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Background Paper

Globalisation: The Need to Balance
Political Economy with Political Ecology

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**Executive Summary**

A brief survey of the recent history of the global economic crisis (Section I) notes that it was originally the result of inflation hitting mainly developing Asian economies; followed by a bursting of asset bubbles and subsequent loss of confidence in the banking system, leading to a credit-crunch hitting developed economies. The cumulative effect of the bursting of the housing bubble and the banking crisis in the latter was a decrease in their consumer spending and a rebound increase in saving, leading to decreases in trade and an economic contraction. The immediate response was for developed countries to rescue their banks and also for these and many developing countries to administer fiscal stimuli to try to revive their economies leading to more-or-less large budget deficits. The shape of the recovery in the long-term remains to be seen, but it will be affected by the fact that the global population is continuing to grow, with changing demographics; and by the fact that humankind is already over-exploiting the planet’s natural resources.

With regard to the prospects for ‘developed’ economies (Section II), one concern is that the banking system will prove to be irredeemably crippled, and that a re-run of the Japanese ‘lost decade(s)’ will be the result, with deflation and stagnation. However, if one assumes that the past intemperate excesses of bankers have been contained, then the main worry is with regard to the restoration of confidence in the various nations’
economies. One need is to ensure monetary responsibility, by containing inflation; how this impacts on the dollar is not clear. The other is by ensuring fiscal responsibility: given the mounting level of sovereign debt, it is important that governments produce effective plans for post-recovery decreases in public spending and increases in taxation (with preference given to expenditure or carbon-based taxes), timed so as to avoid short-circuiting the recovery which the stimulus aimed to promote. However, the potential for recovery is compromised by gloomy prospects regarding unemployment; and the fact that populations in developed countries are ageing, with implications for government spending. These together with other factors complicate the democratic process and also raise as yet unrealised fears about protectionism.

It is concluded (Section II.6) that the present economic crisis has compounded the problems for the majority in developed economies' populations regarding adjusting to a globalising world, in terms of employment prospects and wages, especially given their existing social safety nets and ageing demographics. In the absence of a massive, successful round of job-creation, these economies would seem to look set to founder in terms of overall standard of living.

In the case of developing countries (Section III), these were primarily affected by the spike in inflation in 2008; this has set back attempts to reduce poverty. The effects of the banking crisis were weaker than in the developed world, and acted primarily to affect export earnings; and additional effect was to affect the volume of remittances from migrant workers. Recent developments which look promising for easing the burden of the poor are mobile phone money services and 'social finance', a new class of assets and financial tools. Whilst the regional giants – China, India and Indonesia – have been largely unaffected by the crisis, for differing reasons, the smaller and more open economies of Southeast Asia have had a much harder time, primarily as a result of the decrease in exports and increased unemployment. Nevertheless, there is evidence for a rebound by economies in the region, which would seem to have been aided by various stimulus packages. In the case of China, one aim of the massive economic stimulus was to enhance infrastructure and the development of the hinterlands. Nevertheless, there is evidence that small and medium businesses are at a continuing disadvantage compared with the larger state-run ones, which may jeopardise the recovery of industry (although there is little evidence for over-investment). The package also sought to reduce household savings and promote consumer spending and thereby reduce the country's dependence on exports, through increased investment in improving social infrastructure, presumably partly in anticipation of the progressive ageing of Chinese society: an important and seemingly inevitable future bottleneck.

Thus (Section III.4), amongst the developing countries of the region, China's economy would seem to have become decoupled to some extent from those of developed countries with regard to trade; the economies of Southeast Asian nations would seem to be stuck in the middle due to the relative smallness of their local domestic markets. Further facilitation of decoupling will require expansion of regional trade markets; and also liberalisation of fiscal markets, so that local currencies are no longer tied to the US dollar. The latter is important as one way of avoiding the frothing of regional economies with asset bubbles, thereby engendering another financial crisis. Thus there is the need for careful timing in fiscal policies, in order to optimise the effects of the various stimulus packages whilst restraining the future, uncontrolled growth of the rebounding economies.

Regarding regional stability (Section III.8), there is the worry that ethnic, religious and social disaffection may lead to internal (and possibly inter-national) disruption. The
lack of any apparent progress towards achieving the Doha round has had the potentially undesirable consequence of leading to various smaller-scale, ultimately less meaningful agreements. On a broader scale, whilst China's increasing weight, or at least its increasing readiness to use it, puts Southeast Asian nations at a marked disadvantage, there is the potential for it to be counterbalanced in the future by the further development of India, and (or) by the rejuvenation of the US after its latest bad experience, in the Middle East.

It is concluded (Section III.9) that China has become a major engine for global growth; and that it has used its economic stimulus package in order to develop not only infrastructure but also social safety nets as a means to quell potential domestic unrest in the face of increasing internal inequalities.

It is increasingly obvious that human activity is degrading the environment, and one recent analysis identified nine sets of impacts (Section IV). One of these relates to human greenhouse gas emissions (GHGEs) from a variety of sources – mainly in developed countries in the past, but now also from China and various other developing countries, including through deforestation and land development – and their effects on the global climate system. Projected increases in mean global temperatures will have various effects on humanity, and more especially on people in developing countries: for example, through rising sea-levels. Thus there is the need to take measures to adapt to the changes already occurring in response to past GHGEs; and to mitigate against future environmental and social degradation by reducing GHGEs over the next few decades. However, these measures will cost money, albeit less than the amount generally predicted to be incurred by business-as-usual. Because mitigatory costs mean that it would not be in the national interest for countries to act on their own to reduce their GHGEs (others would get a free ride, benefiting from their now cheaper products), it is necessary to establish and implement an international framework for curtailting future GHGEs, as well as for helping poorer nations to adapt to the consequences of the climate change already in progress. However attempts to achieve this, most recently in Copenhagen, have been blighted by national self-interest. Thus, whilst governments should ideally each take out 'insurance policies' against the likely future consequences of past and present behaviour, they are constrained by the need for increased public expenditure and also by pressure from special self-interest groups partisan politics in democracies further complicates the issue, as well as fears of social instability in these and other countries. This means that, especially because of the present economic climate, there is little incentive to implement the policies necessary for public and private investment in alternative technologies to protect the future global climate. Other environment-related issues which are potentially threatening the future of much of humanity – water availability (Section IV.3) and food security (Section IV.4) – are related to fears about climate change, as well as to the increase in the size of the world's population, with the increasing prosperity of many.

It is concluded (Section IV.5) that, as global phenomena which will ultimately affect everybody in the developed and the developing worlds alike, climate change and related issues require global solutions. There is thus the need to press ahead with seeking a legally-binding international agreement. However, climate change has caused a profound split between developed and developing nations: in order for the gap to be bridged, the populations of (over-) developed nations need to lower their sights from what they desire to they actually need; whilst there is the need to accept measures to ensure that money will be used properly and efficiently.
Cambodia’s economy, with its narrow base, has been badly affected by the spike in inflation in 2008 and the subsequent economic crisis and global recession (Section V). Of the four pillars of its economy, only one (agriculture) has continued to grow, although incomes have been affected by the recent decrease in world food prices. The other three – the garment industry, the services sector (including tourism) and the construction industry – have all contracted as a result of the global economic crisis, and their recovery is dependent on that of the world economy.

Overall (Section VI), it is concluded that, whilst the global economy may be recovering, developed economies are still in a fragile state, with knock-on consequences for the long-term prospects of these and also developing economies. Also (Section VI.1), whilst China has gained considerably in economic power (giving rise to the notion of a ‘G2’ with the US), potential future threats of direct political confrontation remain relatively small at present despite the recent economic upheavals; instead, China is progressively building itself up as an indirect threat to the economic and geopolitical supremacy of developed nations, aid by the economic and political weaknesses in the latter.

Regarding the financial and banking sphere (Section VI.2), it is concluded that central banks need to focus not just on inflation, and they need to increase the number of tools in their armamentarium in order to try and also control bubbles arising from undue asset inflation whilst also trying to minimise political interference. There is also the need to introduce regulations in order to contain future ‘irrational exuberance’ by banks and other financial institutions by increasing reserves and reducing moral hazard; whilst at the same time maintaining a single global market. In the long-term (Section VI.3), this may also involve setting up a global, neutral reserve currency to replace the predominant role of the dollar. On top of this (Section VI.4), there is the need for politicians in developed economies to expand their industrial and other economic bases into new areas, rather than avoid the temptation of resorting to protectionism (which would be likely to be self-defeating, to a greater or lesser extent).

A preoccupation with the recent economic crisis has distracted from the ongoing, incremental ecological crisis which is resulting from resource depletion and environmental degradation, the latter in part as a result of climate change. It is concluded (Section VI.5) that the intrinsic psychological and thus social limitations of members of the human race will make it difficult for humanity as a whole to react positively to try to avert the looming crisis. Thus (Section VI.6), it is concluded that it is difficult to see how effective supra- or transnational organisations can be developed to implement policies, especially within the limited time-frame available. On a highly speculative note, it is suggested that the lack of global governance might lead to an evolutionary bottle-neck (Section VI.7), with implications for the future trajectory of the human race; this will clearly be influenced by the demographics and other aspects of individual nations’ relative development.

I. Introduction

1. The causes of the recent financial crisis

The recent crisis – the so-called Great Credit Crisis (‘Credit Crunch’) – was characterised by a failure of financial markets, especially those for securitised assets unrelated to real, tangible economic growth; thus those for goods and services, including the capital markets, remained largely unaffected (Cox, 2009). Broadly speaking, the ultimate causes of what has proved to be the worst financial crisis and global recession since the Great Depression of the 1930s – can be attributed to:
1. global inflation as a result of the rapid growth of developing economies and their demand for oil (fig. 1), which peaked in July 2008, and has since fallen back to low levels (PricewaterhouseCoopers, 2009); but primarily.

2. the subsequent development of housing and other bubbles in developed economies, as a result of the ready availability of loans which were hidden by securitisation in the 'shadow banking system' (Smick, 2008).

The onset of the global crisis was anticipated by the effects of the increasing inflation on developing Asian markets; and it was heralded, one week in September 2008, by the sacrificial collapse of Lehman, together with the acquisition of Merrill Lynch by Bank of America and the government rescue of American International Group.  

A proximate cause of this implosion was that banks' confidence in each other was shattered, so that funds for inter-bank and other loans dried up through a mutual lack of trust. Governments had to apply 'stress tests' to try to determine key financial institutions' exposure, given their potential losses at a time when house prices were falling and unemployment rising; central bank funds were made available to those who were found wanting and could not secure private backing within six months.

This has meant that the recent crisis has also been a crisis in the public's (and also some economists') faith in the 'dismal science', and more specifically the standard 'Anglo-Saxon model' of economic theory. However only two areas of the discipline have turned out to be wanting, with much of the rest of economic theory unrelated to the causes of the recession. Thus areas which have been identified as needing re-thinking are:

1. Central bankers' and other macroeconomists' concentration on controlling inflation, and thus the prices of goods and services, to the exclusion of asset bubbles; and their assumption, for convenience, that finance and the prices of assets could be ignored because capital markets worked perfectly.

2. The Economist 12th September, 2009, pp. 66-68.
3. Because of the 'toxic assets' such as subprime mortgage loans, which they had hidden in the their shadow banking system and which they had farmed out to unsuspecting others through securitisation (Smick, 2008).
5. The liberal 'Anglo-Saxon' model aims to let the markets decide 'at arm's length', rather than through the interventionist hands-on approach of continental European and Japanese economies. Thus the former, more markets-based approach encourages innovation and the financing new ideas and technologies, and thus industrial renewal; whilst the latter, with their greater dependence on banks for loans, are generally rather conservative and tend to stifle innovation and thus also the efficient reallocation of resources from sectors in decline to those on the rise (Cox, 2009).
7. Ibid.
2. Financial economists’ use of traditional models, based on the ‘efficient markets hypothesis’, to underpin financial engineering and the design of tools such as derivatives and other increasingly complicated alternatives, whilst assuming that the markets will regulate themselves; however, these models ignored certain important features which underlay the recent crisis, including the role of financial institutions and the element of human irrationality, and thus were misapplied in extreme situations where these models break down.\(^9\)

![Figure 2](source: US Bureau of Economic Analysis)

*Figure 2* Changes since the end of the Second World War in (A) consumption and residential investment and (B) the current account balance of the US, as a percentage of GDP (adapted from *The Economist* 25\(^{th}\) July, 2009, pp. 10-11 and 69-70).

2. **The immediate consequences of the mushrooming financial crisis**

Prior to the financial crisis, there had been a progressive rise in private consumption, including residential investment, since the ‘Great Moderation’ of the 1980s\(^10\) (fig. 2A), growing faster than GDP; this was accompanied by a decrease in household saving rates from about 10% to virtually nil, and an increase in their indebtedness from 67% to 132% of disposable income, meaning that the US’ current account balance went progressively into the red (fig. 2B).\(^11\) Around 2000, growth in income stalled, but household debts continued to surge,\(^12\) borrowed against anticipated continuing increases in house-prices and facilitated by novel financing devices. This spending spree, which served as the engine for US’ and global economic growth, ended with the financial crisis, when US$13 trillion of consumer wealth was wiped out and the shadow banking system evaporated as a source of credit.\(^13\) This meant that 27% of all US mortgage-holders (14 million households) owed more in the first quarter of 2009 than their homes were worth. The result was a dramatic change in consumer behaviour, with a marked switch towards saving: it had reached

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8 “(T)he price of a financial asset reflects all available relevant information that is relevant to its value”, with the public being deemed to be ‘rational investors’, thereby denying the possibility of asset bubbles; thus, it is now realised by many academics that such models are too simplistic, leading to the development of alternative models such as behavioural economics (*ibid.*).


10 Characterised by low rates of both inflation and interest and relatively stable business cycles.


12 It has been argued that, because wages stagnated, household borrowing increased to compensate for the rise in the standard of living, thereby giving rise to the debt bubble which lay behind the present financial and economic crisis: Steingart (2008; *The Economist* 16\(^{th}\) January, 2010, p. 32.

5% (about US$545 billion) of disposable income in the second quarter of 2009, with severe effects on the construction industry (Cox, 2009).

Also, whereas before banks focused mainly on the asset side of their balance-sheets, now they are concentrating on their liabilities – the capital which they possess, and its amount and quality, including its likely durability (Palmer, 2009). Also, superimposed upon their ongoing problems from toxic assets and other headaches inherited from their overindulgences in previous years, banks’ profits are being affected by the low interest rates for lending, as has been experienced by Japan in the recent past; another constraint is government involvement may lead to closer scrutiny of banking fees in the face of consumer activism by their voters (Palmer, 2009).

**Figure 3A**: The percentage change in US’ GDP, quarter-on-quarter (adapted from Guest, 2009); **B**: Changes in US trade data (US$ billion; adapted from Guest, 2009); **C**: Change in merchandise imports, percentage year-on-year (adapted from *The Economist*, 23rd July 2009, pp. 61-62); **D**: The percentage decrease in export volumes, based on the latest data compared with a year earlier (adapted from *The Economist*, 27th June 2009, pp. 82-83).

The immediate result of the financial crisis and the change in lending and spending patterns has thus been a dramatic decrease in the GDP of the US (fig. 3A), which is projected to recover only slowly, accompanied by a large drop in imports and exports (fig. 3B). The decrease in imports and exports reflected the global spread of an economic crisis, with other nations also being affected (fig. 3C, D), associated with a global decrease in GDP.
3. The short-term palliative responses to the financial crisis

Because banks were under-capitalised during the financial crisis, state intervention (to the tune of 6% of GDP in the US, the euro area and Britain) was required in order to prop them up through loans or other injections of capital and the provision of guarantees.\(^\text{14}\)

The main drains on US taxpayers’ money to prop up the banking system were AIG and the mortgage finance agencies Fannie Mae and Freddie Mac: US$160 billion has been invested in them (\textit{cf.} US$180 billion in banks), with the figure likely to rise to US$300 billion, and the total bill including loans and other forms of assistance set to reach more than US$800 billion (6% of GDP; US$207 billion for AIG) according to the latest of four upward revisions.\(^\text{15}\)

Nevertheless, despite the economic turmoil, the dollar strengthened in the aftermath of the collapse of Lehman Brothers in September 2008, because Treasury bills were considered by many to be the safest resort.\(^\text{16}\)

Because of the seizing up of the many key elements of the global banking system and the resultant lack of liquidity, together with the drying up of consumer spending in the US and other developed countries, the world moved into recession with the risk of a new depression. In anticipation of such a grim possibility, there was a worldwide response, with various nations trying to boost their economies through the administration of various types of stimulus package (fig. 4).

The end result of the need to bail out the banking system and to rescue the economy through application of stimulus packages is that many countries are now deeply in debt (fig. 5). Another result of the crisis has been that the uneasy truce between Keynesians\(^\text{17}\) and classical economic purists\(^\text{18}\) on monetary policy and the regulation of business cycles has been blown asunder with the stimulus package as the touch-paper.\(^\text{19}\) Various possibilities exist for the nature of any resulting recovery. Ignoring whether the trajectory prior to the crisis is resumed, the various possibilities are that any rebound will be ‘V’, ‘U’ or ‘W’ shaped:\(^\text{20}\)

- ‘V’-shaped – there will be a rapid rebound in response to existing, previously frustrated demand; or
- ‘U’-shaped – any rebound will be sluggish, reflecting conflicting demands; or
- ‘W’-shaped – any rebound (\textit{e.g.} due to financial stimulus) will be transitory, with the need for further excitatory inputs, whether government-induced or otherwise.

\(^{14}\) \textit{The Economist} 12\textsuperscript{th} September, 2009, pp. 15-16.

\(^{15}\) \textit{The Economist} 15\textsuperscript{th} August, 2009, pp. 51-52.

\(^{16}\) \textit{The Economist} 24\textsuperscript{th} October, 2009, pp. 75-76.

\(^{17}\) Who believe that investment and demand are affected by uncertainty

\(^{18}\) Who believe that supply creates its own demand, resulting in full employment

\(^{19}\) \textit{The Economist} 18\textsuperscript{th} July, 2009, pp. 9-10 and 59-60.

\(^{20}\) \textit{The Economist} 22\textsuperscript{nd} August, 2009, pp. 8-9.
A ‘V’-shaped rebound has been characteristic of other American recessions since World War II. However, whilst these recessions were due to high interest rates, the present crisis has a very different aetiology: a massive private debt accompanied by paralysis of the global finance system. Thus, despite the fact that it was met by the response of a massive financial stimulus, it would seem likely that, more time will be required for debt to be repaid so that, as with the Japanese banking crisis of the 1990s (see Section II.2), it has been argued that the present recovery will be a long drawn-out affair. Thus, whilst the initial data appear to indicate that the global economy is again in a ‘V’-shaped recovery, but whether it will be sustainable remains to be seen.

4. The need for longer-term curative responses to set the global economy back on its feet

There are two different sets of responses of a nation which are important in regulating its economy: a monetary response (typically involving control of interest rates to contain inflation) by the central banks; and a fiscal policy, based on the balance between taxation and government spending, as decided by politicians. Ideally, the two should be independent, with the central bankers not subject to political control; and, obviously, both should be directed toward optimising a country’s recovery from any economic hiccups or worse.

The former is under way in the central banks, and will require keeping deflation at bay through low interest rates, but being ready to increase these should inflation loom. On the other hand, fiscal policy plans by politicians, to cope with greatly increased public debt resulting from those stimulus

22 Ibid.
23 Ibid.
packages administered to date by developed economies (fig. 6), would appear to have been largely neglected: in part this is because of the need to wait for correct timing later on in the recovery, with the correct balance between increasing taxes and cutting back on public spending and the underlying political considerations.\(^{25}\)

In the aftermath of previous recessions, there has been a full recovery with the economy bouncing back to resume its previous trajectory:\(^{26}\) scenario 1 in figure 7. Nevertheless, a recent analysis of 88 previous crises over the past four decades found that, seven years after a banking crisis, output was still 10% below what would have been expected without the crisis (Cox, 2009). However, Cox (2009) concluded that a more likely result of the present crisis is that there will be a sustained decrease in demand,\(^{27}\) which leads to a permanent decrease in either output or, worse, in the rate of growth: respectively scenarios 2 and 3 in figure 7. Either way, there will be a long-term setback to the global economy, reflecting a sustained weakening of developed countries’ economies for which the increased demand in developing ones may not be able to compensate (see Sections III.9, VI).

![Figure 6](image.png)

**Figure 6** The public debt of the ten richest G20 countries is projected to increase to 114% of GDP in 2014 (a per capita debt burden of US$50,000; more if recovery is even slower than predicted), whereas that of the other ten members is projected to remain stable (adapted from The Economist 13\(^{th}\) June, 2009, pp. 70-72).

![Figure 7](image.png)

**Figure 7** Possible trajectories for the recovery of the global economy (adapted from Cox, 2009).

5. **The population problem**

Societal advances mean that the global population continues to grow (fig. 8A), with most of this expansion being in developing countries (fig. 8B). In the face of the economic crisis and its aftermath, this has clear implications for the recovery and continuing expansion of developed (see Section II.4) and developing (see Section III.7: China is a major exception) economies alike.

More people obviously mean more demands on the environment; more people expecting a higher standard of living over-and-above a basic subsistence level obviously exacerbate these demands. The situation is made worse by the fact that humanity is now already living beyond its means: our existing

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\(^{25}\) The Economist 12\(^{th}\) September, 2009, pp. 18-19.

\(^{26}\) As a result of the accumulated slack of idle production resources being resurrected to resume their former roles.

\(^{27}\) And thus the leaving behind of unemployed workers, who increasingly lack the relevant skills, together with a diminution of capital investment in economic infrastructure.
use of environmental resources is unsustainable, since it exceeds the capacity of 'Spaceship Earth' for self-renewal.

Figure 8A: Whilst the bar-chart indicates that population growth has passed its maximum, global population will only start to level off within the next 30 years; B: Plot of a country's fertility rate against national GDP (2007 data: circle diameter is proportional to population size) (adapted from The Economist October, 2009, pp. 29-31).

6. The resultant environment problems

Thus, for example, a preliminary evaluation of humanity's demands on the planet's renewable resources (Wackernagel et al., 2002) indicates that growth since the end of the 1970s has been unsustainable (fig. 9A). Their analysis was only partial (due to limitations in the data available): for example, they did not include the impact on the environment of obtaining and using nonrenewable resources (other than the need for a sink for greenhouse gas emissions, GHGEs), or the negative effects of other forms of non-greenhouse gas (GHG) pollution. Based on the parameters which were input, this ecological overshoot reached 20% in the last year of their assessment, 1999, meaning that what was used that year would require 1.2 earth years to be regenerated (or the area of 1.2 Earths to be sustainable). The main contribution to the progressive increase in demands on supposed

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28 With the latter's anticipatory recognition of the need for a genuine global governance, and thus the need for responsible 'captain' - http://www.3olorado.5du/econ/Kenneth.2oulding/spaceship-earth.8tml

29 Nevertheless, as they pointed out, even such preliminary analyses are of use for economists and others, to help society to reach more informed decisions and plan for the future, despite the limitations of their accounting.
renewable resources was for trees, both as a source of timber and as a sink for CO$_2$ (fig. 9B): there are thus conflicting demands on this resource (see Section IV.2.9ii).

Figure 9 (from Wackernagel et al., 2002)

A: Estimated recent changes in ecological demands on renewable resources indicate that current utilisation rates already exceed the Earth's regenerative bio-capacity.

B: The analysis recognised six different categories of activities dependent on natural resources, and tracked how these changed over time:

a) crop-growing (and thus demand for cropland for food, animal feed and other natural products, including rubber and vegetable oils);

b) farming of land mammals (and thus demand for pasturelands for meat and other animal products);

c) harvesting of timber (and thus demands on natural forests and plantations for wood);

d) fishing (and thus demands on fishing grounds, both freshwater and marine);

e) space for built-up land (and thus demands on arable land); and

f) energy production (the need for natural sinks to sequester the resultant GHGEs from fossil fuels).

Not only does present consumption not take into account further population growth, but the problem is compounded by the fact that those who already have a comfortable life-style by global standards expect it to become ever more comfortable:30 the 'brat race', fostered by Western politicians who have to try to keep their electoral majorities; combined with the largely Western-inspired31 need for other governments (e.g. China) to keep the general population happy in their understandable

30 And thus, arguably, are becoming over-developed.
31 Not least through the media, perhaps most especially through Hollywood's exports.
desire to catch up with those countries which have set the benchmark desideratum since the start of the Industrial Revolution.

7. Conclusions

Although the bankers might be happy that their jobs are saved and they can spend the fortunes they continue to receive in bonuses to help further deplete the planet's overstretched resources, many of the general population are set to suffer the long-term consequences of the economic crisis as a result of increasing unemployment rates, together with the increasing struggle to compete for the selfsame pool of dwindling resources.

There have been profound effects on the global economy. Thus\(^\text{32}\) the large developed and developing economies of the G20 account for 90% of world's economy, and growth in 2010 is expected to be below its trend rate.\(^\text{33}\) Also, the output gap\(^\text{34}\) of the developed nations of the Organisation for Cooperation and Development (OECD) is predicted to increase to 8.5% GDP, with associated rising unemployment and the increased risk of deflation.\(^\text{35}\)

Traditionally, there has been the distinction drawn between developed and developing countries based on their economies and other features. This was apparent in the origins of the recent financial crisis, and will continue to be relevant in the near future as the world tries to recover from its effects (although the terms 'developed' and 'developing' may become less appropriate), as emphasised by the differential effects of the crisis on their public debts (fig. 6). The following two sections will these two groupings in turn; thereafter, the anticipated impact of the growing environmental crisis will be considered in Section IV, and the implications of this together with the ongoing economic crisis will be considered in Section V.

II. The political economies of developed nations

1. Overview

The identification of nations as 'developed' has a variable membership, depending on the criteria used.\(^\text{36}\) apart from a core of the 30 members of the OECD, the UN, the World Bank and the IMF recognise other members. The present discussion follows the mainstream in not categorizing the newly-industrialised economies in Asia (including the four 'Asian Tigers' – Hong Kong, Singapore, South Korea and Taiwan: the latter two are members of the OECD) as developed economies, to make for a more comprehensive regional consideration (Section III).

The lead-up to the present crisis was the second period over the past 15 years when American consumers (fig. 10), as with most other Western consumers, enjoyed an unprecedented increase in

\(^\text{32}\) The Economist 4\textsuperscript{th} April, 2009, p. 12.

\(^\text{33}\) The trend, or potential, rate of growth in GDP is the maximum which does not affect unemployment and thus inflation, thereby depending on labour supply and rate of productivity improvement; in turn, it determines the limits to the financial sustainability of an economy: The Economist 16\textsuperscript{th} May, 2009, p. 82.

\(^\text{34}\) The difference between actual and potential economic performance.

\(^\text{35}\) The Economist 4\textsuperscript{th} April, 2009, p. 12.

\(^\text{36}\) http://en.wikipedia.org/wiki/Developed_country

Figure 10 The net worth of US households (% of disposable personal income; adapted from Cox, 2009).
their nett worth (Cox, 2009). Thereafter, the credit crisis has meant that there has been a massive increase in household debt (see Section I.2).

Partly as a result, the present economic crisis has also resulted in a large decrease in GDP, associated with a drastic decrease in world trade, including in the exports of the three largest developed economies (figs. 11A, B). Thus, it is predicted that world trade flows will fall in 2009 for the first time since 1982, after an average 6% annual increase in volume over the period 1990-2006. Whilst there was a quick recovery from the bursting of the dot.com bubble at the turn of the century (fig. 10), it is not clear whether the same will apply after the present, fundamentally different crisis.

2. The immediate prospect

Despite the projected impact on world trade, there was evidence for a turn-around in many developed economies by the first quarter of 2009 (fig. 12), with a rebound in GDP and production increasing to replace much depleted stock inventories. Evidence of a positive GDP, partly as a result of the government’s stimulus package, indicates that the US’ recession ended in the third quarter of 2009; and that there is no immediate need for an additional stimulus. However a continuing rise in unemployment will mean that private spending will remain low, so that there may be the need for further fiscal stimulation despite popular antipathy to the burgeoning deficits.

The application of economic stimulus packages, together with a decrease in tax revenues, inevitably means that there will be an increase in the budget deficits of developed nations (fig. 6). Japan remains with the highest debt-to-GDP ratio of any

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developed nation (fig. 13), and this is set to rise further; this means that 20% of its annual budget is used for debt repayment, at a time when tax revenues are falling.\textsuperscript{42}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{chart.png}
\caption{The gross budget debt (% of GDP) for selected developed economies (adapted from The Economist 24\textsuperscript{th} October, 2009, pp. 31-32).}
\end{figure}

\textit{B}: Based on the most optimistic predictions of national debt for various of the most developed economies in the G20, they are required to have budget surpluses by 2014 if they are going to be able to meet interest payments and thereby climb out of debt (all data are % of GDP; adapted from Cox, 2009).

However, the boost in GDP from replenishing stocks is likely to be short-lived, and the effects of the stimulus are set to start fading in 2010.\textsuperscript{43} Much of the present global recovery is the result of increased public spending: an increase in private demand is essential for a proper, sustainable recovery.\textsuperscript{44} To this end, the US economy (in contrast to that of Germany, for example) needs to somehow become more export-oriented to offset the likely long-term slump in its own consumer demand.\textsuperscript{45}

The history of Japan's 'lost decade' (in reality, two lost decades;\textsuperscript{46} fig. 14) provides a cautionary tale at the present stage of recovery from the 2008 financial crisis. Reminiscent of the present crisis, the Japanese government provided an injection of funds to crisis-hit local banks in 1999 in order to ease somewhat similar problems. However, whilst this led to a short-term recovery of confidence, it failed to forestall further market deterioration, due to the banks' many bad assets as a result of loans to what turned out to become 'zombie' companies (Cox, 2009). It was only later, in 2002, that a new government introduced more drastic measures to force banks to clean up their books; it took another four years for their efforts to bear fruit and the banks to have sufficient capital (Cox, 2009). By 'quantitative easing',\textsuperscript{47} pioneered over the period 2001-2006, the Bank of Japan boosted the reserves it held for commercial banks and thus buffered their liabilities should liquidity become frozen during a

\begin{table}[h]
\centering
\begin{tabular}{|l|c|c|c|c|}
\hline
\textbf{Country} & \textbf{Debt 2009} & \textbf{Debt 2014} & \textbf{Budget deficit* 2009} & \textbf{Budget surplus required† in 2014} \\
\hline
United States & 88.8 & 112.0 & -12.3 & 4.3 \\
Japan & 217.4 & 239.2 & -9.0 & 9.8 \\
Germany & 79.8 & 91.4 & -2.3 & 2.8 \\
France & 77.4 & 95.5 & -5.3 & 3.1 \\
Britain & 68.6 & 99.7 & -10.0 & 3.4 \\
G20 & 100.6 & 119.7 & -8.6 & 4.5 \\
\hline
\end{tabular}
\caption{Budget deficits and surpluses for the G20. (Source: IMF)}
\end{table}

\textsuperscript{42} The Economist 24\textsuperscript{th} October, 2009, pp. 31-32.
\textsuperscript{43} The Economist 25\textsuperscript{th} July, 2009, pp. 10-11 and 69-70.
\textsuperscript{44} The Economist 25\textsuperscript{th} July, 2009, pp. 10-11 and 69-70.
\textsuperscript{45} The Economist 25\textsuperscript{th} July, 2009, pp. 10-11 and 69-70.
\textsuperscript{46} The Economist 4\textsuperscript{th} April, 2009, pp. 69-70; 2\textsuperscript{nd} January, 2010, pp. 52-53.
\textsuperscript{47} A form of monetary policy implemented when interest rates are too low to be available as an instrument; the central bank effectively 'prints' money to purchase bonds and other assets, so that the recipient can use this 'IOU' in order to e.g. finance loans; however, it is a risky strategy, which may reduce confidence in the central banks and lead to inflation: http://en.wikipedia.org/wiki/Quantitative_easing
financial crisis.\(^{48}\) Although Japan was spared housing or credit bubbles during the present crisis, it was hit by the collapse in exports of high-value products such as cars and electronics,\(^ {49}\) which led to the collapse of a bubble of overcapacity which had resulted from the overconfidence of exporters and consequent misallocation of resources. Thus the economy has shrunk as a result of stock inventories being run down: as elsewhere, any beneficial effect of stock replacement will be offset by reduced profits, and thus investment; and by rising unemployment, and thus depressed domestic spending.\(^ {50}\)

**Figure 14A**: The predicted slump in GDP for 2009 will eliminate much of Japan’s gains since the turn of the century; B: this has been accompanied by a sharp decrease in the difference between actual GDP and what it would be if the economy was functioning at full capacity (adapted from *The Economist* 4\(^{th}\) April, 2009, pp. 69-70).

C: After a peak in the Tokyo stock-market at the end of 1989, the Nikkei has slumped to be replaced by government bonds as the investment of choice (adapted from *The Economist* 4\(^{th}\) April, 2009, pp. 69-70; 2\(^{nd}\) January, 2010, pp. 52-53).

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\(^{48}\) However it has been suggested that this measure in itself was not effective: rather it was the stability it introduced to the financial markets which helped, in synergy with a favourable economic environment elsewhere: Cox (2009); *The Economist* 17\(^{th}\) October, 2009, p. 73.

\(^{49}\) Although Japan is less dependent on exports than is generally assumed (these are much less than China or Germany, as a percent of GDP, and more comparable with the US), the cheap yen and the consumer boom in the US since the turn of the century led to an increase in exports of such high-value products: *The Economist* 4\(^{th}\) April, 2009, pp. 69-70.

\(^{50}\) *The Economist* 4\(^{th}\) April, 2009, pp. 69-70.
Amongst developed economies, the 'Continental model' has been relatively resilient during the present recession, in part through the automatic stabilisers established by existing safety nets. However, the strengths of this model are also its weaknesses: it discourages the hiring of full-time employees, and also increases economic inertia through discouraging business flexibility and entrepreneurship. Thus such economies performed only poorly during the previous period of global economic expansion, for reasons which are likely to hamper them during any future global recovery.

3. The long-term financial prospect

i. The problem with bankers The banking crisis has massively eroded the wealth of many banks' shareholders, as well as seriously affecting the incomes of many low-ranking staff: small banks have been the worst affected, because they are not big enough to be rescued instead of being allowed to fail (Palmer, 2009). The global banking system is still fragile with a hangover after their prolonged party. Thus, whilst a few big banks in the US have bounced back, the situation is more gloomy for the rest, most especially the smallest banks.

A major concern is that the recent 'stress tests' applied to the big banks by the US have not been rigorous enough: there are still too many bad assets in American banks, and many banks there and elsewhere (mainly in Europe) are presumed to have failed to fully disclose how bad their books are (Cox, 2009). However, Cox (2009) concluded that the experience of the Japanese and others means that governments should only force banks to be honest if regulators are prepared to step in and prop up the system; and thus that tough measures should be deferred until the economic situation is favourable. Also, the US is unlikely to follow the same trajectory as Japan, because the bubble was relatively smaller; furthermore, more immediate action was taken in the recent crisis, and the problem was with 'zombie households', who will now start to save and thus start to fund the rest of the economy, including companies' investment. However, both past misguided excesses and the possibility of future regulation mean that many banks are being extremely cautious about loans as they try to recoup their losses (Cox, 2009). This will put a damper on economic recovery, through effects on industrial growth and productivity, with clear knock-on implications for the job market.

This has meant that, whilst large firms have rebounded after the crisis, with the return of the ability to raise money from credit and from the stock market, smaller companies have benefited less: banks, more especially the smaller ones which were worse hit by the crisis, remain reluctant to make loans. Worst affected are those manufacturing companies which are dependent on heavy initial investments over and above what is possible using their previous profits (e.g. the computer, electronics and chemical industries), because of the slow rate of return on these investments (Cox, 2009). In the past, such problems were more likely in developing economies; now they are extending to companies in developed ones, at a time when profits have been severely hit. Thus investment in new manufacturing facilities will be most likely postponed, with consequences for potential output: moreover, once the

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51 With its emphasis on regulation and protection of its industries together with an emphasis on providing social protection through safety nets and the resultant heavy taxation, in contrast to the laissez-faire 'Anglo-Saxon model'.

52 Although Germany has suffered more than others because of its dependence on high-value exports: The Economist 9th May, 2009, pp. 47-48.


54 The Economist 24th October, 2009, p. 78.

55 The Economist 28th February, 2009, pp. 67-68.

56 Apart from worries about nationalisation and the intervention of 'big government' with its attendant inefficiencies.

57 Always assuming that they know.

supply side for loans recovers, increased capital costs will likely mean that there is a reduced demand for them (Cox, 2009).

Young companies have been severely affected by the financial crisis because of the drying up of venture capital, after the gains which they made as a result of deregulation of previously protected markets; another negative factor is the Sarbanes-Oxley act's tightening up of accounting procedures, which is a disproportionate burden on small companies. Similarly, self-employed start-ups have been badly affected, since the use of their house as collateral is no longer a possibility (Cox, 2009).

Given that the deficit for dealing with the direct effects of the banking crisis in 2009 is likely to be less than was feared (11.2% vs. 12.9% of GDP), and in recognition of the problems in accessing credit, the US government recently announced that the money left over from the TARP funds set up to support banks in difficulty would be used to provide support for small businesses by giving easier access to credit, as well as other ways of promoting and securing employment.

Assuming that the worst of the present banking crisis is over, then the main headaches for developed nations will be the restoration of internally and externally balanced economies; and for the development and implementation of measures which will prevent it being repeated.

**ii. Monetary policy and the central banks** To date, the main tool available to the central banks is to use interest rates to control against deflation or excessive inflation, based on the macroeconomic lessons learned during the crisis (see Section I.1).

At the moment, deflation is seen to be a bigger threat to Japan’s (and, by extension, other developed nations’) recovery than the vast public-sector debt. Provided that ‘quantitative easing’ is used judiciously, inflation is considered to be unlikely to be a cause for concern unless there is rapid economic growth with businesses operating a full capacity, leading to a rapid decrease in unemployment.

The US dollar, together with associated Treasury bonds, is the world’s major reserve currency (fig. 15A): for the US, this will be essential to fund the debt and facilitate ‘quantitative easing’. Whilst there has been a recent slide in the dollar, this is unlikely to presage a crash, despite the mounting burden of public debt: there is too much at stake for other countries. Rather it reflects the high value of the dollar at the time of the financial crisis, when Treasury bills seemed the safest option, together with the subsequent cyclical weakness of the US economy. In principle, a continuing slide should help to promote global economic recovery through encouraging US exports, although this is offset by the fact that the Chinese yuan is tied to the dollar (see Section III.6).

Nevertheless, the dollar’s case for being the sole reserve currency has been severely damaged, with proposed alternatives including a basket of currencies including the dollar. Thus, in the longer term, there is likely to be a shift away from reserve currency status: the pressure for this will depend on the success of the US government in being able to formulate and enact adequate fiscal policies (see Section VI.5).

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63 *The Economist* 24th October, 2009, pp. 72-73.
64 *The Economist* 24th October, 2009, pp. 72-73.
65 *The Economist* 24th October, 2009, pp. 72-73.
Figure 15A: The dollar accounts for almost two-thirds of the world's foreign exchange reserves, as of the first quarter of 2009, with the euro a distant second (adapted from The Economist 11th July, 2009).

B: China has recently taken over from Japan as the largest holder of US Treasury securities (US$ billion; adapted from Miles (2009).

C: Treasury securities account for only about a third of China's foreign exchange holdings, but more than half of its dollar holdings (adapted from The Economist 11th July, 2009).

iii. Fiscal policy plans and the politicians

Whilst there is an obvious recognition that the US, like other developed economies, faces a debt-ridden future, it is not clear how and when this will be paid off (figs. 7, 16). The implementation of measures to tighten up fiscal policy after the stimulation will require careful timing, given the likelihood of but a slow and prolonged recovery. On the one hand, governments do not want to tighten their belts too soon, otherwise it would defeat the purpose of the original stimulus by putting a brake on the growth they were striving for. On the other, if they delay too long, or if there is slower than expected growth, then sovereign debt burden becomes excessive; this will lead to rising interest rates (with consequent increases in the amount and duration of the debt burden's demands on tax revenues) and an uncertain economic climate with regard to taxes, in turn causing a loss of business confidence and reduced private investment and thus depressed recovery and growth.67

One worry, especially for the bond markets, is that governments may choose either to inflate their way out of debt, or else to default on it. Thus fears of inflation are being fuelled by the US' and British central banks printing money to buy government bonds through a form of 'quantitative easing.'68 If such worries were to appear to be justified, then interest rates would rise and further recovery would be jeopardised.69

One way to minimise uncertainty and its consequences for financial and business confidence is for a national non-political (or at least bipartisan) body to be established which has the authority and the

68 The Economist 13th June, 2009, pp. 11 and 70-72.
69 The Economist 12th September, 2009, pp. 69-70.
credibility to lay down a overall framework of fiscal rules in order to cope with the present and consequent future debt burden. Thereafter, it is up to the government to put in place policies, whether through decreasing public spending and/or increasing taxes, to remain within the framework, and to be transparent with its accounts, including future costs. Such a plan for recouping government outlays needs to be comprehensive, credible and transparent, with proposals to constrain public expenditure and/or policies to devise and implement a system of taxes which will not compromise the objectives of the original stimulus package. Given a realistic bail-out plan on the cards, with a suitable time-frame and mechanisms in place to absorb the likely future shortfall and neutralise its inevitable economic consequences for a necessary recovery, business confidence would be boosted.

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**Figure 16A:** The difference between the US’ federal revenue and spending, as a percentage of GDP, indicates that a considerable deficit problem will remain after the banks have repaid their bail-out money (adapted from *The Economist* 21st November, 2009, pp. 27-29).  
B: There are various different projections for the future of US’ sovereign debt (% of GDP; adapted from *The Economist* 24th October, 2009, pp. 72-73).

In the case of the US, one fundamental problem is spending: apart from the fact that it has an ageing populace with potential future increases in health expenditure for the population at large (see Section II.4), there is the need to trim the surplus pork-barrel earmarks and other fat from the federal expenditure budget. Increased taxation is also inevitable, despite being politically problematic. There is evidence that property taxes are less repressive than consumption taxes for growth, whilst income taxes are more so. Thus the best option would be to increase consumption (expenditure) taxes - the introduction of federal sales or value-added taxes (VAT), for example – rather than income taxes, to try to encourage economic growth whilst at the same time promoting savings and investment. In part, this is because expenditure taxes do not penalise saving; moreover, their revenues tend to be more stable over time, thus again being potentially better than income taxes. The fact that such consumption taxes hurt the poor most could be avoided by exempting various essential goods.

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70 The Economist 12th September, 2009, pp. 69-70.  
75 The US is the only OECD country not to have a VAT levied at each stage of production (in contrast to sales taxes): The Economist 21st November, 2009, pp. 27-29.  
items (food, etc.; but this introduces inefficiencies) or by setting a sufficiently high level of VAT so that most workers could be exempted from income tax.\textsuperscript{77}

An alternative would be to introduce carbon taxes, or an economically responsible cap-and-trade system, with appropriate adjustments to the existing taxation system (see Section IV.9(ii)).

Whatever measures are selected, there will be political problems in the US (and, by extension, in many other democracies), with the threat that any reforms will be either diluted down and rendered ineffective, or else stonewalled and stillborn. Thus, there is the continuing need in the US for promoting a mechanism of bipartisanship, whilst trying to ensure that members of Congress do not feel slighted by presidential initiatives in the absence of an obvious immediate threat to national solvency and credit status.\textsuperscript{78}

In the aftermath of Japan’s ‘lost decade’, there was an attempt at restructuring the business environment, including a turning away from the tradition of lifetime employment. Although questions have been raised about whether such efforts were sufficiently extensive,\textsuperscript{79} employment promises to be a major issue for other developed economies in the near future.

\textbf{iv. Unemployment} Despite evidence that the US’ recession ended in the third quarter of 2009 (fig. 12), unemployment is expected to remain high.\textsuperscript{80} The decline in jobs in US was greater than would be expected from the decline in GDP, especially if those who are likely to be either perforce part-time and those who have given up are factored in.\textsuperscript{81}

The recent growth in US’ unemployment rates (fig. 17)\textsuperscript{82} means that levels are now comparable with those in the euro-area;\textsuperscript{83} about half of the 8 million jobs lost have been in construction, manufacturing and the financial sector.\textsuperscript{84} This reflects the fact that relatively little of the US’ fiscal stimulus originally went towards labour-related issues (but see Section II.3.iii). In contrast, the recent crisis has prompted continental European governments to implement policies to try to cushion the impact of the crisis on workers, by promoting job-retention and hiring, as well as cushioning the blow of unemployment (rather than promoting early retirement, as was the response to previous crises).\textsuperscript{85} However, one European measure – to promote job-retention and thus domestic consumption by subsidising shorter working weeks – may serve as a damper on development in the long haul through stifling the normal evolution of the labour market, for example into new industries, in response to globalisation and technological advances. On the other hand, their measures to encourage new jobs hold more long-term promise.\textsuperscript{86}

In the US, unemployment has followed the pattern in previous downturns with a rapid increase; it is not clear whether this will be followed by the usual rapid rebound. The US’ high ‘churning’ rate has meant that jobs were destroyed at an annual rate of about 15% between 1977 and 2005, to be replaced by many more new ones as a result of innovation, with start-ups providing a third. However the present climate does not favour start-ups, although an economic down-turn is often a time when important ones have been founded, when customers are generally more discriminating (Guest, 2009).

\textsuperscript{77} \textit{The Economist} 21\textsuperscript{st} November, 2009, pp. 27-29.
\textsuperscript{78} \textit{The Economist} 21\textsuperscript{st} November, 2009, pp. 27-29.
\textsuperscript{79} \textit{The Economist} 20\textsuperscript{th} June, 2009, pp. 61-62.
\textsuperscript{80} \textit{The Economist} 31\textsuperscript{st} October, 2009, p. 39.
\textsuperscript{81} \textit{The Economist} 5\textsuperscript{th} December, 2009, pp. 35-36.
\textsuperscript{82} With three times as many men as women being made redundant: \textit{The Economist} 2\textsuperscript{nd} January, 2010, pp. 7 and 49-51.
\textsuperscript{83} \textit{The Economist} 7\textsuperscript{th} November, 2009, p. 15.
\textsuperscript{84} \textit{The Economist} 16\textsuperscript{th} January, 2010, p. 32.
\textsuperscript{85} \textit{The Economist} 7\textsuperscript{th} November, 2009, p. 15.
\textsuperscript{86} \textit{The Economist} 7\textsuperscript{th} November, 2009, p. 15.
Nevertheless, projections suggest that unemployment will continue to rise in 2010 in all OECD countries, despite the various measures which have been introduced (Cox, 2009). As with after the 2001 recession, high unemployment and a weak labour market now look set to again depress wages, so that spending will also be depressed due to the reduced scope for obtaining credit; as a result, the potential for recovery – including of jobs in the retail and entertainment sectors – will be further blighted. Thus, a major worry, based on the experience of Europe, is that if the recession is prolonged then the resultant higher unemployment levels will become a fixture even after any recovery; many of the unemployed will drop permanently out of the labour market due to marginalisation of erstwhile workers, in part through loss of their skills. This concern is compounded by the age-related demographics of these countries, as will be considered in the next section.

4. The demographic factor

Because of their stage of development, all OECD countries (including Japan, South Korea and Taiwan) are ageing fast (fig. 18A), portending an unprecedented socio-economic and political change. As a result, changing demographics mean that all of these ageing societies are facing problems, the attendant economic costs of which promise to far exceed those projected for the present economic crisis (fig. 18B): this is without even taking into consideration the projected costs incurred due to environmental deterioration as a result of climate change and other factors (see Section IV). The result is an increase in the proportion of older people in the populations of developed countries (and also China), and thus an increase in the dependency ratio assuming existing retirement ages (fig. 19A). Thus the US' trend rate has been decreasing for more than a decade, in part as a result of the ageing population and its current implications for labour supply. Such a reduction in the proportion

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87 The Economist 16th January, 2010, p. 32.
88 Cox (2009); The Economist 5th December, 2009, pp. 35-36.
89 As a result of increased life expectancy together with lowered birth-rates; the higher birthrates in developed countries during the 'baby-boom' period after the Second World War have served to accentuate the change.
90 And also China, for other reasons – see Section III.
91 Including on existing pension plans and personal savings.
92 The Economist 16th May, 2009, p. 82.
of working people\footnote{The retiree:worker ratio is projected to reach 45\% (70\% in Japan) in 2050, compared with 20\% in 1980 – with clear implications for private or public pension systems where funds provided by workers provides for the pensions of the previous, now retired cohort; for China, the ratio is 10\% now, and projected as 40\% in 2050 (Beck, 2009).} will lead to slower economic growth: the OECD has predicted that, compared with the past three decades, growth will be reduced by a third over the next three (Beck, 2009). Beck notes that it has been predicted that increased spending by aged populations (in contrast with the emphasis on saving in middle-aged ones) will lead to dwindling assets as part of an economic decline. Apart from trying to reverse the decline in birth-rates (with the inherent time-lag before the next generation is recruited to the labour market), the only national solution to this problem is to increase the age of retirement, and thus reduce the time-span between finishing working and the expected time of death to a level more comparable with that when pension systems were first introduced (fig. 19B; Beck, 2009): a politically sensitive measure which will only get the more so as the older proportion of the electorate continues to swell.\footnote{Indeed, in the current recession, older workers were the least affected as regards employment, at the expense of the younger generation: \textit{The Economist} 12th September, 2009, pp. 37-38.}

Apart from trying to reverse the decline in birth-rates (with the inherent time-lag before the next generation is recruited to the labour market), the only national solution to this problem is to increase the age of retirement, and thus reduce the time-span between finishing working and the expected time of death to a level more comparable with that when pension systems were first introduced (fig. 19B; Beck, 2009): a politically sensitive measure which will only get the more so as the older proportion of the electorate continues to swell.\footnote{\textit{The Economist} 19th December, 2009, pp. 51-54; 16th January, 2010, p. 32.}

This is made the more necessary, given that the alternative – an international one, with immigration of younger people from developing countries to augment the work-force (a factor which has helped to reduce the demographic threat for the US in the past, and continues to have great potential)\footnote{Obviously the increasing use of unmanned remote control weapon systems will be an important modifying factor to compensate for such changes, as well as providing an important psychological ‘buffer’.} – is also politically sensitive, with short-sighted pressures to maintain existing barriers or erect new ones in response to the economic changes resulting from globalisation. The latter reflects one aspect of a changing geopolitical scene: as Beck (2009) notes, the dwindling work-forces of most developed countries mean that the latter will become more averse to diverting necessary manpower to the military, suggesting that the US will become further the dominant power amongst developed nations because of its relatively younger, still growing population.\footnote{Obviously the increasing use of unmanned remote control weapon systems will be an important modifying factor to compensate for such changes, as well as providing an important psychological ‘buffer’.}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{chart.png}
\caption{The percentage of the population aged 60 and over is projected to steadily increase over the next 40 years, more especially in developed countries; \textit{B}: The cumulative costs over this time-span (as \% GDP) for spending on the aged are projected to dwarf the effects to date of the present impact on the fiscal deficit (adapted from Beck, 2009).}
\end{figure}
Increased life expectancies mean that men and women in developed countries now live, on average, much longer after their retirement; B: As a result, the dependency ratio (the proportion of the population aged 65 and over, as a percentage of that aged 20-64) is projected to further increase if retirement ages remain the same (adapted from Beck, 2009).

Comparisons between countries in 1975 (blue) indicated that fertility rates dropped progressively a measure of national development, with the most developed countries having rates less than the replacement level of 2 offspring/ woman. However a 'hockey-stick' relationship had become apparent 30 years later (red), when there was evidence for a rebound in the most developed countries (adapted from *The Economist*, 8\textsuperscript{th} August 2009, pp. 64-65). However, the foregoing must be qualified by recent evidence\textsuperscript{97} which indicates that, in the most developed countries (those with an HDI\textsuperscript{98} of greater than 0.90 in 2005: \textit{cf.} the maximum of 0.89, for Canada, in 1975), there is an increase in total fertility to tend towards the replacement level of 2 children/family (fig. 20). Whilst the decrease in total fertility rates with increasing HDI in 1975 (approximately from 8.0 to 1.5) has been attributed to access to family planning and thus the ability

\textsuperscript{97} The Economist 8\textsuperscript{th} August 2009, pp. 64-65.

\textsuperscript{98} Human Development Index: derived from measures of levels of education, average personal income and life expectancy ranging from 0 to 1, with the latter being the highest level of development.
of women to join the labour market, the subsequent recent rebound for higher HDI countries may be related to the introduction of employment policies which are more amenable for working mothers. One important consequence of the changing demographic profile is that the older, typically more conservative members of the electorate will wield progressively more power in developed nations.

5. Political factors

Apart from devising and implementing fiscal policies to contain and repay the public debt, there is the need for developed countries to avoid the temptation to prolong the application of a fiscal stimulus, with a consequent increase in the reach of 'big government' (Cox, 2009). Whilst such interventions will be beneficial in the short term – for example, through improving transport infrastructure – there is a need to ensure that pork-barrel politics does not rear its inevitable ugly head; and that government influence is countercyclical, being reined in during the subsequent recovery as it repays the accumulated public debt (Cox, 2009).

As noted above, it would appear that there is also the likely inevitable need to increase taxes. The increasingly partisan nature of the US political scene (Mahbubani, 2005, 2008; Zakaria, 2008) inevitably means that any attempts to either increase taxes or decrease public spending are sure to face resistance from either side of the growing political divide in the US.

With regard to the European Union, national politics complicates the establishment of a fully functional economic unity in the face of national diversity. Thus there has been a long-standing concern that pre-existing differences between member states will lead to a 'two-speed Europe', comprising a central core of dominant members and a host of potentially 'parasitic' satellites. The recent financial crisis has created the spectre of a 'two-speed euro zone' as well. Thus the euro zone suffers from a trade imbalance: for example, Germany's export-oriented economy has served to offset the import-oriented, mainly Mediterranean economies. The end result (O'Sullivan, 2009) is that, because European governments are loth to give up control of their own revenues, it has been difficult to set up a central fiscal policy for the euro zone, so that the European Central Bank lacks any effective means of control and thus individual governments pursue their own national interests. However, badly-hit countries in the euro area (e.g. Ireland, Spain) no longer have the option of devaluing their way out of debt to regain their competitiveness, raising fears of default. Thus the onset of the financial crisis and the varied effects on, and responses by, different countries in the euro area has led to a loss of confidence in the euro and flight from their bond markets to the dollar (O'Sullivan, 2009).

99 Together with decreasing child mortalities and increasing cost of raising an individual child.
100 The Economist 29th January, 2010, pp. 7 and 49-51.
102 Not just reflecting the traditional divide between the Anglo-Saxon and continental European models or the 'North-South' divide, which are too simplistic.
103 The Economist 8th August, 2009, pp. 7 and 63-64.
The financial crisis and the political consequences of rising unemployment have raised obvious fears of protectionism by developed countries. A foretaste of this was in the 'Buy American' stipulations in the US' stimulus package (matched by a 'Buy Chinese' requirement in that country's).  

Concerns about trade protectionism have been reinforced by the decision of the US government to impose a tariff on Chinese tyres (with a relatively minor tit-for-tat response by China to launch an anti-dumping inquiry regarding American chicken and car-parts) might seem to confirm these fears. The broader costs may exceed the paltry immediate gains: not only has it set a bad precedent for the demands of other sectors in the US economy, but also it sets a bad example for the rest of the world. However the available data do not suggest an excessive resorting to such measures, most of which have been initiated by developing countries (fig. 21; see Section III.8.ii)).

In addition, government intervention has curtailed the international activity of various big banks, since tax-payers want their money to be channeled into domestic loans, not into offshore ventures. Another aspect of such 'financial nationalism', as a potential threat to globalisation, is that governments will seek to exert greater regulation of the local branches of foreign banks, especially in the wake of recent experience with Icelandic banks (Palmer, 2009).

6. Conclusions

There has been recent optimism that the worst of the financial crisis may now be over, and that it was not as bad as had been feared. For example, the US' Troubled Asset Relief Program (TARP) and other national bail-out schemes for banks are now expected to cost less than 1% of GDP, much less than previous similar crises; for the US, this has been helped by the lack of a simultaneous currency crisis. However this ignores other measures taken to support the financial sector (for example, the propping up of Fannie Mae and Freddie Mac) and non-cash subsidies (for example, government guarantees), as well as indirect consequences such as decreased government revenues. Also, any optimism may be unjustified, just as it was at a similar stage after previous crises, including the Japanese banking one: perhaps the most important lesson of the Japanese experience is the need to avoid over-optimism about any apparent recovery, and thus premature tightening up of fiscal policy.

There must be pessimism about the short-term prospects for recovery by many developed economies. The present threat to their recovery boils down to a lack of money for investment, and the increasing risk of stagnation or, worse, regression for the majority of their population. The present crisis differs from most previous ones is that it is households rather than businesses which were most affected. This means that many consumers in developed countries are now required to reduce their debts relative to their incomes and the decreased values of their homes: deleveraging will require consumption to grow more slowly than income. This has led to an increase in domestic savings and a reduced demand for credit; in turn, this will result in Keynes' 'paradox of thrift', where people in developed economies will spend less, trade will be depressed and this will destroy companies and jobs. This contrasts with the preferred response, which would be a short-term increase in spending, so as to restore demand and thereby boost the economy to keep it from entering a deflationary spiral and then stagnating, with the resultant increased unemployment likely to lead to political instability.

104 The Economist, 27th June 2009, pp. 82-83.
105 The Economist 19th September, 2009, pp. 13 and 43-44.
111 Difficult to achieve with fiscal stimuli, since people will use any attempted stimulus to pay off their debts.
and xenophobia.\textsuperscript{112} Similarly, whilst government is now encouraging banks to lend more to help re-
stoke the economy, they will be expecting them to lend less in the longer term (Palmer, 2009).

Thus the need for increased domestic saving and the consequent reduced consumer spending, together with increased unemployment, raises the worry of deflation with depressed wages and prices,\textsuperscript{113} such as has afflicted Japan; the problem is compounded by the lack of established tools for central banks to try and correct such a situation.\textsuperscript{114} The knock-on effects of the recession and the application of stimulus packages in the US and elsewhere in the developed world can be expected to increase interest rates and taxes to cope with public debt; almost inevitably, this will also reduce investment, and consequently (together with greater financial regulation) the pace of innovation.\textsuperscript{115} Increased competition for limited jobs – compounded by pressures for increasing the retirement age (see Section II.4)\textsuperscript{116} – will likely lead to an apathetic yet frustrated underclass who have given up hope of finding employment and who lose whatever motivation and skills they had.\textsuperscript{117}

One consequence of the crisis will be on social safety nets, which have been labeled as "the ultimate Ponzi schemes", in which the next generation picks up the tab: they have worked up until now because of economic and population growth, by they threaten to be overwhelmed by present decreases in population size and/or tax revenues.\textsuperscript{118} Budget deficits resulting from fiscal stimuli augmented by decreasing tax revenues as a result of increased unemployment and thus also increased pay-outs to those who are jobless.\textsuperscript{119}

The ramifications of the recent economic crisis and the measures taken to contain it magnify the growing worries, prior to the crisis, about the implications of globalisation for employment and wages in developed economies. Thus, Steingart (2008) considered that the short-term benefits to the West from cheap imports (and thus lower inflation) were offset by the fact that it was effectively exporting many of its unskilled – and also, increasingly, skilled – jobs in domestic production;\textsuperscript{120} and that this was resulting in the emergence of a poor, apathetic underclass. He went on to argue that developed economies were placed at a relative disadvantage because of their development of the welfare state: a product of their social evolution, this has added to the monetary costs built in to the price of labour; and it had become an albatross, in part because of consumers' desire to obtain the best deal in the purchasing of goods whilst ignoring the social costs of their decisions.\textsuperscript{121} Thus he concluded that naked (often state-run) capitalism in China and many other developing countries has re-emerged at the expense of the softer, more socially responsible version which has developed in the West.\textsuperscript{122}

Many of the proponents of globalisation recognised the problem of changing labour markets for developed economies, but assumed that entrepreneurs would create new sources of employment to

\textsuperscript{112} The Economist 14th March, 2009, pp. 63-65.
\textsuperscript{113} So that there is an increase in the real, as distinct from the nominal, value of previously-incurred debts, thereby further depressing spending: The Economist 9\textsuperscript{th} May, 2009, pp. 15-16.
\textsuperscript{114} The Economist 9\textsuperscript{th} May, 2009, pp. 15-16.
\textsuperscript{115} The Economist 16\textsuperscript{th} May, 2009, p. 82.
\textsuperscript{116} Not least so that older members of the population can recoup their losses from the crisis.
\textsuperscript{117} The Economist 16\textsuperscript{th} May, 2009, p. 82.
\textsuperscript{118} The Economist 2\textsuperscript{nd} January, 2010, p. 53.
\textsuperscript{119} The Economist 4\textsuperscript{th} April, 2009, p. 12.
\textsuperscript{120} Note, however, that technological innovation has destroyed more jobs in developed countries than have been lost through outsourcing (e.g. Bishop, 2008).
\textsuperscript{121} In a fundamental sense, they have become over-developed, which normally leads to extinction in the natural world.
\textsuperscript{122} A conclusion which must be tempered by recent developments in at least some of developing economies, as a result of their stimulus packages: see Section III.
replace those lost to the growing competition from cheaper developing economies.\textsuperscript{123} Whilst history has shown that recessions are a time when new opportunities arise for those who can see them and take advantage of them, as creative destruction weeds out the weaker performers – be they companies or (in the longer term) countries,\textsuperscript{124} it is difficult to believe that the extra impetus provided by the present crisis over and above the changes which have occurred previously would allow history to repeat itself on the scale necessary to rescue many or all of the current developed economies.

Thus, the efforts of bankers and others to feather their own already well-endowed nests has gone further to ensure that the underlying worries about the effects of globalisation on workers in developed countries will be realised: in particular, whilst developed economies have provided safety nets to rescue these failed capitalists,\textsuperscript{125} the social safety nets to rescue their innocent\textsuperscript{126} victims, including those who are unemployed or aged, must be jeopardised if governments are to recoup their losses and repay their acquired debts. The inevitably increased taxation will only lead to migration of the top earners; thus the main tax burden will fall on the man-in-the-street.\textsuperscript{127} Thus, whilst Steingart's (2008) assertion that the effects of globalisation raised the spectre of future social disturbances and 'class warfare' seems rather melodramatic,\textsuperscript{128} it is interesting to note that The Economist Intelligence Unit recently identified certain Western European countries as potentially at risk from social unrest.\textsuperscript{129}

Given the foregoing, together with other factors such as ageing populations (see Section II.4) and the political problems of democracies and their resultant inertia\textsuperscript{130} (see Section II.5), it might be anticipated that the recovery of developed economies will be W- or U-shaped (Section I.c), and that it is unlikely that the trajectory would return to what it was before (i.e. not scenario 1 in fig. 7). However a major unknown is the impact of changes in the natural environment: not only is there the problem of the unsustainable use of existing physical resources but also there is the problem of climate change and its impact on various countries. Nevertheless, the likely end-result is that the US economy will no longer be the driver of the global one, despite having better demographic characteristics than other developed economies: alternative consumer markets need to take up the slack, with China being the most obvious replacement (Cox, 2009; see Section VI.1).

The following section will turn to considering developing countries, with particular reference to those in East, Southeast and South Asia.

### III. The political economies of developing nations

#### 1. Overview

Developing nations\textsuperscript{131} are obviously those which are not categorised as developed. Given the variability in identifying which countries are considered as 'developed' or 'mature', there are obviously differences between classifications regarding which countries are identified as 'less economically developed'. The sheer size of the category means that various attempts have been made

\begin{footnotesize}
\footnote{An assumption which seems to rest on the belief that workers in developed economies have the capacity to do things that others are not – a nonsense, not least because of various other countries' investment in education, in order to develop their natural talents.}
\footnote{\textit{The Economist} 3\textsuperscript{rd} October, 2009, p. 76.}
\footnote{Because they expected a free lunch, in the form of a 'socialist'-style rescue, when their wheezes back-fired.}
\footnote{Or else either very badly misled or dangerously naïve (probably both), in the case of those who took out sub-prime mortgages.}
\footnote{\textit{The Economist} 2\textsuperscript{nd} January, 2010, p. 53.}
\footnote{http://www.economist.com/daily/chartgallery/displaystory.cfm?story_id=15098974; see fig. 37.}
\footnote{Equally characteristic of other forms of non-revolutionary government: resistance to change is a human characteristic, a product of our evolution.}
\footnote{The potentially less pejorative term 'less economically developed' is often used instead.}
\end{footnotesize}
to identify subcategories using assorted criteria: for example, newly-industrialised economies (in the transition to developed status: including the four ‘Asian Tigers’ – Hong Kong, Singapore, South Korea and Taiwan); the (big) emerging markets; and a subdivision between middle and low-income countries. The present discussion follows the mainstream: amongst Asian countries, only Japan is considered as a developed economy (Section II), whilst the newly-industrialised economies in Asia are not, to make for a more comprehensive regional consideration.

Whilst there has been a dramatic decrease in poverty in China (from 84% in 1981 to 16% in 2005: fig. 22), this was accompanied by increasing inequality (the Gini index rose from 29.1 to 41.5). Its decrease in poverty, and also the increase in inequality, was more dramatic than that seen in Brazil and India (fig. 22) which, together with China, account for more than half of the world’s poverty.

Developing countries were initially adversely affected by the spike in inflation in 2008, as the result of a demand-fuelled increase in oil prices (fig. 1). Thus, Asian economies were affected by falling demand as a result of rising food and fuel prices in early 2008, this being accentuated by the introduction of monetary policies to control overheating of the economy and inflation. Thereafter, the subsequent global recession has also hit developing countries, but differentially and to a lesser extent than developed ones: thus, South Asia was relatively unaffected (fig. 23). Nevertheless the recent global economic crisis, and more especially the prior spike in inflation, has set back efforts to decrease poverty and South Asia and elsewhere (fig. 24) and thus to achieve some of the key Millennium Development Goals (see Section IV.4).

The problem is compounded by the fact that, after a steady rise, commodity prices have plummeted, so that not just oil-producers but also mining and agricultural exporters have been severely affected: whilst this has benefited importers of raw materials, it has been a blow to those in the export sector who had been beginning to enjoy better times. The economic crisis has also affected those countries which had benefited from the increase in tourism, including Cambodia (see Section V).

In part, the effects of the recession on developing economies have been the result of the drying up of export markets (figs. 3C, 11A). Nevertheless, it is important to note that emerging markets’ exports to developed economies have remained stable since at least the start of this century, with most of the

135 The Economist, 27th June 2009, pp. 79-81.
136 In the main, this is because India was not too dependent on either foreign investment or exports; in addition, it benefited from increased government pre-election spending prior to the crisis, which proved to be a preemptive stimulus package: The Economist 20th June, 2009, pp. 58-60.
137 Ibid.
growth being in exports to other developing countries; thus there is the potential for a more rapid recovery of many emerging markets in Asia (and also South America, to a lesser extent) than is likely for the rich countries.\footnote{139}

\begin{figure}[ht]
\centering
\includegraphics[width=\textwidth]{figure23.png}
\caption{Although the economic crisis has had profound effects on developed countries' growth, its effects on world trade mean that many developing economies have also been adversely affected; note that the post-crisis rebound assumes a full global rebound recovery within the near-term – option 1 in figure 6 (adapted from PricewaterhouseCoopers, 2009).}
\end{figure}

\begin{figure}[ht]
\centering
\includegraphics[width=\textwidth]{figure24.png}
\caption{The reduction in global poverty rates is projected to be slower in 2009 than the average for the previous three years (adapted from PricewaterhouseCoopers, 2009).}
\end{figure}

\footnote{139 The Economist 10th January, 2009, pp. 61-62.}
However, another problem for many poor and developing countries is that foreign aid is likely to fall,\textsuperscript{140} together with capital flows from private overseas investors and remittances from migrant workers overseas.\textsuperscript{141} The latter is an important source of money for the peoples in many developing countries,\textsuperscript{142} but this has been affected, to some extent at least, as a result of the financial crisis (fig. 25). The importance of this source of money is indicated by the fact that not only is it much more than the amount of official OECD aid (US$120 billion) to developing countries; but it is also more efficient, since wastage as a result of employing middlemen and corruption is minimised. On the other hand, the money generally does not reach the poorest, most vulnerable members of their societies, since those who can migrate need some initial finance to provide for education and travel.\textsuperscript{143}

The reduction in capital flows from banks will mean that they are likely to recover more in debt repayments from developing economies than they pay out in loans to them, further adding to the latter's burdens.\textsuperscript{144}

2. Innovations to help the poor (rather than just the rich) help themselves

One way in which mobile phones have been a boon to developing countries is because they give access to money services, allowing poor people to take the first step towards using the financial services offered by traditional banks.\textsuperscript{145} However, although a few banks have been enlightened and recognised the opportunities of a new business model, many others have considered mobile-money services as a threat to their business, and thus tried to prevent their development. Regardless, there are inevitable regulatory concerns related to the need to avoid fraud and opportunities for money-laundering.\textsuperscript{146}

'Social finance' – a new class of asset – has become popular, including with philanthropic institutions such as the Rockefeller and the Bill & Melinda Gates Foundations (the latter is thus trying to establish a model for a 'merchant bank for the poor').\textsuperscript{147} It uses innovative financial strategies in order to develop instruments which directly benefit the most needy in society, and centres on 'impact investing' which provides not only a financial return for the investor but also an environmental or social benefit in developing economies (including investment in new start-ups). Its major appeal (apart from the fact that it presumably salves the consciences\textsuperscript{148} of those in the financial industry) is that assets should make money (yields can be expected to be higher than from investments in

\textsuperscript{140} Thus the once much-vaunted Millennium Development Goals look ever more unlikely to be realised.

\textsuperscript{141} *The Economist* 17th January, 2009, pp. 53-55; 14th March, 2009, pp. 54-55.

\textsuperscript{142} World-wide, there are about 200 million of these migrant workers who have gone abroad and who transfer about US$328 billion/year from developed to developing countries: *The Economist* 10\textsuperscript{th} October, 2009, pp. 61-62.

\textsuperscript{143} *The Economist* 10\textsuperscript{th} October, 2009, pp. 61-62.

\textsuperscript{144} *The Economist* 21st February, 2009, pp. 59-61.

\textsuperscript{145} *The Economist* 26\textsuperscript{th} September, 2009, p. 13.

\textsuperscript{146} *The Economist* 26\textsuperscript{th} September, 2009, p. 13.

\textsuperscript{147} *The Economist* 26\textsuperscript{th} September, 2009, pp. 73-74.

\textsuperscript{148} Or at least seeks to restore the badly tarnished public image.
developed economies), whilst spreading risk by investment diversification, as well as benefit others who are more much needy.\footnote{The Economist 26th September, 2009, pp. 73-74.}

3. A regional perspective

Most East and Southeast Asian economies have a reputation for being savers.\footnote{cf. South Korea: The Economist 15th August, 2009, pp. 7 and 58-60.} Nonetheless, since 1990, there has been an average annual increase in consumer spending of about 6.5%, higher than for any other region in the world (fig. 26A). Thus, private consumption in most developing Asian economies is similar to other countries with comparable income levels, at 50-60% of GDP: China is an exception, having decreased from 46% in 2000 to 35% in 2008.\footnote{The Economist, 27th June 2009, pp. 79-81: To correct this, the Chinese government has taken steps to further increase consumption by both urban and rural households, including the possibility of making loans more readily available and comparable with elsewhere (see Section III.4).}

![Figure 26A: Consumer spending in emerging Asian economies as a whole has increased relative to that in the US. Whilst it has fallen as a share of GDP, this reflects the even greater increase in investments and growth. In each case, the data are in volume terms, with 1990 data set at 100 (adapted from The Economist, 27th June 2009, pp. 79-81). B: Emerging Asian economies, and most especially China and India, have shown a rebound (based on year-on-year change in GDP), in contrast to Western economies and Japan (adapted from The Economist, 27th August 2009, pp. 58-60).](image)

The present rapid recovery from the successive shocks of increased inflation followed by the collapse of major export markets recalls developing Asia's rapid rebound from the 1997-8 East Asian financial crisis and the dot.com bubble-related recession of 2001. Accordingly (fig. 26B), China,\footnote{After a hiccup at the end of 2008 which reduced its previously stellar growth rates.} India and Indonesia have been largely unaffected by the crisis, so that there have been increases in retail spending.\footnote{The Economist, 27th June 2009, pp. 79-81; The Economist, 27th June 2009, pp. 79-81; 15th August, 2009, pp. 7 and 58-60.} On the other hand, the smaller populations of other, more open emerging Asian economies were more affected by the global economic recession, with reduced wages and increased unemployment leading to a cut back even more that the US on consumer spending; nevertheless, they would still seem to be bouncing back.\footnote{The Economist, 27th June 2009, pp. 79-81; 15th August, 2009, pp. 7 and 58-60.} Thus projections suggest that, as a whole, emerging Asian
economies are set to grow about 8% for 2009, compared with a 3.5% contraction for the G7 economies (fig. 26), lending extra credence to the idea that there is a fundamental shift in economic power in progress (see Section III.5).

India’s growth has remained consistent (fig. 23), without the need for a major economic stimulus in response to the recent global recession, as a result of growth in domestic markets (so that the excess in imports has helped to sustain the global economy). India is rather remote from East and Southeast Asia as a trading partner, partly because of trading barriers and the lack of trade agreements, together with border tensions with China (see Section III.8.iii). Other historical factors include the fact that India tends to be more westward-oriented, and thus is a late arrival on the 'local' scene when it comes to supply chains.

Given the continuing (or at least renewing) surge in GDP for developing countries in the region, it could be argued that this is the result of over-investment. However, this is not supported by data for total factor productivity (TFP: fig. 27), which is the best (albeit difficult to measure) indicator of growth in productivity, and thus economic development. According to this index, China has shown the fastest growth in TFP since 1990, followed by India and various other developing Asian economies; these in turn are ahead of Japan and other developed economies, whilst Brazil and Russia are the laggards amongst those economies surveyed (fig. 27). Thus, China’s growth reflects a shift in emphasis from agriculture industrialisation, rather than being the result of over-investment; and there has been a shift in return on physical capital from less than half the world average to well above it. The high TFPs of many other Asian economies reflect their open economies and the influx of FDI, together with their investment in education and the flexibility of their labour markets; all of this promotes the exploitation of established and new technologies. This thus provides evidence that the growth seen in the economies of China and other developing nations of the region are the manifestation of a real phenomenon in the evolution of global development.

4. The Chinese experience

As noted above, China’s brief economic downturn was caused by tight credit policies to prevent overheating: it resulted from a reduction in housing and construction (where half of the migrant job losses were), rather than subsequent export slump. Thus, although trade figures (e.g. fig. 11B) suggest that exports have been a major contributor to China’s growth, the fact that much of the

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155 But see footnote 133.
156 The Economist 21st November, 2009, p. 36.
157 TFP also takes capital productivity into consideration, and not just labour productivity (which may be offset by increased investment in machinery, for example): The Economist 14th November, 2009, p. 82.
158 The Economist 14th November, 2009, p. 82.
159 The Economist 18th April, 2009, p. 79.
exported goods were made elsewhere (especially in the region) as part of a global supply-chain network means that, in fact, investment has been the main driver of growth (Miles, 2009). For example, although exports account for 40% of GDP, the use of imported components means that only 18% is value-added and less than 10% of work-force is involved. This indicates that the popular conception that China's growth depends on US markets is a myth: on a value-added basis, to exclude the cost of imported components, US consumers account for only 5% of China's GDP. More so than other Asian countries, China has a reputation as being a nation of savers (see Section III.3); contrary to other Asian countries, this is not based on a myth. Savings have been mainly by companies and, latterly, by households (fig. 28A):

- In the corporate sector, large (state-owned or -controlled) companies benefiting from low exchange rates are able to make big savings, as a luxury. This contrasts with the situation for small and medium enterprises, where savings are a necessity: whilst the latter's number has grown from zero in 1979 to about 60 million today, and they contribute 60% to GDP and half of tax revenues, they lack of access to ready loans (fig. 28B).
- Household savings in China, in part, reflect 'self-taxation', due to lack of state investment in areas such as education, health and other social safety-nets (Cox, 2009). One additional factor is that, whilst there has been a rapid increase in China's GDP growth, this is not reflected in employment, which has only increased by about 1% each year. This means that there has been no corresponding increase in household income, which has decreased from 72% of GDP in 1992 to 55% in 2007: this reinforces a bias towards savings at the expense of consumption. An emphasis on savings is also important for young adults (who might otherwise be expected to be active consumers), because of the difficulty in obtaining mortgages and loans for other assets such as a car, whether for reasons of marriage or simple self-indulgence (Cox, 2009).

Figure 28A: Domestic saving, as a % of GDP, has increased across the board in China (adapted from Cox, 2009).

B: Historically (2001-2005), there have been marked differences in the average interest rate (%) paid by different types of Chinese business (adapted from The Economist 30th May, 2009, pp. 73-74).

While state-owned firms mean a more rapid response to policy initiatives, small and medium businesses are much more flexible and responsive to changes in the commercial climate.

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160 The Economist 18th April, 2009, p. 79.
161 The Economist 16th May, 2009, pp. 77-79.
162 The Economist, 27th June 2009, pp. 79-81.
163 The Economist 19th December, 2009, p. 50.
165 Defined as those employing less than 2,000 people: The Economist 12th September, 2009, pp. 62-63.
Because the vast majority of the latter (more than 95%) are privately owned, and because they accounted for two-thirds of China's exports, they have been severely hit by the global recession: an estimated 670,000 have been forced to close in the coastal cities of China, with the loss of 20 million migrant workers' jobs.\textsuperscript{167} This situation has been exacerbated by their lack of access to loans (see above), and consequently their reliance on savings to survive, never mind to expand. Thus local entrepreneurs are mainly supported by foreign investment.\textsuperscript{168}

To stimulate business activity, China implemented a 4 trillion yuan (US$585 billion) economic stimulus package. A considerable proportion of this is being provided by the state-owned banks through the removal of restraints previously applied to try and contain runaway lending (fig. 29),\textsuperscript{169} with only about 30% coming from central government (Cox, 2009). However, political forces mean that banks continue to favour large state-owned companies,\textsuperscript{170} confirming the perception that the playing field is still not level for the private sector which has been largely neglected by the package.\textsuperscript{171}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{chart.png}
\caption{The economic stimulus has led to large increases in lending by Chinese banks (trillion yuan; adapted from \textit{The Economist} 4\textsuperscript{th} July, 2009, pp. 23-24).}
\end{figure}

This imbalance notwithstanding, China's stimulus package would seem to have had the desired effect on the national economy (fig. 30A). As part of its overall aim, it sought to further facilitate a 'rebalancing' of the economy to promote the inland migration of industries (fig. 30B, C; an important factor in anticipating the potential for social unrest: see Section III.8.i), and thus economic activity as a whole.\textsuperscript{172} Thus about 37.5% of the package was allocated to investment in railways and other

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|}
\hline
Year & Investment (trillion yuan) & GDP (%) \\
\hline
2007 & 0.5 & 8.5 \\
2008 & 1.0 & 9.0 \\
2009 & 1.5 & 9.5 \\
\hline
\end{tabular}
\caption{Annual changes in China's bank credit, as a percentage of GDP (adapted from \textit{The Economist} 16\textsuperscript{th} January, 2010, pp. 61-63).}
\end{table}

\textsuperscript{166} They account for 80% of the new products introduced, as well as two-thirds of patent applications: \textit{The Economist} 12\textsuperscript{th} September, 2009, pp. 62-63.
\textsuperscript{167} Cox (2009); \textit{The Economist} 12\textsuperscript{th} September, 2009, pp. 62-63.
\textsuperscript{168} Review of Huang Yasheng, 'Capitalism with Chinese Characteristics: Entrepreneurship and the State': \textit{The Economist} 4\textsuperscript{th} October, 2008, pp. 85-86.
\textsuperscript{169} Because of a government squeeze on credit initiated before the onset of the global crisis to prevent overheating: see above; \textit{The Economist} 4\textsuperscript{th} July, 2009, pp. 23-24.
\textsuperscript{170} \textit{The Economist} 20\textsuperscript{th} June, 2009, pp. 58-60; 12\textsuperscript{th} September, 2009, pp. 62-63.
\textsuperscript{171} Apart from continuing long-term problems of smaller, privately-owned companies gaining access to credit they also, for example, suffer disproportionately when it comes to imposing environmental regulations: \textit{The Economist} 28\textsuperscript{th} November, 2009, pp. 36-37.
\textsuperscript{172} Cox (2009); \textit{The Economist} 8\textsuperscript{th} August, 2009, p. 60.
infrastructure, especially in the less developed western regions, which will benefit China's development and economic integration in the long-term.173

The package also aims to promote consumer spending by reducing the pressure for household saving. Thus, reforms will be introduced for a pension system which has marginalised the majority of workers up until now.174 Also, US$125 billion will be pumped into the health sector in 2009-11, for example by boosting government subsidies so that patients do not have to pay for items such as tests; this should mean that 90% of the population are covered by insurance by 2011, and a ‘relatively robust’ health-insurance system will be in place by 2020.175 However, these effects would seem likely to take time before they are reflected in changes in people’s spending patterns.

Nonetheless, the stimulus package has resulted in a large increase in domestic spending nationwide. Thus China’s economic stimulus helped to reduce the previous increase in unemployment amongst rural migrant workers.176 Given the counter-inflationary steps taken in 2007 (see above) to control a nascent housing bubble, the government is reacting cautiously in order to promote sustainable growth whilst trying to contain any further speculative bubbles, including by constraining the purchase of mortgaging of properties for investment purposes.177 Thus, although there is the worry is that inflation and bubbles will again threaten (see Section III.6), recovering house sales (fig. 31) are

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175 Cox (2009); *The Economist* 27th June, 2009, pp. 79-81; 18th April, 2009, p. 31.
considered to be beneficial, as a way of boosting both the construction industry as a major employer and household spending on domestic items.\footnote{The Economist 4th July, 2009, pp. 23-24.} However, in order to promote household spending in the longer term, after the effects of the economic stimulus package wear off (even allowing for the delay effects of strengthening social safety nets), there is the need to encourage the redistribution of wealth, through encouraging a switch from capital-intensive manufacturing industries to labour-intensive services and thereby increase employment.\footnote{Cox (2009); The Economist 15th August, 2009, pp. 7 and 58-60; 19th December, 2009, p. 50.}

The end result is that China's monetary and fiscal stimulus added 12 percentage points to GDP in 2009, whilst its current account surplus fell to about 6%, almost half that in 2007.\footnote{The Economist 21st November, 2009, pp. 75-76.} The decrease in the latter, as a result of increased domestic consumption, has served to reduce China's current account surplus, thereby helping to rebalance the global economy. However doubts have been cast about the accuracy of the trade data produced by China, which report surpluses usually quite a bit less than the deficits reported by various target countries (fig. 32A).\footnote{The Economist 5th September, 2009, p. 82.} Nonetheless, this decrease would appear to be real (fig. 32B). Part of the explanation for the disparity reflects trans-shipment through Hong Kong, which China records as an export to Hong Kong itself; furthermore, there is a 25% mark-up in value by re-exporters, explaining another portion of the disparity in trade data. An additional contributory factor is that the value of imports includes the cost of insurance and freight, which is not the case for exports. Much of the remainder of the disparity is presumed to reflect disguised movements of money to avoid taxes.\footnote{The Economist 5th September, 2009, p. 82.} This suggests that the rebound increase in China's GDP does indeed reflect increased domestic growth and consumption, independent of changes in export markets.

For whatever reasons, China's stimulus package has been the target of some scepticism. Critics have variously downplayed the actuality of the package's magnitude (cf. fig. 4); or, subsequently, dismissed the recovery as a 'false dawn', either not accepting the available data or, contrariwise, accepting them and thereby predicting that its economy is bubbling and set to crash, drawing
analogies with Japan in the 1980s (see Section III.6). Although China's economic statistics can be suspect, the fact that they all point to a marked upturn in the economy gives recent data some credence; this reinforces the conclusion of the preceding paragraph, that the available data do indicate continuing economic growth.

Even so, although growth has remained relatively strong despite falling exports, concerns have been raised about whether the increase in domestic investment as a result of the stimulus package might lead to an increase in excess capacity (cf. fig. 27); and whether the increased lending by state-owned banks will mean the risk of many bad debts if corporate profits are hit. The former would seem unlikely to be a worry: although some of the investment has been in the steel and concrete sectors and in the garment and some other export-oriented industries, much of the rest has been in further establishing an infrastructure as a springboard for continued national development (see above). On this basis, a relative lack of excess capacity means that future profit margins should not be affected, easing concerns about bad debts.

However, the credibility of China's corporate earnings have been cast in doubt, in part because the profits of state-owned companies are the result of subsidised banking by state banks with their cheaper interests rates. Considering the broader picture, Smick (2008), for one, is a sceptic about the future performance of the Chinese economy and the fact that it is in the hands of government-run – and thus relatively opaque – banks: apart from them not being accommodating for small and medium businesses (see above), he considers them to be inefficient and often corrupt, with little

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184 Including a 56% increase year-on-year in imports in the quarter up to November, which can be cross-checked with external data.
186 The Economist 20th June, 2009, pp. 69-70.
187 Thus the government will likely make losses in the short-term, but will recoup them in the long run: The Economist 20th June, 2009, pp. 69-70; 16th January, 2010, pp. 10-11 and 61-63.
188 The Economist 20th June, 2009, pp. 69-70.
189 The Economist 30th May, 2009, pp. 73-74.
conception of risk-management. Thus, one cause for concern is inflation (see Section III.6), because of the large numbers of non- and underperforming loans: whilst these are being kept in the minority by active pursuit of new loans, there is a looming potential crisis should rising inflation reduce the taking out of further new loans, raising the spectre of a repeat of the Japanese banking crisis two decades ago.  

Figure 33: Cyclical changes in the activity of the in the major emerging (BRIC) economies, compared with all emerging and developing economies and with the world as a whole (adapted from The Economist 20th June, 2009, pp. 58-60).

5. Globalisation and the decoupling of the world's economies

In the past, it has generally been assumed that continued growth of developing economies as a result of globalisation was dependent on consumer demand in the developed world, and thus the latter's economic health.

However, even before the present crisis, there was evidence to indicate that cycles in the major emerging (so-called BRIC) economies were more ebullient than most others (fig. 33) and that they were coming closely into synchrony, albeit out of phase with the cycles in developed countries: thus there had been a decoupling, contrary to what might be expected from globalisation. Moreover, cycles in BRICs – cushioned by their greater diversification and their large domestic markets, and thus a lesser dependence on exports – have also become uncoupled from those in smaller developing economies, leading to concerns about how the latter will pull through after the crisis because any (relatively smaller) stimulus will be dissipated in part through increased imports.

Subsequent to development of the global economic crisis, this is the only region in the world to have recovered from the global recession, largely a consequence of China's rebound in industrial production after stagnating in 2008 as a result of tightened credit to control inflation and prevent its economy overheating (fig. 34). The main causes of this decoupling from Western economies can

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190 Note that others are more optimistic about the state of the banking sector: e.g. The Economist, 15th November 2008, pp. 76-78.
191 Brazil, Russia, India and China: given Russia's declining promise, there has been a recent switch to considering the BIIC economies, to include Indonesia instead, and thus encompass four nations with good recent growth records and which comprise 40% of the world's population.
192 The Economist 20th June, 2009, pp. 58-60.
193 Including India, which suffered less from the recession due to its lesser dependence on exports (see above).
be attributed to increased domestic spending as a result of the region's larger (fig. 4),\textsuperscript{195} faster-acting fiscal stimuli;\textsuperscript{196} together with the relaxing of financial systems for global trade to allow exports to resume, as a result of the recovery of the banking system, and the fact that sales of much of their manufacturing output underwent a strong cyclical rebound during the recovery (rather than just replacing inventory).\textsuperscript{197} However (as with China: see preceding section), whilst their large stimulus packages may help boost their recovery,\textsuperscript{198} there is the need to promote domestic consumption and borrowing in the longer term, without any further stimuli, through a movement away from capital-intensive manufacturing to other, more labour-intensive sectors.\textsuperscript{199}

\textbf{Figure 34A:} In contrast to the slump in manufacturing output in the US, that of the developing countries of Asia has recovered to pre-crisis levels, mainly as a result of a rebound in Chinese industries (January 2006 = 100; adapted from \textit{The Economist}, 27\textsuperscript{th} June 2009, pp. 79-81).

\textbf{B:} This has meant that the percentage change in GDP, year-on-year, has been much less affected that that of the G7 industrialised nations, which lapsed into recession (adapted from \textit{The Economist} 15\textsuperscript{th} August, 2009, pp. 7 and 58-60).

Nevertheless (and again consistent with the above comparative study on the BRICs), the response has been variable, with evidence (see Section III.5) for a decoupling amongst Asian economies. On the one hand, retail consumption has increased in the large populations of China, India and Indonesia, as a result of restocking, together with the fiscal stimuli provided by their governments. On the other, smaller, more open economies have contracted,\textsuperscript{200} as a result of reduced employment and lower incomes due to reduced exports.\textsuperscript{201} Thus, whilst over 60\% of China's imports come from the rest of Asia, about half of these are components for assembly and subsequent export to developed nations which are now in a slump: this means that the smaller, more export-driven manufacturing economies

\begin{itemize}
  \item \textsuperscript{195} Because many Asian governments' financial status was much healthier at the onset of the crisis than most of those in the West – they were largely unaffected by the banking crisis, with the increase in oil and food prices being the main causes, together with tighter policies to control inflation and contain incipient bubbles; also, the fact that local banks were largely unaffected by the financial crisis meant that increased lending could help fuel the recovery.
  \item \textsuperscript{196} Aided by the fact that households did not have the debt-burden of many in the West, meaning that they would be more inclined to spend their 'windfalls' and thus boost trade.
  \item \textsuperscript{197} \textit{The Economist} 15\textsuperscript{th} August, 2009, pp. 7 and 58-60.
  \item \textsuperscript{198} Especially as there is little household debt to soak up some of the stimulus money; this is the more encouraging given recent evidence that increased domestic spending, rather than increased exports, drove the recovery from the 1998 economic crisis: \textit{The Economist} 16\textsuperscript{th} May, 2009, pp. 77-79.
  \item \textsuperscript{199} \textit{The Economist} 16\textsuperscript{th} May, 2009, pp. 77-79.
  \item \textsuperscript{200} e.g. Hong Kong, Malaysia, Singapore, South Korea, Taiwan and Thailand
  \item \textsuperscript{201} \textit{The Economist}, 27\textsuperscript{th} June 2009, pp. 79-81.
\end{itemize}
of the 'Tigers' and others have been badly hit, with much of the recovery to date being to replenish stocks which had been allowed to run down; and that the resultant spare capacity will reduce investment and increase unemployment until demand recovers.\footnote{The Economist 16th May, 2009, pp. 77-79.}

Moreover, although there is thus some evidence for decoupling from developed economies, the latter is only partial.\footnote{The Economist, 15th August, 2009, pp. 7 and 58-60.} Thus, whereas the growth of emerging Asian economies has averaged about 8% over the past two decades, total consumption is still only about 40% of that of the US. This means that, whilst this year's increase in regional consumer spending will more than compensate for the decrease in the West, the latter markets will remain important in the long-run.\footnote{The Economist, 15th August, 2009, pp. 7 and 58-60.} The only alternative, given the likely slow recovery and a consequent prolonged drop in demand for exports in developed markets, is to develop domestic Asian markets;\footnote{The Economist, 15th August, 2009, pp. 7 and 58-60.} in other words, to promote further decoupling and become progressively more independent of developed economies.

In keeping with realising the latter alternative, and contrary to the general perception, consumer spending over the past ten years has been increasing more rapidly in many developing Asian markets than elsewhere, most particularly the US, although it has fallen as a percentage of GDP, especially in China (fig. 26A).\footnote{The Economist, 27th June 2009, pp. 79-81.} Also, the growth in emerging Asia's surplus with the US accounted for only 6% of its growth in GDP over the period 2001-2006 (when the US' trade deficit peaked), so that the US' markets have become of relatively minor significance for regional growth: even if their markets were to dry up completely, there would not be too drastic an effect on the emerging Asian economies.\footnote{The Economist, 27th June 2009, pp. 79-81.}

On the other, supply side of the equation, the major constraint is productivity and the availability of labour, and the need to avoid too great inflation: the recent stimulus, through developing transport and other infrastructure, should serve to increase productivity. This contrasts with the West, where the costs of the financial crisis are likely to dampen productivity growth for ten years or more, despite the stable or increasing labour supply.\footnote{The Economist, 27th June 2009, pp. 79-81; 15th August, 2009, pp. 7 and 58-60.}

However, to realise such objectives, there is also the need to also promote fiscal decoupling, and let Asian currencies rise so that consumer spending will be further encouraged by increased spending power.\footnote{The Economist, 27th June 2009, pp. 79-81; 15th August, 2009, pp. 7 and 58-60.} Thus it is not clear whether the V-shaped recovery in emerging Asian economies is sustainable, or whether it might fade away in the absence of any carefully-timed follow-through changes in policy (see Section I.4);\footnote{The Economist, 27th June 2009, pp. 79-81; 15th August, 2009, pp. 7 and 58-60.} another worry is that the stimulus packages may have served to restart the inflation of asset bubbles.

6. Concerns about more bubbles

As noted above (Section III.4), there are worries that China's stimulus package might lead to housing and other asset bubbles in the future, fuelled by the misuse of bank lending to invest in the markets, which are rebounding after slumping during 2008 (fig. 35A).\footnote{The Economist, 27th June 2009, pp. 79-81; 15th August, 2009, pp. 7 and 58-60.} Thus, critics who have accepted the available economic data from China have predicted that its economy is bubbling and set to crash, making analogies with Japan in the 1980s (see Section II.3.i); if true, this would have global
ramifications, given the fragility of the world economy.\textsuperscript{212} A similar rebound in asset prices in recent months elsewhere in the region has also fuelled such fears (fig. 35B).\textsuperscript{213}

\textbf{Figure 35A:} The Chinese stock market (whose Shanghai and Shenzhen bourses mean that it is the second largest market after the US, although it is largely barred to foreigners) has undergone a recent rally (yuan, 1\textsuperscript{st} January 2005 = 100; adapted from \textit{The Economist} 29\textsuperscript{th} August, 2009, pp. 66-67).

\textit{B:} This is matched by increases in other stock-markets in the region (% relative to 1\textsuperscript{st} January 2009; adapted from \textit{The Economist}, 15\textsuperscript{th} August, 2009, pp. 58-60).

Although these fears may be premature, they emphasise the need for emerging Asian economies to tighten their economic policies and control the development of bubbles.\textsuperscript{214} One way would be to increase interest rates, but this would attract an influx of foreign money and lead to an increase in liquidity; another is to let their currencies – which are amongst the most undervalued in the world – rise to find their true value against the dollar, which would also decrease domestic liquidity.\textsuperscript{215} For example, China has pegged its currency exchange rates since July 2008, after allowing the yuan to rise by 21\% against the dollar over the previous three years, so that its value has since fluctuated up and down along with the dollar against other currencies. This has been criticised as not only helping to sustain the US trade deficit (although this is debatable) but also sustaining imbalances in the Chinese economy and its dependence on exports.\textsuperscript{216}

However there is the problem that, if China and other regional economies increased their interest rates or took other such measures, this might act to strangulate the recovery, in part through reducing consumer spending as a result of decreased liquidity; whilst there is a reluctance to let exchange rates rise, as this would further constrain exports.\textsuperscript{217}

\textsuperscript{212} \textit{The Economist} 16\textsuperscript{th} January, 2010, pp. 10-11 and 61-63.

\textsuperscript{213} \textit{The Economist} 15\textsuperscript{th} August, 2009, pp. 7 and 58-60.

\textsuperscript{214} \textit{The Economist} 15\textsuperscript{th} August, 2009, pp. 7 and 58-60; 24\textsuperscript{th} October, 2009, pp. 75-76; 14\textsuperscript{th} November, 2009, pp. 77-78.

\textsuperscript{215} \textit{The Economist} 15\textsuperscript{th} August, 2009, pp. 7 and 58-60.

\textsuperscript{216} \textit{The Economist} 21\textsuperscript{st} November, 2009, pp. 75-76.

\textsuperscript{217} \textit{The Economist} 15\textsuperscript{th} August, 2009, pp. 7 and 58-60.
7. The demographic factor

As a result of past extreme family-planning policies, China is facing a demographic crisis (fig. 36), comparable with that which is emerging in OECD countries (including Japan and South Korea; see Section II.4). Thus it is predicted that the number of people over 60 years old is expected to double in the next 20 years, associated with a contracting work-force and a slowing of economic growth (Beck, 2009). However China's future problems will be more acute than those faced by today's developed countries (Beck, 2009): it is less rich, and a social security system is only being developed (see Section III.4). The increased number of older people, together with the dispersion of families as a result of the migration of workers to find work, means that the system which is being developed for health-care and pensions will be under increasing strain, with the likelihood of increasing discontent amongst the younger generations of a family, who are presently morally and legally responsible for their older members (Beck, 2009).

This contrasts with what might be expected for other Asian nations and other developing countries elsewhere. Continuing development and decreasing mortality rates mean that there is less need to have children as an insurance policy (as is common in subsistence farmers), and family sizes are also decreasing as a result of increased female education and access to contraceptive methods. Thus, fertility rates are rapidly declining towards the replacement level, which will be attained for the rest of the world between 2020 and 2050 when the world's population is expected to peak (fig. 8A).

The evolution away from the fecund poverty of an agrarian society to a rich but ageing society with the development of a middle-class is potentially a time of high economic productivity (as a 'demographic dividend'), when there are few dependent children or grandparents relative to the number of adults in the workforce: this transition occurred in Europe over the period of 1945-1975 (“les trente glorieuses”) and is occurring now in Asia and Latin America. However, a smooth transition requires there are sufficient appropriate jobs for a mainly working-age population. Moreover the still-growing population, and the increasing proportion in the middle classes, will continue to put extra strain on limited planetary resources (see Sections I.6 and IV), as well as being in regions of the world that are the most susceptible to the likely effects of climate change (see Section IV.3).

8. Political factors

Historical baggage – including the sometimes seemingly arbitrary decisions of the Western colonial era regarding national and other boundaries, together with the colonial expansion of the Japanese

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218 In this case, because of past implementation of the 'one-child' policy since 1977, and the consequent imposed reduction in birth rates.
219 The 'cradle-to-grave' provision of an 'iron rice-bowl' for urban workers (there was no such safety net for rural workers) was phased out with the shutting down or privatisation of most state-owned in the 1990s has meant the loss of benefits for their erstwhile employees (Beck, 2009).
220 Including a provision of 7.5% of the 4 trillion yuan economic stimulus package: Beck (2009).
221 http://en.wikipedia.org/wiki/Trente_Glorieuses
during the first portion of the last century – continue to dog much of Asian regional politics. Superimposed upon this has been a growing Islamic activism.

**i. Internal stability** This has been threatened as a result of ethnic and/or religious divides: for example, in China, Myanmar and Thailand, as well as elsewhere in the region, to a greater or lesser extent (fig. 37).

Thus a recent report by the Chinese Academy of Social Sciences has observed that there is increasing social unrest in China. For example, although farmers were the first to benefit from China's opening up of its economy, they have been left behind by the subsequent development of industries (especially in special economic zones along the southern coast), which has created internal tensions which Beijing seeks to try to control. Thus, there is discontent about land-ownership and the fact that farmers have been left behind in the economic race after being the early leaders: a shift in focus to the 'Shanghai model' (with its emphasis on urban development supported by large resource-intensive state-owned enterprises and large multinationals) has meant that taxes have reduced rural income growth and poverty eradication, together with the closure of rural schools and hospitals. This means that China is now confronted with a huge challenge in extending economic growth, previously largely confined to its coastal provinces, inland to avoid the risk of social problems and 'class wars'.

*Figure 37* China and several developing countries in the Southeast Asian region are regarded as being liable to experience social unrest in the near future, according to a recently revised analysis by *The Economist* Intelligence Unit (adapted from [http://www.economist.com/daily/chartgallery/displaystory.cfm?story_id=15098974](http://www.economist.com/daily/chartgallery/displaystory.cfm?story_id=15098974)).

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222 news.bbc.co.uk/2/hi/8425119.stm
223 The usual minimum required figure given is 8% annual growth, but this may be an overestimate: *The Economist* 15th November, 2008, pp. 76-78; 24th January, 2009, pp. 27-28.
Superimposed upon this, China has had problems with instability in its hinterlands in response to increasing immigration of Han Chinese, with separatist activities in Tibet and of the indigenous, ethnic Turkic-Muslim Uighurs of Urumqi and elsewhere in Xinjiang. In addition, in its heartlands, there are reports of increasing social unrest in response to pollution and some of the other effects of development, including the corruption of local officials (in contrast to the apparent integrity of those working in central government). On top of this, there has been a resurgence in gangsterism, which reflects a partnership with corrupt police and local bureaucrats. Furthermore, problems of sharing tax revenues mean that local authorities do not have enough money to fulfill their public service responsibilities, especially in poorer areas. Things are made worse by the lack of democracy at local levels; patronage remains the way to be appointed to local government, opening up opportunities for organised crime. Thus, whilst there has been a reaction by local governments against the gangster threat, this has generally ignored the people (officials, and thus businessmen who have sought to promote themselves and their personal interests) behind them.

**ii. Trade relations** Given the continuing failure to complete the Doha round with the WTO, Asian nations have resorted to signing many bilateral and regional free trade agreements (fig. 38). However, bilateral agreements are generally unpopular with business, because of the bureaucracy involved. Also, because the details of each of these deals are different, there is a confusing diversity of rules and administrative requirements for the different preferential agreements, rather than the standardisation, and thus predictability, inherent in broader, multilateral agreements. Furthermore, bilateral agreements tend to conveniently ignore contentious issues, rather than try to resolve them: on the other hand, such bones of contention have acted to choke progress on the Doha round and other attempts to achieve multilateral agreements. Whilst it can be argued that bilateral or regional deals are better than no deals at all, this ignores the fact that such deals undermine wider agreements and make them more complicated due to conflicting requirements and expectations; also, while the progress of previous rounds of negotiation under the

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227 For example, in Chongqing, where the local ‘mafia’ controlled various trades (including drugs), money-lending, and nightclubs and prostitution: *The Economist* 3rd October, 2009, pp. 27-28.
228 Globalisation and selection pressure have meant that such gangs have sought to expand their compass, both nationally (including into higher levels of the five tiers of government) and internationally: *The Economist* 3rd October, 2009, pp. 27-28.
230 A recent exception is Chongqing, were death sentences have been imposed on some of the highest-ranking offenders: *The Economist* 3rd October, 2009, pp. 27-28.
231 The exception are those companies which get preferential treatment compared with the global competition, for political reasons, but this is likely to be to those favoured companies’ ultimate disadvantage: *The Economist* 5th September, 2009, pp. 13-14.
WTO (as well those under GATT, its predecessor) has been less than smooth, agreement has been achieved in the end – the obvious assumption being that the same will apply for Doha.

Regarding regional agreements, China and ASEAN recently set in motion plans to have a single market like that of the EC. During the first phase of establishing a ASEAN-China Free Trade Area, China and the six founding members aim to abolish 90% of tariffs on products. However, whilst ASEAN now has a legal charter, the principle of non-interference excludes the possibility of achieving the sort of unity that the EC is moving towards; this is reinforced by the problem of non-tariff barriers, together with fundamental bilateral and other disagreements which threaten any claim to a deep-seated unity – for example, Thailand's current border dispute with Cambodia and its border problems with other neighbours.

On a broader scale, ASEAN is also signing trade pacts with neighbouring countries, as a possible first step towards a pan-Asian trade bloc; however, because some already have bilateral agreements in place, this is one source of problems, especially as any agreements signed by ASEAN must be acceptable to each individual member. Looking further afield and further ahead, proposals were recently made at an ASEAN summit in Thailand, in October 2009, by the prime-ministers of Japan and Australia, for a more-or-less free-trade zone encompassing the Pacific basin in the medium-to-long-term.

At the bilateral level, China has been actively seeking trade agreements with developing countries in Africa and elsewhere, mainly to tap their sources of resources, but without any strings attached regarding human rights or other issues of conscience. For example, it has been reaching out to countries in Latin America, at a time when US' influence in the region is waning and several countries are becoming more assertive of their individuality. The increasing Chinese influence follows upon a period where many Latin American industries were threatened by the cheaper labour costs – and thus exports – of China. The main feature of the recent trade agreements is the attempts of China (and also India) to secure supplies of essential commodities (e.g. oil, minerals and agricultural produce), reciprocated by imports of cheap machinery which allow the local economies to become more competitive.

Of particular interest is the fact that China and Taiwan are working towards establishing free-trade agreements, given their past prickly relations and the international ramifications which these have had. Although this is politically sensitive for the Taiwanese, being opposed by the pro-independence opposition, the administration is worried that the country will be further marginalised by the China-ASEAN free-trade agreement.

Contrariwise, there is the question of protectionism. Thus, for example, China, and more specifically Inner Mongolia, is the source of about 95% of the world's rare-earth minerals which are not contaminated with uranium (although a new mine is being developed in Western Australia). About two-thirds is for domestic use and, because of the commercial and strategic their value, export

234 Encompassing 1.9 billion people, it is the largest in terms of people and the third largest after the EC and NAFTA in terms of nominal GDP: The Economist 9th January, 2010, p. 27.
235 Although individual members may retain tariffs in politically sensitive areas: The Economist 9th January, 2010, p. 27; http://en.wikipedia.org/wiki/ASEAN%E2%80%93China_Free_Trade_Area
236 The Economist 31st October, 2009, pp. 36-37.
237 The Economist 31st October, 2009, pp. 36-37.
238 The Economist 31st October, 2009, pp. 36-37.
240 For example, Taiwan has generally been bypassed by other countries in making such agreements because of the latters' fear of inciting China: The Economist 8th August, 2009, pp. 25-26.
controls are imposed. As an additional example, the US and the EC have complained to the WTO about China's export tariffs on a number of minerals essential for the steel industry: China justifies this by noting that they are exhaustible resources.

In addition, there exist other non-tariff barriers for all but luxury goods and oil and minerals (China's membership of the WTO in 2001 notwithstanding). These partly account for there being relatively little increase in imports from the US or Europe, despite China's economic growth: apart from overt protectionism, local products are subsidised, and there is also bureaucracy and corruption. Additional factors are preferential local access to suitable land and higher advertising rates in the (state-controlled) media. Thus, the most reliable way to avoid these constraints is for overseas companies to manufacture their products locally, and to compete on the basis of quality after establishing networks to ensure brand-promotion and distribution.

Figure 39 Claims for the continental shelf under the UN Convention on the Law of the Sea submitted by the 13th May 2009 deadline: pale blue indicates the existing 370 km limit, whilst red indicates continental shelf beyond this limit (adapted from http://www.noc.soton.ac.uk/pr/images/ContinentalSubmissions.pdf).

iii. Other international relations In the view of The Economist, China's growth as a global economic power has not been matched by its maturation as a political power on the international scene. Thus, apart from its claims over Taiwan and its resultant sensitivities, it is in dispute with

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242 The Economist 24th October, 2009, pp. 67-68.
243 Bauxite, manganese and magnesium, for example; also including coke.
244 So that, logically, the same argument must also apply to the resultant steels and products made with them.
245 The Economist 17th October, 2009, pp. 63-64.
246 The Economist 17th October, 2009, pp. 63-64.
various of its neighbours about territory in the Himalayan region as well as over islands and thus maritime borders: in recent claims under the UN Convention on the Law of the Sea, which allows countries to extend their claims on continental shelf beyond the pre-existing 370 km limit (within certain constraints), it has laid claim not just to the Spratlys and other island groups (a bone of contention with Taiwan and several ASEAN nations) but also much of the South China Sea (fig. 39).\textsuperscript{248} Also, it is overly sensitive to criticism regarding human rights or other perceived slights, with "a knee-jerk resort to hysterical propaganda and reprisals". Further, it puts "its perceived economic self-interest ahead of strategic common sense": for example, with regard to sanctions against Iran, which it would lose as a key supplier of oil and gas.\textsuperscript{249}

This could be easily dismissed as merely being anti-Chinese bias by a conservative Western publication. However, it is notable that Lee Kuan Yew – former prime-minister of Singapore and previously a staunch supporter of the rise of China and the imminent establishment of the 'Asian century' – has publicly expressed concerns about China's ascendancy, including about the building up of its navy; he argued that there is the need for an increased US presence in the Pacific as a counterbalance, not just as a military power but also as a trading partner to offset the increasing numbers of free trade agreements between China and other Asian countries.\textsuperscript{250} Further support for this viewpoint is provided by China's performance at the recent Copenhagen meeting on climate change (see Section V.2.iv).

Such concerns arise out China's sheer size, in population as in economic power, which means that, at a regional level, it dwarfs Southeast Asian nations and thus can exert an all-pervasive influence on them, whether individually or collectively as ASEAN, presumably including with regard to trade relations.

On the other hand, the 'slumbering elephant' of India, the world's largest democracy, is a different story. It feels threatened by Chinese investment in infrastructure in its neighbours (for example, a land route to the Indian Ocean through Myanmar, for easier access to the latter's natural gas as well as oil from the Middle East and Africa),\textsuperscript{251} which is perceived as a 'string of pearls' aiming to isolate India in the region.\textsuperscript{252} Another problem is an ongoing dispute over their mutual borders, with India wanting to extend the borders of Kashmir in the west; and China not recognising the McMahon line (the colonial boundary between India and Tibet) in the east, claiming a large swathe of Arunachal Pradesh to the extent of blocking an ADB-funded water project there, partly in response to the internal problems in Tibet.\textsuperscript{253} A third problem is that the domestic market has been inundated with Chinese imports, causing India to react by lodging anti-dumping actions.\textsuperscript{254}

This suggests that India is a potential alternative to the US as a counteracting force, should China try to throw its considerable weight around in the broader region. Closer to home, the future nature of China's relations with Taiwan remains an unknown quantity; as do those with Japan and South Korea, especially with North Korea as the joker in the pack.

8. Conclusions

A domestically-driven recession in developing Asian markets coincided with the start of a global one, to initially override any potential decoupling from those of developed economies. Thereafter, the recovery in developing Asia's economies has been aided by the collapse in commodity prices,
together with their current-account surpluses and low public debt: for example, they were able to apply large economic stimuli.

Thus *The Economist*, in a year-end stock-take, concluded that the gloomy outlook at the start of 2009 regarding the future of these and other developing countries has not been realised: stock-markets have more than bounced back (fig. 35A), reflecting an underlying economic resilience and a decoupling from the performance of developed economies, especially for large economies (see Section III.5). Thus, in a major departure from previous crises, the present one has damaged the credibility of the developed rather than the developing world with regard to economic management. This in turn has prevented the political and social instability attendant upon previous financial crises, such as that in Asia in 1997-8; indeed, it has strengthened the popularity of governments in large democracies, with no backlash against globalisation. This contrasts with increasing desire for isolationism in the US, reminiscent of that during the Great Depression of the 1930s.

The result is that, for now at least, China rather than the US is the main market for exports from other, smaller Asian economies; and thus it is China that is clearly the main engine for growth in Asia and, given the faltering US’ economy, the world. For example, the resultant growth in GDP means that China has a projected current-account surplus of US$297 billion in 2009: about half of Asia’s surplus, and 30% of the world’s (Cox, 2009). Despite the immediate effects of the stimulus on domestic consumption, such a drastic asymmetry reflects a continuing shortfall in local demand and thus a continuing imbalance with the US, and also with the EC to a lesser extent (Cox, 2009). Whilst Chinese exports fell by 17% in 2009, this was less than for other countries, so that it overtook Germany as the world’s largest exporter (fig. 11B), having surged over the past decade to 10% of the world’s total. Its market share in the US rose to 19%; although the US imports from China fell 15% year-on-year in 2009, this was much less than the 33% slump for the rest of the world. Thus, although its trade deficit with the US has decreased, China now bears almost a half of the US’ trade deficit, compared with less than a third the previous year. Whilst these figures might indicate that China is holding back the recovery of developed nations and thus global growth, this is to some extent counterbalanced by the fact that its imports have already rebounded by 27%; imports from the US increased by 13%, whereas the latter’s exports to other NAFTA members fell by about the same amount.

Looking to the immediate future, two major problems look likely to be important influences on the evolution of China’s policies: worries about further bubbles in the economy and concerns about social unrest. These problems may be interrelated. Thus Smick (2008) has noted that China is confronted with a paradox as it presses on with its development: it needs to expand as fast as possible to create jobs and thus contain the threat of political and social tensions (Section III.8.i), but such rapid growth creates the threat of an inflationary bubble with concomitant economic and financial instability (Section III.6) – and thus, again, the potential for unrest. Presumably, it is partly for this reason that governments took measures to contain the risk of effervescence (as well as the knock-on problem of

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258 Note, however, that the nature of global supply chains means that the apparent dependence of China’s growth on Western markets is much exaggerated: Section III.4.  
261 These imbalances cannot be solely blamed on the yuan being pegged artificially low – other factors include reduced spending power meaning that Western consumers have turned to cheaper goods, and China’s benefiting from the removal of global textile quotas at the start of the year: *The Economist* 9th January, 2010, pp. 65-67.  
the increase in the price of foods and other commodities) in China and elsewhere in the region in 2007.

Others have also expressed concerns about a resumption of bubble-formation (cf. Section III.6). For example, the recent surge in China's bank lending (as part of the fiscal stimulus) poses certain risks, especially if it leads to a boost in asset prices rather than being channeled into productive investments. Moreover, some have made comparisons between China's present situation and the Japanese effervescence of the 1980s as a prelude to that economy's subsequent prolonged decline (with global ramifications, given the fragility of the world economy). However, fundamental differences mean that an analogy with Japan's economy in the 1960s may be more insightful: this would suggest that any collapsing of future bubbles would be a transitory hiccup, rather than the prolonged stagnation of Japan's past two decades. Thus the fact that investment in housing is funded in major part by savings rather than speculative borrowing should serve as a cushion.

It has been argued that the Chinese themselves are making the same mistake by comparing their present situation with that of Japan of the 1980s, compounded by their considering that the latter's subsequent problems resulted from the yen being allowed to appreciate against the dollar: an alternative interpretation is that, after being held artificially low for a long time, the subsequent very rapid rise the yen combined with lax monetary policies to be the real cause of Japan's problems in the 1990s. This reiterates that there is a need for the yuan to be allowed to rise to seek its own level against other countries, rather than the central banks stockpile dollar reserves: the need to promote exports is no longer a sustainable excuse, so that the need to restrain future bubbles whilst helping to re-balance the global economy should take priority.

Given the sustainable growth of the Chinese market, with or without the recovery of those of developed economies, the other Asian economies face similar challenges in the short-term if the recovery to proceed apace without the risk of bubbles in credit and assets (including stock-markets and housing); and, in the longer term, to enact reforms to boost private consumerism to maintain the growth initiated by the economic stimulus. Thus, having gone some way towards decoupling their market economies from that of the US, other developing Asian economies still need to decouple their monetary policies: something which they are reluctant to do, given that exports are still reduced, especially given their experience of the Asian financial crisis, which taught them to run trade surpluses as an insurance against future financial problems, rather than only accumulate enough to cover only a few months (Cox, 2009). When applied, such changes in policy will require careful implementation, in order not to overly reduce the stimulus-induced recovery. If timed properly, it will dampen exports but also boost imports, so restoring a balance to the global economy and go some way to neutralising threats of protectionism; at the same time, it will contain domestic liquidity.

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263 In anticipation of this, the Chinese government has taken recent steps to increase interest rates and control any potential credit bubbles (and thus minimise the future risk of non-performing loans): The Economist 16th January, 2010, pp. 10-11 and 61-63.
265 For example, China's housing boom is mainly restricted the richest quartile and is based on a substantial cash savings deposit, with most mortgages covering about half of the property's value, compared with the Japanese boom's dependence on credit – thus Chinese households have a much smaller debt-burden (35% cf. 130% of disposable income); average Chinese house-prices have fallen relative to income over the past decade; there is a great difference in development between China now and Japan 20 years ago, so that China has much more growth potential: The Economist 16th January, 2010, pp. 10-11 and 61-63.
266 Although this raises the possibility of the lack of low-cost housing in Beijing and Shanghai, and thus social unrest: The Economist 16th January, 2010, pp. 61-63.
269 The Economist 15th August, 2009, pp. 7 and 58-60.
(useful during the recovery to promote domestic spending) and thus the risk of bubbles.\textsuperscript{270} Otherwise, if the timing is wrong, it will convert individual economies' recoveries from a V- to a W- or U-shaped one with potential consequences for the subsequent trajectory (Section I.4; fig. 7).

Looking into the longer term, China's one-child family policy of the 1970s and 1980s will create increasingly profound demographic problems: by 2045, about one in every three Chinese will be over 65, meaning that the labour supply will be decreasing faster than the population, so that standards of living will decline as a result of decreased returns on capital and thus a fall in capital stock. Such events will inevitably further exacerbate underlying social tensions (Smick, 2008). Thus the government is using its stimulus package to take active steps to strengthen social safety nets (thereby countering criticisms by Steingart, 2008: see Section II.6) which, together with other infrastructural targets, should go some way to reduce inter-regional and other inequalities and thus quell nascent domestic discontent. Also, as noted above, there is also the need for China to expand employment opportunities away from manufacturing into the more labour-intensive services sector; this would also increase consumption and diminish China's trade surplus.\textsuperscript{271}

Similarly, the social pressures which have been reported in China might be expected to also affect developing economies in Southeast Asia and elsewhere, especially if an adverse climate for development and employment mean that the demographic dividend expected from their changing demographics (see Section III.7) fails to materialise: something which may prove to be the case, given the implications of global climate change (see Section IV).

In conclusion, China faces a variety of internal pressures which potentially threaten to destabilise it; these pressures have been accentuated by the present economic crisis (although the ogre of inflation would seem to have been removed from the situation). The situation is complicated by the fact that the US and China share an unusual co-dependency in their economic relations, related to the dollar as a reserve currency (Smick, 2008; see Section V.2): they can be regarded as the G2 of the world economy,\textsuperscript{272} with one borrowing on environmental capital and lending to the other (Steingart, 2008). However, on the international front, such mutual interdependence is increasingly likely to be perceived by both parties as a source of weakness, and thus provoke attempts to wean themselves from the relationship and/or insulate themselves against the potential negative consequences (cf. Section VI.1).

However, the foregoing ignores a major unknown: the problem of the unsustainable use of existing physical resources (fig. 9); as well as the potential future problems posed by climate change, as well as for energy, water and food security (see Section IV).

IV. Political ecology and the deteriorating environment

Above, it was noted that the human population has exceeded the sustainable carrying capacity of the planet (Section I.6; fig. 9). However, as the authors of that study recognised, their data-set was incomplete and they could only present a preliminary, partial picture (Wackernagel et al., 2002). Assuming that more information would not reverse their conclusions, then there is obvious cause for, at the very least, concern.

There is a growing realisation that the environment is deteriorating. Whilst this is most obvious for the social environment in developed countries (through depressed wages and increasing threat of unemployment as a result of globalisation and, more recently, the present economic crisis: see Section II.6), the general populations of developing nations are being exposed to a more adverse

\textsuperscript{270} The Economist 15\textsuperscript{th} August, 2009, pp. 7 and 58-60.
\textsuperscript{271} The Economist, 29th November 2008, p. 79; cf. Steingart's (2008) take on the issue (see Section III.2).
The physical environment as a result of changing land-use, increasing pollution and the other inevitable consequences of development itself.

The following will provide an update on some of the material reviewed by Munro (2008) regarding major environmental issues. It is important to note that, whilst science can seek to identify and quantify environmental problems, their likely future development and impact, and how to cure (or at least palliate) them; it is up to policy makers to devise means for implement solutions for dealing with these problems and then selling their ideas to the public.

1. Humanity’s ‘footprint’ and planetary boundaries

Rockström et al. (2009a, b) have noted that the past 10,000 years of the Holocene have been characterised by relatively stable climates (fig. 40); this has resulted in a relatively predictable environment which favoured the evolution of civilisations; ordinarily, this would be predicted to continue for several thousand years more.

![Figure 40 Record of changes in temperature over the past 100,000 years, based on relative concentrations of $^{18}$O; note that there was the evolution of not only ‘Great European’ but also other great civilisations: Mesopotamian, Arab/Muslim, Chinese, Indian, those in the Americas, … (from Rockström et al., 2009b).](image)

Early in human evolution, societies were small, and survived by exploiting the environment for their short-term, sustainable gain. However, the transition to a more sedentary, agricultural life-style and, thereafter, the onset of the Industrial Revolution meant that the growth of civilisations is increasingly based on effort invested in the more extensive and intensive exploitation of their environs (Rockström et al., 2009a, b). Inevitably, the culmination of this change in strategy is that, since the onset of the Industrial Revolution, there has been a progressive transition to a new era, the ‘Anthropocene’: accelerating social development is placing increasing strains on the local and, latterly, the global environment, thereby throwing the erstwhile stability of the Holocene period out of kilter and leading to a period of increasingly unpredictable instability. This raises the possibility of anthropogenic changes driving various aspects of the global environment across certain thresholds, thereby making the ecosystem as a whole hostile for the continuance of human life as we have known it (Rockström et al., 2009a, b).
A recent preliminary analysis of the natural environment has identified nine global subsystems. The inner green nonagon indicates the proposed boundaries for each for maximum human perturbation, where identified; according to existing measures of human impact (red shading), the boundaries for three of the seven subsystems have already been exceeded (Rockström et al., 2009b).

In a pilot analysis, Rockström et al. (2009a, b) have categorised the impact of humanity on the natural environment into nine subsystems (fig. 41):

1. climate change, largely as a result of increased emissions of CO$_{2}$ and other so-called greenhouse gases (GHGs);
2. ocean acidification, as a result of dissolution of increased amounts of CO$_{2}$;
3. stratospheric ozone depletion, now seemingly under control as a result of taking steps to regulate the release of chlorofluorocarbons;
4. increased fertiliser use, leading to disruption of nitrogen and phosphorus cycles;
5. global freshwater exploitation;
6. land system changes, mainly through the expansion of agriculture;
7. biodiversity loss, through habitat destruction and other human influences; and
8. aerosol loading, through varying effects on the climate system and also on human health; and
9. chemical pollution, other than that associated with specific effects on the other systems.

For the first seven of these, they identified potential 'boundaries' (Rockström et al., 2009a, b):$^{273}$

There are insufficient data for them to propose such boundaries for the other two subsystems.

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$^{273}$ There are insufficient data for them to propose such boundaries for the other two subsystems.
linear. They used a conservative approach (the precautionary principle) for the identification of boundaries, in order to minimise risk-taking given the limitations of current understanding of global systems (Rockström et al., 2009a, b); however, their seemingly arbitrary selection of thresholds has inevitably exposed the authors to criticism by their peers (e.g. Bass, 2009; Molina, 2009; Schlesinger, 2009), which will inevitably devalue their efforts in the eyes of a broader audience.

Of these seven with proposed thresholds, three have already been exceeded (fig. 41). However, the situation is complicated by the fact that changes in one of these subsystems may mean that other subsystems are compromised, and thus have lower thresholds (Rockström et al., 2009a, b); the tight coupling between different systems as a result of continual dynamic interactions means that it is obviously facile to concentrate on only a few of the already-identified subsystems (and thus ignore any other possible candidates).

![Figure 42](image)

*Figure 42* The bars show how annual temperatures have varied from the average for the whole of the 20th century; whilst there is a clear trend, the lack of smooth variation reflects the impact of other factors such as recurrent El Niño and La Niña phenomena and volcanic activity. Also shown is the progressive increase in atmospheric CO$_2$ (adapted from World Bank, 2010).

### 2. Climate change

Many scientists now accept that the climate is changing, leading to 'global warming' (although the latter is a rather misleading term, it does reflect the projected long-term trend for the planet as a whole). This is based on a wide variety of evidence, not just that provided by a certain research institute whose e-mails were recently stolen and selectively released to the public in a manner

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274 Thereby threatening the resilience of established global subsystems and potentially tipping them into a new steady-state: the consequences of this are obviously beyond our ken, but are likely to be disastrous for a large proportion of humanity.

275 This states that "if an action or policy has suspected risk of causing harm to the public or to the environment, in the absence of a scientific consensus that harm would not ensue, the burden of proof falls on those who would advocate taking the action. Effectively, this principle allows policy makers to make discretionary decisions in situations where there is evidence of potential harm in the absence of complete scientific proof". [http://en.wikipedia.org/wiki/Precautionary_principle](http://en.wikipedia.org/wiki/Precautionary_principle)

276 Arguably, because this gives everybody a good excuse for doing nothing … so that *que sera sera*.

277 For example, the shrinking of polar ice, especially in the Arctic: [news.bbc.co.uk/2/hi/8307272.stm](http://news.bbc.co.uk/2/hi/8307272.stm); [http://en.wikipedia.org/wiki/Arctic_shrinkage](http://en.wikipedia.org/wiki/Arctic_shrinkage)
selected and presented to promote misinterpretation and ill-informed dissent (Pearce, 2010), in the run-up to the climate-change conference at the end of 2009.

**i. General background** There is increasing evidence for climate change. Natural variations in climate cycles would appear to have been excluded so that, in the absence of definitive evidence to the contrary, it is generally assumed that this is the result of recent human activities – in particular, the increased greenhouse gas emissions (GHGEs) produced through progressive industrialisation (fig. 42). The principle is that CO\(_2\) and other GHGs (including nitrous oxide and various manmade chemicals)\(^{278}\) produced by a variety of sources (fig. 43) act to trap heat resulting from solar irradiation of the Earth's surface, leading to predicted overall increases in atmospheric temperatures. The situation is complicated by numerous other factors: for example, the planet's albedo – its ability to directly reflect light back into space – will be both decreased as a result of melting of polar and other ice and increased as a result of increased evaporation and consequent cloud formation, so that the nett effect will be the balance between these two consequences.

In so far as these different variables can be modeled, predictions have been made regarding the effects of different atmospheric levels of GHGs on global atmospheric temperatures, and their consequences for global ecosystems (fig. 44). However, these are only best guesses: indeed, recent observations on the polar ice-sheets indicate that melting of the Greenland and portions of the Antarctic\(^{279}\) ice-caps is accelerating faster than had been predicted, with obvious consequences for sea-level rise.\(^{280}\) Predictions are further complicated by fears that, as temperatures increase, the global system may go through one or more tipping points, leading to a dramatic acceleration of further change (Lenton *et al.*, 2008; fig. 45). Related to this, the economists' use of cost-benefit analyses with regard to how humanity should react to the threat of climate change has been criticised because of their presumption that probabilities follow a Gaussian distribution;\(^{281}\) instead, many economic

![Image](https://example.com/image.png)

**Figure 43:** Anthropogenic green-house gas emissions (CO\(_2\) equivalents) by source in 2000 (adapted from Aldhous, 2008). Almost 37% are non-energy emissions, comprising those from waste, agriculture and land-use change (forest clearance, etc.); the remainder comprises energy-related emissions, with 'Everything else' including industry (14%) and buildings (8%; including the manufacture and setting of concrete).

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278 Water vapour *per se* can be neglected because of its rapid response as a feedback, rather than a driver, of rising temperatures; however, cloud formation and the effects on the Earth's albedo is one additional, negative feedback as an important factor which is difficult to incorporate into existing climate models:

279 Ironically, the ozone hole has served to insulated the bulk of Antarctica from climate change; once this starts to repair itself, warming of the ice-fields should become an important factor: [http://www.newscientist.3om/article/dn18364-why-antarctica-isnt-melting-much-yet.8tml](http://www.newscientist.3om/article/dn18364-why-antarctica-isnt-melting-much-yet.8tml); [http://www.nytimes.com/2010/01/26/science/earth/26ozone.html](http://www.nytimes.com/2010/01/26/science/earth/26ozone.html).


phenomena show a ‘fat-tail’ distribution, where the probability of extreme events is higher than might be expected based on a normal distribution. This then provides an argument for a pessimistic approach and thus for more pro-active measures to deal with the perceived threat of climate change and its consequences: in other words, there is the need to apply the ‘precautionary principle’ (see Section IV.1 and 2.v).

Figure 44A: Predicted consequences of increased GHGEs (CO₂ equivalents: CO₂e) on the overall rise in global temperatures (median and 90% confidence intervals: note the skew, and what it implies; adapted from Stern, 2006);
B: An analysis of the likely outcome of the Copenhagen meeting (see Section IV.2.iv) indicates that global temperature rises are likely to be 3°C or more, rather than the target maximum of 2°C; however, the proposed funding for adaptational and mitigatory measures is adequate for only half of this anticipated increase (adapted from Parry, 2010)

282 Including financial markets.
With the onset of the Industrial Revolution, western countries and Japan rapidly became major GHG-emitting nations and thus have been the major sources of CO$_2$ over the past one and a half centuries (fig. 46A); the US was one of the largest of these sources, both on a per capita (fig. 46C) and an absolute (fig. 46D) basis. However, the progress of developing countries means that they are now becoming major sources of GHGEs (fig. 46A), with China coming to exceed the US in absolute terms (fig. 46D); thus, although its emissions are much lower on a per capita basis (fig. 46C), it is projected to vastly increase its output over the next few decades, based on current trends. Part of the increase in GHGEs by developing countries is as a result of deforestation (fig. 46B), which reduces the size of the sink for CO$_2$ released by other activities.

**Figure 45** Identification of various large-scale 'tipping points', together with their likely time-frames (adapted from Lenton et al., 2008).

**ii. Anticipated consequences and the need for action** From a regional perspective, some of the most profound effects are expected to result from rises in sea-level (fig. 47). Thus, the low-lying floodplains of many of the major river systems in Asia, including the Mekong, would be rapidly inundated by rising sea-levels, leading to large numbers of 'climate-change refugees'. For example, a 1 m sea-level rise would displace 24 million people living in the lower levels of major river systems in Asia, whilst a 2 m rise would affect 14 million in the Mekong basin alone; in addition, upstream levels would also be affected by floods from melting glaciers in the Himalayas. This would lead to social breakdown of governments and society at large, creating massive security problems, against which the travails of the first modern eco-migrants (as a result of Hurricane Katrina) pale into

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Insignificance; as do those of the victims of the largely ignored war in Darfur, which is generally attributed in part to causes arising out of climate-change.\textsuperscript{284}

Other such eco-migration 'hotspots' include the drier parts of Africa and also Mexico; and also the Caribbean and low-lying islands in the Indian and Pacific Oceans.\textsuperscript{285}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure46a.png}
\caption{The percentage share of CO$_2$ emissions on a historic basis (partial: includes all major emitters) and recently, for low-, middle and high income countries (1.2, 4.2 and 1 billion people, respectively, in 2005); and for recent overall GHGES; B: Emissions of CO$_2$ (tonnes/capita) in 2005 from land-use change and from other sources for low-, middle and high income countries (adapted from The Economist 19\textsuperscript{th} September, 2009, pp. 65-66). C: Comparison of past and projected future total national CO$_2$ emissions (billion tonnes/year) for China and the US; D: greenhouse gas emissions (tonnes of CO$_2$-equivalents per person, 2007 unless indicated) for major emitters (adapted from Miles, 2009).}
\end{figure}

At a global level, the consequences of climate change would not only affect many coastal cities\textsuperscript{286} through sea-level rise;\textsuperscript{287} but also have knock-on effects on food and water-security (fig. 47; see Sections IV.3 and 4), through the direct effects of increased temperatures and the consequent indirect effects on meteorological and hydrological cycles.

\begin{footnotesize}
\textsuperscript{284} The Economist, 27\textsuperscript{th} June 2009, pp. 67-68.
\textsuperscript{285} The Economist, 27\textsuperscript{th} June 2009, pp. 67-68; 12\textsuperscript{th} September, 2009, pp. 28-30..
\textsuperscript{286} Including Mumbai and Shanghai: The Economist 12\textsuperscript{th} September, 2009, pp. 28-30.
\textsuperscript{287} Note that, whilst the Netherlands is spending US$100/person annually on flood defenses, this is obviously not an option in developing countries: The Economist 12\textsuperscript{th} September, 2009, pp. 28-30.
\end{footnotesize}
Thus there is the need for two types of action needed in order to try to contain the effects of human activities on the global climate system:

1. **Adaptational measures** – steps need to be taken to protect against ongoing changes in the environment as a result of GHGs released to date.

2. **Mitigatory measures** – steps need to be taken to deal with producers (by reducing GHGEs from various sources and finding alternative, low-carbon or carbon-neutral energy sources) and with sinks (by restoring forest and developing other consumers of CO₂, as well as developing means to physically capture and sequester this gas).
Clearly, such measures will cost money. One projection regarding the cost of investment funding in mitigatory measures set the figure at around 1% of annual global output, according to the Stern Report (cf. 5% for the recent rescue of the banks), although others have put the costs higher, especially given the likelihood for pork-barrels (Duncan, 2009). Thus, for example, the World Bank (2010) recently concluded that costs would be about 4% for Africa and 5% for India; and that, as a whole, the developing world would have to find:

- US$140-675 billion/year, compared with the present annual influx of US$8 billion, to mitigate against climate change; and
- US$75 billion/year, compared with the present annual influx of US$1 billion, to adapt to those changes in progress.

### iii. Mitigatory measures

There can be no simple single strategy in order to reduce further GHGEs and stabilise atmospheric levels and thus, by extension, the Earth's climate system. Instead, what will be required is a suite of different measures (fig. 48; see also e.g. Munro, 2008):

- Some to reduce sources, through the development and use of low- or zero-carbon technologies; for example,
  - switching to nuclear and renewable (e.g. hydro-electric, solar, wind and geothermal) sources of power;
  - development of bio-fuels, although the US’ programme to support ethanol from corn is a macabre joke: its farmers profit, whilst raising global corn prices and thus hurting the poor; to add insult to injury, it has little obvious beneficial environmental effect (and may even increase GHGEs: fig. 49), whilst the effective sugar cane-based industry in Brazil is penalised with tariffs (Duncan, 2009); and
  - investment of 'carbon offsets', where developed world companies who cannot reduce their own GHGEs economically pay others to do so on their behalf.

- Others to maintain and increase the size of sinks (natural and otherwise) to absorb CO₂ from the atmosphere; for example,
  - ’Reduced Emissions From Deforestation and Degradation’ (REDD) schemes as one of the easiest ways to reduce global GHGEs – deforestation has been claimed to
account for 12-18% of all GHGEs, the latter figure representing more than all forms of transport combined.\footnote{Duncan (2009); \textit{The Economist} 13\textsuperscript{th} June, 2009, p. 62; 26\textsuperscript{th} September, pp. 81-83; 7\textsuperscript{th} November, p. 71; 12\textsuperscript{th} December, pp.59-60.}

- the development of technologies for carbon capture and sequestration (CCS);

However, each of these incurs costs for business and for consumers:\footnote{Albeit only a fraction of the adaptational costs predicted from business as usual, where no attempt is made to take mitigatory measures: Stern (2006).} for example to develop and implement new technologies or to provide funding to support REDD schemes. Governments could achieve the implementation of targets for GHGEs in order to mitigate against future climate change through a mix of up to three different types of measures (Duncan, 2009):

1. government regulation (liked by policy-makers because it seems to be cost-free, and necessary where markets do not work);
2. carbon-pricing (the economists’ preference: precedence should be given to taxes over cap-and-trade, since the latter is open to politicians’ meddling for ulterior motives);\footnote{Note, however, that cap-and-trade does have some advantages over a carbon tax (readers’ letters in \textit{The Economist} 2\textsuperscript{nd} January, 2010, p. 12): it is easier to calibrate, since it is extremely difficult to calculate the correct price for a tax; it is easier to establish at a global level; and it sets a carbon ceiling which cannot be ignored, whereas tax-payers have the choice of accepting the higher costs and continuing with business as usual.} and/or
3. subsidies (favoured by businesses).

\textit{iv. Rio, Kyoto, Bali, Copenhagen … Mexico?} Since climate change and GHGs were first discussed at a meeting of the UNFCCC\footnote{UN Framework Convention on Climate Change.} in Rio de Janeiro in 1992, when all attendees (including Australia and the US) accepted the precautionary principle (thereby acknowledging the inherent scientific uncertainty about the nature and causes of climate change; see Section IV.1) and signed a declaration of intent, global GHGEs have risen by a third, mainly as a result of the increasing outputs of various developing countries (fig. 50; Duncan, 2009). In contrast to the historical average (fig. 46), low- and middle-income countries are now responsible for more CO\textsubscript{2} emissions than are high-income ones, and the picture can only get worse: the formers’ planned power stations can be expected to produce more CO\textsubscript{2} during their lifetimes than has been produced globally since 1850.\footnote{The Economist 19\textsuperscript{th} September, 2009, pp. 65-66.}

However, implementation of such an agreement requires, for the next step, deciding how to apportion out the costs at the international level. Thereafter, assuming agreement has been reached, it will be up to the individual nations to work out how to implement policies to meet their obligations (Duncan, 2009).

The follow-up negotiations resulted in the Kyoto protocol in 1997. According to this agreement, developed countries are expected to reduce emissions by 2020 to 25-40\% below 1990 levels, in order to limit rises to about 2\textdegree{}C according to our best information; developing countries were spared, meaning that the US failed to ratify it, as did Australia until the recent change of government (Duncan, 2009).
However, Kyoto has no teeth – if a country fails to meet its obligations, then there is only the threat of re-emphasising its need to curtail its GHGEs in later rounds of negotiation. Thus many of the signatory developed countries are set to fail to meet their Kyoto targets in 2012, even after buying 'Russian hot air' from countries of the former Soviet Union (where industries have collapsed, meaning they have a surfeit of carbon credits), further devaluing the ideals of the original UNFCCC 'consensus' (Duncan, 2009).

Kyoto is due to lapse in 2012, unless there is a follow-through agreement: this was the aim of the meeting in Copenhagen at the end of 2009, which was meant to build upon and extend what had been agreed at Kyoto. Apart from the necessity to have more ambitious country-targets, there was the obvious need to get the US on board, given the urgent need to implement mitigatory measures world-wide in order to try and curtail further increases; and, thereafter, to reduce GHGEs towards a zero level. In the lead-up to the Copenhagen meeting, the EC proposed to cut their emissions by at least 20% by 2020 relative to 1990, and China proposed to cut their carbon intensity (i.e. emissions as a proportion of economic output) by 40-50% in the same time-frame. On the other hand, the US only tabled cuts of 4% by 2020 relative to 1990.

One accomplishment of Copenhagen was that the idea of REDD schemes gained acceptance in principle. Although REDD was not included in the Kyoto protocol's Clean Development Mechanism (which instead only allowed countries to plant new trees to replace those already chopped down), it is potentially one of the fastest and cheapest ways of reducing GHGEs. However, the devil is in the details of implementing such a scheme (Duncan, 2009): how to make sure that reliable mechanisms can be developed for stopping something from being done, and for identifying who should be paid how much and for how long for not doing it, whilst avoiding the problem of 'leakage' (where wood-cutters just move onto forests new). Thus, REDD schemes very susceptible to large-scale abuse, not least because they would apply to countries where corruption is already rife, so that how they can be effectively implemented needs much more work, rather than just accepting them in principle as was done at Copenhagen. For example, the fact that those countries which stand to gain are the ones which are the worst culprits regarding deforestation means that there should be some sort of retrospective compensation for those countries, such as Costa Rica, which have sought to prevent deforestation in the first place. Also, there is the need for adequate enforcement to ensure that countries abide by their agreements, and do not just move to deforest another area instead, for example. Although those most usually involved in logging are outsiders who are often operating illegally, there should be tangible benefits for the local communities (to compensate for the consequences of not being able to clear land), rather than just for the corrupt ruling class of many developing countries. A major concern is thus various types of ‘green-collar’ crime – fraud, including through 'additionality' (where it is impossible to prove that proposed projects would not have gone ahead without the being supported by offsets), and the possibility of a re-run of Wall Street's past excesses on the mortgage front – which has had a negative effect on politicians' perception of possible legislation (Duncan, 2009).

293 The US complained that this figure is based on existing policies (ignoring the fact that China has been more pro-active than the US in developing such policies): The Economist 5th December, 2009, pp. 11-12.
294 The Economist 5th December, 2009, pp. 11-12.
296 Duncan (2009); The Economist 13th June, 2009, p. 62; 26th September, pp. 81-83; 7th November, p. 71; 12th December, pp.59-60.
297 So there is the need to avoid human rights abuses leading to land-grabs where poorly-established property rights mean that outsiders can oust existing inhabitants and take over land-tenure.
298 Including “carbon cowboys”, when logging companies change into carbon companies: http://www.7uardian.3o.uk/environment/2009/oct/05/un-forest-protection.
On the other hand, Copenhagen foundered because of continuing disagreements about liability and how the costs should be divided up. Thus the 'Basic Group' of Brazil, China, India and South Africa agreed before the meeting that their exemption from mitigatory obligations was non-negotiable. Apart from projected future mitigatory costs, there is also the question of liabilities for adaptational costs incurred as a result of the ongoing effects of past GHGEs. This was also up for discussion at Copenhagen, and proved a major sticking point, because developing countries expected the developed ones to come up with large sums of aid to cover the expected costs. This is because, even if per capita GHGEs rather than national levels are considered, developing countries would have to bear 80% of the burden despite their low carbon footprints.

However, apparently the main barrier to reaching a meaningful agreement was the Chinese delegation, who insisted that there should be no mention of specific targets such as the need for developed countries to reduce their GHGEs by 80% below 1990 levels by 2050 over and above their 2020 goals (presumably so that China will not also have to meet any such obligation). On the other hand, they and the Indian delegations agreed that there should be international monitoring of developing countries' abiding by any agreement which might be forthcoming in the future.

The end result was a largely meaningless bit of paper and mutual recrimination between and within the developed and developing camps. The resulting Copenhagen Accord called for developed countries to commit to emissions reductions to contain expected the global temperature rise to 2 °C at most, with the annual allocation of US$100 billion to developing countries by 2020 to go towards mitigation and adaptation (including the costs of technology development and transfer). Whilst national pledges to reduce emissions are to be submitted to the UNFCCC by 31 January 2010, those made by the close of the meeting indicate that the outcome of Copenhagen would mean that GHG levels will reach 550 parts per million, and thus that there will be warming of 3 °C or more by the end of the century. Furthermore, funding commitments would only be able to support developing countries' adaptation and mitigation for about half of this projected temperature rise, meaning that there are likely to be substantial impacts which could otherwise have been avoided; as well as impacts which cannot be avoided because of the more profound effects of the higher temperature rise on, for example, sea-levels (Parry, 2010: see fig. 44).

Nevertheless, despite the failure of Copenhagen, The Economist considered that there are two causes for optimism. Copenhagen got nowhere because the developed countries wanted to get beyond the fact that only they should be required to cut emissions, whilst many developing countries went to Copenhagen wanting to keep their 'privileged' status under Kyoto. After Copenhagen, developing countries appear to have changed their stance to a more flexible one, including allowing monitoring of their emissions. Also, it may encourage the development of more slimmed-down mechanisms for negotiation: separate fora for different sources of GHGEs, and with fewer members.

Thus, given the hot and heated air of Copenhagen, together with the delegates' contributions to global warming by attending, hope must now lie with a smaller meeting later this year in Mexico. In the meantime, governments (and thus industry) are left in limbo; whilst they may wish to attend to climate change as part of a national agenda, they are caught wrong-footed by the lack of a global framework within which to plan their policies. Moreover, even if something positive emerges from

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301 The Economist 2nd January, 2010, pp. 43-44.
302 The Economist 2nd January, 2010, pp. 43-44.
303 www.guardian.co.uk:80/commentisfree/2009/dec/20/copenhagen-climate-change-accord
304 Assuming that the US government can and will keep its Copenhagen 'promises': Kyoto is not a promising precedent.
later meetings, there will still be the problem that nations will have to sell their planned policies to their populations. This will be considered in the following section.

v. The politics of selling insurance Various critics have claimed that, because a response to climate change appears to rest on the 'precautionary principle' (see Section IV.1), it is an over-reaction based on insufficient evidence of the precise nature and extent of the threat involved. On the other hand, Friedman has noted that, when then Vice-President Dick Cheney observed that if there was a 1% chance that the Pakistanis were helping al-Qaeda to develop nuclear weapons then the response should be the same as if it was a certainty: an application of the very same principle.\textsuperscript{308} Friedman argued that extending Cheney's conclusion to environmental issues, where the percentage chances are generally thought to be much higher, was only the same as taking out a good insurance policy, especially considering the potential permanent environmental effects.

Duncan (2009) considered that the problem for preparing and selling such an insurance policy is political: available technology and practical economics were considered not to be a concern.\textsuperscript{307} But, because climate change cannot be pinned down as a phenomenon (there are much latitude in the predicted long-term changes in temperature, and the consequent environmental effects), such uncertainty makes it hard for politicians to justify any spending plans to their electorates (Duncan, 2009): rather than insurance policies, democracies generally involve selling optimism,\textsuperscript{308} thus encouraging the downplaying of the likelihood of anything but the smallest of possible changes. Thus Duncan (2009) considers that the problem of the need to respond to climate change is:

"... the hardest the world has ever had to deal with. It is a prisoner's dilemma, a free-rider problem and the tragedy of the commons all rolled into one."

The nature of the problems for a government trying to sell such a policy can be identified at three different levels: international, national and special interests. It is perhaps most convenient to consider the last first.

1. Special interests: various groups put pressure on governments (as well as on international and other bodies) to promote their particular cause which may be against the common interest. Thus the need (see Section IV.2.9ii) to develop new technologies in order to evolve away from what is now becoming a dinosaurian reliance on carbon-intensive fuels\textsuperscript{309} inevitably threatens the profits of the fossil-fuel industry. Predictably, the latter, and also special-interest groups dependent on cheap energy from fossil fuels, have sought to deny the existence of climate change, or that GHGs are involved, using fair means and foul to put pressure on governments to downplay scientific concerns,\textsuperscript{310} as they tried to do before with regard to chlorofluorocarbons and the ozone hole.\textsuperscript{311} Recently, having been seen to be fighting a losing battle,\textsuperscript{312} big business has been turning away from arguing that there is a need to anticipate the future problems of climate change, and towards arguing that proposed measures on the legislature are inappropriate (Duncan, 2009).

\textsuperscript{307} This would seem rather optimistic, but the point remains: political problems are relatively much more daunting than the technological or economic ones, especially as the fine-tuning of the latter depend upon a resolution of political issues.
\textsuperscript{308} Which can thus be considered as an 'opium for the people'.
\textsuperscript{309} Apart from their pollutive effects, their limited geographical sources of oil mean that there are increasing concerns about energy security.
\textsuperscript{310} Thus they look like they are latter-day King Canutes trying to quell the tide of evidence, and then, presumably, the rising sea-levels predicted for the future.
\textsuperscript{311} http://archive.greenpeace.org/ozone/greenfreeze/moral97/6dupont.html
\textsuperscript{312} Although one is left wondering who were the thieves who stole the e-mails, to circulate selective extracts?
2. International: after Copenhagen, there is no consensus on what individual governments should do in order to try to contain future climate change. Thus they are left to act as they see fit.

3. National: were an international agreement achieved, then individual governments would have to sell the necessary changes in policy to their people – presumably part of the reason why Copenhagen failed given the present economic crisis – in the face of opposition from special-interest groups. In the absence of such an agreement, it is difficult for individual governments to go it alone, and be able to justify their actions – and thus any resulting compromises on national development and their peoples' prosperity – to their tax-payers; thus the obvious thing is to do nothing.

The current situation in the US legislature provides a political insight into the problems involved for democratic nations. Legislation to rein in GHGEs was supported by 71% of voters in August, but it has been deserted by those Republicans who had previously avowed an interest in the need to control future climate-change. Thus proposed new legislation is under assault from them, in concert with powerful lobby groups with vested interests, as a 'stealth tax' and as hurting the US' economy, including by diverting money to overseas. Whilst the Waxman-Markey bill to regulate GHGEs through cap-and-trade has been passed by the House of Representatives, it only aims to cut emissions by 4% in 2020, relative to 1990 levels (17% relative to 2005): its original aims have been so compromised that only a small proportion of permits will be auctioned, with 85% being given away to special-interest groups (especially electricity generators and energy-intensive industries), and auctions only taking place in 2030. However, its counterpart (the Kerry-Boxer bill) has become bogged down in the Senate, which (with two seats for each state) is dominated by agriculture: the US' farming lobby is strongly against climate-change legislation, due to predicted increases in fuel and fertiliser costs. Thus Democrats from conservative rural states feel threatened by forthcoming elections, leading to the likelihood of the bill being well-larded to further states' self-interests if it is to be passed.

As a result, the slowness of the American political process and the ineffectiveness of their bipartisan system in moving forward in the face of what is the greatest threat to the world since the Cold War has meant that legislation directed at climate change issues has been sidelined and thus preparations

313 In this context, it is interesting to note (see Section IV.2.iv) that the US came to Copenhagen with only a small offer on the table, dwarfed by those of China and the EC; this presumably reflects domestic problems of an increasingly bipartisan politics. In contrast, neither China nor, strictly speaking, the EC has a democratically-elected central government, so that they are released from having to be answerable to their populaces (amongst individual EC nations, the response is much cooler). This raises the question of why China did an apparent about-turn at Copenhagen: international one-upmanship or a recently-perceived threat of future national instability, whether social or political?

314 Whilst the recent financial crisis has just pushed European concerns about anthropogenic climate change into second place, there has been a recent increase in scepticism about in the US, especially amongst Republicans, and also in Australia; such increasing political pressure and polarising partisanship bodes ill for future policy-making: The Economist 7th November, 2009, pp. 53-54.

315 The Economist 26th September, 2009, p. 18.

316 The Obama administration's budget proposals assume that cap-and-trade policies will be in place, with about 20% going to subsidise renewable energy schemes and the rest being as tax-credits for all but the richest 5% (Guest, 2009).


318 Where every state has two votes, but not all states are as likely to be predictably affected by climate change – for example, by rises in sea-level – so that lobbying by big business has even more leverage to push a different agendum (Duncan, 2009).

319 The Economist 24th October, 2009, p. 38.

320 The Economist 12th September, 2009, p. 35.

321 Together with national health issues being prioritised over those of the globe.
for the Copenhagen conference were stymied. This indecision, together with the measly cutbacks proposed, must have had consequences for the outcome of that meeting. Similarly, the absence of clear government policies and the associated incentives, many private 'green' initiatives are in abeyance.

Figure 47A: Clean-energy capital investment (US$ billion) projections in order to contain GHGEs within acceptable limits; B: Share prices in the clean-energy business have been badly hit by the recession (November 1st, 2007 = 100).

(adapted from Duncan, 2009).

The existing GHG emitting technologies are well-entrenched: unless they are forced to pay for the full environmental costs of their GHGEs, they are cheaper to extract and get energy from than their cleaner and thus greener alternatives, and likely to remain so given the abundance of coal supplies. Thus energy-generating business will require large initial investment in order to develop and become competitive in the long-run (fig. 47A): e.g. by a combination of cap-and-trade devices and carbon taxes and offsets, as well as by measures to encourage private entrepreneurial investment. For example, experience indicates that liberalised energy markets are not up to reducing GHGEs, and that it is necessary for policy initiatives in order to achieve the desired goals, through investing in nuclear and renewable power as well as in other nascent, often high-risk expensive technologies, such as those for CSS. However, the present economic climate has badly affected this possibility (fig. 47B), together with the failure of the Copenhagen meeting, despite the fact that much of various nations' economic stimuli were designed to promote green developments (Duncan, 2009). It also means inevitably that, with a lack of any government leadership, energy-using businesses will not change their current practices and move away from a high-carbon economy (Duncan, 2009).

Another factor is that globalisation is leading to concerns that national policies to limit GHGEs, if implemented, would be neutralised by migration of manufacturers to 'carbon havens'. An obvious antidote to this would be to punish more lax countries who are perceived not to be doing enough by tariffs, thereby setting up barriers based on products' carbon footprints (as has been proposed by

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322 Notwithstanding the fact that the US' Environmental Protection Agency looks set to follow up on a previous judgement that CO₂ is a dangerous pollutant and thereby set emission controls (mainly targeted at motor vehicles) – a regulatory alternative (albeit inefficient and likely to be more expensive) feared by businessmen, which may make them more receptive to contemplate legislation: The Economist 25th April, 2009, p. 36; 12th December, 2009, pp. 61-62.

323 The International Energy Agency recently reported that 'peak oil' is likely to be in 2020, unless new discoveries of big reserves are made, although this is not accepted by all: The Economist 12th December, 2009, p. 73.

324 e.g. The Economist 14th November, 2009, p. 60.

325 The Economist 17th October, 2009, pp. 53-54; 14th November, 2009, p. 60.
France's President Sarkozy and is embedded in the climate bill passed by the US House of Representatives, although this contradicts commitments to free trade. However, a recent analysis downplays this fear: it was argued that 'carbon leakage' of GHG emitting-industries to alternative, cheaper locations will increase local competition for limiting resources.\textsuperscript{326}

3. Water security

The evidence for climate change is just one facet of civilisation's assault on the environment at a global level (Rockström \textit{et al.}, 2009a, b). Thus, as a consequence of these changes, there is also evidence for changes in meteorological and hydrological cycles; and also, as a result of the rising CO$_2$ levels, there is a progressive acidification of the oceans (with inevitable consequences for fisheries, at the very least).

In addition, the agricultural use of fertilisers (together with the increased cultivation of leguminous plants) has meant that ecological cycles in nitrogen and phosphorus have been severely disrupted (Rockström \textit{et al.}, 2009a, b; fig. 41). The increased levels of these in run-off lead to algal blooms, which affect freshwater quality for human use and also affect fisheries, including brackish and inshore marine ones, and thus biodiversity in general. Also, other human activities mean that there is increasing pollution, generally at a more local level, which is further compromising the environment.

Apart from aesthetic considerations (including increasingly adverse effects on biodiversity),\textsuperscript{327} such changes can only act to further jeopardise the water (and thus food: see following section) security of various nations, with knock-on consequences for the peace and stability of society at large.

Global freshwater resources are important to humankind for three different sets of reasons (Rockström \textit{et al.}, 2009a, b):

1. soil moisture for terrestrial biomass production and carbon sequestration (threatened by deforestation and land degradation, including through climate change);
2. run-off for water-supply, including for household consumption, hydroelectricity and other industrial needs;\textsuperscript{328} and
3. vapour feedback to regulate local, regional and global climates, including temperature and rainfall.

Although the data on water use (fig. 48A) look reassuring, growing populations and increasing wealth and urbanisation are placing increasing stress on many freshwater resources: agriculture accounts for about 75\% of all use,\textsuperscript{329} and industry for about 20\%;\textsuperscript{330} this has effects on the hydrological cycle and its interactions with the climate in a complex feedback/feed-forward manner, meaning that the anticipated future increase in society's demands are likely to be difficult to meet, especially in those areas of the world where surface water is already a limiting factor (Molden, 2009). Thus there is growing evidence that hydrologic cycles are being speeded up by climate change, with weather in

\textsuperscript{326} \textit{The Economist} 21\textsuperscript{st} November, 2009, p. 80.
\textsuperscript{327} Species extinction-rates are rising dramatically as the Anthropocene progresses, now being estimated to be 100-1,000 times the normal background (Rockström \textit{et al.}, 2009a, b). Simplistically, this might be a "So what?" situation, but Rockström \textit{et al.} note that it is likely to have dire consequences for the resilience of the remaining ecosystems (including agricultural derivatives) due to increased risk of disease (including pest) epidemics. However, it is difficult to identify where the boundary should be: in the face of our ignorance of a most complicated suite of local and global interactions, common sense suggests a risk-averse threshold, which is already much exceeded (fig. 41).
\textsuperscript{328} As well as to sustain important fisheries, \textit{e.g.} in the Mekong and Tonle Sap.
\textsuperscript{329} With animal rearing demanding proportionately more than crops.
\textsuperscript{330} \textit{The Economist} 11\textsuperscript{th} April, 2009, pp. 52-54.
many areas becoming less predictably reliable: rains are briefer and more intense and thus the intervening droughts are longer and more severe. Moreover, the accelerated melting of glaciers is removing them as a slow-release reservoir of water for many rivers.

![Figure 48A: An estimate of renewable freshwater resources (km$^3$ = trillion litres) and withdrawals (km$^3$/year) in 2000, by region; B: The amount of water (1000 m$^3$/tonne) needed to grow particular crops is variable, including between regions (adapted from The Economist 11th April, 2009, pp. 52-54).](image)

![Figure 49: Various areas of the world are projected to suffer large water shortages, including India, the two Koreas and Sri Lanka; or moderate ones, including China, Japan, the Philippines and Thailand (adapted from PricewaterhouseCoopers, 2009).](image)

\[331\] The Economist 11th April, 2009, pp. 52-54; 19th September, 2009, pp. 65-66.
Thus, computer models indicate that climate change is likely to have marked effects on the monsoon cycle. This will mean that, for example, India will face a growing water shortage which will be exacerbated by:

- the lack of facilities for the capture and storage of highly seasonal rainfall;
- competition for river water by damming and channel diversion;
- the loss of storage capacity through siltation and through depletion of ground water reserves;
- a corrupt bureaucracy, together with a leaky distribution infrastructure; and also
- subsidised water and the choice of inappropriate, thirsty crops (e.g. soybeans: fig. 48B).

4. Food security

Climate change is expected to have adverse effects on agricultural productivity in many areas, in part through changes in hydrological cycles. Thus models suggest that, by 2050, there will be a decrease in global production of various cereals (rice, maize, wheat), especially in irrigated systems, with South Asia being especially badly hit.

Even without the future potential effects of climate change, the developing world in particular is facing a growing food problem, as a result of continuing increases in population size and exacerbated by increasing development and societal aspirations for a ‘better’ dietary standard of living. Thus, the FAO has projected that the food demands of developing countries will double by 2050, meaning a 70% increase in global food production, with a doubling in the demand for meat.

\[\text{Figure 50} \quad \text{Global food production has failed to keep pace with global population growth since the ‘Green Revolution’ of the 1960s (adapted from PricewaterhouseCoopers, 2009).}\]

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However, there is little capacity to increase the amount of agricultural land or water supply (even without taking into consideration the future consequences of climate change), so that alternative means must be sought.\textsuperscript{335} Thus there is the need to take steps to increase the productivity of existing agricultural land and to reverse the slump in investment in R & D (and thus the rate of increase in productivity: fig. 50) since the period after the ‘Green Revolution’ (which primarily benefited Asia and the Americas). One possible key means of achieving this within the necessary time-frame, and thereby accommodating the rapidly changing circumstances, is through the use of transgenic genetically-modified (GM) seed technologies pioneered by the bête-noire Monsanto for control of weeds and bug infestations; together with Monsanto’s accelerated selective breeding techniques, which have increased yields and hold promise for the future for the development of plants which can use nitrogen more efficiently and can tolerate low water availability.\textsuperscript{336} However this will require overcoming the antipathy of a sector of the public to past practices resulting from the models developed by big business, amongst other negative reactions.\textsuperscript{337}

In one sense, the recent spike in food prices,\textsuperscript{338} which peaked in the first half of 2008 (fig. 51), has proved useful;\textsuperscript{339} it served to renew political attention in poor developing countries where agriculture is a mainstay of the economy.\textsuperscript{340} This has led to a reversal of the previous trend for their decreasing investment in the agricultural sector by, for example, the introduction of safety nets for farmers, subsidies of fertiliser and better quality seeds, as well as by investment in infrastructure to promote access to reliable markets as an incentive to increase productivity. In addition, there has been a 50% increase in spending on agriculture by the World Bank, to US$6 billion.\textsuperscript{341}

However the recent price spikes have also had other unfortunate consequences.\textsuperscript{342} Thus there was a rise in the number of malnourished people worldwide in 2009, back to over 1 billion, despite an overall increase in food supply (fig. 52A). Another was to make various rich countries (e.g. China, South Korea, various Gulf states)\textsuperscript{343} lose confidence in the existing food markets\textsuperscript{344} and do ‘land-grabs’ by purchasing or leasing about 20 million hectares of land (often undeveloped forested and other areas) in developing countries in Southeast Asia and Africa.\textsuperscript{345}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure51.png}
\caption{FAO food price index (2002-4 = 100) (adapted from The Economist 21\textsuperscript{st} November, 2009, pp. 61-63).}
\end{figure}

\textsuperscript{335} The Economist 21\textsuperscript{st} November, 2009, pp. 13 and 61-63.
\textsuperscript{336} The Economist 21\textsuperscript{st} November, 2009, pp. 71-73.
\textsuperscript{337} The Economist 21\textsuperscript{st} November, 2009, pp. 13 and 61-63.
\textsuperscript{338} Driven by structural imbalances in food markets, partly as a result of the rise in the price of oil and the diversion of maize towards ethanol production: The Economist 21\textsuperscript{st} November, 2009, pp. 13 and 61-63.
\textsuperscript{339} The Economist 21\textsuperscript{st} November, 2009, pp. 13 and 61-63.
\textsuperscript{340} Triggered in part as a response to riots in more than 30 countries, which led to two governments – Haiti and Madagascar – being toppled: The Economist 21\textsuperscript{st} November, 2009, pp. 13 and 61-63.
\textsuperscript{341} The Economist 21\textsuperscript{st} November, 2009, pp. 13 and 61-63.
\textsuperscript{342} The Economist 21\textsuperscript{st} November, 2009, pp. 13 and 61-63.
\textsuperscript{343} The Economist 23\textsuperscript{rd} May, 2009, pp. 55-57
\textsuperscript{344} Big food producers responded to the possibility of social unrest by limiting exports in order to reduce domestic price rises (Thailand and Vietnam did so for rice), leading to a loss of confidence in the markets by major food importers: The Economist 21\textsuperscript{st} November, 2009, pp. 13 and 61-63.
\textsuperscript{345} As “outsourcing’s third wave”, after manufacturing in the 1980s and IT in the 1990s: The Economist 23\textsuperscript{rd} May, 2009, pp. 55-57.
grow staples and thus guarantee their own future food security; this raises the risk of protectionism in the future, as well as potentially constricting the continued development of their ‘client’ developing countries – for example, through the introduction of farm machinery at the expense of rural employment. Moreover, this pursuit of food self-sufficiency by the land-grabbers flies in face of the EC’s experience with farm-subsidies and ignores future changes as a result of climate change. Instead there is a need to increase global efficiency, not only in productivity but in the downstream markets.

Figure 52A: There has been a progressive rise in cereal production, although stocks have remained more-or-less stable (billions of tonnes; adapted from The Economist 4th July, 2009, pp. 50-51).

B: Nevertheless, there has been a recent reversal in the number of undernourished in the world (billions; adapted from The Economist 21st November, 2009, pp. 61-63).

The peak in food prices in 2007-2008 (fig. 51), after the fastest in 30 years, was followed by bumper crops of cereals almost worldwide (fig. 52B). This, together with a decrease in the price of oil (which diverted some of the maize back to food and/or feed from the production of bio-fuels), led to a transient drop in food-prices. However prices have since rebounded; and they promise to continue doing so, in part reflecting continuing population growth, with increasing demand for cereals; and the continuing expansion of the middle-class in developing countries, with increasing demand for meat.

This picture contrasts with the fact that food wastage has become a big problem in developed countries: US now throws out about 40% (150 trillion kcals) of its food supply, up from 28% 25 years ago. Apart from the food itself, this is associated with the wastage of more than a quarter of its

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346 And also bio-fuel, to some extent.
348 Although such land-grabs usually involve direct government-to-government negotiations, so that such worries might be expected to be unwarranted unless corruption is involved: The Economist 23rd May, 2009, pp. 55-57
350 Mainly as a result of increased yields in developed countries (e.g. as a result of release of land in the EC previously required to rest fallow), with productivity in the developing world – excluding Brazil, China (where marginal land re-assigned for forests was allowed to revert to arable) and India – decreasing, despite food being a recession-resistant essential: The Economist, 4th July 2009, pp. 50-51.
351 The Economist, 4th July 2009, pp. 50-51: additional factors include the rebound in fuel prices diverting some cereals back to bio-fuel production; and cyclical factors such as the restoration of depleted stocks.
freshwater consumption and 300 million barrels of oil/year, whilst rotting food produces methane, a potent GHG. This trend was attributed to a ‘push effect’, resulting from increased availability of cheap food together with supply-chain marketing strategies.

5. Conclusions

Climate change, and other general, downstream environmental factors including water and food availability for the population at large (and getting larger: fig. 8A), is a global phenomenon. It would seem likely that in the long term there will be other, more profound changes – already set in motion – in the world's physical climate, which will affect ultimately everybody in the developed and the developing worlds alike, unless steps are taken to try and avert at least the worst-case scenario. However, this growing perception that there is the need to take steps to minimise the risk of continuing deterioration of the natural environment has had to take a backseat, as a result of the unfortunately-timed financial crisis and its consequences on the socio-economic environment. That being the case does not mean that the longer-term threats of the natural (and thus the social) environment have gone away; they will only come back again with a vengeance, unless the world's nations can get their act together and come up with a unified, targeted solution to the looming problems.

Global phenomena required concerted global actions: piece-meal attempts by individual nations will be self-defeating because, on their own, the self-sacrifices incurred will achieve nothing and only free-riders will benefit. The need for a united action is emphasised, rather than played down, by the inherent uncertainties regarding what the actual effects of climate change of GHGEs (past and future), will be: the fact that the changes could be worse than previously predicted, as suggested by recent data, merely serves to emphasise the need to treat climate change seriously.

There is thus the need to press ahead with seeking a legally-binding international agreement. This can be made more acceptable if it includes measures to ensure that money will be used properly and efficiently: for example, money for developing nations could be made available by developing capital markets, whose risk is subsidised by developed governments, with other steps being taken to improve public administration in developing countries and monitor the implementation of programmes, thereby reducing concerns about corruption. Such transparency will make it easier for developed countries to make proposals which will be acceptable to their sceptical electorates.

However, climate change has caused a profound split between developed and developing nations, with China cannily playing the two heterogeneous parties off against each other. In order for the gap which has been created to be bridged, it would seem necessary – and ethical – that the populations of (over-) developed nations lower their sights for what they desire, to bring them more in line with what they actually need; by the same token, this should also apply – albeit to a lesser extent – for developing countries. This need for a common, intermediate goal is the more so given the existing over-demand on the planet's resources (fig. 9A), including the projected increases in demand for water and food inter alia as a result of increasing population numbers and projected, greater increases in demand as a result of increasing prosperity. However, given human – and thus societies’ – shortcomings, this would seem unlikely to happen (see Section VI.5).

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352 The Economist 28th November, 2009, p. 84.
353 Or abused, through corruption.
355 Although obviously the latter hits the wall of the finite resources of the planet, never mind the projected impacts of climate change on water and food availability.
356 The product of millions of years of evolution in an environment quite different from that of the past century.
V. Where can Cambodia go from here?

1. Overview

There are three pillars which support the Cambodian economy, in part through externally-earned income as part of the global system:

1. Primary: agricultural (especially rice) and other natural products;
2. Secondary: garments and other manufactured (including processed) products; and
3. Tertiary: tourism and other, local services

In addition, construction has been another important driver for growth: it is supportive of the above three categories but, as part of a broader, developmental category, it is also open to outside as well as internal investment in order to promote each of the three pillars.

Together, these four pillars have led to an average annual growth rate of about 8% over the first nine years of this century; as a result poverty fell from about 50% of households in the mid-1990s to 30% in 2007, albeit with evidence for growing inequality (International Monetary Fund, 2009).

Furthermore, there is the potential for Cambodia to establish itself as a source of fossil fuels, with all the promises and risks that such a resource bequeaths.

As with the rest of the developing world (see Section III), Cambodia was badly affected by inflation in 2008, in particular the effects on the costs of food and oil (fig. 53; cf. fig. 1). These local effects, together with the global effects of the subsequent economic crisis, have combined to have a great impact on the Cambodian economy, with some reversal in the decline in poverty and concerns about the exposure of local banks to bad debts (International Monetary Fund, 2009).

Despite evidence that Cambodia's down-turn had started to bottom out in mid-2009, the International Monetary Fund (2009) was equivocal about the prospects for 2010, given the uncertainties of the global economy as a whole and reduced bank lending.

Figures 54 and 55 provide a summary of the recent and projected GDP growth of Cambodia, together with the contributions of each of the above four components. The following sections will consider each in turn. All but the primary, natural products sector have contracted as a result of the global economic crisis, with a bursting of the property bubble and worries about local banks’ balance sheets (International Monetary Fund, 2009).

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357 So that Cambodia's Gini index ranks it 137 out of 182 countries: UNDP (2009).
## 2. Agriculture

A census, carried out on 3rd March 2008 (National Institute of Statistics, 2009), indicated that 72.3% of the population (75.11% of women cf. 69.37% of men) were involved in the agricultural sector.

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<tbody>
<tr>
<td>Total GDP</td>
<td>11.4</td>
<td>6.7</td>
<td>-2.7</td>
<td>4.3</td>
</tr>
<tr>
<td>Agriculture, fisheries, and forestry</td>
<td>8.7</td>
<td>5.7</td>
<td>5.0</td>
<td>5.0</td>
</tr>
<tr>
<td>Industry</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Of which: Garments</td>
<td>13.1</td>
<td>4.0</td>
<td>-9.5</td>
<td>3.4</td>
</tr>
<tr>
<td>Construction</td>
<td>13.2</td>
<td>2.2</td>
<td>-15.0</td>
<td>3.0</td>
</tr>
<tr>
<td>Services</td>
<td>11.1</td>
<td>9.0</td>
<td>-4.7</td>
<td>3.2</td>
</tr>
<tr>
<td>Of which: Tourism</td>
<td>15.4</td>
<td>9.8</td>
<td>-10.0</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Sources: Data provided by the Cambodian authorities, and IMF staff estimates and projections.

Figure 54: Main contributions to real GDP growth for Cambodia (adapted from International Monetary Fund, 2009).

Figure 55A: Sources of growth for Cambodia (percentage points), 2004-10; and
B: comparison of annual percentage change in growth with the region, 2008-10 (adapted from International Monetary Fund, 2009).
down from 77.53% in 1998; it accounts for 85% of employment (87% for women) in rural areas (National Institute of Statistics, 2009).

Agriculture accounts for 32% of the national GDP (UNDP Cambodia, 2009), and has proved to be a reliable – if low-key – source of GDP growth, being the only pillar to remain positive during the recession (figs. 54, 55). Moreover, despite being the lowest growing of the four sectors, it has averaged almost 4%/year since the 1990s, thereby exceeding population growth (UNDP Cambodia, 2009). As elsewhere (fig. 56), agriculture is an effective means of increasing the prosperity of the poorer segments of Cambodian society; however much of agriculture is subsistence-level, with only a small proportion being marketed: relatively little produce is exported (UNDP Cambodia, 2009). Nevertheless, recent income was affected by depressed global agricultural prices (fig. 51); something which is likely to be short-lived (see Section IV.4).

Rice production is the main agricultural activity, although crops such as cassava and maize have become popular (UNDP Cambodia, 2009). Low labour costs mean that the production of rice (fig. 57A) and other crops can be produced relatively cheaply; however the lack of mechanisation or other off-farm inputs (fertiliser, pesticides, etc.) mean that productivity remains low (fig. 57B). This is compounded by the general lack of irrigation, which restricts paddy production (and thus rural employment) to one season/year; and the lack of diversification into other crops, most especially vegetables which instead are mainly imported from Vietnam (UNDP Cambodia, 2009).

![Figure 56 Increasing the GDP from agriculture has the greatest effects on poverty (adapted from PricewaterhouseCoopers, 2009).](source)

The performance of the rice sector is further constrained by limitations for rice milling (UNDP Cambodia, 2009): the available capacity is underutilised due to lack of access to bank credit and thus working capital, meaning that fixed operating costs are high due to the resulting excess capacity. These constraints mean that much of the rice production is exported to Thailand or Vietnam for milling as a necessary step for access to global export markets of the processed product.
Figure 57A Comparison of the costs of rice production within Cambodia and with selected other areas; B: Comparison of the unit value of crop-production/hectare in selected Asian countries (adapted from UNDP Cambodia, 2009).
**Figure 58** Growth in garment exports (% year-on-year) and the resultant pattern of employment by the industry (adapted from World Bank, 2009).

**Figure 59A**: Growth (seasonally-adjusted 3-month moving average) in garment exports from Cambodia and US retail sales; B: Sources of Asian garment exports to the US (year-on-year percentage change) in August 2009 (adapted from International Monetary Fund, 2009).
Figure 60A: International tourism arrivals into Cambodia have progressively increased over the years, despite some setbacks; B: The poor in Cambodia benefit relatively less than do those in selected other tourist destinations, on the basis of percentage of direct tourist spending (adapted from UNDP Cambodia, 2009).

3. Manufacturing industries

The 2008 census indicated that 8.50% of the population was involved in the industrial sector, up from 4.24% in 1998 (National Institute of Statistics, 2009).

The mainly foreign-owned garment industry, which accounts for about 65% of merchandise exports in 2008\textsuperscript{358} (International Monetary Fund, 2009), has been a mainstay of the economy in the past, as a

\textsuperscript{358} Almost 75% of which were destined for the American market: International Monetary Fund (2009).
source of GDP growth and as a major employer\textsuperscript{359} (figs. 54, 55). However the recent recession has led to a contraction in the industry with a sharp decrease in exports (figs. 58, 59). A major decrease was seen in those to the US, with Cambodia among the worse-affected Asian countries (fig. 59B). The picture is made worse by the fact that those other severely-affected Asian countries are 'mature' economies, where the garment industry is much less important as a source of export revenue; it is a consequence of Cambodia's poor infrastructure and high costs (electricity, transport and other factors),\textsuperscript{360} and resultant low productivity despite relatively low wages (International Monetary Fund, 2009; UNDP Cambodia, 2009). The resulting closure of many factories led to a decrease in employment (fig. 58); most other factories switched to shorter working hours, reducing the wages of those still in employment (International Monetary Fund, 2009).

4. Services

The 2008 census indicated that 19.2\% of the population was involved in the services sector, up from 18.23\% in 1998; this accounts for 60\% of employment in urban areas (National Institute of Statistics, 2009).

Tourism is a major potential earner in the services sector (fig. 54), although hotels and restaurants have contributed relatively little to GDP growth in the past (fig. 55). Thus, UNDP Cambodia (2009) has calculated that tourism, which has undergone a marked surge over the past two decades (fig. 60), accounts for almost 10\% of the national economy, based on spending in hotels and restaurants and on transport; the downstream benefits on, for example, the retail and construction industries means that the overall benefit may be as high as 20\%. It has also been a magnet for FDI, accounting for about a third of all inflows over the past two decades (UNDP Cambodia, 2009).

On the other hand, the benefits of tourism for the population at large are low (fig. 60B): there is relatively little direct benefit from spending by tourists for the poor, through purchases of crafts, agricultural produce, \textit{etc}. Thus, existing inequalities are being increased rather than smoothed out, a result magnified by the fact that many poor are adversely affected by tourism developments as a result of their lacking recognised land-rights: this is part of a general problem for Cambodia's development, including the fact that many are precluded from securing loans using land or property as a collateral (UNDP Cambodia, 2009).

The recent crisis has hit world tourism (fig. 61), including those visiting Cambodia: whilst those who arrive by air have shrunk in number, there has been an upsurge in overland arrivals from neighbouring countries (fig. 62), who generally spend much less. Thus, although Cambodia has benefited from the diversification of source markets for tourists over the past two decades as an

\textsuperscript{359} At its height, the garment industry employed 4\% of the workforce: UNDP Cambodia (2009).

\textsuperscript{360} Including US tariffs imposed historically, on grounds which no longer apply.
insurance against changes in demand from particular countries (UNDP Cambodia, 2009), this has been only a partial buffer.

The effects on tourism were part of an overall slump in the services sector, with the retail industry being badly affected, most notably that for cars and motorbikes (International Monetary Fund, 2009).

![Figure 61 Growth in tourist arrivals world wide (% change year-on-year (adapted from PricewaterhouseCoopers, 2009)).]

5. Infrastructure development

There has been a recent boom in the construction industry as an enabler for future growth and development, with project costs increasing from about US$500 million (average: US$157,000/project) in 2003 to about US$3.2 billion (average: US$1.65 million/project) in 2007 (UNDP Cambodia, 2009). However, as a symptom of the recession and a decrease in FDI (see below), together with the collapse of a housing bubble, construction has slumped since the middle of 2008 (fig. 63).

![Figure 63 Imports of construction-related materials (year-on-year percentage change, seasonally-adjusted 3 month moving average) into Cambodia, 2007-09 (adapted from International Monetary Fund, 2009)).]

361 Although the peak in project costs relative to GDP was one year previous, in 2006: UNDP Cambodia (2009).
6. Demographic considerations

A census of the population, carried out on 3rd March 2008 (National Institute of Statistics, 2009), indicated that there has been a declining fertility since the previous decadal survey, associated with an increasing proportion of those aged 55 and above; the median age in 2008 was 20.96, compared with 16.82 in 1998. It was found that unemployment rates for both males and females have decreased, more especially in rural areas, and economic activity rates have also increased in rural areas (mainly by children, presumably at the expense of their education); this presumably reflects a greater involvement in agricultural activities. The informal sector predominates and many have second jobs, especially those in the 35-49 age-group and older and particularly in rural sectors. There was also a decrease in fertility rates and in the dependency ratio (Table 1), consistent with Cambodia’s continuing development, with all that implies for the future (e.g. the demographic dividend: Section III.7).

Table 1

<table>
<thead>
<tr>
<th></th>
<th>Fertility Rate</th>
<th>Dependency Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>2.1</td>
<td>65.7</td>
</tr>
<tr>
<td>Rural</td>
<td>3.3</td>
<td>91.4</td>
</tr>
<tr>
<td>Total</td>
<td>3.1</td>
<td>86.2</td>
</tr>
</tbody>
</table>

Based on data from National Institute of Statistics (2009)

*Figure 64 Comparison of annual changes in gross national income (per capita, purchasing power parity) in Cambodia and selected other ASEAN countries (adapted from UNDP Cambodia, 2009).*
7. Other Considerations

As a result of the increase in GDP, there has been a slow increase in average wage (fig. 64); this is associated with a relatively low level of tax revenue (fig. 65A), meaning that the government has relatively little income for investment in public goods (UNDP Cambodia, 2009).

FDI is an alternative source of money for the development of infrastructure and various other sectors of the economy. After a surge in investment in recent years, there has been a decline (fig. 65B), with incoming monies even lower in 2008 and 2009 (UNDP Cambodia, 2009).

![Comparison of the tax revenue (% of GDP) of selected ASEAN countries](image1)

![FDI investment (US$ million) in the different sectors of the Cambodian economy, based on approved projects](image2)

*Figure 65A: Comparison of the tax revenue (% of GDP) of selected ASEAN countries; B: FDI investment (US$ million) in the different sectors of the Cambodian economy, based on approved projects (actual expenditure is lower; adapted from UNDP Cambodia, 2009).*
8. Conclusions

Given the slump in the garment industry, there is the need to develop other – whether alternative or additional - sources of employment: this is especially important, given that about 250,000 join the labour market each year, only slightly fewer than the total number employed in the garment sector (fig. 58A; UNDP Cambodia, 2009). Similarly, there is a need for the diversification of the tourist industry away from a reliance on Angkor Wat and the adjoining area, both to maintain its attraction (including for return visitors) and to increase the amount of time spent in-country by visitors; thus UNDP Cambodia (2009) considers that there has been a decrease in tourism-related FDI since 2004 (cf. fig. 65B), together with evidence that Cambodia is losing market-share through lack of competitiveness (including in costs, despite its being meant to be a relatively cheap destination) for both business and leisure tourists.

Figure 66: Comparison of Global Competitiveness Index (GCI) scores for selected ASEAN countries (adapted from UNDP Cambodia, 2009).

A common thread to all sectors with regard to further development (UNDP Cambodia, 2009) comprises several threats to Cambodia's competitiveness and its ability to realise its full potential in the global arena:

1. perceived problems with existing land-rights and the application of land-related laws, as a source of financial and other security for the population at large;
2. high electricity costs;
3. high transportation costs, including 'under-the-counter' payments;
4. high costs for the developing information and communications technology (ICT) sector (including internet access), together with the lack of a clear regulatory framework, as an essential additional reinforcement for the four pillars of the economy;

For example, through ecotourism and, perhaps more especially, coastal tourism: UNDP Cambodia (2009).

Although this has grown at an average annual rate of 32% over the period 2005-2009 and now accounts for an annual turnover of about US$ 429 million: UNDP Cambodia (2009).
5. the general need for human resource development, in ICT and in other areas;
   - this is particularly the case for higher positions, to reduce the need to import expensive
     foreign expertise.

These and other factors mean that, despite its recent rapid progress, Cambodia rates relatively poorly
in terms of competitiveness with other nations in the region (fig. 66), ranking 109 out of 134
countries worldwide (UNDP Cambodia, 2009).

![Figure 67 Comparison of scores for various indicators of competitiveness for Cambodia, compared
with the overall average for those ASEAN countries for which data are available (adapted from
UNDP Cambodia, 2009).](image)

VI. General Conclusions

On the surface, the global economy would appear to have bounced back, based on the recovery in
share prices and forecasts of a better-than-expected increase in GDP in 2010 (see Sections II and III,
with caveats). Thus a leader in *The Economist*\(^\text{364}\) has argued that 2009 should be considered as the
year of the 'Great Stabilisation', where a depression was avoided by a rapid response by various
governments to provide stimulus packages; as a result, the large economies of the developing world
led a bounce back (fig. 68; see Section III.5).

However this should not lead to over-optimism and thus complacency.\(^\text{365}\) Two factors, at least, mean
that the global economy is still fragile: first, in contrast to previous crises, many countries have been
affected simultaneously, with consequences for exports independent of any protectionist measures;
and secondly, the fact that it was public funds which have been the driving force behind rescue
measures will place inordinate demands on the satisfactory development and implementation of
government policies. Thus, whilst the global economy as a whole would appear to be on the road to
recovery, some are sceptical that it is no more than the various stimulus packages working their way

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\(^{364}\) 19\(^{th}\) December, 2009, p. 13.

\(^{365}\) Thus there were several apparent rebounds in the Dow Jones between 1929 and 1932, reminiscent of the
recent series of stock-market rallies: *The Economist* 25\(^{th}\) April, 2009, pp. 11-12.
through the system: the recovery of the markets may simply reflect an inherent, unrealistic optimism, whilst the recovery in manufacturing merely reflects the rebuilding of stock inventories.

In the longer term, the large residual effect of the crisis will mean that household debt in the US and various other developed countries will still be high and assets low; this implies that private spending will also remain low, especially given expectations that unemployment has not yet bottomed out. Furthermore the large public debt resulting from rescue measures will make it hard for their governments to borrow more; instead, the prospect of continuing unemployment (with further increases in public debt as a result of demands on social safety nets) and as other political pressures increases the risk of protectionism. Also

In the case of developing economies (see Section III), whilst the bounce back of large ones suggests that they have become decoupled from the developed nations to some extent, they face the potential problem of asset bubbles unless their governments tighten up their economic policies: for example, by letting exchange rates seek their own levels. Furthermore, in addition to the consequences of depressed global markets, a reduction in FDI will also affect many of the smaller developing countries.

Long-term recovery for the world as a whole requires that private spending in developed countries increases to allow their governments to reduce public spending and replenish their reserves through taxation or alternative measures (e.g. raising retirement ages or trimming back social safety nets, including health costs). Thus the future would seem to be gloomy, at best, for developed economies (see Section II), with the promise of lacklustre growth meaning increases in idle capacity and thus idle people; and with the threat of deflation and a ballooning public debt to try and maintain social safety nets and contain the ongoing effects of the financial crisis.

The end result is that there is likely to be a drastic change in economic growth patterns, even if environmental factors (Section IV) are not factored in (fig. 7); either there will be a return to the previous rate of growth without compensating for the growth lost during the financial crisis, or future growth rates – and thus those in investment, employment and productivity – will be at a slower rate than enjoyed previously. This will be associated with a normalcy, the 'new normal', which is predicted to feature a trimmed-back banking system, especially the securities markets: thus finance will be more expensive and investment weak, leading to reduced growth and increased

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366 Low interest rates in developed economies have meant that investors have moved from banks to assets, leading to a recovery of the markets and worries about bubbles (especially in developing economies where there is more optimism and because they are favoured by currency pegs: see Section III.6): The Economist 9th January, 2010, pp. 61-63.
367 The Economist 25th April, 2009, pp. 11-12; 3rd October, 2009, pp. 77-78.
368 The Economist 3rd October, 2009, p. 10.
369 The Economist 25th April, 2009, pp. 11-12.
370 The Economist 25th April, 2009, pp. 11-12.
371 Even if the withdrawal of economic stimuli and a switch to more frugal government is optimally timed, to minimise the risk of a prolonged deflation and stagnation.
373 In contrast to what has been typical in the past.
unemployment with depletion of physical capital and thus depressed future prosperity (Cox, 2009). Such pessimism is reinforced by the possibility that the global recovery will trigger another oil shock, especially as the factors which led to the previous rise in prices (fig. 1) remain true today.

Whatever the future, it would appear obvious that there is a major shift in international relations as a result of the evolving economic scene.

1. A new, repolarising world

There is an inherent continual struggle between those who borrow and their creditors: the latter want to maintain the purchasing power of their savings, whilst the former want inflation (thereby overriding the current primary concern of their central banks: see Section VI.2) to reduce the real value of their debts. In a democracy, this reflects a conflict between the moneyed elite, with their political influence, and the larger population of voters, with their voting influence. On the international arena, creditor nations and their debtors have the same competing interests, related to exchange rates.

![Figure 69A: Percentage change (year-on-year) in US government spending as a percentage of GDP: federal spending been largely stable as since the 1970s (adapted from The Economist, 30th May, 2009, pp. 23-25).](image1)

B: Comparison of the US’ and China’s defence budgets (US$ billion; adapted from Miles, 2009).

The close economic interdependency between China and the US (fig. 15) has given rise to the notion of ‘Chimerica’, whereby the Chinese purchase of Treasury bonds lent money to the US at low interest rates, which in turn bought Chinese goods, allowing China to lend further dollars (Guest, 2009; Miles, 2009). The rise of China and the potential emergence of a ‘G2’ partnership with the US reflects its achieving near-parity with the latter in certain respects, and the need for their conjoint action in dealing with global problems. Nevertheless, Miles (2009) concluded that China is still very much in second place as a world power: although its growing military power could challenge US pre-

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374 For example, the need to rely on less easily extracted resources (which are often dependent upon nationalised oil companies which can be manipulated towards political ends) and the industry's under-investment in locating new reserves (as a result of previously low prices and the inefficiencies of nationalised companies) remain true today: The Economist 23rd May, 2009, pp. 65-67.


376 The Economist 16th May, 2009, p. 78.

377 China’s economy is less than one-third of the size of that of the US, with per capita GDP only about one-fourteenth and a defense budget of about one sixth: The Economist 24th October, 2009, p. 15.
eminence in the Pacific in the future, its relatively low levels of military spending (fig. 69) mean that it is far from a global power in this respect. On the other hand, as principal creditor owning US$800 billion of their national debt, China has a potential stranglehold over the US economy, although this fear is unlikely to be realised.378

The foregoing notwithstanding, political uncertainty and the possibility of increased US-China tensions in the short-term can be expected, especially given the changes in the top Chinese leadership slated for 2012 at a Communist Party Congress, at a time when there are major elections not only in the US but also in Taiwan, on the top of the continuing after-effects of the global financial crisis.379 This is accentuated by China's increasing desire to exert its influence as a global player.

In order to establish its presence in the global arena, China has sought to reach out to the rest of the world380 through not just funding of infrastructure in developing countries where it has commercial interests (namely the sourcing of raw materials and the establishment of further markets for its exports) and hosting the Olympic Games in 2009 but also through Confucius Institutes which seek to promote Chinese language and culture.381 Also, it is taking other steps in order to strengthen its future position: for example, foreign firms vying for contracts to help expand the rail-system and provide new rolling stock are subject to the proviso that there is extensive technology transfer, meaning that China will be a competitive threat to them in the future.382

Thus there is an increasing bullishness of China on the international stage, as exemplified by its attitude at Copenhagen (see Section IV.2.iv).383 As a result, China's rise has meant that, apart from its forays into developing markets, it is also poised to become a major investment player in companies in developed nations.384 Associated with its ascendancy is a general perception that western governments seek to constrain China's growth.

In turn, the Chinese renaissance has led to the perceived problem (for outsiders) of increasing nationalism,385 which is often exploited to smooth over or distract from internal divisions.386 Furthermore, presumably reflecting internal demographic problems387 (see Sections III.7 and 8) at least in part, China's deals with various developing world countries involve setting up Chinese enclaves,388 which deny work for the local population and thus (reminiscent of the colonial era) largely preclude harmonious interactions: something exacerbated by the local markets being swamped with cheaper Chinese imports.389 This, together with the fact that China has followed in the Western hypocritical tradition of being an arms supplier390 and then coming in as a peacekeeper, means that antipathy to China is not restricted to developed countries who feel that their past preeminence is threatened391

378 Miles (2009); The Economist 24th October, 2009, p. 15.
379 Miles (2009); The Economist 24th October, 2009, p. 15.
380 Including establishing close contacts with many developing countries whose regimes are spurned by developed nations.
381 The Economist 9th January, 2010, p. 29.
383 In contrast, the Chinese government sees market openings in the automotive industry, especially in 'green' electric and hybrid vehicles as a way to carve out an economic niche whilst reducing the environmental impact of rapidly increasing car ownership (Miles, 2009).
384 Miles (2009); The Economist 24th October, 2009, p. 15.
385 Official, as seen in this year's National Day parade, as well as popular, including on the internet.
386 Miles (2009); The Economist 24th October, 2009, p. 15.
387 More specifically the imbalanced sex-ratio as a result of selective infanticide.
389 The Economist 9th January, 2010, p. 29; see also Section III.8.
390 Thereby interfering in local politics, contrary to one of China's stated tenets on international relations.
China has also been active on a more regional basis. However, whilst its stabilisation of the yuan during the 1997-8 Asian economic crisis helped to stabilise the region (and thus boost their prestige), the opposite is now the case: not only is the pegging of the yuan against the dollar hindering efforts of developed nations to re-balance the world economy, but its mercantilist\textsuperscript{392} underpinnings mean that it is also detrimental to other regional economies.\textsuperscript{393} China is using a combination of hard and soft power (a military build-up\textsuperscript{394} combined with economic and cultural influence) to establish its place in today's world (Miles, 2009). This exacerbates other worries based on China's increased political power (see Section III.8).

At the same time, the US would seem to be becoming more inward-looking: for the first time in more than four decades, people are not making demands of other countries about democracy and human rights; also, the public sees China as a major threat.\textsuperscript{395} In part, this reflects the weakening of its and other developed nations' economies as a result of the present crisis and the long-term implications of sovereign debt burdens (see Section II). Thus, some have sought to turn the original notion of a chimaeric symbiosis on its head: apart from China being blamed for destroying US jobs, their support of the US dollar has been cast as a scapegoat for the asset bubble (Guest, 2009).

2. The need for prophylactic responses to minimise the risk of future financial collapses

The effects of the economic crisis\textsuperscript{396} bring out the need for new thinking and new, more realistic models, which incorporate the exchange of ideas between different subdisciplines (see Section I.1).\textsuperscript{397} Thus, it has revived interest in the work of Hyman Minsky, who argued that stable economies ultimately self-destruct.\textsuperscript{398} He considered that the financial system exaggerates economic cycles because participants assume that they can extrapolate into the future from existing trends. Thus, they become overconfident during the growth phase, and take on increasingly levels of debt based on expectations of future increases in prices.\textsuperscript{399} Thereafter any small instability can initiates a cascade of falling prices, asset-selling and loan defaults during the subsequent contraction phase, with the evaporation of capital leading to 'deflationary destruction'. The consequent need for government intervention is contrary to the ideal of free markets,\textsuperscript{400} further emphasising a need to revisit and revise certain fundamental aspects of standard economic theory (see Section I.1).

\textsuperscript{392} Mercantilism, as exemplified by Europe in 18th century, is “an economic theory that holds the prosperity of a nation is dependent upon its supply of capital, and that the global volume of international trade is ‘unchangeable’. Economic assets or capital, are represented by bullion (gold, silver, and trade value) held by the state, which is best increased through a positive balance of trade with other nations (exports minus imports) and assumes wealth and monetary assets are identical. Mercantilism suggests that the ruling government should advance these goals by playing a protectionist role in the economy; by encouraging exports and discouraging imports, notably through the use of tariffs and subsidies” (http://en.wikipedia.org/wiki/Mercantilism).

\textsuperscript{393} Never mind the regional and global consequences of its demand for resources and the resulting pollution: \textit{The Economist} 9th January, 2010, p. 29.

\textsuperscript{394} Over and above that necessary to contain Taiwan: including the construction of an aircraft-carrier.

\textsuperscript{395} \textit{The Economist} 12th December, 2009, pp. 35-36.

\textsuperscript{396} Arising in part because banks' recent strategies were based on the assumption that recent performance is an indicator for future tactics, especially as it was presumed that securitisation meant that risk was dispersed and so could be ignored (Palmer, 2009).

\textsuperscript{397} \textit{The Economist} 18th July, 2009, pp. 9-10 and 59-60.

\textsuperscript{398} \textit{The Economist} 4th April, 2009, p. 71.

\textsuperscript{399} Such as happened during the recent housing bubble, for example, when low interest rates drove the formation of bubbles as people borrowed against predictions of future price rises

\textsuperscript{400} \textit{The Economist} 4th April, 2009, p. 71.
To date, the central banks have mainly relied on one tool, the control of short-term interest rates, to contain one target, inflation; ideally, this has been whilst excluding political interference on matters such as unemployment. However things are now not so simple: thus it has been argued that central banks should monitor not only inflation of consumer prices but also those of assets. Furthermore, deflation is an alternative potential problem (see Section II), requiring the devising of a completely different set of tools. In addition, the notion of the ideal of their political neutrality took a knock when central banks had to step in to repair bridges between banks, after the latter lost trust in each other as a result of the financial crisis.

As a result, apart from developing and fine-tuning new tools (e.g. quantitative easing), central banks also need to define new goals other than just controlling inflation; and thus they need to no longer presume that markets are efficient in devising and implementing monetary and fiscal policy. In turn, this means that there is the need for macroprudential supervision, rather than that of individual banks: what might be considered to be an acceptable risk for one to take is no longer so when it is taken throughout much of the rest of the system. However this reversion to a more intrusive form of regulation resurrects the same old problem of the difficulty for central bankers, like others, to identify ballooning bubbles at a time when the appetite for risk is high and thence intervene before these burst. In turn, this will place central bankers in situation where they are likely to facing conflicting demands; and thus will mean that they will have to be more likely to be subject to government interference.

Because the US' government's recent, likely abortive preoccupation with health-care, there has been little consideration about introducing new regulations to tame bank's future excesses, but likely new measures include raising capital-adequacy standards, as proposed by the Basel Committee and subsequently backed by a meeting of the G20. This would increase the resilience of the financial system by making banks reduce their exposure to systemic risk (Cox, 2009). Set against this, however, there is a major problem with the EC banking system, in that individual countries' banks can operate throughout the EC, but are only constrained by their national central banks.

The involvement of the central banks would have to be part of a concerted international effort to devise and implement financial regulatory structures which require banks to be more transparent and thus less likely to indulge in self-serving manipulations of the markets. The policing of banks will mean ensuring large buffers of equity and other risk capital (thus reducing their profitability); and monitoring of their liquidity, with regulation of the 'shadow' banking system including hedge and money-market funds. Thus, once credit shortages have eased, Palmer (2009) has predicted that one

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401 Their reliance on short-term interest rates was first compromised by the excessive rise in savings globally, which served to decouple long- from short-term rates; this was further increased as a result of the financial crisis and the resultant decrease in confidence; investment in infrastructure will be of real benefit, rather than a reflection of pork-barrel politics and the buying of votes: The Economist 25th April, 2009, pp. 65-67.
404 Thus inflation had nothing to do with the present crisis, nor with the Great Depression or the Japanese banking crisis: The Economist 4th April, 2009, p. 71; 25th April, 2009, pp. 65-67.
405 Which takes the stability of the system as a whole into consideration, as well as the performance of each of the component institutions (Palmer, 2009).
408 The Economist 12th September, 2009, pp. 15-16 and 66-68.
410 The Economist 20th September, 2008, pp. 13-14 and 87-88; Carr (2009).
likely future innovation will be that various governments may require the use of a leverage ratio\(^{412}\) as one means of containing banks' self-seeking short-term tendencies. In addition, banks are likely to be required to hold more liquid assets, for example as government bonds; and to accumulate and deplete their capital counter-cyclically (Palmer, 2009).

As noted by Palmer (2009), the decrease in credit flows in the aftermath of the credit crunch has been mainly as a result of the effects on hedge-funds and other non-bank lenders in the shadow banking system and their purchasing of securitised loans. Securitisation – the main cause of the recent financial crisis (Cox, 2009) – needs to be retained in any revision of the existing financial systems, in part to aid in deleveraging (Palmer, 2009). Securitised assets aim to sell loans as securities (and thus spread risk), but Cox (2009) observed that many banks held onto sub-prime loans (made without their traditional careful exercising of judgement, and in areas marginal to the central focus of their growth strategies), possibly as a source of leverage\(^{413}\) for their own borrowing from other banks.

Arising from this, first, there is the need to limit borrowing between banks in the future, in order to try and ensure stability in the face of inevitable boom-bust cycles: given the past undercapitalised, mutually-dependent morass where one bank's assets became another's liabilities and vice versa, the existing system obviously needs to be strengthened in order to ensure greater individual responsibility (Cox, 2009). More generally, Smick (2008) notes that such regulations clearly are also needed to improve the reliability of risk evaluation. Thus, there is the need for more stringent stress tests to determine an institution's exposure to individual risks and how it can cope with the pressure of exposure to multiple risks: for example, decreased liquidity over relatively long periods of time, or as a result of other institutions being themselves stressed (Palmer, 2009). Bankers' pay should also be tied to performance, and thus profits, over the long-term and after adjustment for risk, in order to discourage foolishly greedy risk-taking during the good times and then the need to be bailed out by tax-payers' money when things go bad (Palmer, 2009).

Secondly, there is the need to contain the moral hazard problem which has been made potentially worse by the extending of the original safety net which underlay Reserve-regulated banks to include other financial institutions, and thus has placed constraints on government regulatory powers to protect the public interest and prevent abuse of the system (Smick, 2008). Thus there is a need for a mechanism to ensure that the original issuers of loans are the first to bear any losses; moreover, individual banks and other institutions should concentrate on specific areas where they have an advantage over their competitors, based on the amount of risk to which they are willing to expose themselves (Palmer, 2009). The problem of moral hazard could also be reduced by, for example, requiring banks to prepare 'living wills': if they run into difficulties in the future, it would be easier to let them fail and divide up the remnants rather than rely on the taxpayers as a source of rescue funds. However such a mechanism may be naively optimistic, given the complex web of connections of banks with each other and with creditors and counterparties, and thus the likelihood of initiating a panic reaction. The simplest way out of this would be to require each bank to individually 'ring-fence' its various operations, making it relatively easy to contain any damage.\(^{414}\) There may also be pressure to separate retail and investment banks, and to split up large banks which are at present to big to be allowed to fail (Palmer, 2009). On the other hand, any attempt to break large banks up into smaller, more easily regulated 'narrow banks' would be extremely complex, as well as reducing the efficiencies of scale.\(^{415}\)

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\(^{412}\) A fixed ceiling determined by the total value of a bank's assets as a proportion of its capital: Palmer (2009).

\(^{413}\) “Investing with borrowed money as a way to amplify potential gains, at the risk of greater losses”: http://wordnetweb.princeton.edu/perl/webspin?w=leverage

\(^{414}\) The Economist 12\(^{th}\) September, 2009, pp. 15-16.; 3\(^{rd}\) October, 2009, pp. 79-80.

Theoretically, such measures would help to contain bankers' short-sightedly 'irrational exuberance' in the future, given that the biggest credit bubble in history has badly tarnished their reputations. It would also help to correct the perception that, because governments have been forced to guarantee large parts of the financial system and its flows of payment and credit in order to protect it, bankers can continue to take unwarranted risks in the pursuit of vast personal profits through business-as-usual, albeit now at the tax-payers' expense.416

On the other hand, Smick (2008) cautions that the possibility of such tighter regulation is likely to affect market liquidity; and a return to tighter regulatory controls would be likely to stifle the funding of entrepreneurs by sources of liquidity other than banks, which would put a brake on growth through evolution and innovation given banks' poor record in lending to start-ups due to their lack of imagination. This will mean that either many of the affected funds will seek ways around the imposed constraints. Given that such regulation of global markets is necessarily imperfect, financiers will seek to find ways to beat the system:417 asymmetries mean that the likely rewards of doing so provide a strong motivation, compared with the much smaller wages earned by the restricted number of government regulatory officers who will always be a few steps behind (Smick, 2008). Furthermore, banks in the US have kept their lobbying power: while regulators may get new legal powers, the finance industry has political power and thus can always find ways to get their own way (Carr, 2009).

Arising from this, another major worry is that the failure of attempts to seek a consensus and introduce a global regulatory system might lead to a splitting of a common financial market into two or more components (Smick, 2008): one comprising the more tightly regulated economies of today's 'rich' world, condemned to slow growth because constraints on financing entrepreneurial risk; and the other comprising the emerging economies, whose savings use a wider range of instruments to maximise their growth and further development. The end result would be that the 'rich' countries would lose their existing financial dominance; this would be accelerated by differences in approach to environmental issues, including global warming (Smick, 2008).

On the other hand, if such a schism did not occur, then the introduction of stiffer regulations will mean that the survivors of the present crisis will be protected from competition from foreign banks and new domestic ones (Palmer, 2009). Thus we return to the question of free markets: are they desirable and, if moot, are they avoidable? Expanding upon this theme, one central bone of contention relates to exchange rates (see Section III).

3. The need for a new reserve currency?

The Asian financial crisis taught developing economies to run trade surpluses as an insurance against future financial problems, rather than only accumulate enough reserves to cover a few months. To date, the willingness of China and others to buy dollars as a way of holding these ever-growing reserves has been the US' saving grace (Stiglitz, 2006) – or, alternatively, they may have provided the rope with which it could hang itself.418

However, Stiglitz (2006) has noted that dollar bonds have very low interest rates, compared with other less secure investments,419 so that investors420 have suffered an 'opportunity cost' because they could have gained more elsewhere (albeit at a greater risk). A consequence is that, by their buying dollars and creating an artificial surplus of the latter, the US can use this 'borrowed' money for its

419 At least until recently.
420 National or otherwise: governments have to put up matching reserves to cover major private projects.
own investment and to finance its own (and thus its population's) ever-increasing debts. Furthermore, the increasing pressure for keeping exchange rates fixed to maintain the value of the dollar as a de facto reserve currency will prop it up and prevent the necessary devaluation as an essential step towards correcting the US' trade deficits. Another worry is about inflation and other sources of volatility, where a small increase can devalue the debt for those who 'lent' the money in the first place, leading to a potential crisis of confidence.

Given these criticisms of retaining the US dollar as a reserve currency, proposals have been made for a neutral alternative, truly global rather than national one (e.g. 'global greenbacks': Stiglitz, 2006). Such a supranational currency would increase stability because it would not be subject to the wild fluctuations which can occur with the dollar or other national currencies in response to a decrease in the underlying fundamentals or speculative attacks by investors. It would also ensure that other countries got value for their own money, rather than sustaining the US and other spendthrift nations: the latter would also be encouraged to save rather than parasite the earnings of others, as has recently been the case. Moreover, in the long run, it would be better to find an alternative to a national currency as the global reserve currency; otherwise, there will be a repeat of the bubble which led to the sub-prime crisis.

On the other hand, Cox (2009) has proposed that an alternative could be to offset the purchase of dollars by developing nations through the US expanding its investment overseas as an international venture capitalist, using its increased savings to balance the nett inflows. Thus such venture capital and/or FDI would serve as an alternative to domestic industrial policies; as well as weakening the dollar and so improving the trade balance (Cox, 2009).

4. The need for national responsibility to avoid future economic collapses

The recent Pittsburgh summit went some way towards promoting a shift in political will on the part of the members of the G20 through introducing the academic concept of peer-review, albeit without the oversight of any editor.

Given the problems posed by the economic crisis for developed and, to some extent, developing nations, there have been worries about the spread of protectionism (see Sections II and III). As noted above, available evidence indicates that this is only a minor concern to date (whilst tariffs have been raised, these are within WTO's existing limits, given the continuing failure to complete the Doha round), although it may become more important as the stimulus packages run out and unemployment threatens to rise. In this regard, two factors differ from the situation in the 1930s, when the erection of trade barriers exacerbated the depression. First, global supply-chains are now a deterrent against tariffs on imports since such measures are likely to backfire: they will cause such chains to break if they are raised too high, with consequences for various of a nation's own products. Secondly, thanks to the agreements brokered by the WTO and others, protectionism is now more subtle, with non-tariff approaches the method of choice: mainly practiced by governments of

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421 Assuming that the resultant returns exceed those that have to be paid out as interest to those who bought their dollars or treasury bills.
422 The 'twin debt' problem, where fiscal deficits are accompanied by trade deficits.
423 This is at the expense of global aggregate demand, and thus weakening the global economy: other governments are denied the full benefits of their earnings, and thus the development of their populations suffers to the benefit of the US, which can live beyond its means at the expense of others (Stiglitz, 2006).
developing countries, examples include tighter licensing requirements, import bans (e.g. through supposed environmental or human safety concerns) and purported anti-‘dumping’ measures.

On the other hand, politicians in developed countries have mainly turned to inefficiency-promoting subsidies429 for their own industries which are in trouble – for example, the automotive industry; protectionism is no longer feasible given these industries' reliance on global supply-chains and the fact that many foreign companies also have local factories.

Proponents of globalisation (e.g. Friedman, 2006) had anticipated that job losses in developed countries would be a problem, but assumed that there would be an orderly evolution of the global economic system: developing economies taking over much of the basic unskilled manufacturing industries and developed economies moving on to more specialised manufacturing niches as well as continuing into knowledge- and services-based ones. However this hope has not been realised: developed countries have not carved out niches, whilst developing countries are moving ahead faster than anticipated (Smick, 2008; Steingart, 2008: see Section II.6).

Thus, there is the need for active political initiatives to create alternative jobs in new industries for the workforces of developed countries; otherwise, Steingart (2008) worries that there will be a continuing shift in the balance of economic power from the West to Asia, aided by the latter's investment in education and research together with a social decline in the West accelerated by their ageing populations.

5. The need for an integrated response to obviate the risk of ecological collapses

The world is now facing problems of global proportions, which threaten not only the future of individual nations but also the fate of the human race as a whole, or at least in a large part.430 A growing recognition of the threat of climate change has led to a deepening rift between developed and developing economies (Duncan, 2009). At stake is the amount of habitable living space, the availability of adequate food and water, and other, downstream consequences, which threaten to create a bottleneck in the near future for humankind’s general health and well-being (Section IV).

Thus it is becoming apparent that humanity may be becoming a victim of its past progress: the changes wrought on the environment threaten to backfire in a previously unconceived manner, and the widely promulgated 'American dream' is turning into a global nightmare. These problems ultimately relate to existing inequalities between and within nations, and how these are being accentuated in the rush towards globalisation (whilst some developing countries are benefiting, others are not, especially in sub-Saharan Africa: see Section III); and how they will be further compounded as the predicted consequences of continuing GHGEs and global climate change become manifest (see Section IV). The prospect of the environment passing through one or more 'tipping points' (fig. 45) means that all – rich and poor, developed and developing – are at risk. The problems are accentuated by the other effects that humankind is having on the environment (fig. 41), reflecting the fact that, globally, we are living beyond our means in an unsustainable fashion (fig. 9).

However, as Copenhagen has confirmed, it is not clear whether humanity, with its existing political, economic and other social systems, is mature enough to handle the host of problems which extend from the here-and-now to the horizon and beyond. Similarly Brown (2008), in his Plan B – with its proposed rapid actions using existing technologies to counter the present energy crisis431 together with limitations on other resources and climate change – noted that the measures which he proposed were shaped not by what is possible politically but by what is essential for the future of civilisation,

430 The 'upper crust' will obviously secure the high ground, or have the ability to otherwise keep afloat.
431 He went so far as to aver that "(p)eaking of oil production raises questions more difficult than any since civilisation began."
implying a similar scepticism on his part. He noted that the projected further growth of China, never mind India and the others, means that the Western economic model – based on fossil fuels, a dependence on automobiles and a throw-away attitude – is nearing its expiry date. He thus concluded that, with the ever-widening socio-economic gap in education and health-care as well as income, humanity was reaching a ‘civilisational tipping point’. Likewise, Diamond (2006) considered that we may have only 50 years to come to terms with, and then try to solve, the global problems we have been creating, and thereby get our house in order.

Be that as it may, human nature imposes major constraints on the pursuit of a coordinated, far-sighted global response, mainly because any purported ‘altruism’ is a highly selective part of our inherited make-up, more-or-less narrowly focused on specific identifiable (and thus identified-with) groups. Thus, most clear-cut are the concerns of businesses, big or otherwise, as a major component of the special interest groups lobbying for their own internal agenda. However, as a category, special interest groups can be readily expanded to include nations, as well as lesser and larger geographical units as different types of ‘tribes’ (sensu latior). The question is: can humanity transcend its inherent ‘tribal’ inadequacies in the face of the need to cope with an increasingly adverse global (including economic and thus social) environment?

6. The need for an effective system of transnational institutions

It would seem obvious that humanity is thus approaching a crossroads. There is the need for a proper, globally (rather than just locally) responsible leadership to better coordinate the progress of developing countries, together with the continuing further evolution of developed countries, in the face of a variety of growing problems: the globalisation process, with the attendant energy crisis as a result of the decreasing availability of oil and petrochemicals, and the looming prospect of changes in global climate systems which have been blamed on the past and continuing use of fossil fuels, as a major component of the broad human threat to the environment.

From a global perspective, Munro (2008, 2009) has noted that, while democracy is a great ideal at the national level, there are problems when trying to translate its advantages at the supranational level. Furthermore, there are problems with democracy even at the national (or lower) level: it can be compromised by corruption (including the lobbying tactics of special interest groups in what are superficially democracies).

Another problem is that there is the current lack of a clear global leader (Mahbubani, 2005, 2008; Zakaria, 2008): the US is preoccupied with its own internal affairs, as would also seem to be the case with China based on its actions at Copenhagen. The situation is made worse by the fact that the US’ past practices have set an example and a precedent for others to follow. Thus, in the absence of a responsible, acceptable and transparently accountable supranational leadership, the world faces the same problems in attending to the present credit crunch and deteriorating financial environment as it does with trying to deal with the threat of global climate change and the deteriorating physical environment (Munro, 2008).

Walker et al. (2009) have noted that, whilst sovereign states have the capacity to enforce cooperation within their borders for the maximum good, such enforcement is problematic at the global level: it is

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432 For example, there is some evidence that corporate social responsibility have suffered as a result of the crisis brought on by the previous social irresponsibility of others: philanthropic budgets for charities and NGOs have been cut, and many ‘green’ tendencies forsaken unless they are immediate money-savers or still have near-term promise: The Economist 16th May, 2009, pp. 67-68.

433 To include e.g. various physical units, from the nimby (‘not in my backyard’) up to the nation, as well as other, generally more diffuse special interest groups (e.g. specific industries, religions).
too easy for individual states to forego cooperation and freeloading to the increased cost of other nations. They noted that it is obviously unrealistic for nations to surrender their sovereignty, and thus their capacity for cooperating with each other. Thus there is the need for a suite of ‘transnational’ institutions, somewhat similar to Munro’s (2008, 2009) proposal for ‘supranational’ institutions.

Unfortunately the existing such bodies are toothless and ineffectual; or else they are overly influenced by the often narrowly national special interests of certain unrepresentative members: the United Nations and its Security Council lie towards opposite extremes of the spectrum. In either case, there is the further limitation that decision-making is a long drawn-out process: if even it did seem to be going in the necessary direction for the common interest, the due process is too slow given the urgency of dealing effectively with environmental or other problems (Munro, 2008, 2009). In social evolutionary terms, the ultimate problem is that all but the most autocratic of individual states need to worry about the short-term expectations of their people and how these relate to the proximate consequences of domestic policies.

Walker et al. (2009) considered that the problem with existing institutions is that they each focus on a narrow subset of problems; and thus that what is required is the formation of super-institutions which can consider the larger picture with all the inevitable interactions. They believed that such super-institutions should be better able to form an interface between growing knowledge and understanding, on the one hand, and possible means of action, including changing human behaviour in the face of existing and continuing global inequalities. Thus (see also Munro, 2008, 2009) free-riders can be deterred by designing incentives to encourage cooperation and sanctions to punish violations: a model would be the approach of the WTO, where multilateral agreements mean that violations of bilateral trade by one country mean that the other can, with the agreement of the international body, impose proportionate retaliatory countermeasures.

Thus Walker et al. (2009) argued that the core problem is that existing institutions cannot see the wood for the trees. This contrasts with a proposal that the failure of the Copenhagen meeting regarding problems associated with dealing with GHG emissions reflected the fact that there is the need to parcel issues up into smaller, more digestible portions for consideration by separate bodies (see Section IV.2.v): in effect, there is the need to look at the trees (or at least specific stands and/or species) rather than focus on the whole jungle.

Regardless of the possible mechanisms, the main problem is to get countries to agree to any such system of rules imposed by a transnational organisation: they need to gain more than they would lose in order to be able to accept the legitimacy of the regulations and abide by the enforcement mechanisms without any perceived over-riding threat to national sovereignty. However, this would seem to be overly naïve, since most countries (e.g. the US and China; the EU is an interestingly notable exception: see Section IV.2.v) do not just aim to break even but rather to maximise their gains. Nevertheless, Walker et al. (2009) proposed a linkage between trade and efforts to limit environmental degradation, and more specifically climate change: however experience from the long-stalled Doha round for the WTO would seem to provide little ground for optimism, especially given the more broad-ranging yet more profound demands of any meaningful environmental accord.

To return to the central issue: ‘tribal’ human frailties and thus global inadequacies. Democracies face the biggest problem, as illustrated by the travails of trying to get a health reform bill on the books in the US. The two parties are increasingly polarised and partisan, as well as being subject to lobbying by self-interest groups and the potential for pork; superimposed upon which the Senate, with two

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434 Parasitise might be a more accurate term, although the typical biological responses of hosts to parasites would probably not be politically – or at least ethically – acceptable in civilised society.

435 For example, the long-stalled Doha Round.

seats for each state regardless of its size and the requirement of a 'supermajority' to avoid stonewalling filibusters, is itself undemocratic in that it potentially allows the wishes of the majority of the people, according to the popular vote, to be blocked by the minority party voting on party-lines. Amongst other large nations which are not generally considered as democracies (e.g. China), their sheer size creates problems of potential social unrest and consequent fragmentation. The end result is that an overwhelming proportion of the planet's population can be expected to give priority to short-term 'tribal' solutions rather than a longer-term global one for existing and future problems.

7. Concluding remarks

It is pertinent to close by noting that Diamond (2006), in a study of humans' effects on the environment and its resources, has chronicled that individual, often isolated societies have died out in the past as a result of one of four main sets of reasons: either -

i. they failed to anticipate a problem;
ii. they failed to perceive a problem once it had already arrived;
iii. they failed to try to solve a problem once it has been perceived; or
iv. they failed to succeed in efforts to solve the problem.

The first two are a product of ignorance – through willful self-denial or otherwise – of the decision-makers, if only because they are distant from the site of the problem. A pertinent example in the present context might be the failure by many to appreciate the complexities, and consequent fragility, of the financial system which they were creating (see Section I.2).

On the other hand, the latter two sets of reasons are the result of a failure of leadership to show an adequate response. This failure may take many forms, as a result of rational or irrational behaviours (Diamond, 2006). Rational behaviours are directed towards the acquisition of short-term benefits (economic or political) for the actors or for their groups, to the ultimate cost of all; whilst irrational behaviours are driven by non-economic considerations (e.g. religious tenets).

Issues regarding climate change and other aspects of the planet's environment clearly fall increasingly within the category of failure of global leadership, as does the financial environment now that some of the problems of the 'Great Moderation' of the past 30 years have been revealed. In neither case can leadership fail any more: now, serious problems beset not just isolated island and other local societies, but potentially many of the human race.

The use of labels for Western economies such as 'developed' or 'mature' would seem to be wishful thinking: it implies that these have reached the end of the road and are incapable of further improvement; and that they are the model for other, 'developing' or 'immature' economies. Instead, there is the need to come up with a more open-ended or other terminology.

- One possibility, given the evolving demographics (see Sections I.5, II.4 and III.7), would be to include an extra category: that of ageing economies, with the more advanced 'maturing' economies possibly being categorised as the new 'mature' ones.
- Alternatively, given the unsustainable demands being placed on the planet's limited resources (fig. 9), the existing 'mature' economies could be argued to be over-developed, with the need to reduce their demands accordingly.

437 Not only do the sparsely-populated farming states have a disproportionate say in national affairs, but a 'supermajority' of 60 of the 100 votes is required to pass a bill: thus it can be blocked by 41 votes, representing as few as about a tenth of the population. Where a vote is in the balance, it gives potential swing-voters inordinate power in terms of their ability to extract concessions of whatever nature.
438 When he estimated that humanity only has 50 years left based on present behaviour.
439 Examples include conflicts of interest between short-term gains – to society as a whole or to an isolated elite – and costs to society in the longer term.
Evidence is rapidly accumulating that the world is approaching a major ecological transition: climate change has served to focus minds (at least until recently), but it is just one component of this apparent phase-change – the present economic crisis may presage another, albeit more subtle such component. In the past such transitions, whether as a result of terrestrial or extraterrestrial causes, have led to species extinctions and the evolution of new ecosystems with their associated new biota. In the future, humans as a species may not be extinguished, but only a select small proportion out of the many billions are likely to survive; it is tempting to speculate that this bottle-neck will thus lead to the evolution of a more enlightened 'Homo sapienter', although it would be equally plausible to propose any of a number of other (more likely?) alternatives. The question is: who will pass through the eye of the evolutionary needle to inherit the Earth – the rich or the meek? Contrariwise: are the existing rich meek enough to acknowledge their global impact and give the rest of humanity a chance?

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