisfied* with decreasing throughput or output.

Now, if by value we understand aggregate “market value”, or what GDP approximately counts, the answer is complicated. First, it requires a clarification of what determines exchange and market value: utility, labour, embodied energy? Then there is the problem with GDP, which is not even an aggregate of utility and market value: it counts marginal not total utility, it mixes bads with goods, and it includes public expenditures and imputed values for which no exchange occurs.

If exchange value is ultimately determined by labour and energy (on top of which monopoly rents, debt and money speculation form observed market value or price), it then seems that the output of the economy cannot grow without an increase in throughput – unless there are more people working, or workers increase their working time, for which there is a limit. Indeed, from a labour or energy theory of value you cannot produce something that is valuable for exchange without human labour and matter/energy. But does this mean that the more aggregate exchange value you produce, the more labour and matter/energy you use?

6 I am grateful to Herman Daly, Dan O'Neill and Salvador Pueyo for their comments on an earlier draft of this section.

Machines complicate matters. A Marxist labour theory of value does not suggest that aggregate market value cannot increase without an increase in human labour: it can and it has done so in the past because of machines and improvements in productivity (machines involve dead labour, of course, but this does not mean that the work that machines perform is equal to their embedded labour, or energy). At the extreme of a hypothetical fully robotized society, items of value could be produced without human labour (but they would still require energy). Granted, robots embed dead labour (and energy), but this is labour and energy that died long ago, so an increase in current production may come about without an increase in current amounts of energy or labour.

Improvements in labour productivity by new machines may come at the expense of energy. No matter how efficient future machines and robots may be, further growth in their output will require growth in energy and resources: resources to make robots and feed them, and resources that the robots will transform (the latter may not hold if the robots provide services that do not transform matter; we discuss services below). Even if robots are more resource efficient, their efficiency will lower the relative cost of resources, leading to more resource use in other tasks (a rebound effect). This also holds in the case where technological improvement is qualitative, improving productiveness, e.g. new ideas for doing things better or new forms of organizing production that offer greater yields with less. In restricted cases of qualitative development, output and total market value could grow even if human and non-human work decline, but crucially this will not happen automatically if left to the normal operation of the market. It will only happen if energy, resource use and working time are capped and this cap is mandated to decline. Otherwise, more productive forms of producing things will simply reduce the cost of resources and labour, increasing the demand for them (Polimeni *et al.* 2008).

If production is dehumanized and automated or robotized, there is a problem of expenditure. If humans do not work, then there will be no customers to which capital owners can sell the products of the machines. In a socialized economy, the collective product could be distributed independent of people's purchasing power. In that case, however, there will be no market exchange, and no market value, or GDP (whether the machines could produce more stuff without an increase in energy and materials use was discussed above). In a capitalist economy, the only option for generating

the demand necessary for keeping an automated economy going is that the otherwise redundant labour works in unnecessary tasks for which it is paid by the owners of capital so that it then buys the goods their robots make. The question is then how much labour, and relatedly energy, would be necessary to support the demand side of robotized production.

What about the possibility of a “weightless” service economy with higher value (Coyle 1999)? One might think here of the value created from data and information, or value from art, high-end cuisine or fashion designers. Can value from such services endlessly grow without a corresponding increase in labour and energy?⁷

From a labour or energy theory of value, the answer to this is probably no, because if a service has higher exchange value, this means it uses more labour or energy – think of the skilled labour and the energy required to extract and transport the specialized materials needed for computer hardware and software, gourmet cuisine or high-end clothing.

From a neoclassical perspective, though, the answer is yes. Exchange value represents relative utility: if people find certain services that have lower resource demands more useful, and if they are willing to pay more for them, then, at least in theory, aggregate market value can grow while throughput decreases, as long as the new “weightless” and higher-value services substitute heavier, lower-value goods or services. But there are at least seven reasons I am sceptical of this.

First, note that there is nothing automatic that guarantees that this will happen in a market economy. It could well be the case that new, leaner services increase GDP but that the older heavier goods continue to exist, with the overall result being an increase in throughput. Again, the only way to secure a reduction in throughput is to cap it and regulate its decrease (Daly 1996).

Second, once all heavy goods and services are gone, and the only ones that remain are lean ones, any further growth will invariably mean an increase in throughput, no matter how lean the goods are. Of course, in theory this could be postponed further if there are even leaner and higher-value services to substitute the already-lean ones, ad infinitum.

7 Higher value is not just high price. It means a service with better quality that is more expensive. An increase in the price of fossil fuels, for example, is purely inflation, and in principle it should not be counted in GDP.

Third, in market equilibrium, the price ratio of two goods is equal to their marginal utility, which equals their marginal production costs. So if the price, or market value, of a good increases, it means that both its marginal utility and its production costs (energy and labour) go up. In other words, it is not only that the marginal utility of a Michelin starred restaurant is higher than that of a fast food one, but also that its marginal production costs are too. This makes it harder to argue that growth can be sustained by increases in value alone.

Fourth, services also use resources. Data and information need servers, which burn electricity; high-end restaurants import products from all over the world; and expensive garments use either very skilled labour or rare and costly materials. The life-cycle energy and resources costs of services depend on the specifics, and they may vary greatly between types of services. Logically, one could imagine growth in services that have very low material and energy input or waste: singing, say, or writing novels. But these are too small a part of the total economy to sustain growth of the whole.

Fifth, if the increasing value of “weightless” services increases, then the purchasing power for material goods of those who sell these services increases too. If the use of materials is capped, however, then this higher exchange value is not realized – not in terms of material purchasing power at least (unless there is a rise in productivity in material-using sectors, which allows the production of more with fewer materials; this is a case we discussed above, and it is likely to have both secondary energy and resource costs as well as face absolute thermodynamic limits (see Ward *et al.* 2016)). Furthermore, if throughput and material production are limited, then the relative prices of resources and material goods will increase. Those with more money will price out those with less from purchasing such goods (think of rising housing prices in popular “world cities”). In a market, the unproductive expenditures of the capitalist and managerial classes who benefit from a growing service economy can get priority even over the basic reproductive expenditures of workers (Pueyo 2017).

Sixth, important questions are who buys the weightless services and how do they pay for it and why. Consider data and information: if its value stems from organizing production better, then under certain conditions better data and information can increase production without increasing throughput. If, however, the value is value for advertising, then this value represents

more consumption of other, often-resource-intensive, goods and services. The value of Facebook's stock relates to the fact that it collects data that can be used to micro-advertise cars, fast food and clothes: all products with substantial material footprints.

Seventh, when we say that a service has a higher price because it gives greater utility to those who pay for it, what we are saying is that people are willing to devote a higher proportion of their work for this service. This work may, though, have resource implications. If, in order to pay for a more expensive meal or garment, a miner has to mine more minerals, then the service has an indirect material effect.

Likewise, for a qualitative change in a service – such as an increase in value – to be realized, there must be a concomitant increase in its power to purchase resources. But if the restaurateur or fashion designer spends their money on going to work in a Learjet or on couriering ice-cream via helicopter to their yacht in the Mediterranean,⁸ then the extra revenue has resource implications. Logically, one can imagine growth in services being paid for by workers who are paid for working in these or other services, with revenue spent again in similar “weightless” services.

But is this empirically possible? And is it anywhere near what we observe in the economy today? If it were, how come the material footprint of service economies is high? And how is it that it keeps increasing in line with GDP? Can an economy grow through a closed circuit of exchange between increasingly efficient and value-added services, without this spilling over into the material part of the economy? And even if this is logically possible, could it be done without restrictions and regulated reduction in resource and energy use? Would growth in services still be possible if throughput were restricted? If growth could take place within limited and degrowing throughput, why is there such a reaction against environmental limitations and regulation? Is it possible in a capitalist economy to limit expenditure outlets and to tell the people who accumulate money where they can spend it and where they cannot? After all, money is about controlling people and resources.

8 One reviewer of my book was surprised by this example and thought I must have meant something else. But I did not. The example is from Robert Frank's *Richistan: A Journey through the American Wealth Boom and the Lives of the New Rich*. The author refers to a British concierge service specializing in “how to order Ben & Jerry's Chunky Monkey ice cream at midnight if your employer is on a yacht in the Mediterranean”.

The underlying theoretical question is whether market value and GDP are bounded in some way by the human and non-human labour that goes into the economy. This requires engagement with different theories of value – more engagement than I have demonstrated in this book. But beyond logical possibilities, it is important to see how actual market value is produced in the economy, with input–output or life-cycle-of-service activities, and to test the metabolic feasibility of scenarios of supposedly weightless service economies. We need to go beyond a superficial accounting view whereby some high value–low throughput services can in theory substitute for low value–high throughput ones and see if this is indeed how the economy works, given the interdependencies between primary, intermediary and final inputs and outputs.

Beyond such theoretical exploration, and until proven otherwise, we should continue to work with the empirically informed assumption that more income flowing through an economy translates into more resource and energy mobilization.

Commodification

More than by increasing productivity or shifting to services, the economy can also grow without throughput growth by increasing rents, debts or by commodifying unpaid goods and services. These processes can sustain growth in the short term but they cannot do so indefinitely; and their environmental impact depends on context.

Rents are payments that owners of a resource demand to allow access to it, in addition to compensation for any work they may have put into producing, sustaining or providing the resource. Land, fossil fuel and housing rents are examples, as are rents over capital (say, interest rates above what intergenerational allocation and the work and risk of intermediation justify) and rents from controlling intellectual property or unique artworks. In the fictional world of the self-regulated market, rents would be eliminated by competition. In the world that we live in, they are not. A concentration of rents in particular places and at particular times may give the impression of growth without throughput: an example would be the increase of land value and rents in Barcelona or in other world cities. Rents, however, are redistributing wealth, not producing it. The income that flows into Barcelona

and ends up as rents is produced somewhere else, and it has an ecological footprint. While some people, or some regions or countries, can appropriate a greater share of global income through their power to collect rents, the global economy as a whole cannot grow on the basis of rents.

The growth and resource effects of commodification are more complicated. Consider a painting that is held by a museum as a public good and has no market value, and then consider the same painting traded by an art collector for millions. Or consider a park or a beach that are public and are free to access, contributing to “psychic” income but not market income, unless they are enclosed. As Ricardo noted, if water previously available for free was to be enclosed and sold, this would increase the fortune of the person who sells it but not the real wealth of the community (Douai 2009). Enclosures increase the GDP of the community without any material change (the water, the park or the beach do not change when they are enclosed – the institutional relations that determine who has access to them and on what terms do). Strategies of “intensive” accumulation – that is, growth through enclosure and commodification – have proliferated recently with the commodification of environmental goods and services (carbon trading, wetland and river restoration banking, markets for ecosystem services) and with the growth of the rental or “gig” economy (Airbnb, Uber, etc.), where people charge for assets and services (empty rooms, car rides, chores) that previously would have been left unused or offered without the need for compensation.

In the gig economy there are exchanges that increase GDP without any real increase in value (such as when you pay a friend for sleeping in his empty room and he pays to sleep in yours, whereas before you were just hosting one another) and exchanges that create value by mobilizing new work (such as the work you put into renting your vacation home through Airbnb). Whether or not such growth leads to growth of throughput is a separate question that depends on the specifics. If Airbnb rooms simply substitute hotels, then it is a more resource-efficient way of hosting and travelling. If they increase the number of trips by decreasing the price of dwellings, then air travel and energy use grow. D’Alisa and Cattaneo (2013) find that commodified care work in Barcelona is more energy intensive than unpaid care work, but this cannot be generalized to all goods, times or places.

The growth or throughput effects of the commodification of resources or care work can be more complicated. Often what is commodified was previously appropriated for free. If a corporation pays a fee for the pollution

it previously emitted for free, or if salaried workers pay someone to clean their homes instead of cleaning them themselves, then GDP seems to be growing. This is, however, just a redistribution from what would otherwise be accumulated in the bank account of the corporation or workers and now ends up as taxes to the state or as wages to cleaners. In the trading of ecosystem services or carbon permits, some exchangers make money but some producers pay more to pollute or use ecosystems that they were previously appropriating for free. There is no change in the actual value produced by the economy, and there is no actual growth in GDP – only redistribution. There might even be a negative effect on growth because there will be less accumulation and investment further down the line or because the cost of primary production increases.

The growth of financial services might give the impression that the economy can grow purely through financial instruments. Speculation, however, should not be confused with value production. When money flows to derivatives or Bitcoin to seek profits, this is simply a redistribution of value produced elsewhere in the economy. Those who make money out of Bitcoin experience a growth in their wealth, but for the economy as a whole there can be no growth, since nothing new is being produced (apart from services that Bitcoin may provide as a store of value or a medium of exchange). Growth in the value of Bitcoin is mostly because of redistribution of existing value to a new commodity. In the short term, and in specific countries, concentration of such financial gains may give the impression of growth decoupled from resource constraints. But this is an illusion.

The issue of debt is related, but it is different. Central and private banks have the power to create money, and often this creation of money exceeds the real growth of the economy (Soddy 1933; Daly & Farley 2004, Chapter 2). Even if this might act as a stimulus for the economy in the short term, in the long term there can only be inflation or debt accumulation and eventually cancellation of debts, with associated value destruction. Cheap money also leads to bubbles in financial products or assets, from land and houses to raw materials and Bitcoin. There is no real value produced here, only value borrowed from future generations: value that can never be paid unless there is equivalent growth. Crashes are not proportional to bubbles, however, and their resource implications are complicated since the use of some resources may escalate during debt-fuelled growth while the use of others instead increases after a crash.

In terms of research on decoupling and the relationship between GDP and throughput, there is scope for more research disentangling the contributions of debt, commodification/financialization and rent in GDP growth, as well as understanding better their complex relationship with resource and energy use. Studying European economies over a period of 18 years, Kovacic *et al.* (2017), for example, find no substantial change in energy use per hour worked, concluding that most growth must have come from financialization (debts, rents, speculation and commodification).

Is degrowth a Western idea?

One might criticize this book, as well as the academic debates on degrowth in general, as Western or Eurocentric, oblivious to the realities and ideas outside Europe and North America. Is the discourse on degrowth just one more effort by the West to dominate the rest at the level of ideas, degrowth imposing itself as an umbrella slogan to anti-extractivist and environmental justice movements in the Global South? Is degrowth the product of the privileged preaching the nobleness of poverty to the poor in order to protect their own privileges? Or, more cynically, is the idea of degrowth symptomatic of an old European society in decay, with Europeans preaching stagnation to the rising tigers?

Let us start with the last question: degrowth is a minoritarian, and of course not a prevalent, idea in Europe. European elites accept no stagnation and there are no major political parties or leaders (with the exception of the Pope) advocating degrowth in Europe, or anywhere in the world. Goal 8 of the UN's recently published Sustainable Development Goals is economic growth (a goal that from a degrowth perspective is in conflict with and undermines all the other (laudable) goals of the UN's agenda).

Second, from my experience of communicating degrowth, it is more difficult to talk about it in the United Kingdom or in the United States than it is to talk about it in Greece, and it is more difficult to talk about it in Greece than it is to talk about it to indigenous groups in Brazil. As Martinez-Alier (2012) notes, the small movement for degrowth in Europe finds more natural allies in movements against extraction and for environmental justice in the Global South (movements that confront in practice, rather than in theory, the growth of the insatiable metabolism that supports the imperial

mode of living) as well as among indigenous groups who profess values of sharing, sufficiency and common ownership, in their own language and with their own significations.

Degrowth does not aspire to give meaning to or colonize every struggle or experience. Growth, nonetheless, is a Western invention, produced and theorized in the West and fuelled from the outset by the exploitation of people and resources in the colonies. Bringing colonialism to an end also requires a decolonization of the social imaginary from the ideology of growth, starting from the West, “the belly of the beast”, where the colonialist ideology of growth was invented and is now refined and reproduced.

Degrowth is in a sense a non-Occidental Western theory – not to be exported to the rest of the world, but to open up possibilities for pluriverses (see Escobar 2015). Earlier I discussed what degrowth might mean in terms of a redistribution of output and throughput. But as Escobar argues, the point is not for the Global North to degrow so as to open up ecological space for the Global South to grow. This framing turns degrowth into a quantitative, economistic problem. And it underestimates the economic, political and cognitive power and autonomy of the Global South. The concept of degrowth makes sense from a Southern perspective only as an attempt to deconstruct and undo in the West a Western imaginary that has been at the heart of colonialism and that is used by domestic elites in the Global South to justify inequalities and eradicate alternatives. Degrowth therefore opens up conceptual space for alternative cosmovisions and life projects.

Population and immigration

Population

The prospects of sustaining well-being without crossing planetary boundaries is better with 7 billion people than it would be with 15 billion. As of 2010, almost half of the world’s population lived in countries with sub-replacement fertility: a total fertility rate (around 2.1 children per woman) that if sustained would lead to each new generation being less populous than the previous one.⁹ Save for immigration, the population in countries

⁹ https://en.wikipedia.org/wiki/Sub-replacement_fertility (accessed 31 January 2018).

with sub-replacement fertility eventually peaks or declines. Some developed countries such as Japan, Germany, Italy, Spain, Portugal and Greece are experiencing a decline in population as a result of low birth rates and/or emigration after economic crisis.

The UN's 2017 projections predict that global population is likely to increase to 11.2 billion by 2100 (from 7.6 billion today), with a roughly 23–85 per cent chance of peaking or falling before the end of the century.¹⁰ For a while it seemed as if global population would peak at 9 billion by the middle of the twenty-first century, but this is no longer the case. Population growth is, nonetheless, slowing down: it took 12 years for the global population to grow from 5 billion to 6 billion and from 6 billion to 7 billion, but it is expected to take 25 years to grow from 9 billion to 10 billion, and then roughly 45 years after that it will reach 11 billion.

From a degrowth perspective, peaking or declining populations in some countries are good, and they should be extended to others. The faster that global population peaks, the better. Fewer people means less pressure for growth, lower resource use and a better average standard of living for a given level of output.

From a growth perspective though, depopulation decreases demand for products and increases wages and labour costs, while output has to be taxed more to support an ageing demographic. Natalist policies are likely in pursuit of growth and they should be opposed from a degrowth standpoint.

But should extra measures be taken to control population (Daly 2015a) in high-fertility areas like Africa: one-child policies, say, or tradable birth permits like those advocated by Herman Daly? A degrowth perspective is anti-colonial and puts democracy and gender equality first. International population control policies that target women in developing countries (see Hartmann 1995) are ruled out *a priori* from a degrowth perspective, and so are the biopolitics of controlling, and establishing markets out of, people's bodies.

On the other hand, processes that support a voluntary demographic transition should be supported. These include food, health and sanitation improvements that reduce mortality; empowerment of women to control their reproductive choices; redistribution and economic restructuring so that the value of children's work is reduced; and an increase in parental

¹⁰ https://en.wikipedia.org/wiki/Projections_of_population_growth (accessed 31 January 2018).

and public investment in education. Daly (2015a) argues that demographic transitions require ecologically unsustainable growth. It is not clear why this is so. A steady-state scenario allows for convergence from poorer nations – a convergence that may be sufficient for a demographic transition. And decent levels of well-being, health or education can be achieved at lower levels of output than the unsustainable ones currently found in high-income countries (chapter 4). Degrowth in high-income countries could liberate resources for autochthonous improvements in Africa.

A crucial research question is the extent to which fertility rates depend on income rather than factors that may be correlated with, but are not reducible to, income – such as sanitation, health or education. We know, for instance, that fertility adapts to mortality. Declines in mortality and increases in life expectancy can be achieved at one-sixth the current level of US income, or even less (see figure 4.6).

The relationship between population and environmental impact is more complicated than the IPAT identity – whereby Impact (e.g. tonnes CO₂) equals Population times Affluence (dollars per capita) times Technology (tCO₂/\$) – suggests. Affluence and population are not independent factors, and technology depends on population or affluence (and vice versa: population and affluence depend on technology). Depopulation increases the cost of labour. Locally this may lead to substitution of workers by machines that use fossil fuels or by chemical fertilizers, as happens in rural India (Robbins & Smith 2017).

From a degrowth perspective we should not put the cart (population) before the horse (capitalism and growth). Unlike what IPAT suggests, population growth is not exogenous: it is determined by other underlying causes. In capitalist settings, reproduction responds to labour demand. Lower population increases wages. Capital, instead, needs cheap workers and therefore population growth or, failing that, outsourcing and/or immigration. Let us put the horse first: reducing the pressure for profits and growth reduces the pressure for population growth and further dampens the growth of output (and throughput). This is where the emphasis should be, not on intervening with the bodies of women and immigrants.

Another cause of population growth has been cheap energy and cheap resource inputs. Global population would not have grown as much as it has without the enormous mobilization of fossil fuels and fertilizers that have supplied food, shelter and healthcare. If inputs decline in the future,

population growth will probably slow down too (notwithstanding the possibility that the demand for labour may increase).

Could this happen without an overshoot: that is, without a population increase beyond the level that resources can support, followed by collapse through higher mortality? A degrowth hypothesis would be that yes, population could slow down smoothly alongside output and throughput through family planning and voluntary reduction of reproduction. The important research question is whether declining income and a shift to more labour-intensive production would increase fertility or mortality. Not necessarily: cultural, work and gender role changes are here to stay. If anything, in developed countries income reductions seem to now lead to a reduction, not an increase, in reproduction. The twentieth-century population boom was the result of a time lag between reproductive practices and norms developed in a context of high infant mortality persisting into an era of improving health standards and declining mortality. There is no reason why this would be so during a supposed economic slowdown.

Immigration

Daly (2015a,b) connects population with immigration because, in many countries, as in his native United States, immigration is the main cause of population growth. He claims that growth is legitimated in Europe in the name of accommodating refugees, and that immigration is justified in the name of producing more growth. Immigration therefore stands against the goal of a steady-state economy, Daly concludes. Furthermore, the social costs of immigration are likely to be larger than the benefits, both for the host community and for the community from where immigrants depart (Daly 2015b).

Daly (2015b) invokes Hardin's (1977) "lifeboat ethics". As he puts it: "Shipwrecked passengers on an already full lifeboat face the dilemma of what to do about other survivors still in the water trying to board. Helping everyone board will overload and sink the lifeboat – everyone drowns, but no one is favored." The premise is that each nation, like a boat, can take a certain number of people without exceeding their social and ecological capacity.

This is a false analogy and diagnosis.

First, as far as the planet and its boundaries are concerned, there is only one lifeboat: planet earth. What happens in each country's boat (*sic*) is irrelevant. For the planet as a whole, immigration is simply a reallocation of the "cargo" (*sic*) to different parts of the ship.¹¹ A movement of people from high- to low-fertility countries will reduce global population growth and accelerate the change of values and expectations necessary for a demographic transition (even if there is a generation time lag, this is faster than waiting for the transition to happen back home). Likewise, immigration from poorer, typically less resource-efficient, countries to more efficient ones reduces resource use for a given level of income, accelerating the convergence between rich and poor people advocated by steady-state economists.

Second, there is no meaningful sense in which the United States or any other national "boat" is overloaded. Ecosystems do not follow national boundaries. Ecosystems are either bioregional or world-regional and planetary. The US economy is open and it imports resources from all over the world and exports goods to the rest of the world. The environmental impact of the United States is not confined to what goes on within its borders: it extends to regions covered by its footprint, i.e. the places where its resources are extracted and its consumer goods are manufactured and those affected by its carbon emissions.

Third, there is a strong moral case for the United States and Europe – who have benefited most from cheap labour and resources from colonies in the past – to pay back some of their ecological and carbon debts. One way to pay is by aid. Another, perhaps faster and more effective, way is by accommodating people from the regions most affected by the legacy of colonial exploitation. Rich countries should be responsible for the poor people from former colonies who are most vulnerable and exposed to climate disasters, while at the same time being the ones least responsible for past emissions.

Fourth, there is a contradiction in Daly's (2015b) argument for border controls when he claims that immigration will both generate growth that will damage the environment *and* put the welfare state under strain, reducing the wages of low-income groups. Either one or the other can happen: either immigration dampens growth and stresses welfare revenue and income distribution; or it increases output, damaging the environment, but

11 I apologise for using these unfortunate metaphors for human beings, but I want to show how the "lifeboat" model is irrational in its own terms.

it increases tax revenue, allowing growth of welfare and incomes. It cannot do both.

The relationship between immigration and growth or wages is complex and bidirectional. Contrary to what Daly claims, there is no evidence that immigration boosts an otherwise steady or contracting economy: immigrants go where the economy is doing well and there are jobs. People emigrate out of countries that are in recession or crisis. The literature suggests that the effects of immigration on an economy are generally positive, though disproportionately so for high-income groups who benefit from cheaper menial labour. Low-income groups may see their wages fall due to competition from migrants. New data nonetheless finds that refugees have little or no impact on the wages of average native workers and no large detrimental effects on less-educated workers (Clemens & Hunt 2017). Most research also focuses only on short-term outcomes – recent historical research finds that the long-term economic and social outcomes of immigration to the United States between 1860 and 1920 were positive (Nunn *et al.* 2017). Stricter border controls – such as the 1965 exclusion of almost half a million Mexican seasonal farm workers (*braceros*) from the US labour market – do not increase the employment level or wages of native workers (Clemens *et al.* 2017).

The literature is certainly diverse, and there are studies in certain contexts and periods and for certain groups that come to different conclusions. But even so, the point here is that Daly's depiction of a limited national social and economic system whose carrying capacity is stressed by incoming migrants is a gross over-simplification. Immigration might have good or bad social and economic effects depending on context.

The same applies for effects on migrant-sending communities, as suggested by a huge literature on the so-called brain drain. Those leaving poorer countries tend to be those with a higher level of education or more money. They take with them their resources and the resources spent on their education. But they send back remittances, organize new networks and occasionally return with new resources, skills and ideas. The option to migrate may increase the incentive to study. Indeed, the overall effect of migration of skilled workers on "human capital formation" (*sic*) in the sending regions appears to be positive (though not if the country's levels of migration and education are high (Beine *et al.* 2008)). A recent study in Malawi shows that those districts that had the greatest exposure to migration have better-educated workers three decades later (Dinkelman & Marioti 2016).

The opening of Daly (2015b) – a paper on migration – confuses migrants with refugees in an example about refugees in Sweden (even if he then calls for distinguishing between the two groups). The recent increase in people coming to Europe is because of the humanitarian catastrophe of the Syrian war and those of other war-torn regions in Iraq, Afghanistan, Somalia and parts of Pakistan (Europe hosts only a small proportion of Syrian evacuees compared with Lebanon or Turkey). When your neighbours' house is on fire, you let them out and you help them get back on their feet. You do not deliberate over the costs and benefits of doing so. The support of refugees is dictated by international agreements and is a matter of basic humanity. It has nothing to do with steady-state economics.

In conclusion, there is no ecological case for closing borders and there is no evidence that immigration undermines degrowth. There are many more immediate and clear hurdles to degrowth so we should not worry about the uncertain effects of immigration. Degrowth theory has little to add, as such, to current research or social debates about immigration, other than to make a broad appeal, in the name of direct democracy and international social justice, against authoritarian controls on the movement of people and in support of refugees fleeing wars or areas of environmental disaster.

Having said that, I do not see a degrowth case in favour of open borders either (Bregman 2016). It took two world wars and millions of deaths for the nation state system to stabilize – we should think twice before advocating its collapse. A nation, like any social system, needs to assert controls over the people or goods that enter its territory – controls that should be democratically decided following principles of international solidarity and social justice. In an uneven capitalist world of relentless competition, open borders – for goods, money and people – may indeed lead to a post-national, corporate feudalism (Daly 2015b).

On the other hand, capitalism brought into being the nation state system, and the nation system facilitated the expansion of capitalism. Capitalism depends on border control and the differentiation of people (labour forces, etc.) that border control allows, reducing wages when and where necessary (Dale 2015). Why continue privileging “the nation” as the political community in an era of planetary boundaries, where we need structures for global commons governance? Is it possible to have nation states controlling migration without authoritarian controls on the movement of people?

These are my personal, half-baked thoughts and questions on a topic that I have not researched. The only claim I can defend is that there is no ecological–economic basis for lifeboat ethics. There is definitely more room for political thought on nation states, degrowth and immigration, along the lines of Francois Schneider’s work on “open localism”, and related debates about openness versus closure in the governance of the commons (Varvaroussis & Kallis 2017).

Research and degrowth

This book has presented the case for a radical social transformation that leads to a significant reduction in a society’s throughput. I have argued that such degrowth is necessary because if growth continues at pace, we will cross planetary boundaries with unforeseen and in all certainty very undesirable consequences. Degrowth is not only ecologically necessary, it is also socially desirable. The pursuit of perpetual growth is a major obstacle to the achievement of a more equal society that lives in creative balance with its environment. Growth is fuelled by exploitation and cost-shifting. A sharing society cannot, and should not, be one that constantly expands, constantly creating new frontiers that only few can access.

In terms of planetary boundaries, the options are either technological miracles or social transformation, changing institutions and power relations in ways that allow us to live better with (much) less, sharing what there is. I have argued that it is unlikely that technology will allow the economy to grow while resource and energy use degrow to the level necessary. A reduction in throughput will more than likely come with a reduction in output. I did not prove that it is logically impossible to have absolute decoupling for the resources and pollutants that matter, but I have shown that the way in which capitalism works, and given what we know from the empirical record, makes this seem a very unlikely scenario. If this is right, then the future will by necessity be one of lower throughput – the question is whether it will be by design or by disaster. The spread of the degrowth imaginary creates the conditions needed to turn the disaster into a desired future.

The history of technology suggests that big new technological fixes will have unforeseen consequences and incur costs further down the line. From a thermodynamic understanding of the economy, the more energy we use,

the more matter we transform and the more disorder we produce – in one form or another, here or there, now or later. The current conundrum is political. Perpetual growth is impossible and its pursuit is disastrous; planned degrowth is not politically possible because of established class interests.

True, economic growth is coupled to resource and energy use, but well-being is also coupled to economic growth (up to a point). There is no precedent for a technological or structural change leading to less rather than more resource use; but there is no precedent either for a peaceful social revolution of the type envisaged here that has improved well-being and reduced throughput. Whether we are for or against degrowth, we are all engaging in wishful thinking. Let me then consider for a moment that maybe, *just maybe*, technology could allow absolute decoupling, cleaning the atmosphere of CO₂ and restoring ecosystems. And that maybe economic growth could continue for a few centuries more. Even then, it would be dishonest to claim certainty in such outcomes. Even if the probability that the degrowth diagnosis is right were low, there would still be a strong precautionary case for studying and experimenting with degrowth.

When facing an uncertain future, we have to study all possibilities. While a lot of funding and research goes into technologically or economically fixing our way out of problems, very little goes to studying how, and under what conditions, we could transform society in a degrowth direction. In this chapter I have identified several important questions.

Could well-being be secured at lower levels of throughput than we currently have? If so, how? Would population decrease or rebound if throughput was to degrow, and under what conditions would each of those scenarios occur? How feasible, metabolically speaking, is a “prosperous way down”, and how could it unfold? What do we learn from societies and civilizations that have managed to live well for a long time without growth?

How do collectives and movements undo growth in practice, and how do they unsettle its imaginary? How do their ideas travel through and change society – or not? How do performance, prefiguration and conflict effect common sense and imaginaries? How do public administrations interact and incorporate, co-opt or oppress new social ideas and imaginaries? How and under what conditions could capitalist economies evolve to new configurations with lower metabolisms? What would it take to overcome their entrenched power and exploitation structures: how and under what conditions? How do niche practices and thoughts accumulate to bring forth

systemic changes, and how do changes in environmental conditions create new openings? What do we learn from past systemic transformations in periods of expansion and in periods of collapse?

How did the idea of growth establish its hegemony in different parts of the world, and how does growth reproduce its hegemony and adapt to the conditions of today? Is growthmanship coming to an end, or is it morphing into a new, authoritarian version?

How do human societies produce value, and what would an economic system that pursues a multiplicity of incommensurable values look like? Why do service economies use more and more materials? How do automation, artificial intelligence and the tertiarization/elitization of the economy change market value, output and throughput? What opportunities and what obstacles do such tendencies create for a degrowth transition?

You may agree or disagree with the degrowth prognosis and diagnosis, but you cannot deny that they raise inconvenient questions that we can no longer afford to ignore.