



**S.A.P.I.E.N.S**

Surveys and Perspectives Integrating Environment and Society

**4.1 | 2011**  
**Vol.4 / n°1**

---

## Unsustainable Development: Could it be a Ponzi Scheme?

**Shobhana Madhavan et Robert Barrass**

Gaëll Mainguy (éd.)



**Édition électronique**

URL : <http://journals.openedition.org/sapiens/1083>

ISSN : 1993-3819

**Éditeur**

Institut Veolia

**Référence électronique**

Shobhana Madhavan et Robert Barrass, « Unsustainable Development: Could it be a Ponzi Scheme? », *S.A.P.I.E.N.S* [En ligne], 4.1 | 2011, mis en ligne le 16 mars 2011, consulté le 10 décembre 2020. URL : <http://journals.openedition.org/sapiens/1083>

---

Licence Creative Commons



## Perspectives

# Unsustainable Development: Could it be a Ponzi Scheme?

Shobhana Madhavan<sup>1</sup>, Robert Barrass<sup>2</sup>

1. Westminster Business School, University of Westminster.

2. Economic Consultant – Environment & Transport.

Correspondence to: madhavs@wmin.ac.uk

**Abstract** This paper explores the extent to which analogies can be drawn between unsustainable development and a Ponzi scheme. A Ponzi scheme is a type of fraudulent investment strategy and an extreme form of market failure caused by ill-informed decisions based on questionable criteria; the driving force is individual and collective deception and self-deception. Unsustainable development is possible because economic activities are frequently distanced, spatially and temporally, from their associated environmental impacts. As in a classic Ponzi scheme, this creates a separation between enjoyment of benefits and the disbenefit in the form of eventual unsustainability; the deception relates to disregard for, or concealment of, disbenefits and their inequitable incidence.

Analogies with Ponzi schemes can be perceived or implied in relation to resource depletion, environmental degradation or unsustainable living standards, and also when questions are raised concerning the justification of interventions ostensibly to promote sustainability. Most environmental concerns, particularly with medium- and long-term impacts, have the potential to generate such perceptions: examples include climate change, nuclear waste, hazardous wastes, toxic substances, soil degradation, declining biodiversity, and fish stock depletion.

Perspectives are influenced by the definition and scope of sustainability, the nature of technological change, time frames and time inconsistency, and concepts of equity. These factors reflect underlying tensions between the pursuit of sustainability and the free play of market forces, exacerbated by a dissonance between individual and collective rationality. The dilemmas are compounded by uncertainty, exacerbated by the inherent unpredictability of discontinuities. Consciousness, knowledge and awareness differ both conceptually and in degree, such that Ponzi-ism may even be inadvertent. The ultimate question then is what is known – when, by whom and in what way? The remedies lie in informed decision making, consensus on the key issues of equity and efficiency, and an explicit recognition of environmental property rights.

**Keywords:** Ponzi Scheme, Deception, Sustainable development, Environmental impacts, Inter-generational equity, Uncertainty

### TABLE OF CONTENTS

- 1 Ponzi schemes: individual and collective deception and self deception
- 2 Economic development and environmental impacts
- 3 Examples of spatial and temporal dissonance
- 4 Strong and weak sustainability
- 5 The nature of technological change
- 6 Time frames and time inconsistency
- 7 Discounting and inter-generational effects
- 8 Rationality
- 9 Uncertainty and Suspicion
- 10 Issues
- 11 In conclusion

## 1. PONZI SCHEMES: INDIVIDUAL AND COLLECTIVE DECEPTION AND SELF DECEPTION

“Environmental despoliation may... be conceived as kind of global Ponzi scheme, the early investors doing well, the later ones losing everything.” (Paulos, 1996, p.96).

A Ponzi scheme is a type of fraudulent investment strategy. Typically fraudsters promise very high returns, and use money from new recruits to the scheme to pay off early-stage investors, until the scheme gets so big that the inflow of new money is insufficient; at which point the scheme collapses amid losses and recriminations (Sander, 2009, p.2). The fraud is often assisted by intermediaries who are reckless and negligent, rather than dishonest, and who guide investors towards the scheme. The beneficiaries are either well-informed and dishonest (the scheme promoters), wilfully and negligently ill-informed (intermediaries), or ill-informed but fortunate (investors who withdraw their funds before the collapse). The victims, those left with worthless investments, are both ill-informed and unlucky.

This is in essence a form of market failure, characterised by extreme asymmetry of information. Investors are actively ill-informed: not only do the scheme promoters mislead and lie to them, but there is also an element of complicity on the part of those who fail properly to scrutinise the misinformation. Thus investors' judgement is distorted by a suspension of the disbelief that would otherwise caution them against opaque accounting and promises of implausibly high returns. In short, the victims believe what they want to believe.

A further essential precondition for the operation of a Ponzi scheme is a separation between the initial activity (the early investments) and the eventual outcome (the scheme's collapse). The separation is always temporal, but it might also be geographical and social. The victims suffer the consequences of the earlier action of the beneficiaries; victims' inability to detect the fraudulent nature of the scheme can be exacerbated by distance or by unfamiliarity with the nature of apparently sophisticated investment plans.

If sustainable development is a well-informed, rational and responsible approach to investing in society's future, then a development path without these features may be characterised as unsustainable.

In contrasting sustainability and unsustainability analogies can be drawn with the relationship between an honest investment and a Ponzi scheme. Unsustainable development is driven by individual and collective deception and self-deception. Economic activities are frequently distanced, spatially and temporally, from their associated environmental impacts. As in a classic Ponzi scheme, this creates a separation between enjoyment of benefits and the disbenefit in

the form of eventual unsustainability; the deception relates to disregard for, or concealment of, disbenefits and their inequitable incidence.

Paulos (1996, p.96) identifies the strong element of self-deception, and calls for action to “keep us from being our own Ponzis”. This begs a question: who are the “us”? The answer in general is anyone who benefits from economic activity that fails fully to cover its associated environmental costs, and who then suffers, financially or otherwise, from the ensuing environmental damage. Defined in this way, virtually the entire global population can be characterised as living, consciously or otherwise, in conditions created by fraud. However, culpability, and its degree, depends upon the incidence of economic activity and environmental damage.

While not necessarily involving explicit deception, entitlements over environmental capacity can have parallels with a Ponzi scheme. This is seen in the recognition of so-called grandfather rights, whereby existing usage is allowed to continue, effectively conferring a property right that can then be sold to newcomers. Although it can be seen as less equitable than the alternative procedure of auctioning the rights, grandfathering can be easier politically because it buys off opposition from established interest groups. Whether these property rights should be recognised is a question that tends to be obscured, with an implicit element of deception. Grandfathering on a global scale may be inferred from the perpetuation of extreme imbalances in the use of environmental resources: for instance does the United States have an entitlement to a level of per capita energy consumption approximately 16 times that of India?

Acknowledgement of the problem in general terms is often combined with specific denial of responsibility. The implicit line is that others may be Ponzis but we are on the whole victims. This is illustrated by “a senior official in the [Indian] foreign ministry [who] characterises America's line as ‘Guys with gross obesity telling guys just emerging from emaciation to go on an emergency diet’... India defends [its increased greenhouse gas emissions] on moral grounds: its people have the same right to wealth as anyone. Indeed, given their special vulnerability to climate problems, they have a particularly urgent need for economic development. After all, a factory worker with an air-conditioner will feel global warming less than a subsistence farmer will [sic]” (The Economist, 2008, p.30). While America may have more obesity than India, the solution to emaciation is not for wealthier people in India to join the ranks of the obese – just as if a Ponzi scheme is perpetrated by erstwhile victims, that does not make it a legitimate investment.

The scope for Ponzi-ism is enhanced where environmental property rights are ill-defined. The phenomenon is illustrated by the often perverse results of programmes designed to help potential victims, which are distorted by rent-seeking



behaviour taking advantage of a lack of transparency in programme management and with respect to property rights. The outcome can be an increase in the burden of environmental damage borne by the intended beneficiaries. For instance, the Indian Drought-Prone Areas Programme (DPAP) has provided assistance for districts “with an abundance of rainfall – but where one section, the poor, can suffer acute drought”. This has led to a misallocation of water resources: “around 73 percent of sugar cane produced in the state [of Maharashtra] is grown in DPAP blocks! And sugar cane is the most water-intensive crop you can get” (Sainath, 1996, p.319). A situation where “about two percent of farmers in the state use around 70 percent of [irrigation water]” leads to “an agricultural drought, even where there is no meteorological drought. That is, you can have adequate rainfall and still have crop failure” (Sainath, 1996, p.320). If the poor had access to water as a property right, it might be more effectively and equitably managed.

A quite different perspective is offered by Lomborg, who perceives an inherent bias towards negativity in perceptions of the quality of the environment, such that “the stream of information we receive is inherently lopsided”. He sees difficulty in compensating for this bias because “historically and perhaps biologically we are disposed to welcome negative news” (Lomborg, 2001, p.42). The predisposition towards negativity is certainly not manifested in Ponzi scheme investors, who tend to disregard bad news in a willing suspension of disbelief when offered returns that are literally too good to be true.

Nevertheless, “we need to confront our myth of the economy undercutting the environment” (Lomborg, 2001, p.32). The inference is that “we” are engaged in self-deception. In Lomborg’s view this deception is reinforced by environmentalists who preach “the litany of our ever deteriorating environment” (Lomborg, 2001, p.3), which suggests that, whatever their motivations, the “litanists” might be some species of Ponzi.

On the other hand, the “litanists” could claim that there is an element of Ponzi-ism in holding out the prospect of ever-increasing prosperity while downplaying environmental risks. Lomborg presents a massive assemblage of environmental “facts”; but it must be recognised that change is constant, and new challenges are always in prospect (see below; for further discussion of Lomborg’s perspective see Barrass, 2003).

## 2. ECONOMIC DEVELOPMENT AND ENVIRONMENTAL IMPACTS

A Ponzi scheme carries the certainty of its own demise. Economic development, depending upon its sustainability, has the potential for its own destruction. Sachs (2009, pp.80-81) identifies a “paradox of enrichment”, whereby “humanity’s vital success in appropriating the Earth’s riches could also prove to be its downfall”, leading from “the transitory successes of industrialization to the point of ecological collapse”.

The market economy has similarities with evolutionary biology in which short-term success can lead to a long-term dead end. Competition is analogous with the intra-species “arms race” (Dawkins, 2009, p.383): although “natural selection can drive a population to extinction... [it] will still favour the most competitive individuals right up to the moment when the last one dies.” (Dawkins, 2009, p.390). Markets typically exhibit impatience, discounting the future at the expense of long term survival: for instance slow growing species can be harvested unsustainably, resulting in a loss of biodiversity (Sachs, 2009, pp. 39-41).

Processes of change may be abrupt or gradual, and each carries potential threats. Extremely complex processes can have sudden dramatic impacts, produced by an interaction of causative factors. Thus “when a natural system is characterized by thresholds combined with positive feedbacks, it is also likely to be characterized by abrupt changes [resulting from] a chain reaction of positive feedbacks” (Sachs, 2009, p.79). Human actions without regard to, or in ignorance of, the pressures that are generated on ecological systems can lead to “severe and unanticipated consequences” (Sachs, 2009, p.79).

## 3. EXAMPLES OF SPATIAL AND TEMPORAL DISSONANCE

A Ponzi scheme requires separation between benefits to perpetrators and impacts on victims. Similarly, unsustainable development can be a consequence of the uneven spatial and temporal incidence of economic development and environmental impacts. Most environmental impacts, particularly those with an extended time frame, have the potential to generate a Ponzi-like separation of benefits and ultimate costs: examples include climate change, radioactive waste management, hazardous wastes, the use of toxic substances, soil degradation, declining biodiversity, and fish stock depletion.

One instance is graphically described by Jared Diamond as follows: “despite Montanans’ long-standing embrace of mining... some... now say in retrospect when we compare the multi-billion dollar mine clean-up costs borne by us taxpayers with Montana’s own meagre past earnings from its mines... we realize that Montana would have been better off in the long run if it had never mined copper at all” (Diamond, 2005, p.38). The extraction of benefits leaving eventual environmental damage costs to others has a strong element of Ponzi-ism: “until 1971, mining companies in Montana on closing down a mine just left it... because the state of Montana had no law requiring companies to clean up after mine closures.” (Diamond, 2005, p.428).

## 4. STRONG AND WEAK SUSTAINABILITY

The fraud inherent in a Ponzi scheme lies in the victims’ deprivation of an entitlement that they had been promised. In the context of sustainability this raises a question as to what

precisely is involved in a commitment to sustainable development; and, conversely, what is the nature of any breach of trust if a development path proves to be unsustainable.

While there may be a wide agreement that economic activity should be sustainable, the nature of sustainability is often ill-defined. There are two definitions of sustainability, strong and weak, and in practice the commitment would seem to lie somewhere in a range between these extremes, perhaps veering towards the weak version.

The difference between strong and weak sustainability lies in the distinction between natural and man-made capital and the degree of substitutability between them. Strong sustainability may be defined as requiring maintenance of the aggregate and the natural capital stock, or preservation of the physical stock of critical natural capital, that is capital that cannot be substituted by man-made capital (Neumayer, 1999, p.27). Weak sustainability has less stringent pre-conditions, requiring only that the value of the aggregate stock be maintained; this implies substitutability between natural and man-made capital (Neumayer, 1999, p.23).

In practice this means that the use of energy from fossil fuels and nuclear power drives the economic growth that can provide resources for future generations to combat the effects of climate change and manage the legacy of nuclear wastes. It can even be consistent with strong sustainability if the gains from conventional energy production are invested in development of renewable energy (Neumayer, 1999, p.27). If this does not happen, future generations will have been given false promises, like the victims of Ponzi schemes.

Unsustainability can be manifested in various ways:

- 1 Depletion of environmental resources and assimilative capacity.
- 2 A legacy of environmental degradation that must be managed.
- 3 Living standards are unsustainable, and will be lower in the future.

Of these, 3 is clearly a case of unsustainable development. Both 1 and 2 could be consistent with weak sustainability, provided that there is sufficient investment to make provision for adaptive and remedial measures. Even strong sustainability might be accommodated, but only if there is no effect on critical natural capital.

The implication of these insights is that sustainability is achieved by indirect targeting. There is an analogy with rocket science, whereby spacecraft make use of gravitational forces in following an elliptical course. This concept of a sustainability trajectory is illustrated by the conclusions drawn from Nordhaus' Dynamic Integrated Model of Climate and the Economy (DICE), that "little should be done to reduce carbon

emissions in the near future; that controls on carbon should be put into effect in an increasing, but gradual manner, starting several decades from now... that it would be more equitable (and efficient) to invest in physical and human capital now, so as to build up the productive base of economies (including, especially, poor countries), and divert funds to meet the problems of climate change at a later year" (Dasgupta, p.5).

However, it is necessary to ensure that the productive investment is of the right sort, and does not exacerbate the problem. The inherent difficulties have been described as follows: "both "weak" and "strong" criteria... imply a centralized decision-making process and a decision-making process and a decision maker who decides on behalf of "society" among alternative programs and plans. But the real world is not at all like that. In reality, virtually all economic decisions are decentralized among many much narrower interests... Even with the best intentions as regards future generations and planetary welfare, most decision-makers will optimize within a much narrower context" (Ayres et al., 1998, pp.11-12).

The problems may be particularly acute, as in the case of climate change, where a coordinated response is required in the face of a global threat. At the 2009 Copenhagen Climate Change Summit, the G77 developing countries group called for a UN body "with powers to direct a worldwide transition away from a high-carbon economy" (Jha, 2009). The difficulty would be to reconcile top-down "direction" with the often ill-directed and bottom-up nature of innovation and technological change.

With respect to the Ponzi scheme potential, the key issue is the scope for deception: a misrepresentation of the viability of current living standards (case 3) or of the level of investment needed, or allocated, to ensure weak or strong sustainability. This in turn raises questions concerning incentives to deception and the structures that can prevent it.

## 5. THE NATURE OF TECHNOLOGICAL CHANGE

To avoid being "our own Ponzis", it is vital that the structure of incentives should point towards sustainable development. Substitution of natural with man-made capital will not necessarily secure sustainability, even in its weak form. Everything depends on the character and use of the man-made capital, and specifically the nature of technological change. If insufficient attention is given to the wider impacts, the result can be economic inefficiency and ultimate unsustainability.

The history of industrial development following World War II illustrates the dangers of unsustainability and the consequent need for remedial action to return development to a sustainable path. The 1972 United Nations Conference on the Human Environment (UN, 1972) noted "man's capability to... enhance the quality of life", but also to do "incalculable harm to human beings and the human environment", and



drew attention to “dangerous levels of pollution in water, air, earth and living beings; major and undesirable disturbances to the ecological balance of the biosphere; destruction and depletion of irreplaceable resources; and gross deficiencies, harmful to the physical, mental and social health of man, in the man-made environment, particularly in the living and working environment”, leading to “a point... in history when we must shape our actions throughout the world with a more prudent care for their environmental consequences”. This UN Conference can be seen as a turning point, prompting awareness of the unsustainability of the development path followed in the nineteen fifties and sixties, and of the consequent need to remedy the backlog of environmental neglect. This thinking influenced the development of policy initiatives, such as – for instance – the European Community’s first environmental action programme, inaugurated in 1973 (see European Community, 1973).

The effect of malign incentives is well illustrated by the history of the EU Common Agricultural Policy (CAP). The main objectives of the CAP, specified in the 1957 EEC Treaty, were to increase agricultural productivity and ensure security of supply. Price supports gave incentives for increasing production, and agricultural development was principally geared to raising output. The consequence was to generate agricultural surpluses through intensive farming, with serious consequences for the environment from over-use of fertilisers and pesticides. Re-orientation of incentives to promote more environmentally friendly technologies and farming techniques proved a tortuous process: initially various environmentally related incentive mechanisms were added on piecemeal, greatly complicating the policy without clear gains for the environment (for further details of this phase of the CAP, see Barrass & Madhavan, 1996, pp.264-65).

## 6. TIME FRAMES AND TIME INCONSISTENCY

If unsustainable development is indeed a Ponzi scheme, its scope is wider and its timescale longer than that of the conventional fraudulent scheme. The environmental medium-term can stretch over decades, as the consequences of neglect take time to become manifest. The long-term is defined in terms of generations. The differences in time frame can be represented as follows:

*Conventional Ponzi scheme:* early participants’ “returns” are financed by payments received from subsequent participants, rather than yields on investments, so that the scheme ultimately collapses leaving investors with little or nothing.

*Environmental Medium-term:* industrial development is undertaken without regard to environmental protection, leaving a legacy of environmental damage (and hence remedial costs), such that subsequent industrialisation is severely constrained in its use of the diminished absorptive capacity of the environment.

*Environmental Long-term:* potential inter-generational impacts are especially problematical, because of the long time scales and because the victims (or beneficiaries) are as yet unborn, and therefore unable directly to influence present day decisions.

The argument that present day economic activity is defrauding the future has been eloquently put by Joe Romm: “we created a way of raising standards of living that we can’t possibly pass on to our children, We have been getting rich by depleting all our natural stocks — water, hydrocarbons, forests, rivers, fish and arable land — and not by generating renewable flows” (Friedman, 2009).

The differences and similarities are summarised in table 1.

Conventional Ponzi	Environmental Medium-term	Environmental Long-term [intergenerational]
Victims volunteer	Victims denied opportunity	Victims not yet born
Terms for participation appear favourable	Terms for participation are unfavourable	Victims have no choices
High rates of return	Returns inflated by lack of provision for damage costs	Positive discount rates
Recovery more time-dependent than asset-dependent (investors make money if they withdraw before the collapse).	Recovery both asset- and time-dependent (impacts depend on the intensity of damaging activities and timing of remedial actions).	Recovery more asset-dependent than time-dependent (impacts depend on technology and the nature, not the timing, of investment).
Explicit fraud on identifiable victims	Degree of “fraud” depends on the transparency and effectiveness of protection measures	Intention not explicit; victims unknowable

Table 1: Comparison of Ponzi schemes and environmental degradation.

Long timescales can give rise to time inconsistency: parameters within the decision framework are not necessarily fixed for all time. One example might be where a carbon tax succeeds in inducing investment in low carbon technology, and the government can then reduce the carbon tax to achieve other objectives. The consequence can either be that those subject to the tax perceive deception on the part of the authorities, or that anticipation of the relaxation of the tax prevents it from having the desired incentive effect (see Helm et al., 2004).

More generally, the values of future generations are unlikely to be the same as those prevailing today, and valuations and trade-offs may be very different. The choices that are faced in the future, and their relative attraction, are an – uncertain – function of decisions that are made in the present. In a weak sustainability scenario economic growth is supposed to provide resources for future generations to protect the quality of



their environment. However, the qualitative nature of growth, and the sort of technologies that are generated, sets the context for future choices. Without some quality assurance, there may be a perception of a potential Ponzi scheme.

## 7. DISCOUNTING AND INTER-GENERATIONAL EFFECTS

A pervasive problem in sustainable development is a multiplicity of timescales. Time horizons range from the political to the geological. The former was encapsulated in the famous remark by a British Prime minister that “a week is a long time in politics”. In geological time the length of a human lifespan, and indeed of the existence of humanity itself, is negligible. Change over geological time, although profound, would be of little significance for humans if it were gradual and continuous; however, discontinuities that bring about catastrophic change are potentially an immense threat with incalculable consequences.

The evidence of biology might suggest that nature favours short time horizons: thus “evolution’s favoring of organisms that respond to local or near-term events results in a steep... discount rate for distant... events (Paulos, 1996, p.96). On the other hand sustainability implies an ethical position such as the Rawlsian just saving principle, whereby each generation altruistically cares for its successor, such that a generation’s well-being “depends not only on its own consumption level, but also on its descendents’ consumption levels” (Dasgupta, 2005, p.9).

The inter-generational impacts of a development path only become apparent beyond any decision-making time horizon defined with reference to conventional economic criteria. In economic analysis the time horizon is conceived in two ways. For practical purposes it is implicit in the use of a discount rate that defines relative valuations of distant and near events; if a cost or benefit is sufficiently far into the future, discounting will render its present value negligible. The horizon can also be set with reference to the short run, in which there is only limited scope for adjustment; this is distinguished from the long run, in which all factors are variable, and in which, as J M Keynes memorably remarked, “we are all dead”.

In order to ensure that the possibilities of unsustainability are not obscured, it is necessary to think beyond the time horizon. In which case it is necessary to consider the basis for discounting future costs and benefits in the very long term: and unfortunately “the biggest uncertainty of all... is the uncertainty about which interest rate to use for discounting” (Weitzman, 2007, p.705). Positive discount rates are normally justified on the basis of future economic growth (so that the marginal utility of future consumption is less than that of present consumption) and a pure time preference for enjoyment earlier rather than later. The latter implies a question: whose preferences? It makes sense for an individual (or group

of individuals) making judgements about the timing of their own consumption now and in the future, but its ethical basis is dubious in inter-generational welfare comparisons. This issue is faced in the Stern Report to the UK government on climate change, which states that “a future generation... has the same claim on our ethical attention as the current one” (Stern, 2006, p.31). In other words there must be inter-generational equity. One possible inference is that, if we do not give equal weight to the interests of future generations, we become the moral equivalent of Ponzi fraudsters, who most certainly put their own interests ahead of those of their victims.

On the other hand, there is no obligation to give priority to future generations over the interests of the existing population. Dasgupta (2005, p.15) shows that the optimum inter-generational allocation of consumption should reflect both the concern for inter-generational equity in consumption and the rate of discount for future well-being. So it is legitimate to make allowance for the benefit that will derive from economic growth, indeed it would be economically inefficient not to do so: but this raises questions as to what is a reasonable estimate of uncertain future growth, and (more fundamentally) what is a reasonable procedure for making the estimate in a way that avoids a bias in favour of the short-term.

One reason for very high (implicit) discount rates, with no thought to future generations, is immediate threats to survival. Such is the situation of those who are “desperately poor and think only of food for the next day” (Diamond, 2005, p.434). Even otherwise, the often criticised short-term focus of the stock markets, favouring investment with a short pay-back period, implies high discount rates. There is evidently a dissonance between the immediate considerations driving a preoccupation with the short-term, and the low discount rates required to meet concerns for inter-generational equity.

## 8. RATIONALITY

The perpetrators of a Ponzi scheme are acting rationally, albeit unethically and illegally, insofar as the short term benefit to themselves of their deception outweighs the eventual penalties and opprobrium visited upon them when the scheme collapses. By the same token a disregard for future generations can be rational. For instance, a high rate of time preference implies a premise that the interests of the present generation should have priority; on this basis unsustainability is rational, if ethically questionable. Furthermore extreme unsustainability can be self-fulfilling: if the worst case – human extinction – is already unavoidable, a high rate of time preference would clearly be rational.

It is a sobering thought that behaviour that is, in economic terms, rational can lead to extinction. With a sufficiently high, and constant, discount rate a stream of utility lasting for a finite time can have a higher present value than a lower utility stream of infinite duration; for example, if the discount rate is



5 percent per year, \$131 per year for 30 years would have a higher present value than \$100 per year forever (for a formal proof of this proposition see Neumayer, 1999, pp.212-13). This means that “we” acting as “our own Ponzis” (Paulos, 1996, p.96), and following the rules of economic rationality, would be in a position analogous to investors who cash in their excessive returns before the scheme collapses.

Self-deception, in contrast, is not rational. It is confused, and manifested in apparent inconsistency in the ranking of preferences and between short and long-term preferences. Individuals can have multiple, and inconsistent, preferences: for example consumers of unhealthy junk food may nevertheless acknowledge that their optimal choice would be healthy organic food (see George, 2001, p.25). Similarly, “the best way to understand how we could be rational in our perception of the risks and probabilities and, at the same time, be foolish in acting on them, would be to have a conversation with a cigarette smoker” (Taleb, 2004, p.215).

Ponzi schemes typically thrive in a chaotic mixture of deception and self-deception. This was exemplified in the febrile atmosphere leading up to the 2008 crisis in global banking. Securitisation of mortgage payments (including those on low-quality sub-prime mortgages) resulted in extremely complex financial instruments which, notwithstanding the sub-prime element, were given highest, triple A, rating. Accurate assessments of the risks was extremely difficult, so “investors relied on the ratings agencies to guide them... which seemed a rational easy solution to contending with the complexity” (Tett, 2009, p.117). Unfortunately the agencies were beset by conflicts of interest between their duties to investors who bought securities and to the banks who sold them, and who were the agencies’ paymasters. Thus “banks constantly threatened to boycott the [ratings] agencies if they failed to produce the wished for ratings, jeopardising the sizeable fees the agencies earned from the banks” (Tett, 2009, p.119).

Societal responses to environmental pressures exhibit similar confusions. Jared Diamond draws attention to the influence of institutions (political, economic and social) and cultural values (Diamond, 2005, pp.14-15), which can result in a mixture of rational bad behaviour, disastrous values, unsuccessful solutions (Diamond, 2005, pp.427-37).

Possible failings include a lack of:

- *Anticipation* Problems are unprecedented, or the precedents are forgotten, or are misperceived because false analogies are drawn. Example: the introduction of alien species in Australia, which “with the benefits of hindsight we now view as incredibly stupid” (Diamond, 2005, p.421).
- *Perception* Problems develop invisibly, perhaps as a long-term trend with short term fluctuations: climate change is a prominent example (Diamond, 2005, pp. 424-25).

- *A will to address problems* What is rational for segments of society is not necessarily rational from the viewpoint of the long-term interest of society as a whole. For instance logging companies can make a Ponzi-style profit from deforestation, but at the expense of biodiversity and indigenous populations reliant on forest products (Diamond, 2005, p.421).

## 9. UNCERTAINTY AND SUSPICION

Uncertain conditions and an uncertain future generate scope for deception and – especially – for self-deception. The interaction over time between human activity and the natural environment amounts to an extremely – almost inconceivably – complex system.

The state of uncertainty is normally defined as one in which it is not possible to attach a probability to known outcomes. A situation in which the nature of the outcomes is also unknown can be characterised as a state of ignorance (see EEA, 2001, p.192). However, in an uncertain world the concept of a “known” probability has an element of contradiction: for example, there can be much less confidence in the estimated probabilities of global temperature increases than in the probability of a coin toss coming out “heads” (conflation of these notions of probability is characterised by Taleb (2007, p.125) as the “ludic fallacy”). It is also conceivable that ideas of the probability of an outcome are firmer than the understanding of the nature of this outcome, a situation that can be characterised as chaotic suspicion.

Uncertainty, ignorance and suspicion are a reflection of the complexity of the human life support system. In the face of a complex reality simplification is a legitimate analytical device, but the limits of knowledge should be acknowledged. Deception arises when reassurance is sought, or offered, through false knowledge, involving a misrepresentation – conscious or otherwise – of the underlying realities.

One way to avoid thinking about complexity is through inertia, with uncritical extrapolation from the past to the future. This is indeed what Ponzi scheme promoters encourage in their victims: a complacent belief that implausibly high returns apparently delivered in the past will continue in the future.

To assume the continuation of present trends – business as usual – is to run the risk that development will proceed onto an unsustainable path, perhaps becoming destabilised by climate change, or conflicts over water resources, or pressures on land use. This failure of anticipation is a criticism that can be made of Lomborg’s sceptical environmentalism, which attacks “litanists” who – allegedly – see all round deterioration in environmental quality (Lomborg, 2001). In fact, environmentalists claim credit for improvements, such as better atmospheric quality due to pollution control measures and cleaner production techniques (see Barrass, 2003).



Past success stories are in the past: the challenge is to be prepared for future eventualities. This proposition can be illustrated in the history of European environmental policy. The first European Community environmental action programme (European Community, 1973) was concerned to remedy an inheritance of previous environmental neglect, particularly with reference to air and water quality; there was no mention of issues that subsequently became prominent on the environmental policy agenda, such as climate change, nuclear waste management, ozone layer depletion and soil degradation.

Anticipation, and the lack of it, are of course much evident in hindsight. Looking forward, beset by uncertainty, deception can be perceived in the (contradictory) forms both of alarmism and complacency. Past experience suggests that hitherto unanticipated issues will in the future rise to prominence on the environmental agenda.

## 10. ISSUES

An analogy between unsustainable development and a Ponzi scheme prompts questions as to the identity of the Ponzis and of their victims. On one level the answer is quite simple: anyone whose activities are damaging and who fails to offset, or compensate for, the damage caused is complicit in Ponzi-like behaviour; and anyone who suffers as a result of that damage is a victim. However, if Ponzi-ism is viewed in terms of motivations and consciousness the issues are quite complex.

The perpetrators of Ponzi schemes do not necessarily set out to defraud. A momentum can develop in which fraudulent behaviour is the only way to keep the scheme going; and the fraudster may be in denial over what outsiders eventually see with hindsight as the inevitability of its collapse. This is, for instance, one possible explanation for the behaviour of Bernard Madoff, famous for running a \$50bn Ponzi scheme (Sander, 2009, p.206).

Similarly, no rational individuals or society deliberately set out on an unsustainable development path. Yet, as Jared Diamond points out, societal collapse is a historical phenomenon. The reasons for this are mixed: dogma, inflexibility, ignorance. Perhaps most fundamental is unawareness of the possibility of collapse: a society in denial cannot avert disaster. Humans are aware of their own mortality, but for the most part choose not to think about it. At a societal level there is even less willingness to contemplate demise: the implicit assumption, in the post-Enlightenment world, is usually optimistic – at least until confronted by unassailable evidence of looming danger.

So the Ponzi-ism associated with unsustainability is most likely to be inadvertent, the result of reckless rather than deliberate behaviour: economic development without thought to the consequences. The victims' inability to gain redress may be a result

of powerlessness, of diffusion of the damage (such that people can be simultaneously a Ponzi and a victim), or (in the case of inter-generational effects) of non-existence in the present.

Equity and economic efficiency are the twin pillars of sustainable development. A failure to take proper account of all the costs of economic activity, both now and in the future, is inefficient. The weightings given to future costs (and benefits) should be equitable between generations. Thus the key to awareness is a better understanding of our development path: and a precondition for this is a conscious will to achieve this understanding. This will diminish the scope for Ponzi-ism by default.

There are certain specific steps that will deter Ponzi-ism. One is an assertion of societal property rights, so that there is a clear interest in avoidance of victimhood. Another step is to make more explicit the nature of trusteeship, and the responsibility for safeguarding the interests of potential victims. Economic incentives should be consistent with sustainability: so it is necessary to reconcile a natural tendency of organisations and individuals, to focus on narrowly defined and short-term advantage with society's wider and long-term interests. Above all it is vital to guard against complacency: to be prepared for the unexpected, and to attempt to come closer to imagining the unimaginable.

The key question remains one of institutional capacity to determine the course of development, and to ensure its sustainability. To "keep us from being our own Ponzis" Paulos (1996, p.96) recommends "a Global Reserve Board to help decide on more rational discount rates"; but is not clear how this could work within a market economy. Clearly, to avoid unsustainability the incentives facing individuals and organisations should favour actions consistent with sustainable development. Sustainability requires that investment should ensure that there is adequate substitution for the natural capital stock. The debate on climate change measures has highlighted the issues surrounding the discount rate for ultra long-term impacts. In the short-term, behaviour typically implies a massive discount on any impacts beyond the fairly immediate future. The investment decisions of enterprises are to a great extent driven by the terms on which finance can be raised; and the monetary authorities use short term interest rates as the instrument of monetary policy. If financing becomes more expensive, businesses discount the future more heavily, seeking higher returns on marginal investment. In contrast, a sustainable development strategy calls for low discount rates for inter-generational effects, and for investment and technological change that specifically meet the requirements of (at least weak) sustainability. To ensure that market behaviour conforms to this strategy would seem to require a conscious reorientation of incentives. This would imply that the authorities should make investment financing and fiscal measures subject to tests of consistency with the strategy.

## 11. IN CONCLUSION

Could unsustainable development be a Ponzi scheme? The answer is a qualified yes. Clearly not in a literal sense, because the concept of a long-term Ponzi scheme is self-contradictory. Nevertheless there are similarities, particularly with reference to self-deception and denial of inconvenient truths, which is perhaps an underestimated element of Ponzi schemes and also figures in some perspectives on environmental protection and sustainable development. If there is a Ponzi scheme it has numerous, albeit unwilling and unwitting, perpetrators, and potentially even more victims; indeed most – perhaps all – the perpetrators are themselves liable to be victims.

The remedy begins with an acknowledgement that there is a problem. This can lead to better informed decision-making, and the building of consensus on the key issues of equity and efficiency. There needs to be a stronger assertion of societal property rights: both the rights of society as whole and of individuals and groups within society. With this would come more explicit concepts of trusteeship, to safeguard the interests of potential victims.

These developments should be paralleled by development of institutional and societal capacity. This would create a framework within which economic incentives are consistent with sustainability, reconciling a natural focus on narrowly defined and short-term advantage with society's wider and long-term interests.

Development as a dynamic process is always at risk of destabilisation, of veering towards unsustainability. The sustainable development agenda thus needs to be subject to continuous review, to identify issues as soon as possible. If this is not done, complacency can be a powerful force for Ponzi-ism by default.

## REFERENCES

- Ayres, R.U., J.C.J.M. van den Bergh & J.M. Gowdy (1998). Viewpoint: Weak Versus Strong Sustainability. [www.tinbergen.nl/discussionpapers/98103.pdf](http://www.tinbergen.nl/discussionpapers/98103.pdf). Accessed: 2011-02-28. (Archived by WebCite® at <http://www.webcitation.org/5wpfrVWYS>)
- Barrass, R. (2003). Review of Bjørn Lomborg, *The Skeptical Environmentalist*. *Sustainable Development* 11: 66-67.
- Barrass, R. & S. Madhavan (1996). *European Economic Integration and Sustainable Development: Institutions, Issues and Policies* McGraw Hill.
- Dasgupta, P. (2005). Three Conceptions of Intergenerational Justice, in: H. Lillehammer & D.H. Mellor eds. *Ramsey's Legacy* Clarendon Press Oxford.
- Dasgupta, P. (2006). Comments on the Stern Review's Economics of Climate Change, prepared for a seminar at the Royal Society, London, November 8.
- Dawkins, R. (2009). *The Greatest Show on Earth*. Bantam Press.
- Diamond, J. (2005). *Collapse: How Societies Choose To Fail or Survive*. Penguin.
- The Economist (2008). Melting Asia, *Economist* June 7 2008.
- EEA (2001). *Late lessons from early warnings: the precautionary principle 1896–2000* European Environment Agency Environmental issue report No 22, Office for Official Publications of the European Communities, Luxembourg.
- European Community (1973). Council Declaration on the programme of action of the European Communities on the environment *Official Journal* 1973 C112.
- Friedman, T.L. (2009). The inflection is near? *New York Times* March 7.
- George, D. (2001). *Preference Pollution: How Markets Create the Desires We Dislike* University of Michigan Press, Ann Arbor.
- Helm, D., C. Hepburn & R. Mash (2004). Time-Inconsistent Environmental Policy and Optimal Delegation, Oxford University Department of Economics Discussion Paper 175.
- Jha, A. (2009). Global body needed to direct green technology, G77 says. *The Guardian* 23 November 2009.
- Lomborg, B. (2001). *The Skeptical Environmentalist: Measuring the Real State of the World*. Cambridge University Press.
- Neumayer, E. (1999). *Weak versus Strong sustainability: exploring the limits of two opposing paradigms*. Edward Elgar.

Paulos, J.A. (1996). *A Mathematician Reads The Newspaper*. Penguin.

Sachs, J.D. (2009). *Common Wealth: Economics for a Crowded Planet*. Penguin.

Sander, P. (2009). *Madoff: Corruption, Deceit and the making of the World's Most Notorious Ponzi Scheme*. OM Books International, Noida.

Sainath, P. (1996). *Everybody Loves a Good Drought*. Penguin India.

Stern, N. (2006). *Review on the economics of climate change*. Cambridge University Press.

Taleb, N.N. (2004). *Fooled by Randomness: the Hidden Role of Chance in Life and in the Markets* 2nd. Ed. Texere, New York.

Taleb, N.N. (2007). *Black Swan: the Impact of the Highly Improbable*. Allen Lane, London.

Tett, G. (2009). *Fool's Gold*. Little, Brown.

UN (1972). *Declaration of the United Nations Conference on the Human Environment* <http://www.unep.org/Documents.Multilingual/Default.asp?documentid=97&articleid=1503> Accessed: 2011-02-28. (Archived by WebCite® at <http://www.webcitation.org/5wpgnXxyr>)

Weitzman, M.L. (2007). A Review of the Stern Review *Journal of Economic Literature* Vol. XLV pp. 703–724.