VI. The social front of globalization

140. Workers vs (businesses & government): new state of exploitation? "Since the beginning of the twenty-first century, we have been living in a state of drastic social transition; indeed, it is surprising that nobody forecast such extreme changes. Especially in Japan, the increase in the gap between the rich and poor has become quite large (…) The power of big business is quite formidable, and the status of workers is in a very fluid state. Indeed, it seems that so-called disposable workers are no longer "human beings." Younger generations are completely exhausted by the new state of exploitation (…) and have little hope for the future. They can be easily replaced by foreign unskilled workers. They are excluded from labor union protections that are typically in place solely for regular workers. And they are looking in vain for rosy opportunities just to become regular workers (…) Foreign workers employed as technical interns also find themselves in terrible situations: they are being exploited with wage rates that are much lower than legal minimum standards. They must work long hours as unskilled workers and cannot acquire any new promised occupational skills. Disappointed from such unfair treatment, they quit their jobs, but then find (at least in Japan) that they have no public status or employment insurance. Some of them turn to crime (…) On the other hand, big business is warmly supported by the government on the pretext of national profits and the maintenance of global competitive power. Why on earth is it that for 15 years we, the common people, have had to struggle for only small and ordinary levels of happiness?"

Kondoh, Kenji (2017): *The economics of international immigration: Environment, unemployment, the wage gap, and economic welfare*, Springer, Singapore.

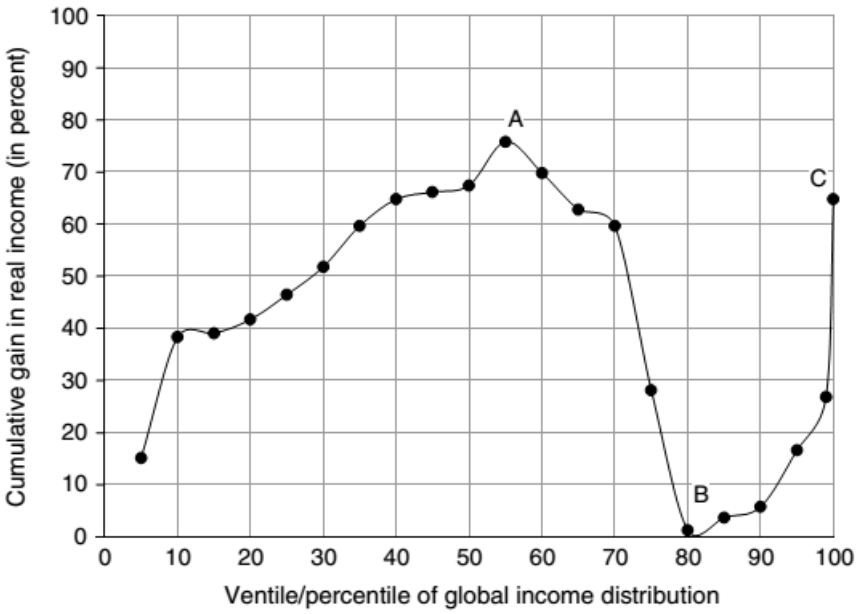
Powell, Benjamin; ed. (2015): *The Economics of immigration: Market-based approaches, social science, and public policy*, Oxford University Press, New York.

141. EU immigration policy: the tension between security and development considerations. During the 2000s, the EU immigration (and asylum) policy appears to have shifted towards its externalization to non-EU member states (such as Turkey and Morocco). This strategy of external governance seems to have been reinforced by the Arab Spring and the Syrian civil war, as the have created for the EU the biggest migrant and refugee crisis since World War II. Migration flows are viewed under a two-fold perspective: as an internal security challenge to be addressed by cooperating with third countries to influence their migration policies; and as tool for national and regional economic growth and development. The tension between these two perceptions creates contradictions and inefficiencies in the EU immigration policy. By externalizing its immigration policy, is the EU sharing or shifting burdens?

Ayselin Gözde Yıldız (2016): *The European Union's immigration policy: Managing migration in Turkey and Morocco*, Palgrave Macmillan, London.

Andrew Geddes; Peter Scholten (2016): *The politics of migration and immigration in Europe*, SAGE, London.

142. The gains from globalization are not evenly distributed: relative gains. The *elephant curve* on the right shows the percentual gain in real per capita income between 1988 and 2008 (the high globalization period). The horizontal axis ranks people in the world from the poorest (extreme left) to the richest (extreme right). The maximum gain (point A) is near the median (people slightly



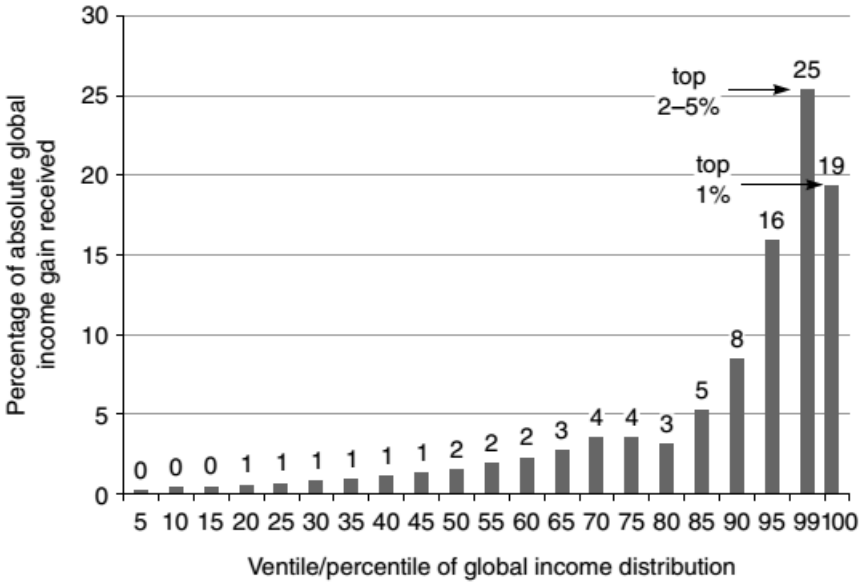
above the 50th percentile of the global income distribution) and for the richest (the top 1%, point C). The minimum gain (point B) corresponds to the global 80th percentile (most of it in the lower middle class of the rich countries).

143. Beneficiaries of globalization (1988-2008). (1) People between the 40th and the 60th percentile (1/5 of the world population). Most members in this group belong to Asian economies (China, India, Thailand, Vietnam, and Indonesia): the emerging global middle class. Hence, the Asian poor and middle classes define the great winners of globalization. (2) The global very rich (the global plutocrats).

144. The least benefited from globalization (1988-2008). (1) The global poor (located in the countries that are not rich). (2) The global lower middle classes (most of whom live in the rich countries). Thus, the great losers of globalization are the lower middle classes and the poorer segments of the rich world.

145. The gains from globalization are not evenly distributed: absolute gains. The chart on the right shows how the total increment in income between 1988 and 2008 has been distributed by global income level. It indicates that around the 44% of all the gains have been received by the richest 5% of the world population.

146. The gains from globalization are not evenly distributed: absolute gains. The chart on the right shows how the total increment in income between 1988 and 2008 has been distributed, by global income level. It indicates that around the 44% of all the gains has been received by the richest 5% of the world population (the top 1% receiving 19% of the income rise). The other beneficiaries of globalization (the emerging global middle class) pocketed only between 2 and 4%.

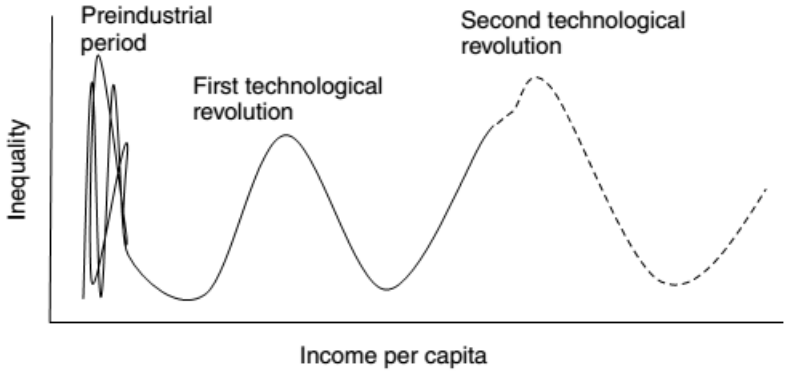


147. Top 1%. According to Oxfam (16 January 2017), the eight richest men in the world together have the same amount of wealth ($426 billion = 0.16% of the world's wealth) as the poorest 50% of the world population. Spending one dollar per second ($86,400 per day), it would take more than 13,500 years to exhaust $426 billion.

https://www.oxfamamerica.org/static/media/files/170105_bn-economyfor-99-percent-160117_embargo-en.pdf

148. The Kuznets curve (or hypothesis). It is the conjecture (by Simon Kuznets) relating the level of economic inequality with the level of real income. Graphically, it takes the form an inverted U: for low income levels, inequality is low; as income grows, inequality increases; and, from some sufficiently high income level on, inequality decreases. However, the recent experience of the advanced economies shows that inequality need not decrease with development.

149. The Kuznets wave (or cycle). It is the conjecture (Branko Milanović) that there are waves of alternating increases and decreases in inequality in time (as income increases). (1) Before the Industrial Revolution inequality undulated around a fixed average income level (in a Malthusian cycle the source of the fluctuation in inequality is demographic: an income rise lower inequality and triggers a population increase among the poor; in the presence of a decreasing marginal productivity of labour, a larger population leads to a reduction in productivity and a fall in income, which increases inequality and moderates population growth). (2) The Industrial Revolution made possible a sustained growth of income and also an increase in inequality. First, because higher incomes create the potential for more inequality. Second, because structural changes in the economy (urbanization, rising importance of the industrial sector) drove up inequality. Inequality eventually decreased when the supply of more educated workers increased and economic policies responded to pressures to correct the uneveness of the distribution of income (the welfare state). Military conflicts and political revolutions (themselves often consequences of excessive inequality) also contributed to the reduction in inequality. The 'Great Leveling' refers to the reduction in inequality in the richer countries between 1945 and 1980. (3) A new technological revolution affected the rich countries in the 1980s (digital revolution) by widening income disparities. The new technologies rewarded the more skilled workers, pushed up the return to capital and made the less skilled worker suffer the strong competition from China and India. The service sector increased in importance, with many of the new jobs not requiring much qualification and being badly paid. Moreover, pro-rich economic policies tended to be universally adopted.

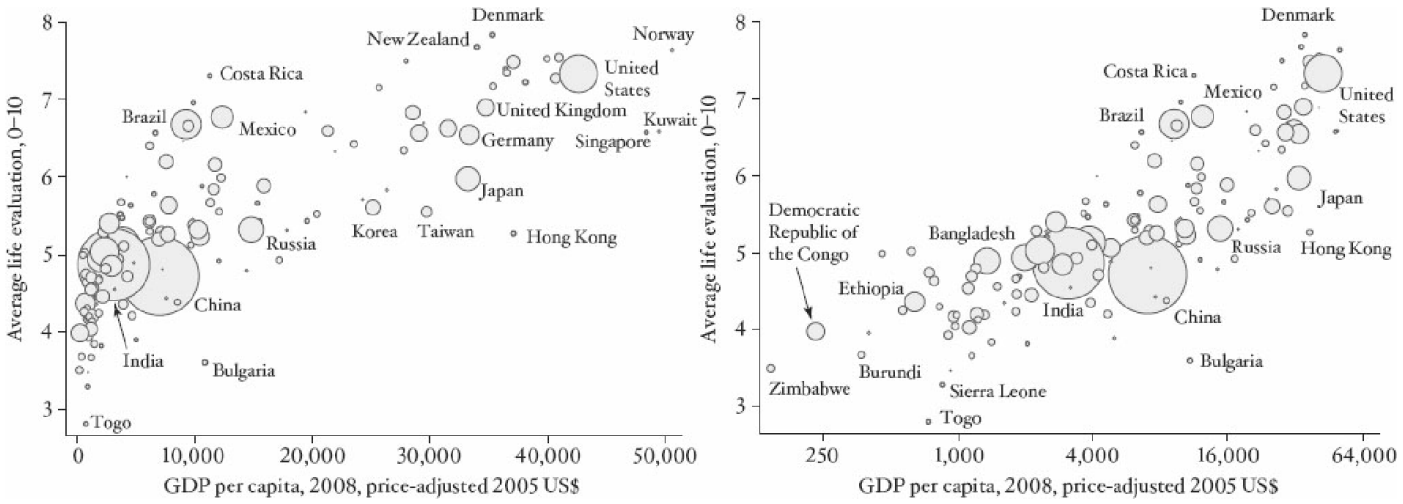


150. How to reduce inequality. Extreme inequality can be solved through the tax system. The mechanisms involved in the first reduction were increased taxation, social transfers, hyperinflation, nationalization of property and wars. Globalization makes more difficult to raise taxation on capital income: it is harder to tax a mobile capital. The rich are also resistant to the application of redistributive measures (neoliberalism and trickle-down economics). And one of the characteristics of globalization is that the winner takes all.

Milanović, Branko (2016): *Global inequality: A new approach for the age of globalization*, Harvard University Press, Cambridge, MA.

151. The Great Escape (Angus Deaton). The expression, taken from the movie about prisoners of war in World War II (directed by John Sturges, 1960), refers to the fact that, thanks to the material progress initiated in the Industrial Revolution, large parts of humanity have escaped from poverty, disease and deprivation. But episodes of progress are simultaneously episodes of growing inequality. "The greatest escape in human history is the escape from poverty and death."

152. Life evaluation and GDP per capita. The two charts below shows average life evaluation against GDP per capita (average income). The left chart shows the positive correlation between life satisfaction and income levels. It may give the wrong impression that, after around $10,000, additional income does not help to improve much one's life. The same information is presented on the right chart on a log scale for GDP per capita (each tick on the horizontal axis multiplies income by four: equal distances are not equal amount increases in income but equal percentage increases in income). Now it appears that income always matters: equal percentage differences in income are correlated with equal absolute changes in life evaluation.

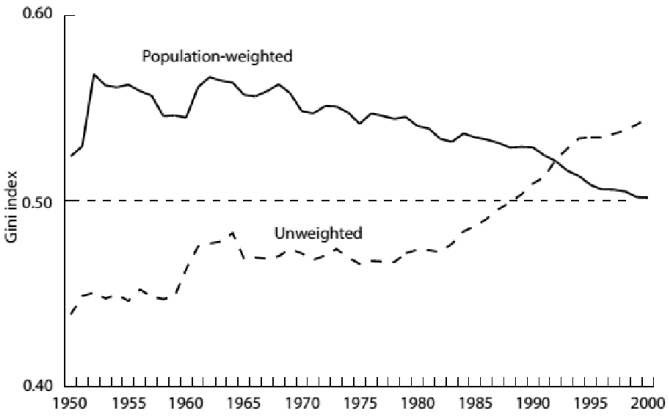


Deaton, Angus (2013): *The Great Escape: Health, wealth, and the origins of inequality*.

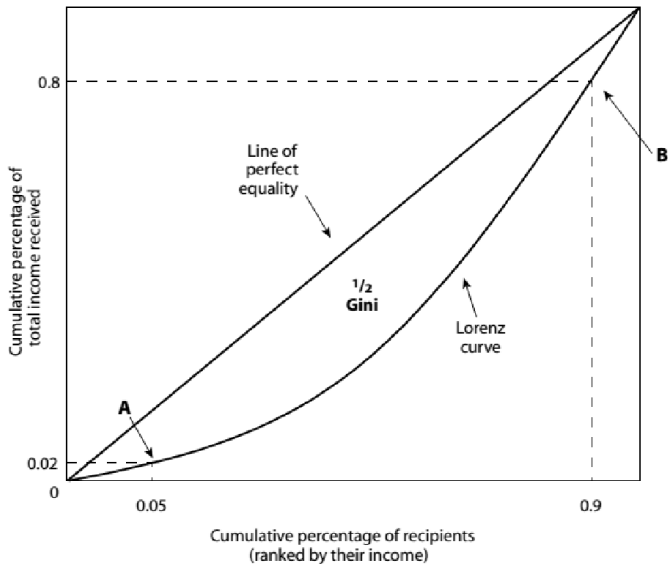
153. Concept 1 of inequality: unweighted international inequality. Concept 1 associates with each country a representative individual, who is assigned the country's GDP per capita. Concept 1 actually compares countries, with all of them given the same weight.

154. Concept 2 of inequality: population-weighted international inequality. As Concept 1, it is assumed that every person in a country receives the same income (the country's GDP per capita), but now the number of representative individuals attributed to each country depends on the country's size. Concept 2 ignores inequality within countries.

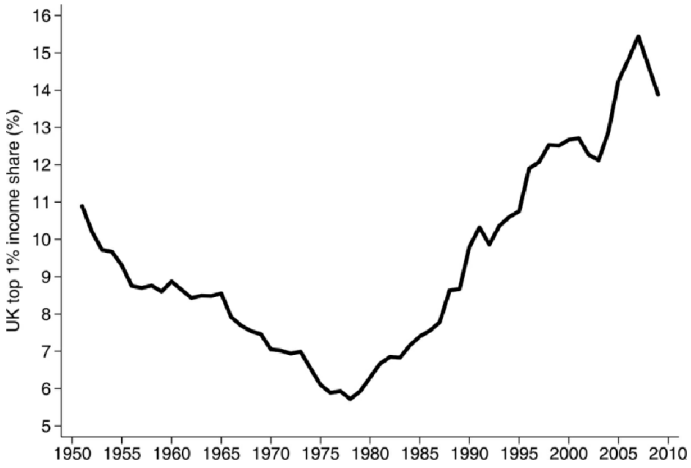
155. Concept 3 of inequality: individual international inequality. In Concept 3 inequality measures are determined directly on individuals, all individuals in the world, with each individual counting the same.



156. Divergent measures of inequality. The chart on the right shows two interpretations of the same reality: according to Concept 1, international inequality has increased (upward trend) in the last decades; whereas Concept 2 suggests a fall (downward trend). The difference: the behaviour of China and India (reduction in inequality essentially limited to a few big countries).



157. Gini coefficient (Corrado Gini). It is a measure of inequality (and income distribution) going from 0 (maximum equality) to 1 (maximum inequality: a single individual receives all the income). The Gini index is the coefficient in percentages. Graphically, it is (twice) the area between the line of perfect equality (the main diagonal) and the Lorenz curve (which charts the proportion of total income received by the cumulative proportion of recipients ranked by their per capita income from poorer to richer; in the graph



on the right, point A means that the poorer 5% of individuals receive the 2% of total income).

Milanović, Branko (2007): *Worlds apart: Measuring International and Global Inequality*, Princeton University Press, Princeton, NJ.

The rise of the super-rich in the UK (McQuaig, Linda; Neil Brooks (2013): *The trouble with billionaries: How the super-rich hijacked the world (and how we can take it back)*)

↵

158. Piketty's $r > g$ theory of inequality: the fundamental force of divergence. The symbol r stands for an average rate of return on holdings of wealth over long periods (average return of stocks, corporate bonds, savings accounts, government bonds, real estate, other financial assets...). The symbol g is the GDP growth rate and can be interpreted as the average speed at which incomes in a economy grow. Piketty's theory (the fundamental inequality of capitalism) is that inequality increases when r grows faster than g. With $r > g$, wealth grows more than income; and as wealth is distributed more unequally than income, a faster growth of wealth with respect to the growth of income contributes to an increase in inequality: the rewards to the owners of wealth are larger than the income that, on average, generates the economy.

$$Y = W + P$$

aggregate income = salaries + profits

$$r = \frac{P}{K}$$

rate of return = profits / capital

$$K' = K + I$$

capital tomorrow = capital today + investment

$$I = s \cdot Y$$

investment = savings rate · income

$$Y' = (1 + g) \cdot Y$$

income tomorrow =

(1 + income growth rate)· income today

Let $\alpha = \frac{P}{Y}$, $\beta = \frac{K}{Y}$ and $Y = \frac{Y}{L} \cdot L$, where L is population and $\frac{Y}{L}$ is average productivity. Therefore, $g \approx \lambda + n$: income growth is approximately equal to productivity growth plus population growth. As $r = \frac{P}{Y} \cdot \frac{Y}{K}$, it follows that $r = \alpha/\beta$ or, equivalently,

$$\alpha = r \cdot \beta$$

which Piketty calls "the first fundamental law of capitalism". Moreover,

$$\frac{K'}{Y'} = \frac{K + I}{Y'} = \frac{K}{Y'} + \frac{I}{Y'} = \frac{K}{(1+g) \cdot Y} + \frac{s \cdot Y}{(1+g) \cdot Y} = \frac{1}{1+g} \cdot \frac{K}{Y} + \frac{s}{1+g}.$$

At a stationary state, $\frac{K'}{Y'} = \frac{K}{Y} = \beta$. Hence, solving for β, it is obtained Piketty's "second fundamental law of capitalism" or dynamic law of accumulation:

$$\beta = \frac{s}{g} \approx \frac{s}{\lambda + n}$$

A falling share $\frac{W}{Y}$ of wages in income can be interpreted as a rise in inequality: capital gets an increasing larger portion of income. From $Y = W + P$, $1 = \frac{W}{Y} + \frac{P}{Y} = \frac{W}{Y} + \alpha$. As a result,

$$\frac{W}{Y} = 1 - \alpha = 1 - r \cdot \beta = 1 - \frac{s \cdot r}{g} \approx 1 - \frac{s \cdot r}{\lambda + n}.$$

The above equation indicates that the wage share $\frac{W}{Y}$ decreases (inequality goes up) when:

(i) the savings rate s rises;
(ii) the rate of return r rises;
(iii) the rate of growth λ of labour productivity falls;
(iv) the rate of growth n of population falls; or
(v) the rate of growth g of the economy declines (this is a combination of (iii) and (iv)).

159. Forces of convergence and divergence of market economies. With a constant s, the dynamics of inequality is explained by the evolution of the private rate of return r on capital and the rate of growth g of income. Having $r > g$ implies that wealth accumulated in the past grows faster than income (and wages). That capital tends to expand itself more rapidly than the economy is the principal force of divergence (inequality). The diffusion of knowledge and skills is a powerful force of convergence (and social stability).

160. Globalization and country divergence. Globalization seems to have favoured so far the forces of divergence: the narrowing of income inequality between countries has been relatively small (look at the Earth at night: light = prosperity; darkness = poverty).

161. Piketty's claims. (1) The growth (or contraction) of an economy's wealth-to-annual-income ratio ($\beta = K/Y$) is the quotient s/g between the net savings (the accumulation rate) and the economy's growth rate. (2) Wealth is eventually concentrated in the hands of a small group: the larger β, the more unequal the distribution of wealth. (3) An unequal distribution of income is the consequence of an unequal distribution of wealth: the privileged small group will steer political decisions on their behalf, to prevent the rate of profit from falling. (4) The privileges of the small group will be preserved through inheritance. (5) When wealth is inherited, the small privileged group will possess great influence (politically, economically, socioculturally) that will most likely be exercised to the detriment of the majority. "The process by which wealth is accumulated and distributed contains powerful forces pushing toward divergence, or at any rate toward an extremely high level of inequality (…) It is possible to imagine public institutions and policies that would counter the effects of this implacable logic: for instance, a progressive global tax on capital. But establishing such institutions and policies would require a considerable degree of international coordination." (Piketty, 2014, p. 27)

Piketty, Thomas (2014): *Capital in the twenty-first century*, Belknap Press, Cambridge, MA.

Dickens, Edwin (2015): "Piketty's Capital in the Twenty-First Century: A review essay," Review of Political Economy 27(2), 230-239.

López-Bernardo, Javier; Félix López-Martínez; Engelbert Stockhammer (2016): "A Post-Keynesian Response to Piketty's 'Fundamental Contradiction of Capitalism'," Review of Political Economy 28 (2), 190-204.

Thompson, William R.; Rafael Reuveny (2010): *Limits to globalization: North-South divergence*, Routledge, London and New York.

162. Yates' dilemma (Michael Yates, 2016, p. 47). "It is impossible to create a society that is both just and capitalist." According to Yates, in a capitalist economy, capital rules: the system works by creating a few winners and many losers, poles of wealth and poverty, periods of expansion and recession, overworked

employees, alienating workplaces, exploitation by the powerful, despoiled environments… "Losses are always socialized, and gains are always privatized."

Yates, Michael (2016): *The great inequality*, Routledge, New York.

163. Some myths. **Myth 1**: Inequality is a necessary counterpart of economic dynamism and competitiveness. According to this myth, rising inequality is an inevitable consequence of rapid economic growth (or a necessary condition for competitiveness). Policies that lower inequality, it is claimed, reduce the incentives to work hard and innovate. **Myth 2**: The best way to help the poor is to help the rich ("Equity needs growth"). **Myth 3**: Inequality is actually not a problem as long as extreme poverty is avoided and incomes are all rising ("the rising tide lifts all boats"). **Myth 4**: As pay is related to ability, rising inequality is just the result of increasing differences in people's ability (I am paid more because I am worth it).

Sudhir Thomas Vadaketh; Donald Low (2014): Challenging the Singapore Consensus.

164. The bright side. Historically recent global trends that have coincided with the unfolding of the last globalization wave: decline in the number of wars and war-related deaths, continuous reduction in absolute poverty, more educated population, more people enjoying higher education, expansion of the middle class…

165. 'What may be the most important thing that has ever happened in human history' (Pinker , 2011). The decline in violence over the course of history and the fact that mankind may be living now the most peaceable era ever. Pinker identifies six major steps in the retreat from violence: the Pacification Process (transition from hunting/gathering to farming), the Civilizing Process (consolidation of centralized authorities), the Humanitarian Revolution (appearance around the Enlightenment period of organized movements to abolish socially sanctioned forms of violence and the ideology of pacifism), the Long Peace (after the Second World War the major powers stopped waging wars among themselves), the New Peace (since 1989, the end of the Cold War, organized conflicts have declined throughout the world) and the Rights Revolutions (inaugurated by the Universal Declaration of Human Rights in 1948, corresponds to the growing revulsion against aggression on smaller scales: against ethnic minorities, women, children, homosexuals, animals…). Forces driving the decline in violence: the state, commerce, feminization (societies more respectful with women tend to be less violent), cosmopolitanism (which allows to understand better others' perspective), and the spread of reason to deal with human affairs.

166. Role of the liberal class. The role of the liberal class in a traditional democracy is to ensure that reform remains a viable alternative. It is placed between the power elite and the general population. The liberal class controls the behaviour of (and civilizes) the power elite, offers hope for change to the general population, makes proposals to gradually reduce inequality and protect the weak, and becomes useful to power elite by discrediting proposals of radical change. In the last instance, the liberal class attributes legitimacy to the power elite and serves as a voice to the general population in their demands for change and improvement.

- One of the consequences of globalization has been the accumulation of economic power (and, through it, political influence and even political power) in the hands of multinational corporations. This power has been used to assault the traditional democracies and deprive the liberal class of its role as a safety valve. The role of the liberal class has been reduced to offer empty rhetoric. "The inability of the liberal class to acknowledge that corporations have wrested power from the hands of citizens, that the Constitution and its guarantees of personal liberty have become irrelevant, and that the phrase consent of the governed is meaningless, has left it speaking and acting in ways that no longer correspond to reality." (Hedges, 2010) Since the liberal class has lost its ability to articulate responses to discontent, it becomes more likely that populist movements and/or violence will arise to deal with the sources of discontent.

- One political lesson of history is that those in power that appear incapacable of performing their duties, and this notwithstanding persist in retaining their privileges, tend to be removed by force. By not fulfilling its traditional tasks the liberal class is exposed to the same fate: to be brutally discarded.
- An ineffectual (dead) liberal class creates a more polarized society: the power elite has no check to prevent the plundering of the economy and the general population increases its frustration and finds more attractive finding solutions outside the democratic institutions or without the instruments of a traditional democracy. In killing the liberal class, the 'corporate class' behaves like a parasite that kills its host: without the liberal class the power elite is free to demolish the system of measures (welfare state) erected by the liberal class to protect the general population from the inequities of the economic system.

Hedges, Chris (2010): *Death of the liberal class*, Nation Books.

Mau, Steffen (2015): *Inequality, marketization and the majority class: Why did the European middle classes accept neo-liberalism?*, Palgrave Macmillan, New York.

167. The principle of social proof. People make decisions and adopt beliefs on the basis on what others do and believe. The individuals' perception of correct/acceptable behaviour/beliefs depends on the extent to which other follow/hold the behaviour/beliefs. To decide what is appropriate people tend to rely on what others do. The presumption is that one makes fewer mistakes by respecting social evidence (the majority cannot be wrong). Social proof appears most influential under uncertainty and similarity.

168. The Halo effect. It is the cognitive bias in which the overall impression of a person influences the belief regarding the person's character (attractive-looking people tend to be perceived as kind, intelligent, successful). [Special case: the Dr. Fox effect. Students tend to rate higher a teacher who presents the material in an engaging, expressive, enthusiastic manner, regardless of the value, interest, usefulness, meaning, plausibility of the content. Talk nonsense under conditions of high expressiveness gets higher ratings than providing informative and useful contents in a dull manner.] [To which extent can social proof be manipulated by the Halo effect?]

169. Dunning-Kruger effect. It is the cognitive bias according to which people tend to overestimate their own competence (one's is not fully aware of his or her own ignorance).

170. Self-serving bias. It is the cognitive bias in which people tend to attribute success to themselves and failure to external factors. It is an expression of overconfidence: people seem to overestimate their skill, knowledge, competence, efficiency, moral virtues…

171. Self-confirming bias. It is the cognitive bias in which people tend to take into account or emphasize information/evidence that reinforces their views/beliefs, and neglect information/evidence contradicting their views/beliefs.

172. Apparently, **people can argue anything**, with or without adequate/insufficient evidence. If pressed, probably anyone can provide an explanation for some phenomenon and next for the opposite: are owners of small businesses more successful by taking risks or by being cautious?

173. Why has religion failed to die away, despite the confident prediction of many intellectuals since around 1950 that religious belief would soon die away? In an unexpected way, religion has boomed.

174. Why do superstitions persist, when modern science casts big doubts on the causality relationships that the superstitious beliefs or practices presuppose? What sustains the belief that certain numbers are lucky and others unlucky?

175. The Five Factor Model (**big five personality traits**). Openness to experience (to be curious and creative vs to be cautious or even dogmatic); conscientiousness (organized vs easy-going); extraversion (outgoing vs reserved); agreeableness (friendly and cooperative vs detached and suspicious); neuroticism (tendency to experience unpleasant emotions easily –anger, anxiety, depression– and the degree of emotional stability).

176. The Hubris Syndrome. Personality change acquired by some persons occupying positions of social, political, economic, ideological leadership. The change is characterized by lack of realism (the loss of touch with reality) and excessive self-regard. Both traits lead to incorrect decision-making. The Hubris Syndrome and power go together: power is necessary for the syndrome occur; leaders suffering from the syndrome that have lost power never regain it.

177. The inverse law of sanity. "Normal persons have mild positive illusion, which, in the context of power, predisposes them to developing hubristic behavior. In contrast, depressed persons are more realistic and empathic than normal persons, and thus, in the context of power, less prone to the Hubris Syndrome."

Peter Garrard et al. (2016): *The intoxication of power*.

178. The paradox of power (Jack Hirshleifer). In power struggles, it is natural to expect that the strong will grow stronger (and the weak, weaker). The paradox of power is that poorer or smaller groups often end up improving their positions in relation to richer or larger ones. One explanation is that the group starting at a disavantage has an incentive to make more effort (fight harder, invest more, take more risks, try new strategies) than the group enjoying an advantage. It is only when the conflict is sufficiently decisive that the richer or larger group gains relative to the poorer or smaller. The paradox explains the adoption of policies that redistribute income from the rich to the poor.

179. Alter-globalization. It is a social, cultural and political movement born (around 2001) in response to the impact and apparent triumph of capitalist globalization, asserting a concept of human rights, freedom and justice within globalization. The movement denies the blind belief in markets, supports the reintroduction in economic thought of the role of the state and defends a vision of human beings in which they are not reduced to the *Homo economicus* caricature. The movement aims at strengthening the citizens' abiity to act globally.

Pleyers, Geoffrey (2010)*: Alter-globalization: Becoming actors in a global age*.

VII. The technological front of globalization

180. Technological progress as a social struggle. The evolution of technology (which technologies become triumphant) cannot be explained on exclusively technical considerations. Technology can always follow alternative paths and it is social forces that select the path to follow: technologies are involved in a process of elimination of technological designs whose outcome is socially determined (by the struggle between social groups pursuing their interests).

181. On the use of technologies. Once a technological design wins out and is adopted as the standard, the technology maybe used for purposes different from the one motivating the technology. Initially, education and public programming dominated radio broadcasting; similarly, television was originally conceived for surveillance and education. When businesses gained control over the two technologies they transformed them into entertainment media.

Feenberg, Andrew; Norm Friesen (eds) (2012): *(Re)Inventing the Internet: Critical case studies*, Sense Publishers, Rotterdam.

182. The technological bluff (Ellul, 1989)

- **Opposition between people and machines.** People adapt badly to modern techniques: people do not adapt to machines nor machines to people. There is a permanent maladaptation between the social and the technical world. Societies evolve slowly; techniques and machines evolve quickly. Societies rely on the past (habits, traditions, rules, conventions); technologies look at the future.

- **The great technical innovation.** The eventual integration of the social into the technical world, from which a new humanity will emerge.

- **Technolatry.** Ellul views Simon's overoptimistic claims as pseudoscientific absurdities: Simon just projects tendencies (without justifying on which grounds the projection is legitimate) and simply presumes that every discovery/invention will have beneficial effects (masquerading inconvenient phenomena for his theses, like the simultaneity of rural depopulation and urban overpopulation). What is good in a computer virus?

- **Rise of the technocrats.** "The technocrats have a strange blindness to the complex reality of the world and to the lessons of common sense (e.g., that no system can grow indefinitely in a closed and finite universe, a truth that they treat sarcastically). Their great knowledge and narrow specialization prevent them from understanding questions outside their field. Yet they write authoritatively about tomorrow's world (…) They are thus plunged into electronics and computers without a thought that perhaps in the future being able to till a bit of ground or light a wood fire or do proper grooming might be more useful than being able to tap on a keyboard. Such is their casual ignorance of most of what constitutes our world (…) They immediately retort that what opponents want is a return to the Middle Ages. As they see it, there has to be growth. They will not accept any other hypothesis. They find their justification in the fact that increasingly everything depends on the application of techniques. Not only is technique good, not only is it indispensable, but also (…) it alone can also achieve all that human beings have been seeking throughout the centuries: liberty, democracy, justice, happiness (by a high standard of living), reduction of work, etc. "

- **Technology is ambivalent.** Technique and technology are not neutral: they may have good and bad effects. For technological optimists, technology is globally good. Technology's ambivalence is captured by for theses:

  (1) all technical progress has its price (creation involves destruction, frequently people's lives: no progress is free from shadows);

(2) at each stage it raises more and greater problems than it solves (law that problems grow with the growth of techniques);

(3) its harmful effects are inseparable from its beneficial effects (cars generate congestion; more and cheaper food available, obesity): favourable effects tend to be apparent in the short-term (and be concrete and clearly identifiable), whereas the negative effects tend to become evident is the long run (and are perhaps diffuse and abstract);

(4) apart from the desired and the foreseen, it has a great number of unforeseen effects (surgical interventions replace one infirmity by another; cultivation impoverishes the soil; unexpected harmful effects of DDT; accidents of new technologies).

- **Technology is essentially unpredictable.** Technical change is not teleological: it has no goal. There is no predetermined destination for technical change: it is errhatic. Therefore, it is unpredictable (and that makes social evolution also unpredictable).

- **The paradox of Harvey Brooks.** The costs and risk of a new technology are usually assumed by a small fraction of the population, while its advantages tend to be widespread.

183. How deterministic is the history of technology? Heilbroner (1967) contends that technological development must proceed in a relatively fixed sequence: some developments must necessarily precede others. For instance, societies must pass through the hand-mill before making a transition to the steam-mill, which is necessary to moving to hydroelectric plants; or mastering electricity is necessary before mastering nuclear power.

Heilbroner, Robert L. (1967): "Do machines make history?," Technology & Culture 8, 335–345.

184. Evidence for the deterministic view. (1) Examples of simultaneous inventions and discoveries. (2) Absence of technological leaps. Most technological advances seem to be incremental and evolutionary. (3) Predictability of technology. There are two constraints to technological capacity in a given time: the accumulated stock of available knowledge (which only expands gradually) and the level of technical expertise (the material competence). Both determine the ability of industries to produce the equipment corresponding to higher technological levels. That ability also depends on the size of the capital stock. Hence, within certain limits, at least the short- to mediium-run evolution of technology appears predictable.

185. Does technology create social orders? That is, does technology impose social and political traits on societies that adopts the technology? There are at least two elements of influence: the composition of labour force and the hierarchical organization of work.

186. Some questions on technology. What fuels technology? Itself? Is the recent explosive technological development a bubble? Is technology necessarily expansionary? Are there limits for technological expansion? Is technology potentially a *perpetuum mobile*? What are the essential resources for technological growth? Are these resources exhaustible? Can technology's strain of nature reach a limit point? Will technology be the new nature? Could a new nature be technologically built? Are the laws of nature subject to technological manipulation? Can laws of nature be technologically created or modified?

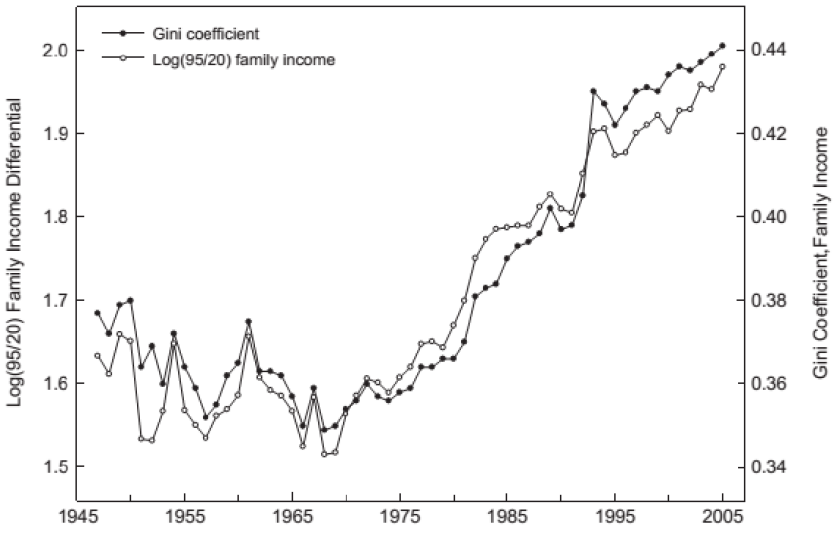
187. Economic revolution by confluence of technologies. A confluence of technologies will lead to the next production revolution: digital technologies (3D printing, internet of things, advanced robotics), new materials (bio- or nano-based) and new processes (datadriven production, artificial intelligence, synthetic biology).

OECD (2017): *The next production revolution: Implications for governments and business*, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264271036-en

188. Standard view of human capital and development. At least illustrated by the American experience in the 20th century, given certain institutional preconditions:

↑investment in education → ↑level of technology and productivity → ↑economic growth → ↑standard of living

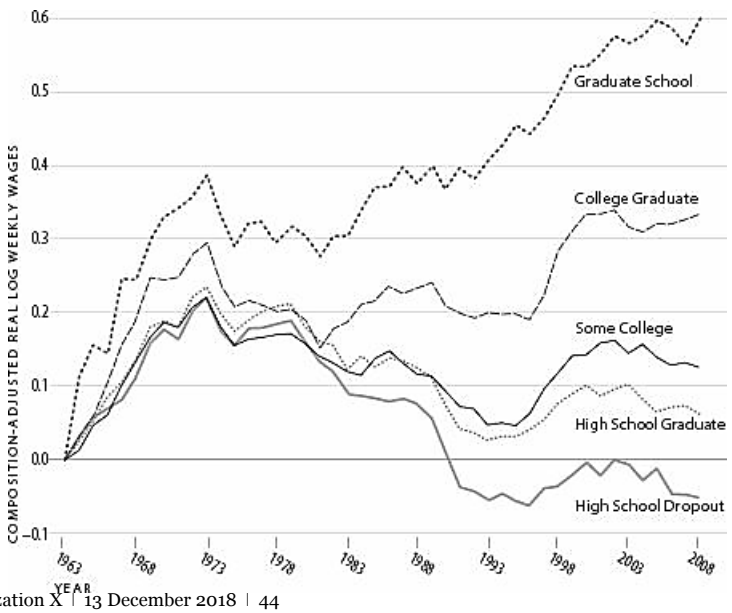
189. Connection between technological change and inequality through educational progress. Nothing guarantees a fair distribution of the results of economic growth: its benefits may be inequally distributed, so the higher standard of living need not be generally enjoyed. Technological advances tend to increase the demand for more educated (high-skilled) workers, whose earnings would increase in comparison with the earning of the less educated (low-skilled) workers. Economic inequality would then rise if the proportion of the more educated with respect to less educated remains approximately constant (or if the changes in the supply of workers in each category do not offset the changes in the demand for those workers). Hence, technological progress would widen the income gap between more educated and less educated workers (skill-biased technological progress). Supply side considerations may alter this conclusion: a large increase in the supply of more educated workers could neutralize the increase in earnings of this group relative to the earnings of the less educated group.



190. Race between technology and education. Apparently, in the US, a rising supply of educated workers (supply of high skills) outstripped the additional demand generated by technological progress: during the first three-quarters of the 20th century higher incomes coincided with a decline in inequality (education raced ahead of technology). In the last two decades, technology raced ahead of education and inequality went up (educational slowdown).

Goldin, Claudia Dale; Lawrence F. Katz (2008): *The race between education and technology*, The Belknap Press of Harvard University Press, Cambridge, MA.

191. Skill-biased technical change. Digital technologies (big data, high-speed communications) have increased the demand for abstract and data-driven reasoning, and this has risen the value of the workers with the right engineering, creative or design skills. The result is a fall in the demand for less skilled workers and a surge in the demand for the more skilled. The chart on the right shows



evidence of the winner-take-all phenomenon: skill-biased technical change favours people with more human capital (mainly obtained through formal education).

192. Law of accelerating returns (Ray Kurzweil). The rate of evolution inherently accelerates, shows continual acceleration (every stage in evolution uses the capabilities and results from the previous stage and, for each stage, going from one stage to the next takes a shorter time).

193. Six epochs of evolution (Ray Kurzweil). These epochs express the continued evolution of information: physics and chemistry (information captured by patterns of matter and energy); biology and DNA (self-replicating mechanisms created: life); brains (mechanisms to acquire and process information biologically); technology (human creations); merger of human technology with human intelligence; and "the universe wakes up" ("the 'dumb' matter and mechanisms of the universe will be transformed into exquisitely sublime forms of intelligence, which will constitute the sixth epoch in the evolution of patterns of information. This is the ultimate destiny of the Singularity and of the universe", Kurzweil, 2005, ch.1).

194. The Singularity (Ray Kurzweil). It is the era defined by intelligence becoming nonbiological and countless of times higher than the current level of human intelligence as a result of rapid technological change. The impact of this change will transform human life: biological limitations will be trascended out, creativity will be amplified, humans and machines will become integrated, we could occupy different bodies and all human problems will be solved (aging, illness, pollution, hunger, poverty… even death). Nanotechnology will make it possible to produce anything inexpensively. The Singularity culminates the merger of biology with technology: it is the time when machine intelligence merges with, and surpasses, human intelligence.

195. Cardwell's law. No country has been at the forefront of technological progress for more than two or three generations. The diversity and multiplicity of players in Europe since the fall of the Roman empire appears to have defined a favourable environment for the replacement of leading or hegemonic countries. The outcome of renewed leadership has been a continuous growth of technology for at least a couple of centuries.

Kindleberger, Charles P. (1996): *World economic primacy, 1500-1990*, Oxford University Press, New York.

196. General approaches to the relationship between technology and society. (1) Internalist approach: technology develops in isolation from society. (2) Technological determinism: certain inventions or innovations cause major changes in society (social development is related to the development of techniques). (3) Dialectical approach: technological and social changes interact mutually.

197. African societies as example of the lack of adoption of superior technologies (resistance to foreign ideas). (i) Tools from Eurasian preindustrial technology (cart, plow, potter's wheel) were not adopted, despite contact with Eurasia. (2) Advanced industrial technology was imported but not successfully integrated with existing locally-based economic structures. African economies remain based on human energy and linear-reciprocal motion (non-human energy sources and technologies based on rotary motion did not spread). Despite exposition to presumably more advanced technologies, material and cultural reasons led to a general rejection of the technologies. The technological gap with Eurasia reinforced rejection: the introduction of more advanced production technologies in precolonial Africa failed to generate transformations in the rest of the economy (failed to create an economy where those technologies could thrive and develop). The benefits of the new technologies were appropriated by ruling elites, which reinforced their privileged position. Precolonial Africa illustrates the possibility that technology spurs economic growth but not development (innovations can be transferred without the technological capacity

embodied in those innovation being simultaneously transferred). Even after 1960, African growth has been characterized by the divergence of African incomes from incomes in other developing regions.

198. Moravec's paradox (paradox of robotic progress). "The discovery by artificial intelligence and robotics researchers that, contrary to traditional assumptions, high-level reasoning requires very little computation, but low-level sensorimotor skills require enormous computational resources." (Wikipedia). "It is comparatively easy to make computers exhibit adult-level performance on intelligence tests or playing checkers, and difficult or impossible to give them the skills of a one-year-old when it comes to perception and mobility." (Hans Moravec)

199. Digitization. One of the most important recent phenomena is that almost everything is being digitized: documents, books, news, statistical information, music, photos, video, maps, social networks, requests for information, responses to those requests, data from sensors, personal information, purchases, services…

200. A by-product of technological progress is that technologies become overcomplicated and more incomprehensible. The current technological level has accelerated the metabolism of the planet, complicating the flow of materials and information.

VIII. The political front of globalization

201. Globalization driven by technology or by politics? Is globalization essentially an inexorable (deterministic) process or essentially a contingent process driven by the decisions of individuals (and, in principle, a reversible project)? In the second case, are the involved individuals just an elite (politically and/or economically powerful individuals)? Is globalization ultimately an economic or a political phenomenon? (Globalization = extension and intensification of economic, political and social activities across borders, political and geographic = make the planet smaller).

202. Convergence. The deterministic view of the globalization process is in line with the presumption of historical convergence. The idea is that technological progress forces social changes, that those changes are inevitable and, therefore, that (regardless of history, cultural particularities, national ideologies and practices) societies will become more alike in their basic organization and convergence also in standards of living. The only difference is the speed at which societies reach the common destination.

203. Death of conflict? The 'death of conflict' expresses the idea that adoption of a core of values and principles in a society will bring social conflict/tensions to an end. Societies become like markets, where interaction/competition is peaceful. The 'rationality' of technology spreads to the social world: social problems can be solved 'technically', technocratically. In the end, a stable social order is reached and the interests of all the groups are reconciled. Globalization is said to dissolve the sources of social and political conflict.

Amoore, Louise (2002): *Globalisation contested: An international political economy of work*, Manchester University Press, Manchester and New York.

204. Tension between democracy and globalization. So far democracy seems to have operated with more strength locally, pulling towards self-organization and accountability in geographically limited areas. Globalization transcends geographical limits and, in principle, undermines democracy (as the forces of globalization tend to evade democratic control and accountability).

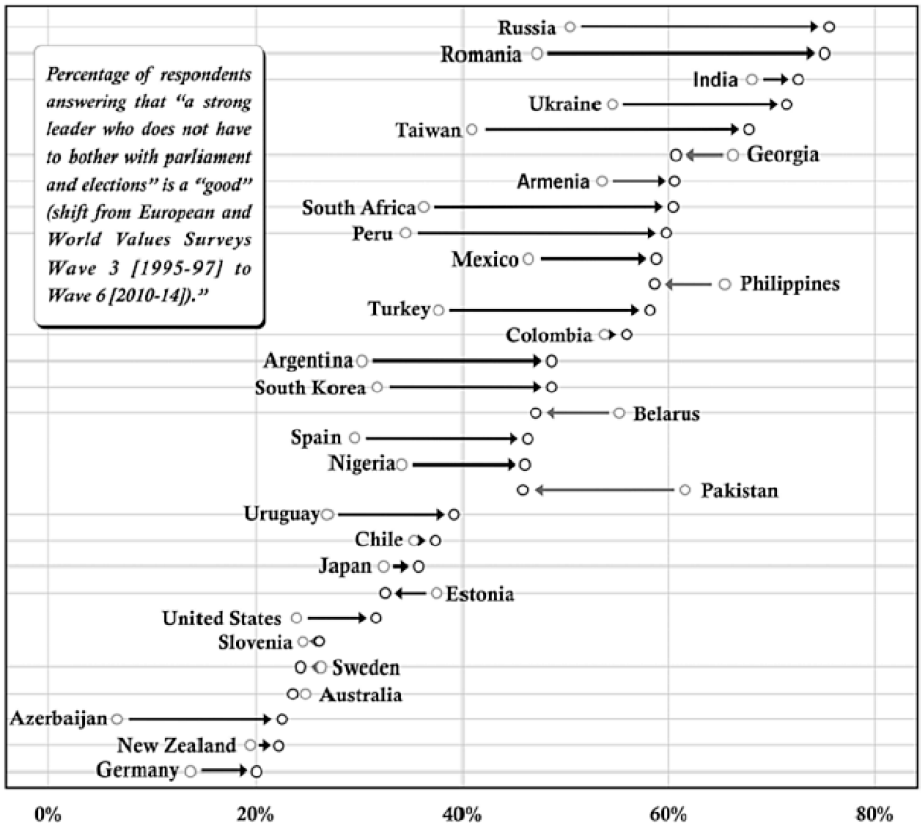
205. Cosmopolitanism. Represents an ethical solution to the tension between democracy and globalization. It involves universal principles (democratic public law) to extend democracy to all domains: local, regional, national and global. It represents a way to control globalization (and arbitrary power) by subjecting it to democratic organization, control and accountability.

206. 'The paradox of our times', Held (2010, p. 4). The paradox is that the current collective issues (or core sets of problems) increasingly trascend political borders but the tools to handle these issues are inadequate or insufficient (problems addressed in an ad hoc manner, lack of coordination among international institutions, not accountable global organizations). The paradox expresses a problem of global governance: global problems cannot be solved at the national level or by nations acting alone. Worse still, the gap between the need for global solutions and the inability of multilateral institutions to meet that need is growing.

207. Global core problems in an increasingly interconnected world. These are problems associated with sharing the planet (climate change, biodiversity loss, resource shortages, pollution), sustaining societies (poverty, inequality, conflict prevention, global diseases) and establishing global regulations (nuclear proliferation, toxic waste disposal, intellectual property rights, genetic research rules, trade rules, finance and tax rules).

208. Is globalization creating a multipolar world? Until a few decades ago, globalization was led by "the West". Now, "Asia" is ascending and regaining geopolitical and economic power (G20 replaces G7, increasing share in world GDP).

Held, David (2010): *Cosmopolitanism: Ideals and realities*, Polity Press, Cambridge, UK.



Heydarian, Richard Javad (2018): *The rise of Duterte: A populist revolt against elite democracy*, Palgrave Macmillan, Singapore.

On the left: Global survey of share of citizens preferring a strong leader "who does not have to bother with elections". (Heydarian 2018, p. 6)

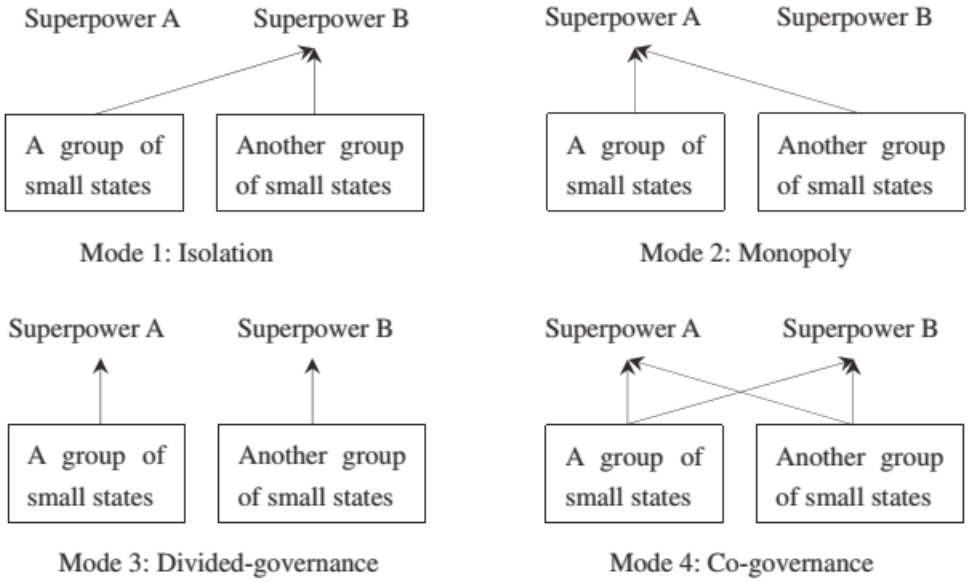
209. Rise and fall of great powers. The rise and fall of great powers appears to be a stylized fact of international relations. It is a process in which the status quo represented by the dominance of some power is challenged by the emergence of a new power. Is it now the turn for the US to fall and for China to rise? Will be system become bipolar? Basic explanations for the fall are: (i) internal instability; (ii) external over-extension. The basic explanation for the rise is emulation: the states lagging behind the leading powers learn from them how to catch up. In the process of developing and accumulating power, the lead states that first go through this process may attempt several strategies of which some may prove unsuccessful. The less developed or weaker states do not have to replicate failures, since they may just adopt the successful strategies. The laggards do not need to go through all the stages that the leaders initially followed and that allows the laggards to catch up faster and at smaller cost than the vanguard states.

John Glenn (2016): *China's challenge to US supremacy: Economic superpower versus rising star*

210. Sino-US interaction: Thucydides trap, Churchill trap or co-ruling? "The 'Thucydides trap' is in a large part an induction of historical experiences on great power politics. In the contemporary era, however, there is small risk of all-out war between a rising power and a hegemonic power. By contrast, the 'Churchill trap', whereby the superpowers fall into a long-term confrontation reminiscent of that between the US and the Soviet Union during the Cold War, presents a genuine risk and one that should be taken far more seriously (…) there is a third type of great power relationship between the two poles, which I call 'co-ruling', whereby rather than being geographically demarcated according to their respective 'spheres of influence', the two superpowers jointly lead all or most of the small and medium-sized countries in the system."

Yang Yuan (2018): "Escape both the 'Thucydides Trap' and the 'Churchill Trap': Finding a third type of great power relations under the bipolar system," Chinese Journal of International Politics, 1-43.

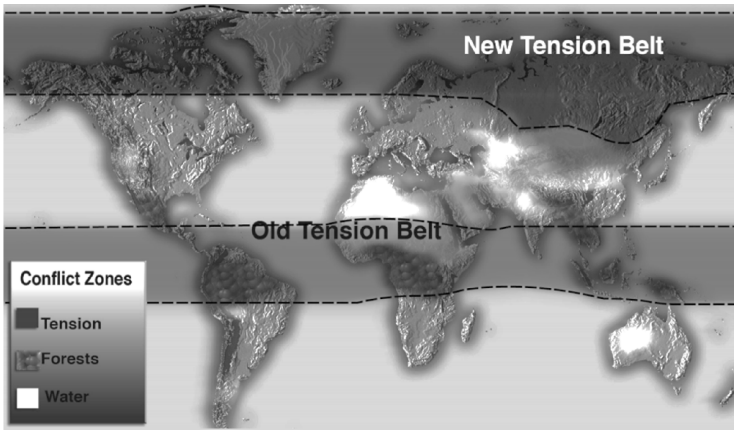
211. The Thucydides trap (Graham Allison, 2017)**.** "It was the rise of Athens and the fear that this instilled in Sparta that made war inevitable." When a rising power threatens to displace a ruling power, armed conflict becomes the most likely outcome. Now China and the United States appear to be have fallen into the trap.



212. A paradox of dominance? If the global contest for dominance is a zero-sum game, then the resources used by the rising powers are no longer available to the lead states to maintain or expand their dominance. In fact, the economic system created by the dominant powers is used by the challengers to rise: when the profit opportunities become scarce in the lead economies, it becomes an attractive option to invest abroad and that helps less developed economies to develop and close the gap with the richer economies. As it is cheaper to produce in poorer economies, these economies could develop easier and faster by selling their production in the leading economies. Hence, the initial leadership of some economies is accompanied by convergence of the rest of economies.

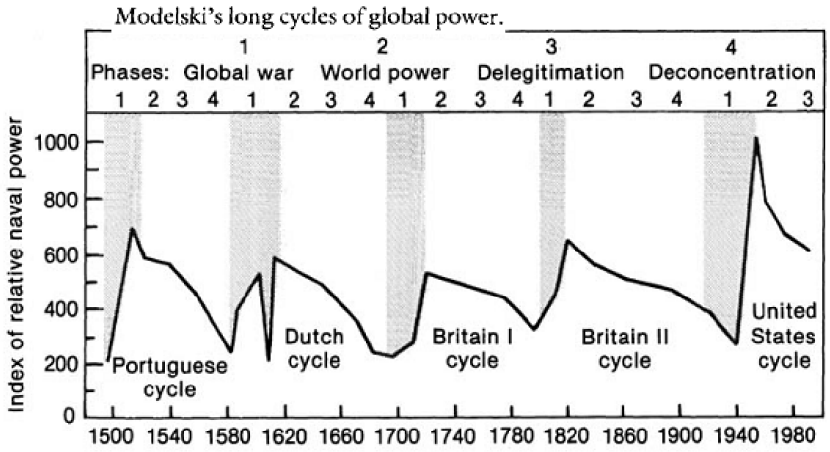
"The paradox of power for the USA is therefore that the very economic system that has propelled it on to the world stage also contains within it the potential seeds of its own destruction." Glenn (2016, p. 2)

213. The tension belts. The tension belts are the manifestation of the view that climate change will reinforce political conflict. Climate change will produce scarcity in some regions and abundance in others; induce the massive displacements of people; generate new sovereignty claims and border disputes…



- Equatorial tension belt. Involves mainly developing countries. Here climate change will lead to hot wars, as it will make the regions hotter and drier (increasing deforestation and worsening water shortages).
- Polar tension belt. Involves developed countries. Climate change will make this region more valuable (it will attract population, create new opportunities for resource exploitation and induce states to fight for its control). As distinguinshed from the hot wars in the equatorial belt, the duration of the cold wars in the polar belt is more likely to be short-term, motivated by opportunity (not desperation) and relative to specific (rather than general) resources.

Lee, James (2009): *Climate change and armed conflict: Hot and cold wars.*



214. Has Western dominance ended? After the fall of the Soviet Union it appeared that the Western way (liberal democracy, capitalism and secular nationalism) had no obstacle to become universalized. Kupchan (2012) holds that this is not going to occur, because the Western way is dependent on socio-economic conditions unique to Western countries. He also contends that no other political model or centre is going to displace it. His prediction is that the world will be multipolar (without a clear hegemon) and politically diverse, consisting of major powers with different political conceptions.

215. Capitalism does not imply democratization. Political authoritarianism has survived in an age of capitalist globalization in part because it has presented itself as guarantor of domestic and international marketization. It is claimed that an oppressive state is needed to conduct the unpopular policies required to response the shock that respresents economic liberalization. Globalization appears to strengthen dictatorial regimes and the illiberal policies pursued by democracies. The paradox is that "the more economically liberal a country becomes, the greater its reliance on authoritarianism seems to be across contexts" (Bloom, 2016).

Bloom, Peter (2016): *Authoritarian capitalism in the age of globalization*, Edward Elgar, Cheltenham, UK.

Kupchan, Charles (2012): *No one's world: The West, the Rising Rest, and the coming global turn*, Oxford University Press, New York.

216. A conflictual view of globalization. Globalization is the expression of the global war for wealth and its associated struggle for political and ideological dominance. Globalization is not a win-win situation but a zero-sum game. That is why the rise of India and China is seen with fear rather than welcomed.

IX. Concepts, models, theories, frameworks

"The chief cause of problems is solutions."
Eric Sevareid (journalist)

217. Systems self-organized critically. The property of self-organized criticality means that individual behaviour tends to cause a system both to self-organize and converge to critical/tipping points where small events may have big global effects.

- Example: sand falling on a fixed point in a table. The sand accumulates forming a pile until a state of repose is reached (at a certain angle of the pile). After that state, further grains create avalanches (a potentially catastrophic global event) and part of the sand falls off of the table.
- Is there an arrow of social time? Do societies necessarily, with time, increase their complexity? If societies are self-organized critically systems, what feature(s) define then the critical points?

218. The Seneca effect (Bardi, 2017). "Increases are of sluggish growth, but the way to ruin is rapid." (*Nunc incrementa lente exeunt, festinatur in damnum*, Lucius Anneaus Seneca, Letters to Lucilius 91, 6.)

219. Taxonomy of collapses. (1) **Black elephants** (Donald Rumsfeld's 'known unknowns'). You choose to ignore (or understimate the effects of) an elephant that you know is in the room (a pyramid scheme). (2) **Gray swans**. A specific occurrence of this kind of event cannot be predicted but its frequency can be determined (so precautions against it could be taken: earthquakes). (3) **Dragon Kings**. They are outliers of a distribution in terms of their large size (the size of Paris in comparison with the rest of French cities). Though their existence is conceivable on the basis of some trend, they are largely unpredictable and no precaution against them is in practice feasible. (4) **Black swans** (Donald Rumsfeld's 'unknown unknowns'). They lie outside the distribution: they are absolutely unpredictable (financial crashes, massive terrorist attacks) and are then capable of generating the biggest collapses.

220. X-events. X-events are high-surprise, high-impact events. In a society, the source of X-events is the 'complexity gap' between the complexity of the control system (the government) and the increasing complexity of the controlled systems (the citizens). The gap must be bridged: either the government forces a reduction in complexity in the population (repression) or raises its own complexity to match the population's higher complexity (free elections are held, civil rights and liberties granted, social mobility allowed, openness accepted). An X-event is the default path of bridging the complexity gap, the vehicle that narrows the different complexity levels of two interacting systems. When a government is not able to bridge the gap, a revolution (an example of an X-event) is likely to break out. The rules for dealing with normal events (for which there is abundant past experience) are different from those for handling X-events (which are rare and unexpected).

221. Examples of X-events. Examples of X events: supervolcano explosions (Toba, 74kya, probably responsible for the near extinction of humanity), the 1918 Spanish influenza epidemic, high magnitude earthquakes, bees massively dying off, 9-11 terrorist attack… The 2011 revolts in the Arab world are examples of X-events. Modern communication and social-networking services (Google, Twitter, Facebook) have increased social complexity (citizens become more empowered, self-aware, informed, connected). Governments responding by restricting access to those services, or shutting them down, made the complexity gap widen to unsustainable levels. A complexity gap is synonymous with trouble and the political expression of trouble is revolt/revolution. The result in the Arab world was regime change in some countries (Tunisia, Libya, Egypt) and challenge to ruling elites (the Assad dynasty in Syria, the monarchy in Bahrain).

222. Outsourcing as an X-event. Manufacturing sectors in developed economies have become more complex (minimum-wage laws, health and safety standards, unionization) than those from developing economies. When both sectors interact through globalization, with a complexity gap becoming too large to be sustainable, the gap is closed by an X-event: outsourcing (manufacturing jobs transferred from developed to developing countries). This X-event downsizes by force the comparatively excessive complexity of the most developed sector. In this respect, globalization creates new X-events and magnifies the consequences of existing X-events.

223. Social complexity and X-events. Societies today are more vulnerable than ever to X-events: the complex structures of modern societies are extremely fragile. The increasing complexity of the global society is the direct cause of X-events. The complexity is expressed in many ways: integration, interdependence of systems and infrastructures; accumulation of bureaucratic layers; mismatch in complexity levels between interacting systems (national and foreign economies; governments and citizens; economies and ecosystems)…

224. Some complexity principles. (1) Emergence: the whole is not just the sum of its parts. Even if the characteristics of the individual components of a system are perfectly known, its interaction may give rise to systemic properties that are difficult to predict from the individual properties. (2) Red Queen hypothesis: one must run to stay in the same place (do the same is a recipe for failure). A system consisting of adaptive, evolving organisms forces the players to adapt and evolve fast and continuously just to remain in the game. This permanent race between the players tends to increase the overall complexity of the system. (3) No free lunch. To increase the efficiency with which a system operates, its resilience (to shocks or changes) must be reduced. Conversely, survival in an uncertain environment demands efficiency sacrifices. (4) The Goldilocks principle (food cannot be too hot not too hold). In an open, dynamic and competitive environment, systems can operate only within a limited range of conditions: the 'edge of chaos'. Policymakers, for instance, must select the right mix of market freedom and market regulation: too much regulation may harm growth; too much *laissez-faire*, may be destabilizing. (5) Undecidability: deductive reasoning (logic alone, rational argumentation) is not always enough to handle problems. (6) The Butterfly effect (ripple, domino, snow-ball effect). Complex systems tend to be very sensitive to apparently minor changes: small changes may have large effects. (7) Law of requisite variety: the control system has to be at least as complex (sophisticated) as the system to be controlled (higher complexity is required to manage lower complexity). Hence, to regulate a system, the complexity of the controller has to be at least as great as the complexity of the system to be controlled.. Complexity gaps do not tend to last and its involuntary adjustement is likely to be traumatic for the system.

225. The standing ovation problem. It is an example that involves thoughtful and interacting agents in time and space and thereby captures basic features of complex adaptive social systems: learning, heterogeneity, incentives, networks… A public event has taken place before an audience: a university lecture, a musical concert, a play in a theatre, a basketball game, a political meeting… Then the audience starts applauding. The question is: for how long is the ovation to be sustained? At any point during the ovation, will it continue or end? The complexity of the problem comes from the fact that members of the audience in general do not decide to stand and applaud independently of what the other members choose to do: a seated attendant being surrounding by enough standing people is more likely to join the ovation and also stand (for several possible reasons: do justice to a good performance, avoid feeling awkward, accept the majority's opinion, possibly despite your own, that the performance deserves recognition…).

226. Diffusion processes and S-shaped curves. The standing ovation problem can be analyzed as a diffusion problem, like the spread of new technologies or commodities. A typical result in diffusion models is that an

S-shaped curve fits the number of agents joining others in taking a certain action. Initially, the group of people taking the action is small. The size of the group goes larger. After the group reaches a certain size, the group begans to shrink until it eventually becomes empty. The life cycle of many products also conforms to an S-shaped curve. Is the spread of globalization also S-shaped?

Miller, John H.; Scott E. Page (2004): "The Standing Ovation Problem," Complexity.

227. El Farol bar problem. 100 people must decide independently whether to go to a bar for enterntainment. The stay is enjoyable if fewer than 60 come to the bar. Hence, a possible attendant chooses to go if he expects fewer than 60 to show up and refrains from going if at least 60 are expected to be present at the bar. The problem is that there is no correct model to define expectations; in fact, any such model is self-invalidating. For instance, if all believe that few will go, all will go and that will prove the belief incorrect; if all believe that the bar will be overcrowded, nobody will go, again invalidating the initial belief. All prophecies are self-defeating. This problem illustrates the difficulties of analyzing complex adaptive systems. It is an example of a minority game, where rewards accrue to a minority (political science focuses instead on majority games).

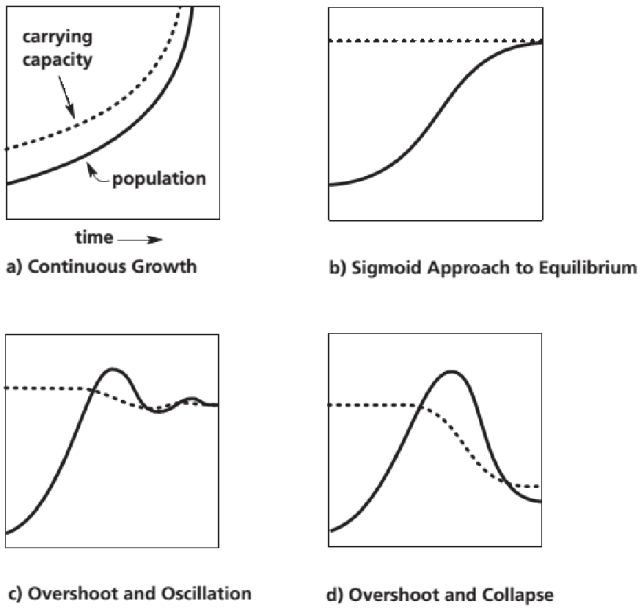
Arthur, W. B. (1994): "Inductive reasoning and bounded rationality," American Economic Review 84(2), 406-411.

228. Does technology create social orders? That is, does technology impose social and political traits on societies that adopts the technology? There are at least two elements of influence: the composition of labour force and the hierarchical organization of work.

229. Dynamics of World3 (Meadows et al., 2005, ch. 4)

- **World3.** World3 is a model of the world economy by Meadows et al. (2005) "to understand the broad sweep of the future": the ways in which the world economy will interact with the Earth's carrying capacity over many decades.

- **Ways to approach the carrying capacity.** Continuous growth, convergence to the carrying capacity from below, overshoot with cyclical convergence and overshoot followed with collapse (see the chart on the right). The authors believe that the world economy is already above the Earth's carrying capacity (overshoot).



- **Feedback loops.** Figs. 1 and 2 below show the feedback relationships regulation population growth and capital accumulation. Fig. 1 displays the connection between population and capital that goes through agriculture; Fig. 2, the one that goes through resources and services.

- **Scenario 1.** In Scenario 1 (see Fig. 3) the computer model World3 is run with parameter values that represent the continuation of the path the world economy followed during the 20th century. Population and production increase until the resource limit is reached. The impossibility of maintaining resource flows lead to a fall in output and life expectancy and a rise in death rates.

- **Scenario 6.** In Scenario 2 (see Fig. 4) the economy develops simultaneously (costly) technologies for pollution abatement, land yield enhancement, land protection, and conservation of nonrenewable resources. Full implementation of these technologies takes two decades but in the end the economy is relatively large and prosperous (though below the top level ever reached).

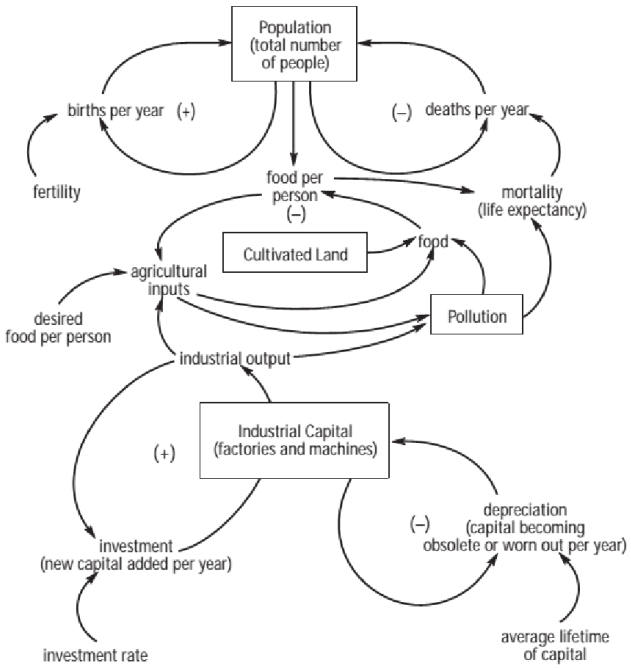


Fig. 1. Feedback Loops of Population, Capital, Agriculture, and Pollution (Meadows et al., 2005, p.144)

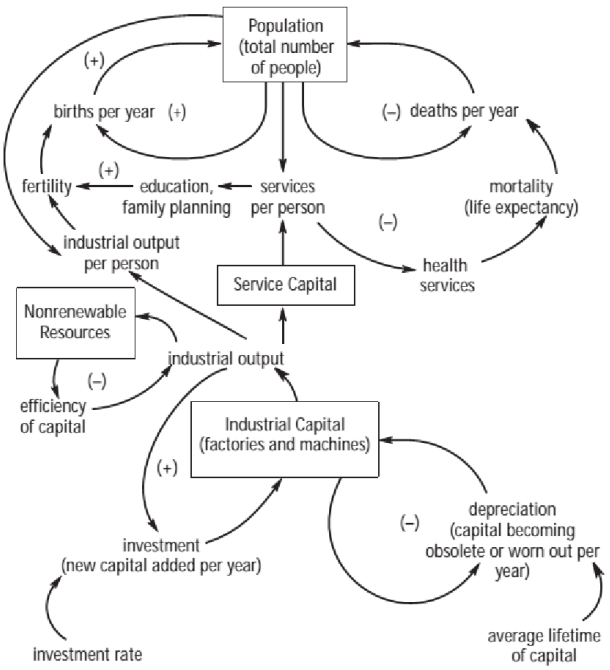


Fig. 2. Feedback Loops of Population, Capital, Services, and Resources (Meadows et al., 2005, p.145)

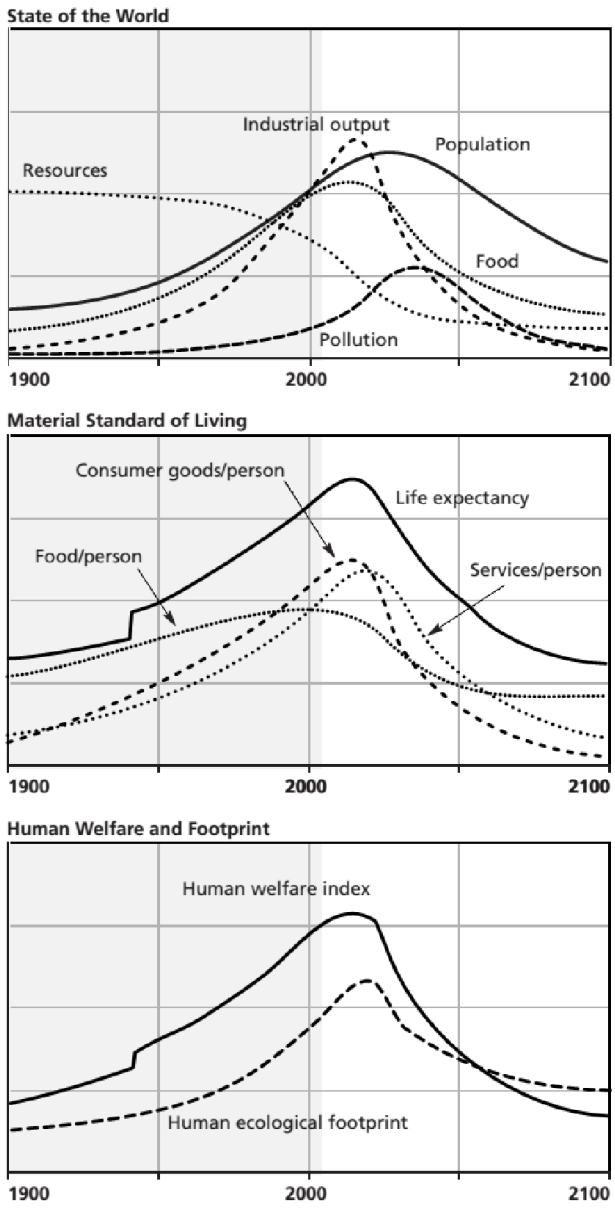


Fig. 3. Scenario 1 of World3 (Meadows et al., 2005, p.169)

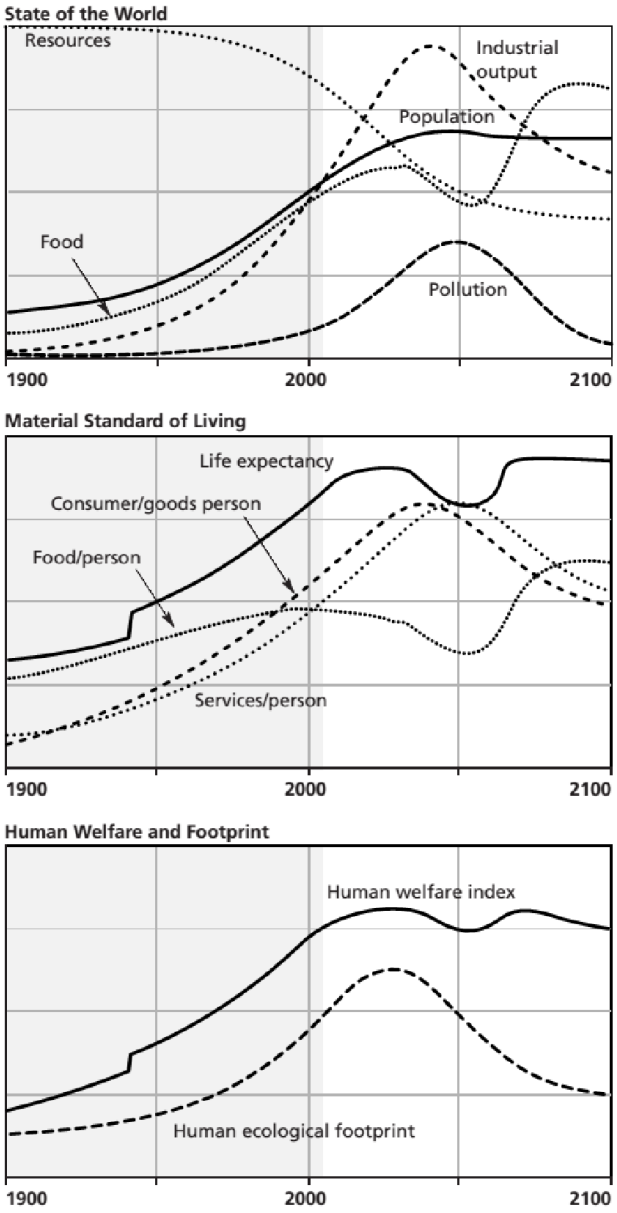


Fig. 4. Scenario 6 of World3 (Meadows et al., 2005, p.219)

230. The Tragedy of the Commons: "freedom in a commons brings ruin to all". It is parable questioning the idea that unregulated markets yield socially good outcomes: self-interest is eventually inconsistent with social stability. The tragedy applies to the exploitation of a free resource (a common), like a pasture. Self-interest compels every herdsman to maximize the cattle on the pasture. But if a sufficiently large number of herdsmen develop the same strategy of increasing the herd without restrictions, the pasture will be exhausted and all the herdsmen will be ruined for trying to take too much from the pasture. Hence, a commonly owned and freely accessible resource tends to be depleted when it is exploited by a sufficiently large number of people. Infinite demands are not consistent with a finite and fragile supply. The logic of the tragedy of the commons seems to explain resource depletion and environmental degradation: taking without concern for preservation (the present matters more than the future).

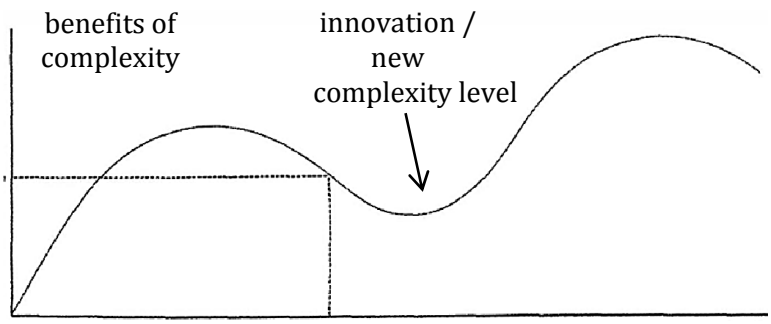
Hardin, Garrett (1968): "The tragedy of the commons," Science 162(3859), 1243-1248.

Machan, Tibor R.; ed. (2001): *The commons: Its tragedies and other follies*, Hoover Institution Press, Stanford, CA.

231. Punctuated equilibrium (Stephen Gould, Nils Eldredge). The expression designates a theory of evolutionary processes according to which evolutionary processes do not occur slowly and gradually, but quickly and suddenly. Long periods of apparent stability and lack of significant change are suddenly followed by a period of radical, dramatic evolutionary changes take place (like the Cambrian explosion, 650 mya, where animals with shells and external skeletons appeared).

232. How similar are the biological and the historical evolutionary processes? Historically, societies appear stable for long periods. Constant adaptation goes unnoticed until societies "go critical".

233. Tainter's (1988) theory of why societies collapse. Collapse means that a society experiences a rapid and significant loss of sociopolitical complexity. Tainter's explanation is based on four ideas. (1) Societies are problem-solving organizations. (2) The sociopolitical organization of societies requires energy for its maintenance. (3) Higher complexity levels of a sociopolitical organization correspond to higher per capita costs: a rising complexity is increasing costly for each member of the more complex system. (4) Solving social problems by investing in sociopolitical complexity has diminishing marginal returns: each complexity upgrading is less capable of solving problems. The productivity (the benefits) of the investment in complexity is eventually declining. Given (1)-(4), collapse arises when the benefits of investing in complexity are insufficient to cover its costs. Collapse is the natural mechanism to downsize a complexity level whose maintenance is excessively costly. Innovation or discovery of new resources (energy subsidies) are common ways to overcome the diminishing returns to investment in complexity.



234. The Fermi paradox: How globalized is the galaxy? Life seems to possess a tendency to expand everywhere and increase complexity. Technology also appears to possess a tendency to evolve and increase complexity. The universe is estimated to be some 13.8 billion years old. It is then reasonable to expect our galaxy to be full of advanced civilizations. The paradox is that we have not yet obtained solid evidence of their existence: the universe is silent. Where is everybody?

- **Basic resolutions of the Fermi paradox.** (1) Extraterrestrials are or have been already here. (2) Extraterrestrials civilizations exist but we have not yet been able to gather evidence of their existence. (3) We are essentially alone in the universe.

- **Webb's (2015) resolution.** Even if life may arise easily, intelligence is probably hard to emerge. Virtually all species on Earth did not need much intelligence to arise and prosper: in general, survival does not require intelligence. Intelligent living beings may be a rare exception in the universe. The development of intelligence may be such a protracted process that it becomes very vulnerable to events that could stop or delay its development (on Earth the process took billions of years).
- **Considerations on the Fermi paradox.** (1) As with many other basic phenomena (the emergence of life on Earth, consciousness, the industrial revolution, the scientific revolution…) we are trying to theorize from a single case/occurence. (2) Are technologically advanced societies inherently unstable? (3) Can technology sustain a high rate of change/progress? Is the acceleration of technological advance since the industrial revolution an exceptional event? A bubble that cannot last? (4) The conditions necessary for a phenomenon to emerge may be quite different from the conditions necessary for the phenomenon to last, develop or evolve (what works to make a poor economy prosper may not work to make it permanently prosperous; the way to become successful in globalization may be different from the way to remain successfully globalized).

Webb, Stephen (2015): *If the universe is teeming with aliens... where is everybody? Seventy-five solutions to the Fermi paradox and the problem of extraterrestrial life*, 2nd edition, Springer, Cham, Switzerland.

235. How globalized is the galaxy? The Russian astrophysicist Nikolai Kardashev classified extraterrestrial civilizations in terms of the potency of their technology. A KI (Kardashev type 1) civilization could employ the energy resources of a planet (human civilization would be KI). A KII, the energy resources of a star. And a KIII, the energy resources of a galaxy. It has been claimed that most extraterrestrial civilizations in our galaxy are of a KII or KIII type.

Ernst Ulrich von Weizsäcker; Anders Wijkman (2018): *Come On! Capitalism, Short-termism, Population and the Destruction of the Planet*. A Report to the Club of Rome, Springer, New York.

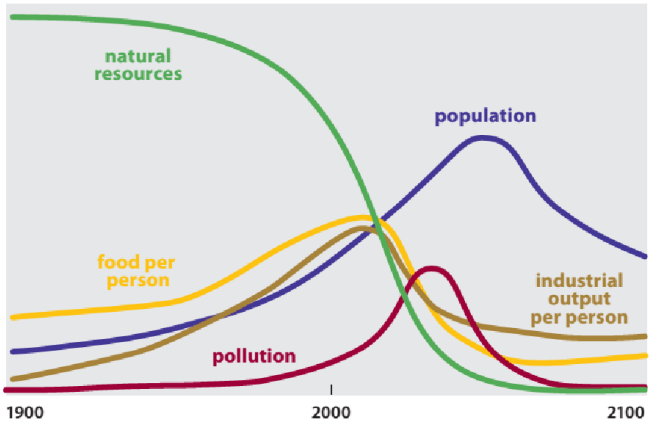
236. Economists vs physicits. The world is facing a perfect storm of problems: overpopulation, overconsumption, environmentally malign technologies, inequalities. All of them seem sustained by the irrational belief that permanent growth is possible in a physically finite economy. They are also the expression of the conflict between what economists believe and what physicists know.

237. Empty world vs full world. The dominant economic views and theories were created in an 'empty world': one in which population was small, natural resources did not represent a limit and the environment had enough capacity to absorb wastes. Economies in an empty world do not face planetary boundaries. If a 'full world' damages to the environment and wastes play a dominant role. On the right a projection of the world economy under a business-as-usual assumption: the logic of an empty world is applied to a full world.

238. A lesson of history? The parallelism of ideas, processes, and developments in different civilizations from the past suggests that, in the presence of certain general conditions, human socities tend to grow bigger, more complex and more environmentally demanding.

239. The price of progress (or the price of not collapsing)**.** "Each time history repeats itself, the price goes up" (Ronald Wright, 2011). Progress allows civilizations to become bigger. More people may indeed be needed to run a more complex civilization and make it more durable. But then, when it fails, more people is affected (the fall of the first civilization, Sumer, affected hundreds of thousands; the fall of Rome, millions; ours, billions).

240. Is science coming to an end? Are there no new big discoveries possible? Have we already converge as much as we can on the truth? Is the apparent strength and potency of present day science not an indication of its near death? As in the chart on the right, a system crashes just before the system is runs at the greatest speed.



- Another sign of the end of science is that most published research is false (John P. A. Ioannidis, 2005, "Why most published research is false", PLoS Medicine 2(8)): scientific research has become just a way of raising money and prestige; pursuing the truth is secondary.

Horgan, John (2015): *The end of science: Facing the limits of knowledge in the twilight of the scientific age,* Basic Books, New York.

X. Future scenarios

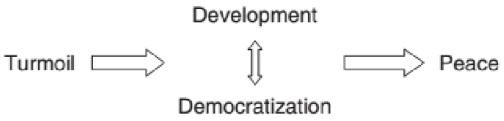
241. Peter Frase's four futures. The future world can end up dominated by either scarcity or abundance (reflecting ecological limits) and also by either hierarchy or equality (reflecting the political limits of a class society). Equality + abundance = communism ('from each according to their ability, to each according to their need': the Star Trek world). Hierachy + abundance = rentism ('the techniques to produce abundance are monopolized by a small elite'). Equality + scarcity = socialism ('live within your means while providing everyone the best lives possible'). Hierachy + scarcity = exterminism ('communism for the few', awaiting a 'genocidal war of the rich against the poor': Neill Blomkamp's Elysium, 2013).

Peter Frase's scenario	**ABUNDANCE**	**SCARCITY**
EQUALITY	Communism	Socialism
HIERARCHY	Rentism	Exterminism

242. Robert Costanza's visions of the year 2100. The scenario matrix involves two dimensions: world views and policies (technological optimism vs skepticism) and the real state of the world (optimistics are right or skeptics are right). Technological optimism + optimistics right = Star Trek (resources are unlimited, technology can solve any problemability, economic competition is good). Technological skeptism + optimistics right = Big Government (resources are unlimited but governments regulate technological development to achieve social development). Technological optimism + skeptics right = Mad Max (resources are limited but free reign has been given to competition and technological expansion, so the world is ruled by powerful corporations). Technological skeptism + skeptics right = Ecotopia (with resources being limited, markets and consumerism have been disciplined to achieve sustainability).

David Costanza's scenario	**OPTIMISTS RIGHT**	**SKEPTICS RIGHT**
TECHNOLOGICAL OPTIMISM	Star Trek	Mad Max
TECHNOLOGICAL SKEPTICISM	Big Government	Ecotopia

243. The liberal, optimistic, convergent view of the future.



Though the world is divided in peaceful and democratic regions and zones in conflict, the peaceful regions will remain prosperous and stable while the zones of turmoil will eventually develop and democratize to become members of the peaceful zone. It is just a matter that the poor economies emulate the rich ones. Economic convergence will gradually contract the turmoil zone.

244. The five most important trends in the next 50 years (Watson, 2012). (1) Ageing. (2) Power (economic, political, military) shifting from West to East. (3) Greater, global connectivity. (4) Convergence of technologies (GRIN technologies = Genetics + Robotics + Internet + Nanotechnology). (5) The environment (planetary conditions, resource exhaustion).

245. The five most important trends that will transform societies in the next 50 years (Watson, 2012). (1) Globalization: everything to become hyperlinked. (2) Localization: countertrend to globalization because not everyone will like globalization or homogenization. (3) Polarization: middle classes will tend to disappear, either going up or down on the income scale (upwards to a new managerial elite or downwards to a enslaved working class or to the unemployed). (4) Anxiety, resulting from greater uncertainty and vulnerability. (5) Search for meaning: will science become the new religion or will traditional religions be reinforced?

246. Arthur C. Clarke's laws of prediction. (1) "When a distinguished but elderly scientist states that something is possible, he is almost certainly right. When he states that something is impossible, he is very probably wrong." (2) "The only way of discovering the limits of the possible is to venture a little way past them into the impossible." (3) "Any sufficiently advanced technology is indistinguishable from magic."

247. Amara's Law (Roy Charles Amara, 1925-2007): "We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run."

XI. Challenges of globalization

248. Disruption. Through globalization, actual and potential connections and interactions increase. The new (more global) interactions tend to disrupt the existing (more local) ones. But globalization does not appear to create mechanisms to give a satisfactory solution to the disruptions. Left by itself, globalization is like a force of nature: you adapt (and accept it) or die.

249. Becoming more connected vs becoming more similar. Globalization occurs by increasing links. A possible side effect is that what is linked becomes more similar (ideas, technologies, goods, institutions, habits… are increasingly shared). Is that necessarily the case? Are there social dimensions (religion, culture, institutions) for which a reaction to increasing similarity will prevail? To which extent is the sequence links → diffusion → integration → homogeneity the most likely result?

250. What is new in the current (since the 1980s) globalization process? One view is that all the globalization processes that have so far occurred are essentially the same and that the acceleration of these processes appear to be the radical novelty of the current globalization episode: same nature, fastest speed.

251. Economic dominance. The extension of the globalization process is more profound in the economic domain. This makes economic globalization the dominant force, to which the rest of globalizations (political, cultural, social, ideological…) subordinate. Though there are many globalizations, the economic one seems to dominate and determine the rest: one globalization controls the rest.

252. Economic revolutions and globalization. If globalization processes are primarily driven by economic forces, it may be conjectured that economic revolutions fuel globalization. Once a sufficient number of hunter-gatherer economies developed, the necessary conditions for the agricultural revolution were created; this revolution gave new momentum to the ongoing (yet limited) globalization processes. When enough agricultural societies approached the limit of their development potential, an industrial revolution become feasible, which in turn facilitated the scaling-up of the globalization process. More recently, with industrialization spreading to underdeveloped economies, the developed economies acquired the potential to ignite a new economic revolution (the digital revolution) capable of boosting again the globalization process.

253. How inevitable is globalization? If economic development is locally inevitable (at least, in the longest run), then globalization also appears to be inevitable: the global economy is the domain where (with enough material means available) economic development would ultimately unfold. Economic expansion would then be like a wild, unstoppable beast that overcomes any obstacle and that nothing can constrain.

254. Capitalism and globalization. Capitalism and globalization appear to feed each other. Capitalism facilitates the occurence of economic revolutions (powers the beast of economic expansion) and thereby accelerates the globalization process. Globalization facilitates the continuation of capitalism and reinforces it. This view would explain why globalization has become more intense and widespread when (since the 1980s) the forces of capitalism have been freed of most controls and have been allowed to exert all its expansionary powers. The new capitalism launched in the 1980s seems responsible for the current globalization wave. Are they then inextricably linked? Is the fate of globalization determined by the fate of the new capitalism? Is a defining characteristic of capitalism creating by destroying?

255. Financial globalization: international rise of the financial sector. Globalization is a magnifier: it amplifies effects and consequences. Finance itself is also a magnifier of real activity (production, circulation

and distribution of goods): finance contributes to makes expansions (economic booms) more expansionary, but also to make contractions (economic busts and crashes) more contractionary. At the national level, finance has proved to be a source of instability. It is likely that it will also contribute to make the global economy also more unstable and volatile. Is a global financial meltdown the most likely possibility in the medium-long run, of which the 2008 financial crisis episode cented on developed countries was an early warning?

256. Economic inequality and globalization. One of the aspects that, at the national level, finance has contributed to magnify is economic inequality. Liberalization and financialization have made property incomes (capital income) more important and capable of growing faster than wages (labour income), thereby redistributing wealth from the majority to a minority. Since, by itself, capitalism appears to concentrate a large share of its benefits in a few hand, a globalization going hand in hand with capitalism is expected to increase economic inequality (the benefits of globalization are asymmetrically distributed).

257. Polarization and globalization. The asymmetry of globalization at a global scale has reinforced the privileged position of 'the centre' (the most developed countries) against 'the periphery' (the rest of countries). The centre is becoming more powerful, which in turn increases the polarization of the global system. The centre still monopolizes technology, finance, resource exploitation, global mass media and the most destructive weapons. The geopolitics is currently dominated by war and competition: among states, among companies, and among states and companies. The game being played (survival of the biggest) may eventually put an end to the game (human civilization is self-destroyed).

258. Labour and globalization. Though the labour market is so far the less globally integrated, it has been one of the most affected by globalization. The international mobility of capital and the relative international immobility of labour has produced a tendency (at least in the developed economies) to the rise of unemployment, a slow growth of average wages, a deterioration in the position of the low-skilled workers and a widening of the gap between high-skilled workers (and those at the head of companies and financial institutions) and the rest of workers and employees. Globalization has created a race to the bottom among the less skilled workers in the developed countries (reinforced as well by the decentralization of wage bargaining) and favoured a redistribution of income in favour of those at the upper ranks of the salary scale (increase in earnings inequality). Globalization has coincided with a shift of power to employers, who have improved considerably their position in the distributional conflict against employees.

259. Technology and globalization. Globalization helps to accelerate technological change. Technological change endagers certain types of jobs. The faster technological change, the harder for workers to retrain and adapt to the new production environement. This makes technological unemployment more widespread and durable.

260. Welfare state and globalization. The ongoing globalization surge has coincided (has been caused) why the widespread adoption among developed countries of economies policies favouring 'the market' against 'the state' (associated with the neoliberal ideology): financial discipline (austerity measures), privatization, deregulation, tight monetary policy, retreat of the welfare state… This neoliberal globalization appears to put in great danger the survival of the welfare state built during the golden age boom (1945-1975). But without a welfare state compensating the strong economic inequalities that capitalism is prone to create, how viable is likely capitalism to be? Is the neoliberal globalization itself viable? Will globalization eventually demand a rebalance between *laissez-faire* and intervention/regulation in favour of the latter?

261. Democracy and globalization. Successful participation in globalization seems to require sacrificing the needs of the majority (Rodrik's trilemma). Will democratic societies adapt or tolerate to this requirement? How will national social structures respond to the domestic asymmetries (gap between economic elite and mass increasingly widened) created by globalization? Is in the last instance democracy incompatible with globalization? Which social structures are consistent with globalization? Specifically, are sufficiently egalitarian social structures unviable under full globalization?

262. Environment and globalization. The productive forces unleashed by capitalism are fed by natural resources. If the continuation of the globalization process (or simply the maintenance of the current state of globalization) depends on the continued expansion of the scale of operation of those productive forces, the limited amount of resources on the planet points to the unfeasibility of an indefinite growth of the global economy. How would globalization respond to the halting of the global growth engine once it runs out of fuel? How much of what globalization has so far achieved is reversible (and how much will be reverted)? Are capitalism and globalization in the last instance bubbles that last and expand as long as there are enough available resources? Are they just parasites having no regard for their host (the planet)?

263. Cultural convergence? We have not yet learned to tolerate diversity and difference (ethnic, linguistic, cultural, religious, political, sexual…). Cultural integration and uniformity seems to be reached by imposition. Western nationstates were erected applying this strategy. Will it work at the global scale? Will globalization backfire culturally? That is, will globalization cause a defensive reaction to what make be perceived as an attempt 'by them' to destroy 'us' (our identity, our way of live, our beliefs, our traditions)?

264. Political convergence? Is global convergence to a unique political system likely? Is global economic convergence possible without political convergence?

265. The big triad: growth, distribution, stability. The challenges of globalization could be defined in terms of three dimensions.

• Growth dimension. Globalization is an expansionary process. The expansion of globalization unfolds in parallel with the growth, expansion or extension of other phenomena: flow of goods, people, information, practices, technologies, habits… Globalization has proved to be good at growth. Many variables have grown with it: global population, development and well-being, technological progress, material prosperity, energy usage, consumption, impact on the Earth System, speed of transport and communication… The impression is that the success of globalization along this dimension has been associated with its connection with the market institution: periods in which international mobility (of goods, capital, people) have been tolerated or stimulated appears to have intensified economic growth and globalization. Globalization itself has grown, as in encompasses or affects more aspects of human and social life.

• Distribution dimension. This refers to how the outcomes of the growth dimension are distributed among people (in this case, those involved in the globalization process). These outcomes could be positive (benefits and gains) or negative (costs and losses). There also a multiplicity of such outcomes, which can be defined in terms of income, wealth, political power, social influence or prestige, knowlege… Regarding distribution, globalization seems to have generated a mixed result: over the long run, its benefits tend to spread; over the short run, they tend to be concentrated. Hence, globalization is not necessarily good at distribution. An accelerated globalization could create a new dynamics in which the benefits initially shared by a few fail to be more or less evenly distributed among the rest. Without social or political institutions accelerating distribution, the benefactors of globalization may successfully block the extension of its benefits to the general population. In this case, inequality and heterogeneity may be the result of a decentralized (unregulated) globalization. The success of globalization to deliver fair distribution appears

then to be related to the capacity of some centralized authority to steer, regulate or control globalization. The need for this authority seems more likely the fastest globalization expands or deepens.

• Stability dimension. This dimension has to do with the conditions necessary for the first and second dimensions to be viable. Concerning globalization, this dimension defines those conditions under which globalization can continue or, at least, be preserved.

(1) Social stability. A breakdown of globalization may occur as a result of insurmountable social or political tensions generated by an unfair distribution. The prospects in this respect do not appear favourable: nothing in past or current globalization processes ensure that social institutions will be developed to handle successfully the distributional problems caused by globalization. Globalization seems to benefit (and favour) mechanisms (like free markets, property rights, monetary profits) that contribute to produce technological progress. Contrariwise, no such mechanism appears to consistently operate to create social institutions conducive to institutional progress (globalization does not need democracy, civil rights and freedoms, social benefits… nor has directly contributed to their creation).

(2) Ecological stability. Destroying the material base of globalization (the environment, its resources and renewal cycles) is the main threat to the continuation of the growth of globalization. Again, globalization is in a precarious position along the stability dimension: though the optimists regard the engine of growth (technology) as the source of solutions for ecological deterioration, the pessimists point to the impossibility of making continued growth sustainable (stable) on a finite environment. Against that limitation there is no technological solution. In parallel, there is the damage already inflicted on the environment, which could be possibly be well beyond repair. Given the characteristics of globalization (growth comes first and above all), it appears very likely that globalization (and civilization, its partner and co-creation) has been the fortunate outcome of exceptionally good conditions provided (but just for a short period of time) by nature. Nature eventually returns to unfavourable conditions. Globalization just helps nature to reach those conditions and, in the process, destroys civilization.

266. Global instability?

- **Sources of financial instability.** (i) Global shadow banking. (ii) International dimension of Hyman Minsky's financial instability hypothesis. (iii) Insufficient or weak global finantial institutions. (iv) Lack of global finantial regulation. (v) Excessive privileges of the US economy and the dollar: the US is the centre of financial flows and US monetary policy diverts international financial flows. (vi) Triffin dilemma: stability vs liquidity.
- **Sources of economic instability.** (i) The global dual structure centre (rich and productive) vs periphery, which also tends to be reproduced at smaller economic scales. (ii) Domestic source: real-wage growth vs productivity growth. Insufficient real-wage growth leads to excessive debt accumulation, which endangers financial stability. (iii) Persistent global trade imbalances. (iv) Growth of transnational corporations. (v) Two views on the impact of globalization on economies: is it a stabilizing or a desatabilizing force? (vi) Is the increasing role of regional powers (EU, China and Japan) a stabilizing or a destabilizing global economic force? Do they favour discrimination excessively (preferential trade agreements)? (vii) Is the rise of China ultimately destabilizing for the global economy? (viii) Technological challenges: (a) is technological development out of control?; (b) is this development creating massive technological unemployment? (ix) Environmental challenges: (a) are we putting to an end the period of benign climatic conditions?; (b) is the working of the global economy depleting the stock of natural resources?
- **Sources of political instability.** (i) How stable are international political alliances? (ii) How stable is an international state system lacking strong institutions of global governance? (iii) The Thucydides trap (risk of an all-out war between hegemon and contender to global dominance) and the Churchill trap (risk of a long-term confrontation between two major powers, as in the Cold War). (iv) Are emerging

powers (China, India, Russia) sufficiently stable domestically? (v) The paradox of dominance: dominant powers create a system used by challengers to rise.

267. Great challenge. The great challenge is to ascertain whether there is a form of globalization in which the three dimensions coexist and if, they cannot, if globalization can mutate into a process in which the last two dimensions are sustainable at the expense of the first one: an intensive rather than extensive form of globalization.

XII. The future of globalization: a stockpile of question

268. Will the big historical events revert?

- Is a Great Convergence (of the Rest towards the West) to follow the Great Divergence?
- Is globalization just a temporary phase to be followed by a deglobalization phase?
- Must the population boom created by the demographic transition be continued by a global population bust (Malthusian thesis of unsustainable overpopulation)?
- Why does religion and non-scientific beliefs persist despite the overwhelming impact of scientific and technological progress in modern societies?
- Will democratization be just a failed experiment and autocracy will finally prevail?
- Is a big reactionary, revanchist response by the privileged to be expected? ['The wolves rule, not the sheep.']
- Is global war the necessary outcome of the unfeasibility of continued global growth?

269. Is everything a bubble? (No matter how far they develop, all social processes collapse and come to an end: population expansion, wealth increase, technological progress, material well-being)

270. The economic dimension

- Is capitalism inherently unstable, self-destructive, or at least prone to crisis?
- Is unregulated global free enterprise socially, culturally and ecologically destructive?
- How dangerous is the excessive financialization of economic activity?
- Is global capitalism just a gigantic Ponzi scheme? (Mitch Feierstein, 2012, *Planet Ponzi*) [A Ponzi scheme is an investment strategy in which an investor makes unproductive use of funds provided by other investors and the returns paid to those investors come from funds contributed by new investors.]
- Must sustained economic growth necessarily be accompanied by increasing economic inequality?

271. The ecological dimension

- Does the development and survival of capitalism (and technological advanced societies) ultimately depend on the exhaustion of natural resources and the overexploitation of the ecological services (processes that purify water, break down pollutants, recycle nutrients)?
- Is economic growth only possible by destroying natural capital? Is then environmental collapse the final destination of global capitalism?

272. The technological dimension

- If continued technological progress is possible, what ensures that the fruits of this progress will be accessible to all? If the singularity is reached (the merging of human and machine intelligence), what guarantees that its benefits and potentialities will be generally available? Will technological progress split humanity into two categories, those who can enjoy it and those who cannot?
- How dangerous are the unintended consequences of technological progress? Will technology eventually destabilize the planetary conditions making human life possible? Will some technological creation (artificial intelligence) replace humans?
- Is there a trade-off between the technological level of a society and its chances of survival?
- How likely is that the apparently beneficial outcomes of two hundred years of technological development constitute the rule for the future and not the exception? ['Extinction is the rule. Survival is the exception.' Carl Sagan]

273. X-events (the wild card dimension)

- Endogenous X-events. The increasing complexity of a technologically advanced and globally integrated society makes it more vulnerable to the consequences of its own outcomes. Technologies alter the environment in unpredictable ways: it is unknown what effects on human health and the ecosystems will cause the genetically modified organisms and the synthetic toxins generated by production and consumption processes.

- Exogenous X-events. Are the cosmic and planetary conditions making advanced intelligent life possible exceptional and short-lived? [Non-human climate change, biochemical cycles, impact of meteorites and comets, solar flares and cosmic radiation, new diseases, alien encounters.]

274. The domestic political dimension

- For how long will the problems and tensions created by a growing technologically advanced global society be solved democratically, at the domestic level?
- Will the elites eventually revolt to take control? Are not economic crisis (and the asymmetric effects of globalization) an opportunity/excuse for elites to invoke the necessity of stability (concentration of power to handle the problems) over accountability (distribution of power)?
- Does domestic democracy need a sustainable global capitalism to survive?
- If continuous growth is not possible, how will the domestic distribution problem be solved?
- Is democracy incompatible with a sufficiently high degree of economic inequality? ["In a democratic society the existence of large centers of private power is dangerous to the continuing vitality of a free people." Louis Brandeis]

275. The international political dimension

- How likely is the creation of a global government to regulate global capitalism?
- Without institutions of global governance, will the interaction of the major global powers be peaceful or will warfare ultimately settle disputes?
- Without institutions of global governance, is a necessity to have a global hegemon? Will that hegemon exploit its position of privilege to its own advantage or will it be concerned with preserving global stability?
- If global continuous growth is not possible, how will the global distribution problem be solved? How will the struggle for global hegemony be settled? IS a global balance of power possible and stable?

276. The social dimension

- How tolerable is social inequality? How sustainable is a growing social inequality?
- Does global capitalism entail a growing social and economic inequality?
- If social development is, in the last instance, an elite project, for how long will the elites be interested in maintaining the social development project (welfare state)?
- What ensures that conflict within the elite and between the general population and the elite are both peacefully settled? Is that possible if sustained economic growth is no longer feasible?
- Will local cultures eventually revert the globalization process? How likely is that globalization will create a unique global culture? If several cultures eventually coexist, what will ensure that they do not clash?
- Will cultural groups turn their backs on each other (in a degrowth/deglobalization context because they will fight to preserve their share in the social wealth; in a growth/globalization context because benefits/costs may be unfairly distributed among the groups)?
- Will the interaction of globalization with local cultures produce a viable hybrid? Or will one replace the other?

277. The psychological dimension

- Do innovation and leadership depend on the existence of psychopathic personalities?
- How robust are technologically advanced societies to the actions of psychopaths (as political rulers, powerful entrepreneurs, social and religious leaders…)?
- Are technologically advanced societies socially more unstable because these societies are less socially integrated (in general, people are more adrift and lonely)?
- Does the principle of social proof, developed in technologically primitive societies, work for technologically advanced societies? [Principle of social proof: as a rule, an individual chooses what to do or believe on the basis of what the rest of individuals do or believe. Hence, an individual regards an action or belief as appropriate when others take that action or hold that belief: if many are doing something, it cannot be wrong to join them.]

- How dangerous is wishful thinking for society? (In particular, an unrealistically positive view of the future?)

278. The moral dimension

- Is there a sense in which moral progress is possible and exists?
- Is technological, material progress socially destabilizing without a parallel moral progress?
- Is civilization (technological, material progress) an amoral monster?
- Are there moral limits to technological change?

279. The metaphysical dimension: the Doomsday argument.

280. The repugnant conclusion (Derek Parfit, 1984). "For any possible population of at least ten billion people, all with a very high quality of life, there must be some much larger imaginable population whose existence, if other things are equal, would be better even though its members have lives that are barely worth living." Let N be any number of people with a sufficiently high quality of life, Q. Let q designate the smallest level of quality of life making life worth leaving. Then, for a sufficiently high number n of people, it must be that the total welfare $n{\cdot}b$ of n persons whose lives are barely worth living is larger than the total welfare $N{\cdot}B$ of N persons enjoying a high quality. Is the situation (n, b) better than (N, B)?

281. A global trolley problem. Is it preferable (1) to save billions of poor people sacrificing a few millions of rich persons or (2) to save the rich and let the poor starve and die?