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Pick Simply the Best: Sustainable Development is About Radical Analysis and Selective Synthesis, not About Old Wine in New Bottles

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ABSTRACT

For sustainable development, accepting limits is one of the two guiding principles identified by the Brundtland Commission (the other one being satisfying human needs). This can be achieved by slimming an economy, limiting the total amount of resources it consumes. While stabilizing resource consumption at the present levels seems to be a minor challenge, dematerializing the economy sufficiently to allow for equitable consumption of all the Earth's citizens, while reducing environmental pressures significantly, is a major challenge.

A means to implement this could be a cap to resource use, combined with access allocation mechanisms not specified in this paper. With a depreciation of the input volumes, the result would be a change in the economic dynamics, and in the very functioning of the respective society and economy. Distribution issues would gain prominence, social security would be a key concern, private property would need to be complemented by a more efficient method of product use such as product sharing, and corporate ownership structures might change significantly.

It has been questioned whether such a resource-limited economy could still be a market-driven one. By identifying some of the objections as based not on reality but on methodological flaws of economic theory, it can be shown that a market economy can survive such transformations, albeit with the need to complement it by other allocation mechanisms.

The resulting society might still be called a capitalist one; it would significantly differ from current capitalism, but not resemble past socialist economies. Rather than categorizing it as one or the other, or than deriving new '-isms', the discussion should focus on the practical means to pursue the sustainable transformation of our societies and economies.

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Introduction

Sustainable development contains within it two key concepts:

1 The concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given, and
2 The idea of limitations imposed by the state of technology and social organisation on the environment's ability to meet present and future needs.

Brundtland Commission (WCED, 1987, p. 43)

THIS PAPER DEALS MAINLY WITH THE ENVIRONMENTAL COMPONENT OF THE ABOVE MENTIONED DEFINITION OF SUSTAINABLE development given by the Brundtland Commission. It focuses on the limitations to resource consumption, discussing their socio-economic impacts, and only partly with the needs perspective. Environmental impacts are caused during the extraction, processing, distribution, use and disposal or recycling phase of resources, all linked by economic as well as physical processes. Whereas the total number of materials entering our economic systems is limited to 50–100 distinct abiotic materials including energy carriers, the output comprises 100 000 substances released or sold by the chemical industry alone, not counting interim products and trace pollutants not monitored (Spangenberg *et al.*, 1998). Rather obviously, it is not sufficient to focus on environmentally hazardous substances when considering limits to resource use, but all materials entering the production process have to be limited. This may be the case for their immediate impacts, for the interim products emerging in processing and degradation in disposal, for the emissions they cause on their way through the economy, or for the sheer volume of waste generated. In this sense inert bulky materials are also relevant, as they cause high volumes of processing, transport and disposal (Haberl *et al.*, 2011) Figure 1.

As a consequence, total material flows are no bad indicator of overall environmental pressures, as it is plausible that the economy must be limited to a maximum physical size compatible with the carrying capacity of the Earth's ecosystems (Daly, 1996). Such limits, however, are not scientific facts but societal choices, based on (at best scientifically informed) societal and political decisions regarding the level of damages a society is willing to accept. Temporarily limiting physical growth by increasing efficiency and outsourcing resource intensive production to the South and the East is no real escape. The relocated industrial production (mainly mining, smelting, refining up to intermediate products, the most polluting and least value adding steps in the production chain) is still polluting the new local environment. The damage has not changed – only those most affected have, and for emissions affecting global ecosystems such as the atmosphere (e.g. CO_2) the effect is largely unchanged. This relocation has obviously contributed to the fact that for instance Germany has kept its primary energy consumption about constant for 40 years now, and its raw material consumption for 15 years (Schütz *et al.*, 2005), while at the same time being the world's top export nation, only in the economic crisis overtaken by China. However, relocation is only the dark side of the coin; the brighter one is the effective gross emission reductions of Europe since the energy price crisis of the early 1970s.[1] Given the technical capabilities, most OECD countries could rather easily follow suit in increasing resource use productivity. However, this would mean stabilizing the resource consumption at a much too high level (Georgescu-Roegen, 1986). Current pollution and resource exploitation levels are the result of 15% of the world population elevating (in consumption terms) from an agricultural to an industrial society. This process is currently being repeated by 60% of the global population. Even if neglecting the poor quarter of the world population not (yet) in this process, using the EU consumption levels as a benchmark would imply a fourfold increase in resource consumption, waste and emission production, a definitively unsustainable perspective. This holds true even if assuming that the economic growth rate[2] in affluent countries would be limited to the rate of resource productivity increase, as this would imply sustaining unsustainable trends of resource consumption (Spangenberg, 2007).

[1]As Kaivo-oja and Luukkanen (2004) have shown, this has been achieved by two distinct strategies: the fuel switch to lower carbon sources, and the increase of resource productivity. In this context, the current government's plans to revitalize nuclear energy in the UK are following the past trajectory of emission management by fuel switch (under T. Blair it was from coal to gas), instead of the more recent efficiency gains strategy. The nuclear phaseout in Germany is to be compensated mostly by energy productivity increases, following the past trajectory, plus some renewable energy.

[2]The term 'economic growth' is in this paper understood to mean traditional GDP growth, regardless of how uneconomic in Herman Daly's (2005) sense it may be.

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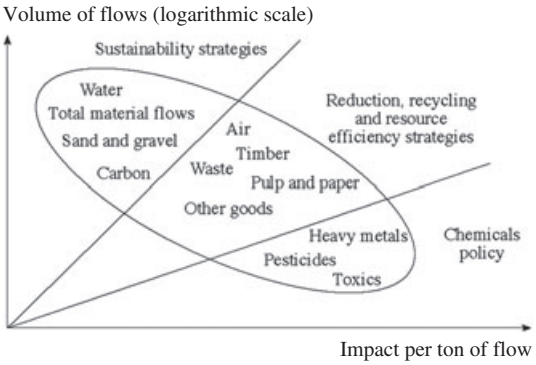

Figure 1. Impacts of resource consumption and mediation strategies

Setting and Enforcing Limits

If societies want to limit environmental damages to an accepted maximum by an accelerated restructuring of their societies' metabolism (Fröhlich *et al.*, 1999), leading to keeping economies in or bringing them back into an environmentally safe operation space (Rockstrøm *et al.*, 2009), their resource throughput must not be allowed to surpass certain limits. For emerging economies this implies a ceiling to be approached asymptotically, while for affluent countries and China it requires a decrease of resource consumption. A factor 10 dematerialization of economies compared with their current physical size has been suggested as a plausible target for affluent countries (Schmidt-Bleek, 2008).[3] Long considered illusionary, this is a figure now on the political agenda, at least in climate politics and in resource use policies. For instance, the conservative German government aims for a factor 5 to factor 20 reduction of carbon emissions, and a factor 10 reduction of consumption was frequently referred to in the discussion on designing the EU resource strategy. This would require an annual reduction of resource consumption of 3–4% in absolute terms. Given the projections of about 30% population growth and nearly 400% economic growth by the middle of the century (OECD, 2012; UNEP, 2011), the efficiency gains needed to environmentally offset the growth impacts become even more daunting: on top of the factor 10 dematerialization of the current economy, compensating for population growth at constant average per capita income would constitute the need for factor 12. Reducing poverty by growth as foreseen by the OECD cannot be compensated by currently rich countries but requires a doubling of resource productivity in the emerging economies in addition to the factor 12 dematerialization in the rich world. This would require efficiency increases of 4-5% in affluent countries, and in those on the path to affluence of 2% above the respective annual growth rate. Although such productivity gains are imaginable in the short run (at least in the industrialised countries – in emerging economies resource productivity growth, although impressive, tends to be below the rate of economic growth), it is a challenge – to say the least – to uphold them throughout the 21st century. Mainstream economists tend to consider this possible (OECD, 2011), being deep believers in technological progress (surprisingly, much more so than engineers), while to most other scholars such leapfrogging seems overly optimistic at best, and a blinding illusion at worst. At least it is not considered an assumption solid enough to serve as the basis for policy development, as is currently the case.

This is not to decry technological progress – a factor 12 dematerialization would already require utmost efforts to develop resource efficient provision and production technologies. It would require a reconstruction of much of our infrastructures, public and private, to a nearly maintenance-free long term service provision. For consumption goods, planned obsolescence is not compatible with dematerialization. If more than a factor 12 resource productivity increase is out of reach, however, conventional economic growth will face limitations as well.

[3]Factor 10 is the result of combining two assumptions. (1) Resources are considered a common heritage of humankind, leading to the postulate of equal consumption opportunities for all humans. This results in a factor five resource use reduction objective. (2) For environmental reasons, a reduction of aggregate resource consumption by half is assumed (reducing global material flows by 40 or 60% instead of 50% would lead to only marginally different results) (Spangenberg, 1995b). Estimates of reduction needs to provide future generations with equivalent services lead to similar results, when taking into account expected efficiency increases and new discoveries (Opschoor and Reijnders, 1991).

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	Hunters and gatherers	Agricultural societies	Affluent industrial societies	Sustainable societies
Energy [GJ/cap × a]	10–20	~65	223	<25
Material consumption [t/cap × a]	~1	~4	22	<2

Table 1. Energy and material consumption of different societal formations (source for historical data: Fischer-Kowalski and Haberl, 1997)
The data on industrial societies refer to Austria 1990. The total material consumption including the activated but not used material throughout the life cycle is significantly higher, about 44 t/cap × a in Europe (Bringezu and Bleischwitz, 2009).

The challenge for the affluent countries becomes obvious when looking at the resource consumption of historical societal formations (Table 1).

At first glance this may seem to indicate the impossibility of bending the trend – progress and development as we understand them today went hand in hand with increasing resource consumption (van Griethuysen, 2010).[4] Taking the technology development into account, the trajectory can be redefined: human societies have developed from a low technology/low throughput formation via a low technology/higher throughput phase to the current high technology/high throughput formation. The challenge then is to close the cycle, to develop further to a high technology/low throughput situation. This requires to understand technology development as a path-dependent social process which must be given a direction by the policy framework and not (only) by market demand (Fournier, 2008).

Rather obviously, this is a transformation going far beyond mere technical innovations. It needs to be embedded in new social practices including strong sustainable consumption (Lorek and Fuchs, 2011), dematerialized production, and a revision of incentives, habits, routines regulation mechanisms and orientations (Latouche, 2010).

A Thought Experiment

To effectively enforce limitations, there must be instruments for doing so. At least in theory, unlike the past situation, there is a tested tool to limit the physical size of the economy: capping resource consumption. The bad experience with the European carbon cap and trade scheme[5] can serve as a learning opportunity, fostering effective implementation and enforcement. Stabilizing the physical size would then be achieved by keeping the number of extraction or input permits and licenses constant[6]; in this case economic growth in monetary units would be limited to the rate of resource productivity increase (Spangenberg, 2010). This does not require any substantial modification of the economic system; indeed, Germany has achieved this steady state of resource consumption over the last decade. However, to significantly decrease resource consumption business as usual is not enough, and contracting caps to resource consumption are needed.

In order to achieve the challenging reduction targets indicated in Table 1, in the thought experiment the cap has to stay in place, but its size must shrink. Shrinking the cap each year would enforce a reduction of the physical size of the economy, and it would indirectly influence the economic growth rate.

Assuming, for reasons of simplicity, that the size of the cap is reduced by discounting resource use permits at the rate of resource productivity increase in the previous year, then the result is an economy with shrinking resource consumption and zero real GDP growth (Spangenberg, 2010). The impacts would be significant: resource efficiency improvement would become the overarching management imperative and resource expenditure the key competition issue, a matter of corporate economic survival: no input, no output, no profit. The economy would become a zero sum game, for every winner there would be a loser, and competition and innovation would come to dominate the business world: not 'happy degrowth' (Bilancini and D'Alessandro, 2012) but 'creative destruction'

[4]However, this may be a retrospective idealization of the process: hunters and gatherers worked less, were better fed and lived longer than early farmers.

[5]As the EU policy Europol has found (Europol, 2009), the majority of carbon permit transactions were part of a tax fraud scheme operating from London. After closing legal loopholes in the UK it was taken over by Deutsche Bank and HypoVereinsbank; their past and present CEOs have been under investigation since December 2012.

[6]Monitoring inputs is easier than monitoring outputs, as the numbers of both substances and 'border gates' between biosphere and anthroposphere are more limited on the input side (Spangenberg *et al.*, 1998).

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(Schumpeter, 1981). Tough times are to be expected in a slimming economy, and new distribution patterns and mechanisms are plausibly needed to avoid hardship and social unsustainability.

Some Thoughts on the Political Economy of Dematerialization

Decreasing resource availability for production and consumption? The immediate suspicion is that this implies rationing, a war time economy.[7] However, this is not necessarily the answer to the problem: rationing indeed implies or is applied if there are limits to availability, but it also includes a specific allocation mechanism. The market, obviously, is another one, central planning one more, and the feudalist privilege economy an even more outdated one. Each societal formation (feudalism, socialism, capitalism) has its own set of distribution and allocation mechanisms. Formations span from absolute to constitutional monarchism, from the Manchester to the Rheinish version of capitalism, or from the Yugoslav to the Soviet and the Maoist models of socialism. Each of them has a wide range of options regarding how resources are allocated.

Slimming the physical economy is an environmental necessity, requiring a boost in efficiency and a breakthrough for sufficiency. Implementing it is inevitably associated with major changes in economy and society. On the one hand, the power structures and institutional settings have to change to make the implementation of such policies possible (Kallis *et al.*, 2012; Lawn, 2011). The politically enforced nuclear phaseout in Germany and Italy, and the ban on shale gas exploitation in France and Bulgaria, are examples of such a change, albeit at a smaller scale. It is essentially a matter of power, an institutional question rather than one of the economic system, and it would be a challenge in socialist as much as it is one in capitalist countries.

On the other hand, resource capping would change the conditions of production and consumption, and thus the development trajectory of every economy and society embarking on such a course. If effective, it would change the three main drivers of economic growth:

1. the monetary system with money creating banks, credit and interest (Binswanger, after an in-depth analysis of the push and pull factors in particular in the financial system, considers a low BIP growth rate of 1–2% for the global economy as necessary; Binswanger, 2009);
2. the profit seeking of companies, requiring a massive change (Altvater, 2005) or an end to capitalism and its accumulation regime (Schwartzmann, 2012; Smith, 2010);
3. unsustainable demand, mainly from household consumption (Paech (2012) argues that consumer demand drives the economy and propagates local self-supply Murtaza (2011) advocates the pursuit of wisdom instead of wealth).

Probably all three mechanisms play a role, if not kept in check; and their effects must be compensated within the system, or the system as a whole needs to be replaced. This has been called a Great Transition (Raskin *et al.*, 2002), a new social contract for a world in transition (German Advisory Council on Global Change (WBGU), 2011) or socialism/communism (Foster, 2011).

In particular, if the monetary system via banks and interest creates increasing flows of money, it must either be stopped, by leverage conditions, Islamic banking or Gesell's '*Schwundgeld*', or there must be sinks other than inflation, bankrupcy or confiscation (Daly, 2011). If profit on the micro level drives growth on the macro level, either the profit motive must be suppressed, or politics must make sure that micro level growth does not lead to an increase in the aggregate, i.e. some agents must disappear together with (some of) their assets. If demand drives growth, either some demand must go unmet, if not suppressed, or new ways must be found to provide real satisfiers for human needs not creating additional wants (Spangenberg *et al.*, 2010). Resource capping, as a macro-economic measure, offers an opportunity to address the first two challenges.

However, it is no stand-alone measure and must be handled in a context sensitive manner (Kallis *et al.*, 2012). Unlike what Alcott claims (2008, 2010, 2012), efficiency, sufficiency and labour market/working time policies are needed to prepare and smoothen the introduction of caps, but he is right in stating that capping is the only strategy directly and effectively addressing the impact side (Spangenberg, 2012).

[7]Surprisingly, rationing is deemed acceptable by the majority of UK citizens if only a just distribution is guaranteed (Redclift, 2012).

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Resource capping would be the end of capitalism as we know it, but not necessarily the end of capitalism as such. While a capitalist economy necessarily has an in-built growth impetus resulting from its basic profit seeking and accumulation driver (it is not only the current design of capitalism, as Lawn (2011) argues), society can set externally defined limitations for the size of the economy. However, this economy – however it may be labelled – will be very different from the current one (Victor, 2008; Flipo and Schneider, 2008; Jackson, 2009; Research and Degrowth, 2010; Klitgaard and Krall, 2012; Kallis *et al.*, 2012). In the end, it is not the choice between two '-isms' we have to make; in between free markets and central plans there is the real world of different brands of mixed economies. Such a pseudo-alternative is a dogma, constructed as a means to protect the status quo against its critics. It is labelling every substantial change (and often even non-substantial ones) as 'socialist' and thus unthinkable in the USA, parts of Western and much of Eastern Europe.

Such a dichotomic world view overlooks important allocation mechanisms already existing at our fingertips. The thought experiment conducted here does not deal with the challenge of power, how to get a cap established and enforced, but with its outcomes. In turn, demonstrating that a steady state does not imply socialism, totalitarianism or Stalinism, but offers choices regarding ownership structures and allocation mechanisms, can be crucial to muster support for such a transition. Some public support already exists: the Resource Cap Coalition is a new Europe-wide civil society initiative, concordant with the 'Enough is enough' initiative in the UK, the post-growth activism in Germany and much of the *décroissance* discourse in France, Italy and Spain (Martinez-Alier, 2010). As each political initiative needs an idea (or an ideology in the sense of Söderbaum (1999) and Marovic (2012)) to emerge into a politically relevant movement, the value of conceptual work should not be underestimated.

Allocation Alternatives

Taking a closer look at the character of the goods to be allocated in a modern economy beyond resources, it is necessary to analyse the general allocation mechanisms available in such a society and its economy. They can be classified as market goods, merit goods, public goods and citizens' or inhabitants' entitlements. For instance, a passport, and with it the freedom to travel abroad, is nowadays considered a citizen's entitlement. It distinguishes citizens and other inhabitants, and it is not for sale, except in the case of corruption, essentially a phenomenon of transforming non-market goods into tradable commodities. In the former Soviet Bloc, however, passports were a merit good: only distinguished and trusted persons had access to them. In continental Europe, high class primary to tertiary education has long been considered a public good, unlike in the USA. Even today, when tutorial fees are introduced to create market structures supposed to enhance the efficiency while actually impinging on productivity, there are sponsorship and credit programs to keep up the illusion of equal access for everybody. Traditional rights, still upheld, guarantee public access to lake shores in Sweden, even if the land itself is privately owned, making access a public good and an entitlement for all inhabitants.

Although these categories seem to be rather generic, different people will most probably prefer different classifications for different goods. Few would opt for washing machines to be distributed according to merits, but also few would consider voting rights as market goods. They are citizens' entitlements, and free access to kindergartens or universities, and social security provision could be one of all inhabitants. A sustainable society must respond to its citizens' preferences, establishing the chosen mechanism as part of its economy.

Distribution Challenges and Ownership Issues

Social concerns are of growing importance in the case of an economy first dematerializing and – at a lower physical size – entering into a steady state (Daly, 1974; Czech and Daly, 2004). In such a society, whatever net surplus is generated by a company after reinvestment and before tax, it must be shared between three

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groups. The owners will claim profit regardless of state or private ownership, the workers demand salaries and social security payments, and the state charges taxes and fees financing public expenditures such as investments or health care and transfers such as public pensions. Social security payments in this context include company in-house pension schemes, market based pensions and private health care systems, mandatory or voluntary. They are all impinging on salaries and disposable income. Thus, besides the business sector, private income would also be affected by a resource cap, and in the case of zero economic growth the average would not grow in real terms unless the share of profits or taxes is reduced. The median income could still increase as a result of redistribution, and the average could decrease if working hours are cut more than the productivity increases, to combat unemployment.

However, with a cap inhibiting physical growth, leading to lowered economic growth rates (maybe zero or negative depending on the cap's discount rate), even median incomes might be reduced if the limited amount of money and resources available is allocated to other priorities, be it business surplus, including profits but also the investement and research financing necessary in a competitive physically slimming economy, or public expenditures: this is a matter of power. In general, but in particular in such a case, to sustain the standard of living the efficiency of service provision and satisfaction generation per good consumed must be enhanced. As private ownership of long-lived consumption goods tends to lead to highly inefficient service provision to service consumption ratios, it would be plausible to strengthen the role of entitlements, public and common pool goods (Spangenberg *et al.*, 2010). Making good use of them should be considered as a strategy of enhancing public welfare. Wherever they have been artificially privatized, re-establishing the public access would allow more people to benefit from them, an element of delinking the standard of living from monetary income. This also applies to 'non-material goods' such as internet communication: the production of a current office computer causes 1.3 tons of CO_2 emissions (i.e. excluding energy consumption in use), while the permissible annual emissions per capita in line with limiting global warming to 2 °C is about 1.7–1.8 tons in 2050. Thus the permanent performance upgrading and rapid obsolescence is unsustainable. Universal access to such services requires sharing as well (Coutrot and Gadrey, 2012).

While the vast majority of goods in such a modified economic system might retain their character as private goods, this does not necessarily imply that they must be allocated through markets. The character of the goods should be the basis of choosing the most appropriate allocation mechanism, including extra-market exchange mechanisms such as sharing, freeware or mutualism.

Strengthening the commons does not necessarily imply abolishing private ownership of the means of production. As far as ownership distinguishes capitalism and socialism, a transition towards sustainability would apply to and transform both systems. Instead, ownership structures should correspond to the classification of the respective goods in the respective society, a political decision which may be different between different countries. Only from an ideological stance, the result of this decision process is clear ex ante; for instance, Smith claims that 'state owned planned industries generally provide better service at lower cost than private industries' (Smith, 2010). If he was thinking of the British railway system privatization he obviously has a point, but a point is not enough for a general statement. Telecom services throughout Europe have become better and cheaper since privatization, for instance. Thus the ownership should correspond to the character of the goods provided to allow for maximum service quality. The outcome will vary between goods, and probably between countries. Similar differences might emerge when privately provided goods are complemented by politically set norms and standards, for the protection and to the benefit of consumers.

A Market Without Growth?

Imagine a steady state economy, not growing in monetary and shrinking in physical terms, with a mixed ownership structure and diverse allocation mechanisms, with the market still playing an important role: the thought experiment draws on a wide range of political economy traditions, including conservative, liberal and socialist ideas, but can this work out? It is easy to foresee the scepticism, claiming that if there are a market and private property and thus capitalism, social and ecological constraints cannot work. Regardless of all political intentions and interventions, the market process would determine the scale of such an economy. Demand for profits drives the capitalist economy, and maximizing profits implies maximum growth.

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However, the experiment postulates a cap on resource consumption, and this alters the rules of the game: decreasing resource availability, while stimulating resource productivity development, would set limits for economic growth. Given the substantiated doubts whether a capitalist economy, with profit driven, private property based market exchange as one constitutive element, can at all be brought to a no-growth state without a collapse, what would capping imply for a capitalist economy?

To the simple mind it sounds plausible: if profit is the driving force for the representative economic agents, and if profit of the economic agents means economic growth, the result is that either the cake is growing or the motivation is lost. Without the prospect of profit, the representative agent will not see any sense in maintaining his (never her) economic activity, and thus will not bake cakes anymore. Thus non-growing cakes are a contradiction in terms: the cake is either growing, or there will be nobody willing to bake it. Move or drop – the old bicycle metaphor is still thought to hold. Fortunately, life isn't that simple, nor is the economy, and economics need not be so. So it may be time to think about whether in reality there are support wheels stabilizing the economy at zero growth velocity.

The first hypothesis to be questioned is that when the economy as a whole does not grow, credit will dry out and the economy will collapse. It assumes that if there is no chance for aggregate surplus potential lenders (financial institutions and share buyers) would not see an opportunity for profitable investments and loans. As a consequence, they would keep their money and the financial markets would dry out. This is only plausible as long as we analyse the economy as consisting of representative agents, one banker, one producer, one consumer. But if we take but one step closer to reality, the Fata Morgana disappears. Just imagine two banks A and B, and two corporations: a winner Wi and a loser Lo. Both apply for credit, and the banks must make a choice. Of course, they will check the risk even more carefully than today (and again will be wrong time and again), but in the end they will make a choice, hoping to make a fortune by picking the right firm to lend to. Assuming bank A was right and bank B was wrong, what would be the result? Company Wi would make a profit, company Lo might go bust, bank A would make a profit and bank B would suffer from a loss. Both would continue lending as long as possible, A to continue success, B to make up for the losses. As soon we give up on conceptual oversimplifications, the risk of a standstill turns out to be an artefact of economic theory, not a threat from economic reality.

The same line of argumentation applies to shareholders and buyers, to the management (trying to make a profit would still be their objective and desire), to entrepreneurs and so forth: as long as some will grow, the situation is not structurally different from today, only the share of losers is higher and thus the competition fiercer. More companies would go bust, some start-ups would falter while others could thrive – all not too new, at least in principle. The innovation dynamic and with it competition would increase. To risk-taking managers not only keen to grow but to enhance their market share, more frequent bankruptcy of competitors might even be appealing. Therefore monopoly and cartel control would become more important than ever.

For corporate staff, this would imply a higher probability of losing their jobs due to employers' bankruptcy more often in their lives, which in turn would require adjustments in the respective benefit and transfer systems, mirroring the transition from lifelong employment to patchwork labor biographies. Labor productivity increases could only be compensated by reducing working hours at constant salaries. From a management point of view (and partly also for the staff), this would be a pretty stressing situation: creative destruction at its best.

The series of permanent bankruptcies is a form of rather steady capital destruction, unlike the simultaneous bust of many companies characterizing recessions and depressions of a growth bound economy. It is shedding off what a capitalist market economy tends to produce above the level of activity set as a maximum (the size of the economy, Daly would call it). While standard economics considers this a major flaw of any external limitation to growth, it is necessary to inhibit the macroeconomic effect of corporate growth. At the same time, capital destruction of corporations and banks limits the growth impulse from the credit and interest mechanism. This way a resource cap addresses two of the aforementioned drivers of economic growth and keeps them in check. For citizens, small savers and many employees this is not necessarily bad news. It would be a different mode of regulation as compared to the more recent path: from of a series of booms, bubbles and bursts, of capital accumulation and large scale destruction, the economy would shift to a more steady process. Given the distribution effects associated with the bubble–burst based mode of regulation, the shift would provide more stability; the risk would be more distributed and thus more manageable.

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Ownership Revisited

Private or state ownership of the means of production is not the decisive issue for degrowth. Ownership still matters, but the supposed dichotomy is oversimplifying the choice: some institutional forms of corporations enhance, and others moderate, the growth imperative. For instance, Nutzinger (1994) and others such as Blome-Drees (2012) suggest legal forms and ownership structures such as cooperatives with extended workers' self-management, community companies with extended citizens' influence, and foundations with more constitutional objectives than maximizing the corporate stock exchange rating, as less under pressure to provide maximum growth. Although the bottom line must be stable as a matter of economic sustainability, they can follow a broader set of company objectives and success criteria. Thus they can be more open to take the fringe benefits for the community, the staff members and/or their customers and stakeholders into account. Since they are not dependent on the development of quarterly success figures, they can more easily pursue long term strategies including resource productivity increases. Some have done so successfully for centuries.

Individual entrepreneurs are not as much under growth pressure as listed companies. Unlike limited companies, they carry the burden of full liability and accountability, often do not work with and most often do not speculate with other people's money; they are usually socially competent and rather risk averse.[8] This enables them – provided the framework conditions are set accordingly – to better take into account human needs not expressed as market demand, and staff needs not expressed as wage issues. Limited companies (Ltd, plc, GmbH etc.) may even turn out to represent an outdated business model.

Outlook

Western (post-)industrial societies are capitalist ones, but to a differing degree incorporate social, non-capitalist elements. The respective societies are characterized by a mixture of traits of liberal, conservative, socialist or communitarian origin. Thus capitalism has proven to be capable of adaptation and evolution into a more socially shaped formation in the aftermath of WW II, when labor was gradually decommodified. Spash (2002) stresses that this approach deserves to be reiterated and extended to environmental valuables such as biodiversity and climate.

However, even with all the changes of ownership forms and allocation mechanisms mentioned above, plus more for restructuring the finance industry and the money creation process, economic growth remains, albeit on a much lower level. There seems to be no way of modifying the *internal* structures of a profit driven market economy so as to achieve a not-at-all growing economy. This is where the resource capping comes in: it provides an *external* limitation, a kind of environmental framework establishing a maximum physical size and indirectly influencing the monetary size of the economy.

Introducing such an external restriction is a matter of political will. It would rewrite the rules of competition, alter innovation patterns and redirect the economic dynamic. This system may still be called capitalism, but it would not be capitalism as we know it. Neither would it be any kind of socialism known so far. It may be better to both escape the Procrustes' beds of traditional classifications and avoid wasting time discussing '-isms', and instead focus on strategies for to getting an effective resource capping into place.

In other words: a sustainable economy must pick the best elements of capitalism and socialism, and a sustainable society of liberalism, communitarianism and conservativism, plus foresight and innovative ideas, to derive solutions to present-day problems and future challenges (Spangenberg, 1995a). One '-ism', however, will be more important than ever: realism (and a sound dose of optimism).

[8]As economic genetics has shown, entrepreneurs tend not to be suffering from the set of genetic defects correlated with short term thinking and overly risk taking attitudes (see, e.g., Cesarini *et al.*, 2009; Kuhnen and Chiao, 2009; Zhong *et al.*, 2009). However, the jury is still out if their scientific results, and those of Wallace, Ebstein, Fehr, Rand, Schunk and others, are solid enough to consider bankers and brokers as genetic aberrations, deserving medical treatment – it will be interesting to watch the ongoing research.

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