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Exploring Possible, Likely and Desirable Global Futures: Beyond the Closed vs Open Systems Dichotomy

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9.1 Introduction

The current era of neo-liberal globalisation is in some important ways similar to the era of new imperialism from the early 1870s to 1914. In *The Political Economy of Global Security* (Patomäki, 2008), I suggest that we can learn from the study of the causes of the late nineteenth-century neo-imperial competition that led to the Great War – an outcome that was not necessary but possible and likely. However, as history does not repeat itself, only limited aspects of historical processes may prove sufficiently similar to provide insights into future possibilities. The point is not to look for exactly similar episodes or sequences, but for comparable structural liabilities and tendencies that may yield in some ways analogical outcomes, albeit in a non-deterministic way. Moreover, what is needed is a causal analysis of the existing structures and ongoing processes, on which scenarios of possible futures can be built.

The key point of *The Political Economy of Global Security* is to analyse the dialectics between limited-scale future wars and economic crises, and the possible rise of a transformative movement that could respond to the problems and contradictions of the global political economy in terms of collective learning, and by building new global institutions. Because I do not exclude the possibility of catastrophic outcomes such as an all-out nuclear war or a runaway process of global warming, my analysis – although the argument is about institutional transformations – has been characterised as 'sceptical, realistic and dismal' (Rivas, 2009: 93).

The three scenarios I propose are not mutually exclusive, but they do differ in the ways they envisage the main dynamics of twenty-first-century history. Scenarios A are concerned with a politico-economic competition among great powers that is partly analogical to the developments that led to the Great War. Scenarios A are also based on an analysis of the consequences of neo-liberalisation as a self-reinforcing process involving securitisation and enemy constructions. Scenarios B focus on the possibilities for emancipatory

transformations towards something that may be called green-democratic global Keynesianism (seen as a transient state of world history and global governance). And scenarios C spell out the implications of possible nuclear and climate catastrophes.

In this chapter, I respond to the criticism that has been raised against the methodological and ethico-political underpinnings of my scenarios and, then, use the opportunity to update the scenarios of *The Political Economy of Global Security* and develop the overall argument a step further. In his review entitled 'Sawing Off the Branch on Which We Sit? Critical Realism, Open Systems, and Possible Futures', Lars S. Skålnes (2009) complains that I while I stress – in line with critical realism (CR) – that prediction is problematic, I also claim that the key goal of social sciences is to identify possible global futures. 'If the scenarios of possible global futures are not predictions, then what are they?' (ibid., 195; the same point has been made, in relation to my earlier theoretical writings, also by Fred Chernoff, 2005: e.g. 129) Following a sympatethic summary of the substantial scenarios, Skålnes concludes his review by raising again his main point against critical realist ontology and methodology:

> Apart from peace researchers and scholars in future studies, *The Political Economy of Global Security* will have particular appeal to students interested in the nature of the relationship between empirical research and meta-theoretical positions such as that of critical realism. Particularly interesting in this regard is the book's emphasis on treating social systems as open systems. It seems paradoxical, however, that to gain the analytical tractability necessary to develop its scenarios, the book relies heavily on theories or models that at least implicitly treat social systems as closed. The problem, I suspect, is that the future is just too open if we take the notion of open systems seriously. To act in the world, we seem forced to pretend (most likely wrongly) that social systems are closed. Put differently, the insistence on treating social systems as open risks sawing off the closed system branch on which we all sit. (Ibid., 197)

From a different perspective, Anna Leander (2008) has raised concerns about the ethico-political implications of building scientific scenarios of world history as a whole. Leander agrees with me that it is critically important to study possible futures. So far 'thinking about the future, let alone modelling it, is a marginal activity in IR/IPE' (ibid., 447). But from her point of view, the attempt to ground scenarios on real tendencies and real working of spatio-temporal causal complexes is bound to be too abstract, selective and in some ways also too close to positivist prediction 'to be useful in thinking about where to direct action, what kind of emancipatory struggles are possible, why, where and how' (ibid., 449). She evokes suspicion that scientific realist scenario building may become a practice of symbolic power

in its own right, narrowing in an authoritarian manner imagination about possible futures:

> There is no easy way out of this competition over the legitimate authority to scientifically depict the world, by no means unique to scenario-building. But precisely because that is so, making symbolic power visible rather than producing scientific scenarios might be the more fruitful approach if the aim is to equip us with images of possible futures. Patomäki has spent quite some time making symbolic power visible and does it also in this book. However, the scientific scenario production works in the opposite direction. It may therefore end up sidelining rather than fostering political imaginations. (Ibid., 449)

Skålnes and Leander have raised important points, worth tackling in some depth and detail. In response to Skålnes, I stress that systems are always open and closed only to a degree. The allegedly radical asymmetry between explanation and prediction does not hold (unlike what some critical realists claim). The future can be analysed in terms of conditional and more or less likely possibilities of becoming. The closer we get to a given point in the future, the more shaped and structured it is. Moreover, it is possible to apply the Bayesian theorem in assessing the intersubjective–qualitative probability of different scenarios. I do this with my scenarios A–C, in light of (i) the election of Barack Obama as the President of the US and (ii) the outbreak of the global financial crisis of 2008–9.

In response to Leander, I discuss briefly the humanistic moment of futures studies. While scenarios are scientific and based on explanatory models, they are also self-critically reflexive exercises in cultural studies, moral philosophy and creative ability. Thus I conclude this chapter by summarising the key normative arguments, concrete utopias[1] and dramatic stories embedded in *The Political Economy of Global Security*.

9.2 Closed vs open systems

Skålnes' criticism that the concept of open systems means 'sawing off the branch on we sit' is valid only if the distinction between closed and open systems is taken as categorical. Many critical realists have been verging on committing this mistake, which originates in the formulations of Bhaskar's early texts (e.g. Bhaskar, 1997/1975: 19). While I have always talked about systems being 'more or less open' (Patomäki, 1996: 112), I did not thematise the relativity of openness and its implications before 'Realist Ontology for Futures Studies' (Patomäki, 2006). I am of course not the first to make this essential qualification to CR. In *Dialectic. The Pulse of Freedom*, Bhaskar (1993: 235) himself makes an important distinction between epistemological predeterminism and ontological determination, and then goes on to

theorise time and the ontological determination of the future (ibid., 140–4, 250–8). Similarly, but from a specific angle, Petter Næss (2004) maintains that qualitative and rudimentary predictions concerning the aggregate-level effects of particular policies and measures are, and for pragmatic reasons must be, possible. Pertti Töttö (2004: 269–84) criticises the dichotomy between open and closed systems and makes the point that almost all systems – including our solar system, the object of Newton's mechanical theories – are in fact situated somewhere between absolutely open and absolutely closed systems, i.e. they are in fact closed to a varying degree.

One of the key arguments of CR is that scientists are actively involved in creating artificial closures in laboratories – they must work hard to reveal the secrets of nature. Scientists isolate a particular mechanism of nature and thereby study its law-like effects. In *A Realist Theory of Science*, Bhaskar (1997/1975: 14) starts by first defining a closed system circularly as one in which a constant conjunction of events obtains. Then he proceeds by examining what this might entail. Bhaskar explains that cutting off a space-time region from non-constant external influences is not enough. It must also be ensured that no qualitative changes will occur within the system. Thus its individual parts must be atomistic or remain constant and the whole of the system can be described exhaustively by the behaviour of its parts (ibid., 69–77).

While helpful in trying to understand and overcome the empiricist position in the philosophy of science, Bhaskar's concept of closure (ibid., 76) does not fully accord with the use of the concept of a closed system in science. The concept of a closed system is often used to refer to a theoretical scenario where perfect closure in a sense of isolation from the surroundings is an assumption. However in practice no system can be completely closed in this sense; there are only varying degrees of closure. Except at the quantum level, real world systems are thermodynamic systems, i.e. various quantities are flowing through it, such as matter, energy, work, heat and entropy. In thermodynamic systems, the boundary does not isolate the system in any absolute sense.

In physics, a closed system can thus exchange heat and work, but not matter, with its surroundings. However, for systems which are undergoing a chemical reaction, all sorts of molecules may be generated and destroyed by the reaction process. In this case, the fact that the system is closed is expressed by saying that the total number of each elemental atom is conserved, no matter what kind of molecule it may be a part of. In life sciences, living systems appear to defy the second law of thermodynamics by constantly creating order from disorder.

According to the second law of thermodynamics, entropy within closed systems should gradually become maximal and disorder should eventually reign (entropy is a measure specifying the amount of disorder or randomness in a system that contains energy or information). In other words, closed

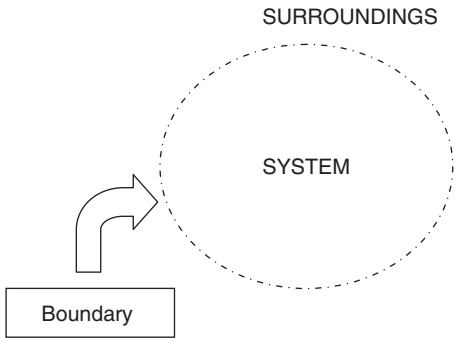

Figure 9.1 A system and its environment

systems are not stable but experience a tendency of increasing disorder called entropy (Kauffman, 1995: 9). Yet living beings are structures and systems exhibiting high levels of order. An organism stays alive in its highly organized state by taking energy and information from outside itself and processing these to produce, within itself, a lower entropy, more organized state (see Mingers, 1994; Schneider and Kay, 1994). Humans are complex living beings and self-organized systems. The point about living systems is therefore applicable to embodied human beings and indirectly to social structures as well (see Figure 9.1).

All levels of reality seem to allow only for what Bhaskar calls the epistemically recessive case, namely, for the constancy of extrinsic and intrinsic conditions and the non-additive principle. All systems – including those artificially created in laboratories – can only be closed to a degree, whether naturally or artificially. This applies also to Bhaskar's key example of the only apparent closure that has occurred naturally, the solar system (Bhaskar, 1997/1975: 61, 68, 198). Despite being stable and regular in many ways, our solar system is not really a closed system.

Firstly, it is part of the Milky Way galaxy and its huge gravitational field, orbiting around its massive centre once in about 200 million years. Secondly, the short-term comets originate in the outer solar system; they are thrown inwards towards the Sun by gravitational perturbations not only from planets but also from nearby stars. In the scale of 100,000 astronomical units, we can also see the entirety of the Oort Cloud of long-term comets that surround the Sun and extend to the boundaries of interstellar space (Sagan, 2006: 8–11). This part of the solar system is recurrently being shaped by the fields of gravitation of nearby stars (also depending on how close the Sun is to the plane of the galaxy at any given time, as our solar system is oscillating vertically across the plane of the galaxy), which also explains why the orbits of the comets are not in the same plane as planets' orbits. Multiple gravitational

fields within the solar system also cause small perturbations to the orbits of planets, which change over time and which cannot be calculated with perfect accuracy. Similarly, the behaviour of asteroids exhibits disorganised complexity, being partly chaotic and irregular, although the system as a whole possesses many orderly and analysable average properties (for a classic text in complexity theory, see Weaver, 1947).

Hence, as the example of the solar system demonstrates, practically all systems are closed only to a degree. Although thought or laboratory experiments and artificially created or natural approximations of closures have played a very important role in modern science, and should continue to do so, we should not exaggerate their role. The closure/predictive approach does not work at all if (Jakosky, 2006: 71):

- the system is too complex;
- it is too large;
- it operates over too long a timescale;
- or if random events can have a large effect on the outcome.

Partly for this reason, and partly because it has now been realised that the cosmos as a whole is a historically evolving entity, many sciences have become increasingly historical. Often their object of study consists of a particular historical episode or process such as the development of our solar system and planet Earth, the latter involving plate tectonics, climate changes, etc. For instance, the ways in which the planets in our solar system came together involved random collisions that cannot be predicted solely from an initial set of conditions. Yet given the narrowness of the habitable zone in a solar system and the specificity of many other celestial conditions of life, these chaotic outcomes have been decisive for the possibility of life. Explanations consist of an inferred sequence of events to construct a historical narrative of what must have taken place in order to leave the evidence that we see today (see ibid., 71–84).

On the other hand, no system can be categorically open without losing its order, structures and identity. If 'no constant conjunction or regular sequence of events is forthcoming' (Bhaskar, 1997/1975: 33), we can have no knowledge of what will happen next. In principle, anything can happen. Yet, fields of science such as meteorology, ecology or medicine, while studying open and chaotic systems, which exhibit markedly multiple and complex causation, can also predict many practically important things within the confines of particular categories of significance to us and limited space-time areas. Their predictions can usually be expressed probabilistic terms. The specified outcome is within a given range of variation with certain probability. The required accuracy depends on the exact purpose. The possibility of some useful predictions indicates that for many practical purposes sufficiently regular events do obtain also in comparatively open and in some

ways chaotic systems. Hence, if the closed/open systems distinction is taken as categorical, it is a misleading guide to science, including human sciences.

As virtually all systems are in fact situated somewhere between absolutely open and absolutely closed systems, i.e. they are closed to a varying degree, we should expect to find not only tendencies but also some regularities. This is acknowledged by Tony Lawson, who has introduced the concept of contrastive demi-regularity, indicating the existence of partial closures also in society. Contrastive demi-regularities concern contrasts between categories or space-time areas and are expressed in terms of regularities within a given range of variation with certain probability. They are not strict regularities but probabilistic, limited to a particular space-time area, and liable to change (Lawson, 1997: 204–13). Critical realists are of course right that it is not sufficient to find contrastive demi-regularities and, then, specify the conditions of their continuation. Rather, there should be a movement towards analysing the deeper social structures and causal complexes generating these manifest phenomena. Also the degree of closure of social systems can vary and become the explanandum of critical social sciences (this is a key theme of many critical theories from the Frankfurt School to CR, concerned with freedom, but it has been perhaps most clearly articulated by Unger, 2004).

Moreover, what is the use of social sciences if they can say nothing at all about the future, conditionally, possibilistically or otherwise? From the pivotally important point of view of futures studies, it is legitimate to search for contrastive demi-regularities also as partial guidance to and illumination about possible and likely short- to mid-term futures. Contrastive demi-regularities are pervasive also in relatively open systems, and many aspects of world futures are very difficult to study systematically without resorting to empirico-analytical models. Although not the only task of futures studies, the anticipation of possible and likely outcomes of existing processes, tendencies, mechanisms and fields is an important part of what relevant human and social sciences should do. In future scenarios the focus is on ongoing and future choices and actions rather than on something that has already happened. A futurologist:

- explains the development of various conjunctures and compounds;
- specifies boundary conditions for the existence and continuation of trends and demi-regularities and for the endurance and transfactual efficacy of the related historical structures and fields;
- develops plausible scenarios and narratives of world history up to a particular, relevant future point.

Sciences, including human and social sciences, study everything from the beginning of the cosmic evolution to the long-term future of life and humanity. Most social sciences are concerned with short- and mid-term

futures, but as I will make clear in the conclusion, our scenarios can be and often are enmeshed with much longer-term considerations as well.

9.2.1 Global future as an increasingly shaped possibility

Also in nature, structures, fields and mechanisms operate transfactually and generate effects in open systems. The interplay of many conditions, fields and mechanisms results in a diversity of outcomes. However, human and social sciences are different from the areas of science such as meteorology, ecology or medicine in that human agency involves the reflective capacity to act otherwise – the possibility of deviating in principle from any given and known expectation or anticipation.

As social beings are historical and actions temporal, time is involved in social phenomena in a complicated and reflexive fashion. Expectations and anticipations of the future are a necessary part of social action, and particularly so in the world of modern organisations. Structured and reflexive anticipations may also constitute a part of the organising rules and principles in a social system. A case in point is an organisation that plans its future actions on the basis of various anticipations and forecasts. Actors may try to shape others' anticipations in a variety of ways. Prophecies can thus be self-fulfilling or self-denying – also on purpose (for an interesting discussion, see Houghton, 2009).

Nevertheless, it is not true that anything can happen, or that all real possibilities are equally likely. Our reflective agency is built upon layers of biological evolution, human prehistory, and history; and geo-historical structures, mechanisms and fields constitute and shape action possibilities. Many social structures and fields endure for long times. Social systems are closed to a varying but significant degree, and while also changing, they exhibit multi-layered continuities.

There are poorly known and not very reader-friendly passages in Bhaskar's *Dialectic* (1993, especially 142–4) providing useful concepts and ontological ideas for futures studies. Bhaskar explains that tense is irreducible and the future is real. He argues that the future is an increasingly shaped and structured possibility of becoming, mediated by the presence of the past. 'The future is paradigmatically shaped possibility of becoming' that, as a possibility, 'may be closer or more distant from us, more or less about, and more or less likely to be actualized'. People and institutions are structured entities that contain various possibilities as powers, liabilities and tendencies. The future is thus an increasingly shaped possibility, existentially constituted by layers of geo-histories embedded in the relevant actors and institutions and interacting in complicated ways.

In *The Political Economy of Global Security*, I assessed the relative probability of the actualisation of four possible global futures. The first is the contrastive case of smooth neo-liberal and neo-imperial developments without changes in the current principles and institutions of global governance. This is

rather unlikely, albeit not impossible (this possibility cannot be excluded also because of the limits of our knowledge and epistemological relativism). Probability assessments of more or less unique historical processes can at best be well-informed but readily revisable qualitative judgements based on knowledge of (i) similar and contrastive historical cases and (ii) existing structures and processes that are, however, liable to change sooner or later. My probability estimate for the '40 years of neoliberal business-as-usual scenario' is less than 10 per cent.

The US turn to new imperialism in the early twenty-first century was a jump-off point in the sense of creating a new imperialist horizon of possibility, not only for the US but for others as well; and a branching point, gradually foreclosing possible lines of development towards a pluralist security community in the world as a whole. This nodal point involved the presence of layers of the past, especially the legacy of the Cold War, itself in part a result of the First World War (the Russian Revolution would probably not have happened without the Great War). But most importantly, this nodal point has resulted from the self-reinforcing process of neo-liberalisation. The main mechanisms, reinforcing the turn to new imperialism, include (i) uneven growth, economic imbalances and contradictory responses to them; (ii) neo-imperial competition over increasingly scarce resources; (iii) crisis-prone global finance and the precarious role of the US dollar in the global monetary system; (iv) de-democratisation and the increasing role of vested interests, and (v) securitisation, enemy construction and an armaments race.

On this basis, I developed three versions of scenarios A about possible paths involving escalation of the emergent conflicts that will gradually assemble the conditions for a global military catastrophe. In scenario A_1, the long downturn and uneven growth will persist in the world economy. Neo-imperial competition between superstates and blocs will lead to securitisation, enemy construction, new alliances and an armaments race. In scenario A_2, the US will crumble economically and react aggressively, causing a rapid process of securitisation and antagonisation. In my assessment, the third scenario A_3 appeared as the most unlikely one, as it is built on the assumption of a new surge in the global economy as a whole. However, in A_3, following the jump-off point of the early 2000s, rapid new growth will co-generate conflicts and an arms race and thus will prove lethal in the sense of lateral pressure theory, as the world remains on the geo-historical path opened up by the nodal point of the rise of new imperialism in the early twenty-first century.

Scenarios B are based on the alternative idea that peaceful and democratic reform of global governance is possible *without* any major global catastrophe. In scenario B_1, the long-term learning processes, combined with some sort of generic understanding of global threats, will suffice to generate a movement to transform and rebuild the systems of global governance.

This movement will eventually also convince a number of governments to change and create new international and global law. In scenario B_2, the same thing will happen only after a series of relatively limited economic crises and wars. Crises and wars are likely to generate resistance to the neo-liberal and neo-imperial framings of the problems of the global economy and security. They can also create momentum for transformative movements to organise collective action.

There are three scenarios C. The first two, scenarios C_1 and C_2, anticipate a major catastrophe, but as a result of global warming, or as a consequence of a catastrophic strike by weapons of mass destruction by lesser states or other actors, not as a result of a war between superstates. C_1 and C_2 may nonetheless result indirectly from the competitive and neo-imperial policies essential to scenarios A. The industrial revolution has increased human capacity to produce and destroy, particularly as a consequence of the use of fossil fuels, developments in explosives and metallurgy, and emergence of nuclear power. However, their increasingly large-scale use has had a major impact on the climate of the planet. This may set in motion cosmopolitan movements and lead to far-reaching changes. Finally, scenario C_3 spells out the possibility of a major catastrophe as a direct result of competing new imperialisms, enemy building and an armaments race (or something equivalent); and radical changes in the decades following the massive catastrophe.

Scenarios are not predictions. They start with an analysis of the existing structures and processes and their inherent potential, coupled with the assumption that futures remain open until a particular possibility is actualised. It is possible to assess the probability of various possibilities in a qualitative manner on the basis of systematic scenarios by employing contextual human judgement, open to intersubjective contestation and argumentation. In *The Political Economy of Global Security*, I merely proposed an order of likelihood, amended here to include all the inter- and intradependent possibilities:

$$p(B_2) > p(C_1) = p(A_i) > p(C_2) > p(C_3) > p(B_1)$$

$$A_i\colon p(A_1) = p(A_2) > p(A_3)$$

On the basis of historical comparisons and analysis of existing structures and tendencies, the scenario of further economic crises and wars creating a momentum for reform movements is the most likely one, followed by a scenario of global warming triggering essential changes in global governance. Given the existing mechanisms and tendencies, further wars involving the US, and possibly also other superstates, are very likely, and it will also be very difficult to avoid financial and other economic crises. These developments are part of scenarios A_i as well, which may co-generate C_2 (a strike by weapons of mass destruction) and/or ultimately amount to C_3 (changes after a massive global catastrophe). Global warming is already happening; the question

is only how much, how fast and with what consequences. B_2 (changes following a series of limited wars and crises) and C_1 (changes triggered by global warming) are mutually reinforcing which increases the likelihood of both of them.

Economic crises, wars and global warming are likely to generate not only resistance to the prevailing orthodoxy but also democratic cosmopolitical responses among peoples, movements and parties. However, everything hinges upon timing. A critical question is whether global warming might become self-accelerating before sufficient measures have been taken. A runaway global warming process without legitimate and effective systems of governance and a widely shared sense of climate justice is likely to contribute to the materialisation of scenario C_2 (a strike by weapons of mass destruction) as well as perhaps scenario C_3 (changes after a massive global catastrophe), the latter via A_i (superpower conflicts and possible catastrophe). Another critical question of timing is whether reforms will make a difference before it is too late to prevent a gradual transformation from world politics to the logic of security and violence, involving a high risk of a major global military catastrophe.

Scenario C_2 (a limited strike with weapons of mass destruction triggers global changes) is more likely than scenario C_3 of fundamental changes following a major catastrophe. This assessment is in part based on the unpredictability of the outcome of such a huge catastrophe as the 2044 nuclear war imagined by W. Warren Wagar (1999). It is overly optimistic to think that the outcome of such a catastrophe would be a cleaner and safer world and a global federation run by a world parliament.

However, C_2 is also undesirable, risky and dangerous. A strike with weapons of mass destruction would be a unnecessary and unwanted disaster. There is also a risk that its effects would not be confined to a particular time and place but would be uncontrollable. Most importantly perhaps, this kind of strike could actually lead to hypersecuritisation, spelling an end to formal democracy in many places, and strengthening tendencies towards scenarios of a major violent catastrophe. Although this kind of a catastrophe would probably also strengthen democratic cosmopolitan sentiments, it might simultaneously weaken people's and non-state actors' capacity to organise collective action. Intensive securitisation and divide-and-rule policies may make the conditions for emancipatory actions next to impossible.

9.3 How to revise scenarios over time: the role of the Bayesian theorem

Since writing these scenarios, many relevant things have already happened. Here I would like to focus on two episodes: (i) the election of Barack Obama as the President of the US in 2008 and the commencement of his term in 2009; and (ii) the outbreak and development of the 2008–9 global financial

crisis. The importance of (i) lies in the way President Obama may have been partly reversing the policies of neo-imperialism that constituted the jump-off and branching point during the George W. Bush administration in 2000–8. On the other hand, the global financial crisis (ii) was a key ingredient of my scenarios A_1, A_2 and B_2 and thus seems to have reinforced the original assessments and their background assumptions.

It is helpful to use the Bayesian theorem as a heuristic device to estimate roughly the extent to which these new events and turns necessitate amendments or revisions to the original probability assessments – and at the same time use it to specify the limits of our precise knowledge about the future (for basic texts on Bayesian statistics, see Bolstad, 2004; Lynch, 2007). The prior distribution of probabilities of the actualisation of different possibilities is based on historical and structural analysis, and on inter-subjective judgements about the likelihood of different possible paths of history. The plausibility of the assigned probabilities is conditional on meeting the standards of qualitative historical and futurological research and on the scrutiny of intersubjective criticism.

Now, the basic idea of the Bayesian theorem is that we revise our beliefs on the basis of quantitative data acquired from observations:

$$p(\mathrm{B} \mid \mathrm{A}) = \frac{p(\mathrm{A} \mid \mathrm{B})p(\mathrm{B})}{p(\mathrm{A})}$$

where

$$p(\mathrm{A}) = \sum_{\mathrm{B}_i \in \mathrm{S}_\mathrm{B}} p(\mathrm{A} \mid \mathrm{B}_i)p(\mathrm{B}_i)$$

The theorem says that a conditional probability for event or development B given event or development A is equal to the conditional probability of A given B multiplied by the marginal probability of B and divided by the marginal probability for A (the sum of the conditional probability of A under all possible events B_i in the sample space). The intuition behind the Bayesian theorem is similar to the idea of the hermeneutic circle. We do not calculate probabilities blindly, on the basis of the data only and then compare it to the abstract distribution of probabilities across abstract space-time (this interpretation implies universally regular probabilities).

Rather our prior information of likelihoods and understandings of structure- and field-specific and changing causal relationships must co-determine the answer. Nonetheless, our answers must be criticisable and revisable on the basis of new observations. For example, if an original probability is very low, a single contrary occurrence does not necessarily increase probability even to a noticeable chance; but even in the case of a very low original probability, like occurrences should have a cumulative effect of making a difference to our estimation of probabilities.

When assessing the probability of future scenarios, many relevant observations become available only in the course of history. A key problem is, however, that we do not have numerical values for the original probabilities. Furthermore, the new observations tend to be theory-laden descriptions of geo-historical events and processes rather than systematic quantifiable data. And yet, somehow the occurrence of these events and turns should slide the estimated probability in the direction of the occurrence in accordance with the Bayesian theorem. The theorem helps to analyse the impact of an occurrence of something by decomposing the problem into smaller parts. For instance:

$$p(\mathrm{A}_i \,|\, \mathrm{Obama}) = \frac{p(\mathrm{Obama} \,|\, \mathrm{A}_i)\, p(\mathrm{A}_i)}{p(\mathrm{Obama} \,|\, \mathrm{A}_i)\, p(\mathrm{A}_i) + p(\mathrm{Obama} \,|\, \mathrm{not} - \mathrm{A}_i)\, p(\mathrm{A}_i)}$$

What is the probability that the possible path of world history outlined in scenarios A_i will be actualised given that Barack Obama became the President of the US in January 2009? This depends crucially on our estimation of the likelihood of the occurrence of Obama administration policies, given (a) that the world history is actually following one of the paths A_i or (b) that it is not following path A_i. The question is really about how compatible the Obama administration policies are with each of these possibilities. If Obama does not make much difference and is fairly compatible with both possibilities, the chances of A_i are in fact being increased by Obama's election (as the relevant processes are anyway moving towards the direction of A_i). The probability of A_i is decreased only if Obama is (highly) compatible with not-A_i and simultaneously (highly) incompatible with A_i. Not-A_i can mean two things:

1. Either the world will muddle through the next 40 years and beyond without any of the above scenarios being realised. This may be in line with the expectations of neo-liberalism, but in my estimation an unlikely possibility (as stated above, likelihood less than 10 per cent).
2. Or adequate changes in global governance will be realised through the fulfillment of B_1 or B_2 before any of the scenarios A_i is fulfilled, creating the conditions for a global security community and constituting a leap in 'the long march of mankind toward its unity and better control of its own fate' (Triffin, 1968: 179).

Barack Obama's liberal public rhetoric seems more in line with not-A_i than with A_i. The key question is: how much difference do the actual policies of his administration make? In *The Political Economy of Global Security*, the paths outlined in scenarios A_i are being produced by the self-reinforcing process of neo-liberalisation and its intended and unintended consequences, including the rise of the neo-imperial mode of responsiveness. The actualisation of

A_i is in line with a slide towards late nineteenth-century style geopolitics, militarisation and arms race. Especially A_1 and A_2 are fully compatible with slackening economic growth and increasing inequalities; and with the occurrence of economic crises and interventions and wars in the troubled zones of the planet, especially in the global South. A_3 is otherwise similar but involves more growth, perhaps to a significant degree generated by military Keynesianism.

Briefly, while the US is pulling out from Iraq and eliminating the long-standing US arrears to the United Nations, and pushing for disarmament negotiations, at the same time the Obama administration is increasing military spending by 4 per cent over the fiscal year 2009 and has not revised the US security doctrine in any significant way. There are preparations to improve US capacity to make further military interventions (*Los Angeles Times*, 2009). The war in Afghanistan is continuing and may be escalating into Pakistan. The financial crisis of 2008–9 has prompted some Keynesian measures, but so far without any significant deviation from the substantive path of neo-liberalisation in most dimensions of policy (Patomäki, 2009a). The responses to financial and economic crisis have not involved attempts to build new global-Keynesian institutions, but have remained national and contradictory.

Elsewhere, I have argued that it is likely that if (a) the negative real per capita global growth rate remains, on average, at the annual level of not much more than 1 or 2 per cent, and (b) if the crisis can be contained and a recovery starts in 2010 or at the latest in 2011, we will see just another round of neo-liberal and technical business-as-usual 'reforms' (Patomäki, 2010). After a partial economic recovery, governments, central banks, media corporations and other authorised bodies are likely to return to their official optimism, grounded in the standard neoclassical theory; and the bulk of regulators and lawmakers can continue to pursue relative state competitiveness at the expense of long-term stability and collective development, also because they do not see any alternative. If the 'recovery followed by neo-liberal business-as-usual' scenario proves right, the underlying superbubble that has already lasted for three decades will continue to grow, gradually creating conditions for an even bigger crash in the late 2010s or early 2020s.

So far, the evidence indicates that Barack Obama has not made a significant difference either way. Unlike Obama's rhetorics, his policies are compatible with A_i and not-A_i alike. If anything, it appears surprisingly compatible especially with A_1 and may even be working against not-A_i. This seems to indicate that scenarios A_i are now closer to being fulfilled than at the time of writing this book. A_3 would postpone the possible catastrophe the furthest, whereas A_2 would bring the catastrophe much closer. A_1 – which now seems the most likely of the three scenarios – is somewhere in between.

Moreover, on the basis of a similar analysis (no space for details here), scenario B_2 – involving major changes of global governance through a rise

of a transformative movement after a series of limited wars and crises – has not yet become more likely after the 2008–9 crisis. Only if the crisis proves really deep and long, short-term transformations of global institutions are likely. In that case, two things will probably happen:

- The tendency towards beggar-thy-neighbour policies by states will become stronger, reinforcing the already ongoing neo-imperial competition over resources and markets and accelerating the already ongoing armament race.
- Demands for global reforms will become stronger and more radical and are likely to include major regulatory and institutional reforms, paving the way for the actualisation of B_2.

This implies a dialectic between two opposing tendencies: (i) a general tendency towards a repetition of the mistakes of the eras 1871–1914 and the 1920s; and (ii) a tendency towards a rise of a global ethico-political imaginary and new globalist movements focusing on global sustainability, justice and democracy. In the two years since completing the book, neither tendency has gained much strength. However, while there are signs of rising economic nationalism (*Economist*, 2009) the actualisation of B_2 has not come any closer. No worldwide transformative movement has risen, and global civil society remains marginal for high politics. A few more occurrences into this direction will suffice to change the order from $[p(B_2) > p(A_i) = p(C_1)]$ to $[p(A_i) = p(C_1) > p(B_2)]$.

But, for the sake of argument, assume that Obama's policies are in fact making a difference, working dialectically with global movements that represent the long-term learning of humankind. In the first half of the 2010s, the momentum for major democratic, ecological and Keynesian changes in global governance is rapidly building up even in the absence of any further crises or catastrophes. Or alternatively, decades will pass by smoothly without any major changes or catastrophes; even global warming turns out much less serious than anticipated. Any clear discrepancy between probability assignments and the actual course of history should be taken as a reason to revise also our models of the underlying structures, liabilities and tendencies. History should be allowed to falsify also our pet theories and models of the world.

9.4 On the humanistic moment of futures studies

As Leander (2008) points out, the construction of global scenarios is a highly selective process. It is necessary to decide which actors, structures/mechanisms and nodal points to use in the construction of scenarios. How do we know whether I have included the right ones? Perhaps other ones should have assumed the main role instead? Perhaps. The upshot is that iconic modelling and scenario construction are continuous and dialogical processes.

Well-taken substantial criticism and alternative and possibly better scenarios can and, if there are good reasons, also should lead to revisions and learning. Ideally the process would constitute a small step in the collective learning of humankind. Furthermore, it is not only the scenarios themselves that can and should be improved but also the methodology of revising them.

Scenarios are in some ways similar to claims about past 'eras', such as the Middle Ages, the seventeenth century, the Westphalian era or the Bretton Woods era (cf. Staley, 2006: 73). Claims about eras or epochs are not in themselves causal explanations. Geo-historical events and processes are generated by complexes of structures, fields, powers and actions. There may be any number of important processes within a location or period, involving a variety of possible scales of time and potentially different tenses. Claims about past eras are abstractions that are relevant only in relation to certain particular questions. Moreover, within the hermeneutic circle of research, and also given subsequent geo-historical processes, claims about past eras may turn out to be inadequate or misleading. Likewise, the global politico-economic scenarios about the first half of the twenty-first century are abstractions that are relevant only in relation to particular questions; the point is not to exclude numerous other possible and legitimate normative and emancipatory concerns.

But even then, does this kind of scientifically realist methodology of scenario production impede our capacity to see and size historic opportunities? Does it not lead to authoritarian objectivism and to the exclusion of unforeseen possibilities and historical opportunities for change? To paraphrase the classical point about philosophy, the alternative to futures studies is not no anticipation of possible futures, but implicit and bad assumptions about possible futures. In *The Political Economy of Global Security*, I have done my best to identify also weak signals of healthy collective learning and transformative movements and opportunities. Nonetheless, I agree with Leander and Jorge Rivas (2009) that the overall conclusion is somewhat pessimistic. The twenty-first century has a lot of potential to turn out even worse than the twentieth. There is nothing I would welcome more than plausible scenarios proving me wrong.

A key point of exploring scenarios of major conflicts is early warning. The focus is on how a major global conflict might be expected to evolve in the absence of various preventive causal interventions and emancipatory transformations. While the three variations of scenario A deal with the gradually accumulating potential for a major military conflict, the two scenarios B analyse the potential for emancipatory transformations of global governance in terms of global Keynesianism, justice and democracy, involving worldwide redistribution and planning of economic growth (the direction of emancipatory changes is also a matter of normative political theory to assess). While I estimate the probability of transformations based merely on long-term learning and related activities of political movements

to be fairly low, there are still good reasons to expect the dialectics of limited economic crises/wars and critical movements to yield emancipatory outcomes in the next 10–30 years (despite B_2 becoming less likely and A_i and C_i more likely.

The first two variations of the C scenario present global warming or a one-off catastrophe (such as the use of weapons of mass destruction by a non-state actor) as a trigger for global reform. In both cases, the prospects are ambivalent and a lot depends on timing. For instance, in the case of global warming, the future of global security depends on the timing of learning the lessons from the by-products of industrialisation and growth, and the resultant remedial actions. The third variation of the C scenario is the most pessimistic and tragic of them all. In this scenario, humanity can learn historical lessons in a Kantian manner only by suffering the catastrophic consequences of its inaction first – exactly what happened in the twentieth century, but this time with more devastating consequences.

Apart from being scientific and based on explanatory models, scenario construction should also be seen as a critically reflexive exercise in cultural studies, moral philosophy and creative ability (in the same way that both research and development and the arts are creative). Social scientific models involve structured stories that may contribute to the resignification and transformation of practices. Although each possible line of world development is an alternative story of how the future may unfold, all scenarios thus involve narratives and, when put together, different stories may also constitute a kind of myth and grand narrative of the possibilities and outlook for humankind. Temporal myths and stories have a structure which is based on both the general human condition and cultural variations in storytelling and world understandings. Every myth and story locates presence as part of a wider and structured temporal whole. Myths and stories organise the anticipation of futures.

The overall narrative structure of my scenarios A–C is a storm warning, which at the same time constitutes a normative argument for global institutional transformations. Storm warnings are typical of a lot of futures studies and science fiction. In contrast to the mainstream of these genres, however, I try to be self-critically reflexive about the storylines I adopt. Within the confines of the scenarios A–C, it is indeed possible to tell many different stories about the likely world history of 2010–50. But what is the best way of telling these stories? The key ethical and methodological question was formulated by Hayward Alker (1996: 269–70): 'Is there a way of making world historical accounts empirically revisable while at the same time allowing them to have the reflective character and dramatic force of a tragic morality play or the ironic happiness of a Russian fairy tale?'

The point is that accounts of possible futures have to be simultaneously empirically revisable and reflective about their dramatic force and implications. Any account of the prevailing mechanisms, fields and processes can be

challenged on conceptual and empirical grounds. The theoretical framework on which causal explanations and scenarios are based must be open to various empirical, conceptual, philosophical and methodological criticisms. As history unfolds, new events and turns can be taken into account and scenarios and their likelihood of being actualised must be reassessed accordingly. But it is equally important to be mindful of the dramatic force and motivating power of scenarios.

Thus, in the last chapter of *The Political Economy of Global Security*, I compared the merits of farce, comedy and tragedy (but omitted epic, lyric and fairy tale, although in particular a modernised version of epic would have been quite pertinent). Interesting and complex combinations of these genres are possible and often desirable. I argued that on both ontological and ethical grounds we should avoid Manichaeism, i.e. the construction of binary self–other relations in terms of good and evil. Manichaean thinking and discourses may be part of the world we are studying, but they should not be a part of the researcher's own meaningful story of temporal events in reality. Moreover, I suggested reading the ongoing era not as an inevitable tragedy, but rather as a farce that may still turn into either a comedy or tragedy – as a story with an open end.

9.5 Conclusions

The idea behind the study of possible futures is to shape worlds that are yet to come rather than merely adjusting to given future realities. The future is an increasingly shaped possibility but at no point predetermined. This is the ontological ground for human freedom. However, given the current institutional context – the lack of adequate planetary institutions – the ability of humanity to control its own fate and shape the path of world history is severely limited. Modernity might have revolved around the principles of autonomy and self-determination, but there are few if any global institutions that would embody these principles.

This suggests an epic tale, involving a much wider timescale than that of *The Political Economy of Global Security*. The tale opens with a prehistoric humanity spreading from Africa to all corners of the planet and gradually cultivating separate languages and cultures. Developments started to speed up about 10,000 years ago, during the agricultural revolution. Some things may have been invented independently by separate cultures and civilisations, but in the Afro-Eurasian continent people also learnt religious, social and technological innovations from each other. Nonetheless – despite occasional vast empires – communication was relatively slow (at least compared to the standards of the early twenty-first century) and awareness of the distant others, of the same human species, was often highly mythological. Some of this started to change with the expansion of the European states-system and the capitalist world economy, from the long sixteenth century onwards.

The consequent 'waves of globalisation' (Robertson, 2003) – starting with the imperial reintegration of the American continent with Europe and thus the rest of the world – have meant a new coming together of humanity, even if it is often under violent, oppressive and tragic circumstances.

The global industrial age has generated new modes of existential interconnectedness. The fate of humanity is now inseparable, and yet humanity remains partitioned into separate communities and states. The meaning of the twenty-first century lies in the way this contradiction will be resolved. The muses of this epic tale are those who are ready and willing to create new concepts, myths, models, scenarios, stories and concrete utopias of new global institutions, i.e. new realities. The main themes are political economy and security. The muses stress that coordinated actions anticipating possible futures, whether real and concrete or illusionary, shape the present and thereby also contribute towards the materialisation of a particular line of development in world history.

There are long lists of global problems that have to be addressed in the coming decades to avoid catastrophe. Thousands of formal scholarly articles and books are being written on these problems; and thousands of speeches are being given by scholars, politicians, international civil servants and representatives of civil society organisations. In the absence of divine or extraterrestrial intervention into human affairs, however, the shocks and turning points of this epic tale are man-made, even if often unintentionally. 'Heroes' – this concept may the most suspicious and ethico-politically problematic part of the epic tale – emerge that embody the values of a new planetary civilisation and propose new myths to respond to the 'quest to ensure human and intergenerational security on and for the planet, as well as democratic human development and human rights' (Gill, 2003: 211). Like in classical tales, the planetary heroes will face adversaries and serious difficulties and will be significantly transformed in the course of twenty-first-century history. But ultimately, they will establish worldwide movements and new forms of political agency – and turn the planet into a home for all of humanity and all life on it.

This is an epic tale par excellence. It is exciting and dramatic. Even better, there is a sense in which it can be said to be thus far true, the future remaining open-ended. This epic tale is certainly compatible with scenarios A–C (which in turn are compatible with a multitude of developments and emancipatory concerns not captured by these scenarios). It has motivating power and may thus play an important role in the emergence of new movements and forms of political agency.

But we have learnt the value of scepticism, too. While all identities are constructed and open, it is all too easy to fix one's identity, in various ways, with potentially or at least metaphorically violent effects. It is also difficult to create ethico-political spaces free from asymmetrical or biased relations of power; and all stories have effects of power. There is thus no substitute for

self-critical reflexivity and openness about the stories we tell. Democracy is valuable also because we cannot trust anyone to know a priori better than others. In democracy, all stories must be open to contestation and revision. This applies to global democracy too.

Note

1. The term 'concrete utopia' emerged in the late 1960s discussions within the Frankfurt School of Critical Theory. I have used it in my previous writings, including in passing in *The Political Economy of Global Security*, but I now realise that 'utopia' is misleading. The term 'utopia' comes from Greek, combining *ou* and *topos*, meaning no-where. Even a concrete 'no-where' would be nowhere. The logical counterpart to modern dystopia is actually eutopia, where the Greek prefix *dys* means 'abnormal' or 'defective', and *eu* means 'good'. An abstract eutopia, and similarly an abstract dystopia, may never be any-where except in human imagination because it is geo-historically impossible, but 'concrete eutopia' and 'concrete dystopia' designate real geo-historical possibilities. For further discussion, see Patomäki (forthcoming), especially Ch. 8, 'the humanistic moment of futures studies'.