

Ability to sacrifice vs. propensity to absorb: a synthesis with the average and total principles in capability framework*

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By making a logical foundation, the present paper introduces a new concept with two faces: ability to sacrifice vs. propensity to absorb. Standard empirical Capability literature theorises that income has diminishing marginal utility. While computing the index of GDP in HDI (till 1998), the idea was being operationalised using Atkinson's formula, which assumes that after certain threshold level income has no significant impact on quality of life. In response to this, the present paper considers the world average level of income of \$8833 (PPP) in 2004 as threshold level, and computes discounted levels of income for the countries. Ability to sacrifice is computed from the positive differences between the actual GDP per capita (PPP\$) and the discounted levels of income up to the mark of threshold level. Propensity to absorb is computed from the negative differences between the actual GDP (PPP\$) below the threshold level and \$8833 (PPP). Such measures are standardised as well as adjusted for inequalities in income as reflected from Gini index adopting suitable weighting schemes. After doing so, these two measures are tested according to average and total principles. The measures according to the former are assumed to reflect the distinctive country positions. On the contrary, those according to the latter are assumed to reflect relative global positions of the countries. The findings are quite interesting. Results are computed for 125 countries. The countries are ranked according to ability to sacrifice and / or propensity to absorb under both the principles. Relationships between these measures and indices of GDP (according to Atkinson's formula and according new method as in HDR 2006) are figured out (or specified otherwise), especially for the 22 rich countries as appear in the table 17 of HDR 2006 as well as for all the 125 countries. The paper concludes with two paradoxes.

Key words: ability to sacrifice, average principle, capability approach, redistribution of resources, total principle

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1. Introduction

‘The ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed the world is ruled by little else.’ (Keynes)

Let us begin with some ideas and issues as following:

1.1. Average principle vs. total principle

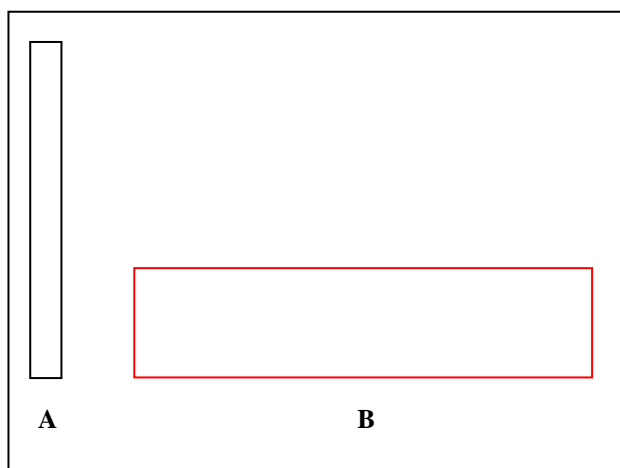


Figure 1. Average and total principles

Figure 1 shows two countries: **A** and **B**, where height of each bar measures how well off people are and the width represents quantity or size (or growth) of population. We may imagine **A** as any of the North American or Western European or Asian industrially developed nations (in true sense, countries in the post-transitional phase), and **B** as India or China or any of the similar other biggies in the pre- or mid- and / or transitional phase.

Now, the basic question is: which outcome would be the better or worse than the other? If other things are equal, according to the average principle, **A** would be better than **B** as people lead better lives on an average in **A**. According to the total principle, **B** is better than **A** as there has been a greater total sum of resources or whatever makes life worth living in **B**.

In the real-world situation (in 2004 according HDR 2006), if we consider income as a measure of well-being, average level is the highest in Luxembourg with per capita GDP \$PPP of 69961. On the contrary, according to total principle, the situation is the best in the United States with GDP \$PPP of 11651 billions¹.

¹ According to total principle China comes in the second position followed by Japan and India. The cases of the United States and Japan are exceptional, and are the only two cases, which do not fit with the above specification of the countries in figure 2.

On the above background, one may ignore the total principle to chronicle the condition and progress of the nations, especially by evaluating well-being at individual level. Ignorance of the total principle means ignorance of the extra amount of resources or like, which mostly comes from the existence of extra groups of people in a larger country relative to a smaller one. Now, can we accept this from moral point of view? According to Derek Parfit (1986), ignoring total principle also, one may state that outcome like **B** is not worse than **A**, as the existence of extra group of people is not bad for humanity². So, ... what to conclude ... should there be any measure of well-being or anything else beyond that – incorporating both the average and total principles?

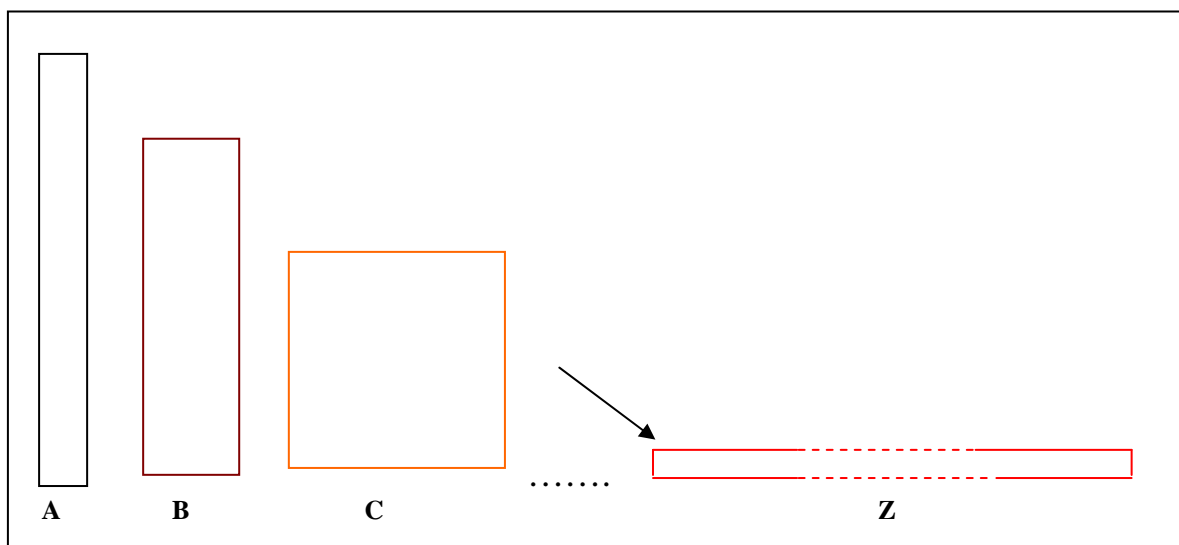


Figure 2. Redistribution of resources and Utility Monster

1.2. Parfit's and Nozick's Utility Monsters

Following Derek Parfit (1986) we may also comprehend a movement from **A** to **B** and so on (as shown in figure 2) as redistribution of resources from the richer countries to the poorer ones with the assumption that when the former sacrifice a small fraction of resources at their command, a large number of people in the latter are benefited. If such a redistribution process goes on, eventually we will reach **Z**, an outcome or country with a very large population. Parfit has imagined such an outcome as one Utility Monster in which there would be the greatest quantity of whatever makes life worth living. From this illustration can we comprehend that higher quality of life (as reflected from ability to have access to the resources needed for a decent standard of living) is associated with another quality: *ability to sacrifice*?

² Such an evaluation / judgment is done without attaching any value to individual life.

The standard theoretical Capability literature assumes that human development enlarges freedom, ... expands choices (Kuklys 2005, Robeyns 2005). Now, what are the elements that a choice-set may consist? Does it accommodate anything like 'ability to sacrifice'? In empirical Capability literature we find that (in HDI) per capita income not only measures prosperity in the income-dimension but also other qualities which are not captured by the other the two indices of longevity and education (Anand and Sen 1994). Can we assume that 'ability to sacrifice' is such a quality, which is captured by the excess income? However, the idea of 'ability to sacrifice' appears to be very important, as the Human Development Reports pay adequate attention to 'overseas development assistance', 'rich countries responsibilities', 'flows of aid', etc.

If we carefully review Parfit's utility monster, we can see that after each process of redistribution or reorganisation of resources, the donor country loses some height (height of the bar = quality of life), and at the same time width (width = size of population) of the receiving country increases. In other words, increase in the total sum of good comes from the increased size of population only³. Robert Nozick (1988) also imagined a similar utility monster that gets enormously greater gains in utility from any sacrifice of others than these others lose⁴. The difference between Parfit's utility monster and the Nozick's one is that in the former quantity (size of population) increases only, and in the latter qualitative improvement is possible⁵.

From the above discussion can we assume that when people of Luxembourg sacrifice a small fraction of resources at their command for people of India, the latter would benefit to a great extent? This may be possible in two ways: either through increase in quantity of life (as in Parfit's Utility Monster)⁶ or through increase in quality of life (as in Nozick's utility monster). If we can do this, we can postulate that quality of life generates other qualities, such as ability to sacrifice and which is good or at least is not bad for humanity. Up to this stage, we may realise that average measures of well-being are good to reflect condition and

³ Students of Ethics may argue that Parfit did not make empirical claims about what would happen if resources were redistributed. His different worlds are purely hypothetical; they are postulates, to test our judgments about what makes one world better than another. It is not really important how they have come about. However, in the present paper, we are taking those ideas to empirical reality.

⁴ Nozick claims that all of our resources should be sacrificed to this monster's maw in order to increase total utility (or happiness from hedonistic point of view).

⁵ Without diverting from the main argument of the paper, one should keep in mind that the latter would fit the best with the concept of sustainable development as viewed in eccentric studies on nature, development, and existence.

⁶ Such an idea contradicts with empirical reality. In the real-world situation, development assistance helps to reduce fertility through proximate determinants of it (Pathak and Ram 1998). On this point, it seems that Parfit is similar to Malthus in idea but Rawlsian in action. Malthusian view in this regard was that any incentive to the poor would actually contribute to a rapid

progress of a nation, but any average measure based on the idea of ability to sacrifice may not reflect the power to sacrifice of a country.

1.3. From average measure to a total one

Capability Approach (CA henceforth) deals with individual, not with community or society. However, it allows country level comparisons utilising aggregate data (Robeyns 2000). While doing that, (as discussed above) one may often realise that average measures are necessary but not sufficient for a complete evaluation of condition and progress of a nation. For example, on an average people of Luxembourg may have very high ability to sacrifice, but what Luxembourg has to offer may vanish (absorb!) all of a sudden in the black wholes⁷ of China and India. So, while doing country level comparisons, one may go for total measures to evaluate relative global positions of the countries incorporating population size with average level of well-being⁸ or what ever makes life worth living.

1.4. Capability Approach and interpersonal comparisons of well-being

Let **C** and **D** are the only two persons in a society and we are comparing standard of living between them. Now, if it is possible to increase the standard of living of one without decreasing the same of the other, the situation is not Pareto-optimal. And when such situations are not Pareto-optimal, we can go for interpersonal comparisons of standard of living.

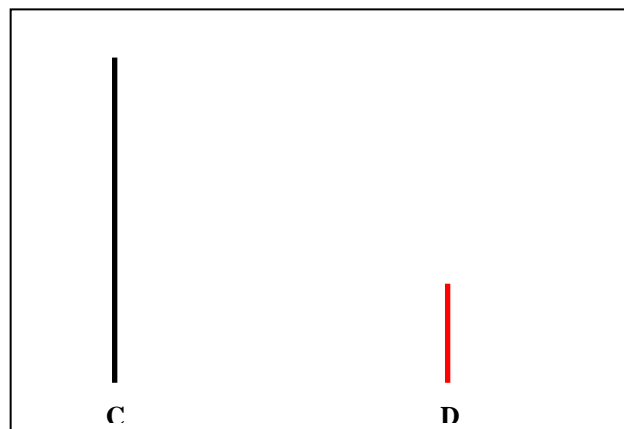


Figure 3. Interpersonal comparisons of well-being

Let us further assume that all resources of that society are distributed unevenly between **C** and **D** as shown in figure 3, where height represents how well off the persons are (for the sake of simplicity we may assume that heights measure income). In such a situation, only when the better-off person sacrifices some resources at his or her command, it will be

population growth (Griffith 1967). Regarding action, unlike Malthus, Parfit was of the opinion that poor people should be benefited from the loss of well-being of the better off groups.

⁷ Please use the concept of astro-physics in rough sense of the term.

possible to increase the level of well-being of the other. In the real-world situation, there will always be some unutilised or under-utilised resources, where redistribution of resources may take place either through sacrifice or through other economic activities. However, from such redistribution or reorganisation, will it be plausible to assume that the better-off person will lose something from his or her level of well-being? If the answer is ‘yes’, the situation is Pareto-optimal – and we cannot go for interpersonal comparisons of level of well-being. In practice we see that CA allows interpersonal comparisons of well-being. It confirms that while indexing with level of well-being CA deals with situation, which are not Pareto-optimal.

The practical mirror of CA, the Human Development Report (among other) takes into account ‘overseas development assistance’, ‘rich countries responsibilities’, ‘flows of aid’, etc. Such information are compiled in table 1 in the appendix. From table 1 we see that the United States sacrificed per capita US\$ 65 in 2004 for the betterment of developing countries. Luxembourg has sacrificed per capita US\$ 524 for the same purpose⁹. From table 18 of HDR 2006 we can confirm that in 2004 China and India received per capita US\$ 1.3 and per capita US\$ 0.6 respectively (from one or more donor countries). According to the principles of CA (as it allows interpersonal comparisons), we may postulate that by sacrificing the above-mentioned amount of resources, people of Luxembourg and the United States have not lost anything in terms of quality of life or standard of living¹⁰. At the same time, by receiving or absorbing the above-mentioned resources, people of China and India are supposed to raise level of well-being to some extent.

Interpersonal comparisons of level of well-being is not possible theoretically when the concept is reduced to that of agency, where such a process of redistribution is not beneficial to the agent himself or herself. By definition, when it is not possible to increase the well-being of a person without decreasing the same of the other, the allocation is Pareto-optimal. It stops interpersonal comparisons of level of well-being (Handerson and Quandt 1980).

1.5. Ability to sacrifice and propensity to absorb

In table 1 we have seen that there are 22 countries, which regularly disburse (sacrifice!) resources for the betterment of more than 150 countries. Now, one can obviously raise

⁸ Total measure = population size (or growth) multiplied by Average measure.

⁹ Please note that (average) ability to sacrifice is higher in Luxembourg then in the United States. The power to sacrifice, as mentioned in section 1.2, is the highest in USA as the country sacrifices a total sum of US\$ 19705 millions (Luxembourg: a total sum of US\$ 236 millions).

question why these 22 countries are able to sacrifice resources and others are not? We may realise that on an average citizens of these countries have excess resources at their command beyond certain threshold level – a level that seems to be sufficient to achieve a desired standard of living. As income of different individuals varies, excess income beyond that certain threshold level also varies and so also ability or power to sacrifice. On the other hand, citizens of the countries, which receive official development assistance from the donor countries, have average income less than that threshold level. On an average, these people have some sort of negative command to sacrifice, which is something like propensity to receive or absorb¹¹.

1.6. Income inequality and ability to sacrifice / propensity to absorb

Inequalities in income will always affect power to sacrifice as well as propensity to absorb. But it may affect individual (or average) ability to sacrifice, and that of country in different ways. If inequality is high within a country, it may urge the better-off people of that country to sacrifice more for the weaker sections. In such a situation one country may attach more importance to reduce internal poverty rather than paying adequate attention to international poverty. It may reduce ability to sacrifice of country even if it possesses a high average quality of life (particularly in income dimension). High income-inequality may increase the propensity to absorb of the worse-off groups in a country or the country as whole, which regularly receives development assistance from donor countries.

1.7. A synthesis of the issues and ideas

These are some of the ideas and issues, which need to be incorporated or addressed while doing welfare evaluation according to the spirit of the present paper. The empirical exercise will be done utilising data on per capita GDP (\$PPP), GDP index, Gini index, and total population from Human Development Report 2006. However, before proceeding to the empirical exercise we may summarise the main arguments of the paper as follows.

The paper deals with two aspects: a) introduction of new concepts: ability to sacrifice and / or propensity to absorb, and b) testing of those with average and total principles.

a) The index of GDP in HDI measures ‘ability to have access to the resources needed for a decent standard of living’. It is true that income after certain level has nothing to do with standard of living. For this reason, income at high levels is discounted heavily using

¹⁰ In the real-world situation rich countries sacrifice a very small fraction of resources only (< 1 per cent of GNI) as shown in table 1.

¹¹ Just to note a bit of caution, in the real-world situation there is no reason to stick to the point that ability or power to sacrifice depends only on income, and so also propensity or command to absorb.

appropriate techniques. However, is this the usefulness of income to human beings (in true sense on self)? Can we think of other qualities beyond the concept of standard of living, which may be generated by the excess income of one person (excess income = actual income minus income needed for decent standard of living)? We have assumed that when individual income crosses certain threshold level, it enables the individual with some power to sacrifice – which we have comprehended as ability to sacrifice. When the excess income is negative, it may be comprehended as ‘propensity to absorb’.

b) While laying the logical foundation of the paper, we have amalgamated the basic principles and / or practices of CA with Parfit’s framework on redistribution of resources. Derek Parfit has beautifully elaborated the debate between the average and total principles, and introduced us with the Utility Monsters. In the present exercise, we have tested the new concepts (as above) according to average and total principles. As CA deals with individual, not with community or society, we can go for average principle obviously. Can we go for the total principle? Theoretically, the development of CA itself confirms its far stand from the utilitarian concept of welfare, and the Rawlsian concept of primary goods (Rawls 1971, Choen 1993). However, in practice we see that though CA deals with individual achievements, it allows country level comparisons utilising aggregate data. While doing that also, one may often realise that average measures are necessary but not sufficient for a complete evaluation of condition and progress of a nation. The debate between the two principles may be averted and we may test the total principle in Capability framework. As the total principle incorporates size (population) of a country, following Parfit one may accept that the extra good from the existence of extra group of people is not bad for humanity. One country as a whole may also be considered as one single entity, otherwise.

2. The construction of the indices

2.1. Step I

In order to compute ability to sacrifice, we assume that the world average per capita income of \$ 8833 (GDP PPP) in 2004 (see UNDP 2006) is the threshold level of income (y^*) beyond which income has no significant impact on quality of life. Any income above this level can be discounted using Atkinson’s formula (as in HDR 1998) for the utility of income:

$$\begin{aligned}
 W(y) &= y^* \text{ for } 0 < y < y^* \\
 &= y^* + (y - y^*)^{1/2} \text{ for } y^* < y < 2y^* \\
 &= y^* + 2(y^*)^{1/2} + 3[(y - 2y^*)^{1/3}] \text{ for } 2y^* < y < 3y^*.
 \end{aligned}$$

We also assume (as in HDI) that the highest level of per capita income is \$ 40000 (PPP). To calculate the discounted value of the income \$ 40000 (PPP) the following formula is used.

$$W(y) = y^* + 2(y^*)^{1/2} + 3(y^*)^{1/3} + 4(y^*)^{1/4} + 5(y^*)^{1/5} + 6(y^*)^{1/6} + 7[(40000 - 6y^*)^{1/7}].$$

As $y^* = 8833$ (PPP\$), $W(y) = 9149$ (PPP\$).

So, after discounting, the maximum limit of income of \$40000 (PPP) is reduced to \$ 9149 (PPP) with the assumption that any individual-income beyond \$9149 (PPP) has no significant impact on the standard of living of that person. The minimum limit is: \$ 100 (PPP). Now, discounted levels of income are computed for the countries so long as actual income is greater than the threshold level of income of \$ 8833 (PPP) [i.e., so long as $y > y^*$].

2.2. Step II

Following the standard procedure (see HDRs 1990-1998) an index of GDP (PPP\$) is computed after discounting income as above (using Atkinson's formula). The index of GDP (PPP\$) taking natural logarithm of income levels is available in the HDR 2006, which is also used in the present exercise.

2.3. Step III

Ability to sacrifice (and / or propensity to absorb) is computed taking the difference between the actual per capita GDP (PPP\$) and the discounted levels of income (and / or difference between the World average level of per capita income in 2004: \$8833 PPP and actual GDP PPP\$) and standardised by dividing 8833:

$$\text{Ability to sacrifice (unadjusted)} = \frac{[\text{Actual GDP (PPP\$)} - \text{Discounted GDP (PPP\$)}]}{8833},$$

for $y > y^*$,

$$\text{Propensity to absorb (unadjusted)} = \frac{[\text{Actual GDP (PPP\$)} - 8833]}{8833}, \text{ for } y < y^*.$$

It is to be remembered that the positive values indicate ability to sacrifice, and negative values imply propensity to absorb.

2.4. Step IV

In order to adjust the above measures for income-inequality the following weighting systems¹² are used:

$$\text{Weight} = (1 - \text{Gini Index}), \text{ for } y > y^*,$$

$$= 1 / (1 - \text{Gini Index}), y < y^*.$$

The above expressions beautifully reflect the facts that high inequality in income reduces ability to sacrifice and increases propensity to absorb. So, Gini-adjusted measures are:

$$Ability\ to\ sacrifice\ (adjusted) = Ability\ to\ sacrifice\ (unadjusted) * (1 - Gini\ Index), \dots \quad (i)$$

$$Propensity\ to\ absorb\ (adjusted) = \frac{Propensity\ to\ absorb\ (unadjusted)}{(1 - Gini\ Index)}. \quad \dots \quad (ii)$$

2.5. Step V

2.5.1. Measures according to average principle: Equations (i) and (ii) are according to the average principle, i.e., they reflect average or individual ability to sacrifice and / or propensity to absorb.

2.5.2. Measures according to total principle: Equations (i) and (ii) are multiplied by relative size of population (with respect to total global population) of the countries to find out relative positions of the countries with respect to the question of absolute power to sacrifice and / or command to absorb.

Results are displayed in table 2 in the appendix after some simple manipulation – expressing the values of all the countries relative to that of the United States, making the latter 100 under each principle.

3. Results and discussions

3.1. Average measures

Figures 4 and 5 shows relationship between per capita GDP (PPP\$) and index of GDP. The figures are self-explanatory and well known to us. These are all what we can do while working with income in the Capability framework. Probably this is one reason, why readers of CA are putting too much importance on other non-income dimensions of well-being (see Robeyns 2005). Though the present paper works with income, it adds a new dimension in it to wipe out the deposition of our mind resulting from the boring exercises with income.

Table 2 in the appendix displays scores and rankings of 125 countries¹³ according to average principle. Norway comes at the top of the list with a score of 120.33, and Sierra Leone at the bottom with a score of -123.37. All these score reflect distinctive country positions with respect to the United States the score of which is set to 100.

¹² Here Gini index is used without multiplier 100.

¹³ For many other countries information on Gini Index are not available. Such countries are not included in the analysis.

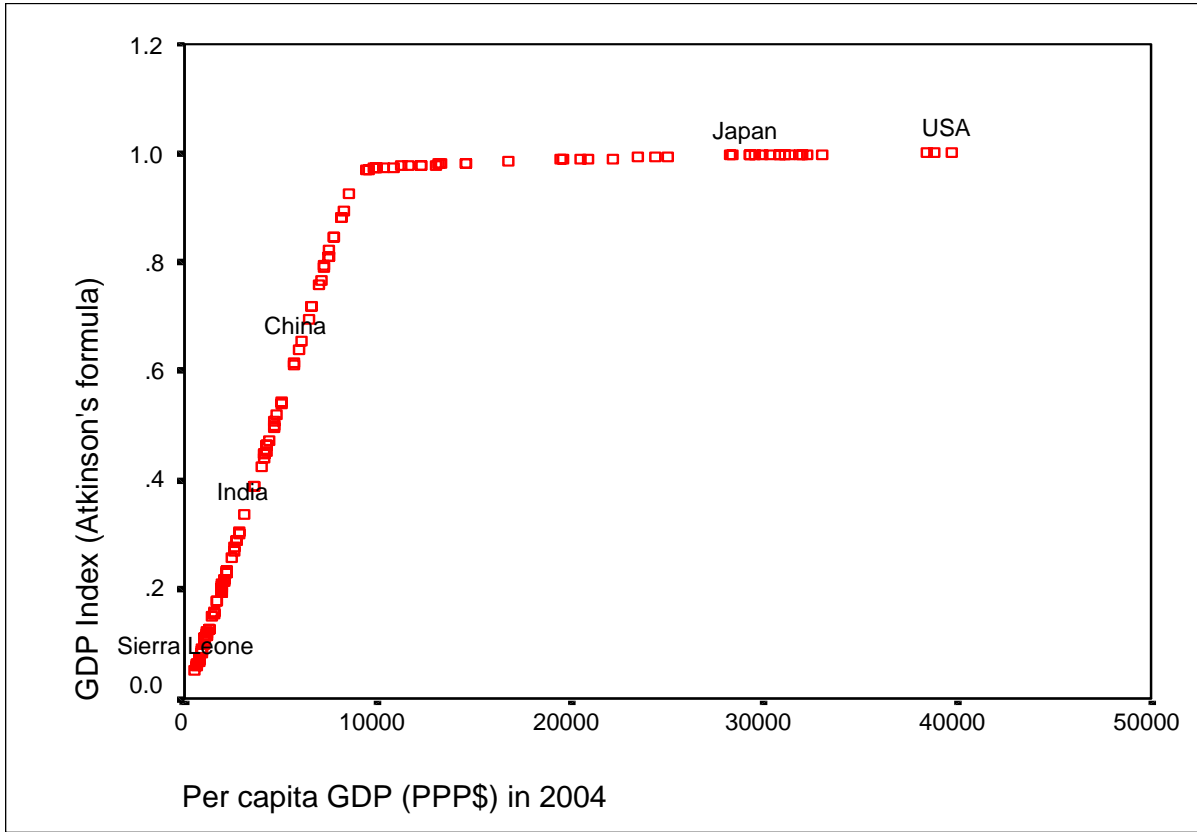


Figure 4. GDP Index (Atkinson's formula) and per capita GDP (PPP\$)

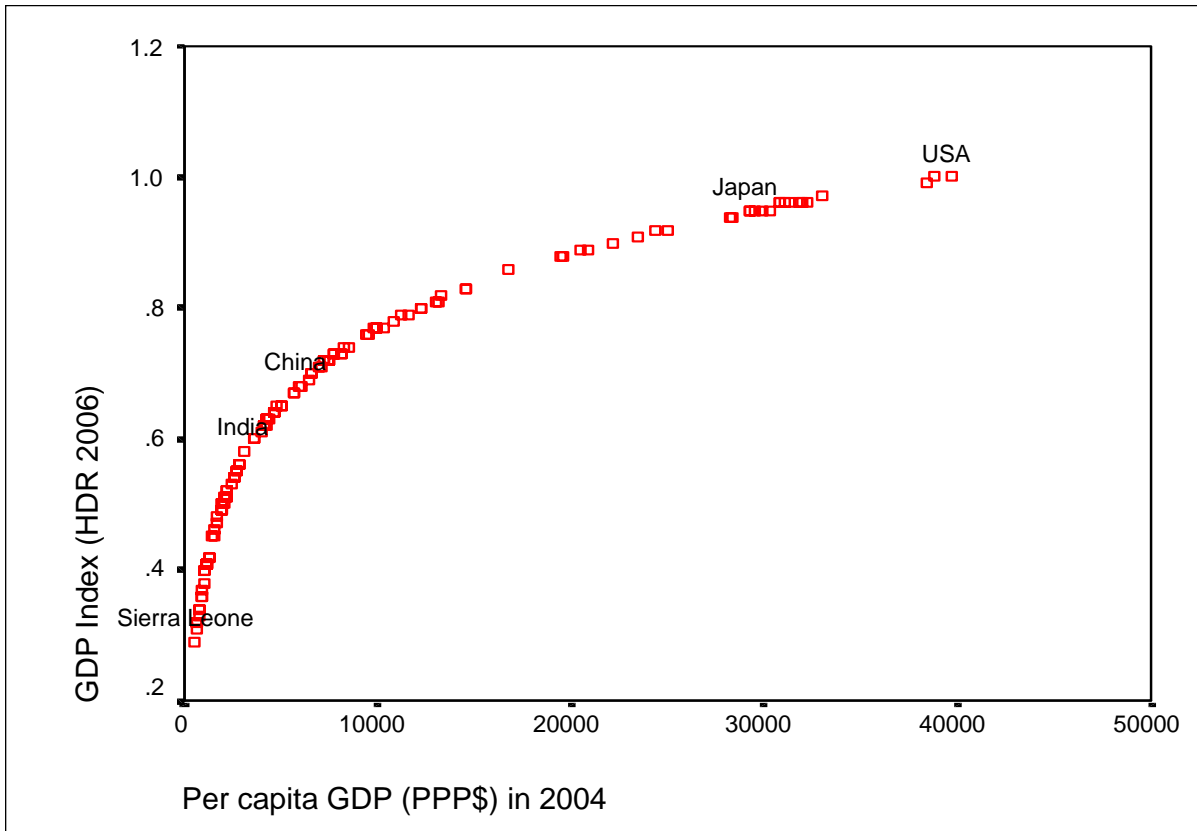


Figure 5. GDP Index (HDR 2006) and per capita GDP (PPP\$)

Information in table 1 (in the appendix) have been compiled from table 17 of HDR 2006. The table shows that there are 22 rich countries, which disburse overseas development assistance regularly. We find all these 22 countries in the beginning of table 2 with some other countries, such as Hong Kong and Israel. However, ranks of these countries in table 1 (according to per capita disbursement) strictly do not follow the same of table 2. We know that Luxembourg has highest ability to sacrifice (as reflected from the highest level of income per capita)¹⁴, and it sacrifices highest amount per capita (\$524, as shown in table 1 in the appendix). Among the countries in table 2, Norway has the highest ability to sacrifice, and among those countries it sacrifices the highest amount also (per capita \$477).

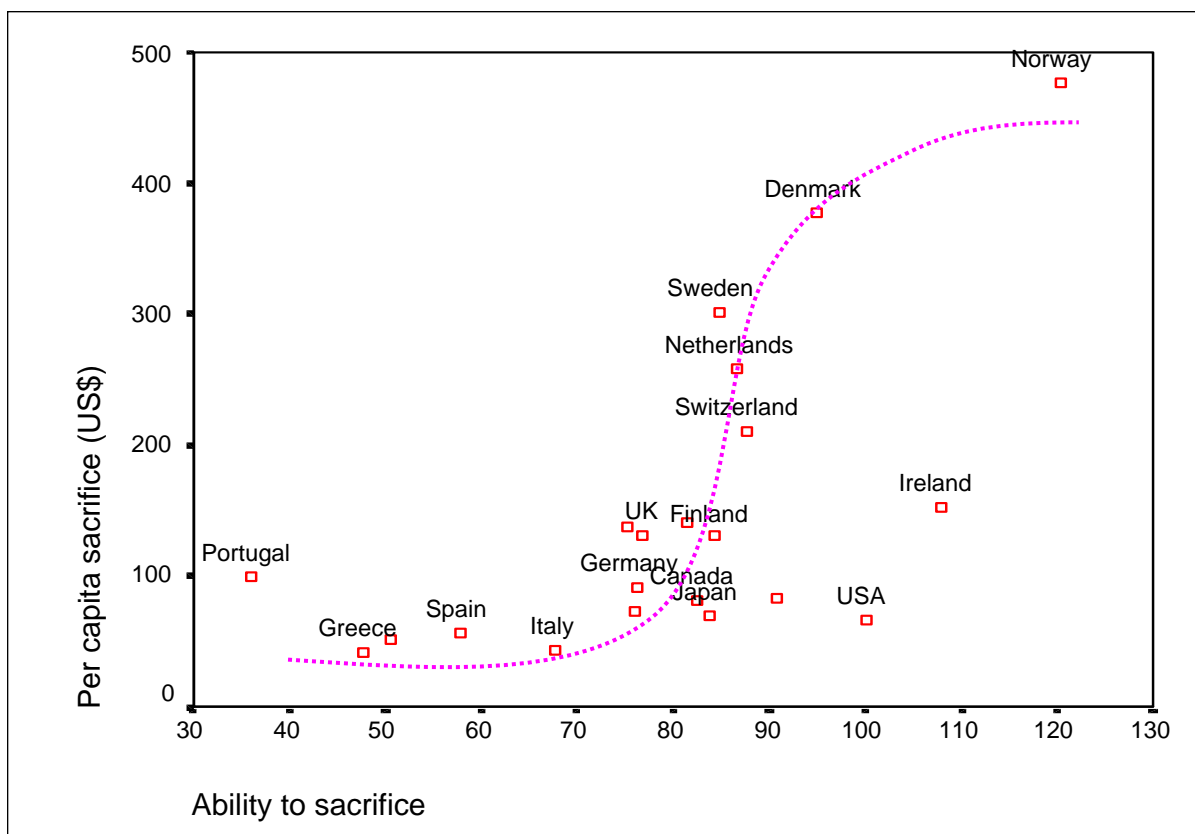


Figure 6. Ability to sacrifice and per capita sacrifice

The relationship between ability to sacrifice and per capita sacrifice in some selected countries (as appear in table 1 of the present paper in the appendix, and table 17 of HDR 2006) is shown in figure 6. A more appropriate form of the relationship is shown by the pink dotted line, which follows a logistic pattern.

¹⁴ Not shown in table 2, as data on Gini Index are not available.

However, average measures are not sufficient to explain why the powerful nations like the United States, Japan, Germany, United Kingdom, France, Italy, etc. lie lower in the picture.

Figures 7 (GDP index: according to Atkinson's formula) and 8 (GDP index: as in HDR 2006) show distinctive country positions (taking 125 countries) according to the average principle. From the figures we can read that, on an average, each person in Norway enjoys the highest ability to sacrifice. On the contrary, on an average, each person in Sierra Leone demands most to receive or absorb.

There are 43 countries with positive scores (i.e., with ability to sacrifice). The score of Romania is zero. It means that the Country (Romania) is neither in a position to sacrifice nor demands anything to receive or absorb. There are 81 countries, which are susceptible to receive funds in order to have decent standard of living.

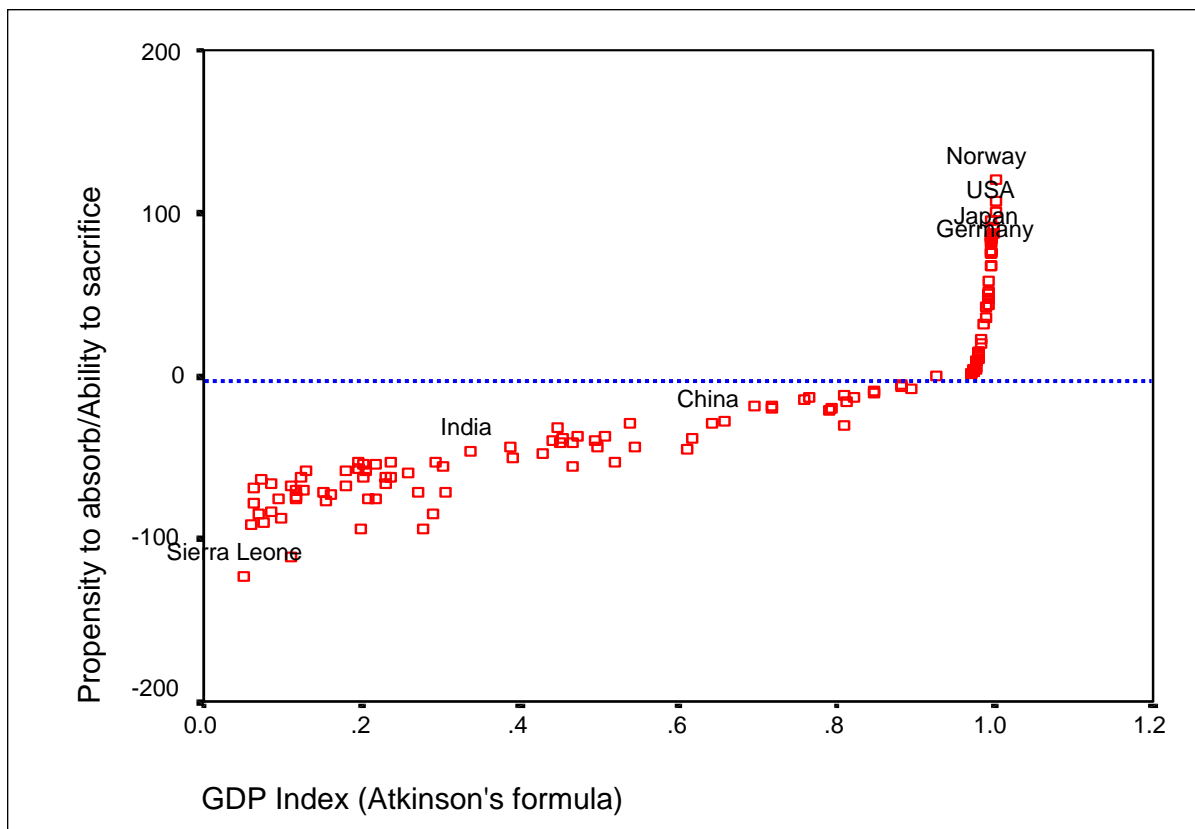


Figure 7. Distinctive country positions according to average principle (Atkinson's formula)

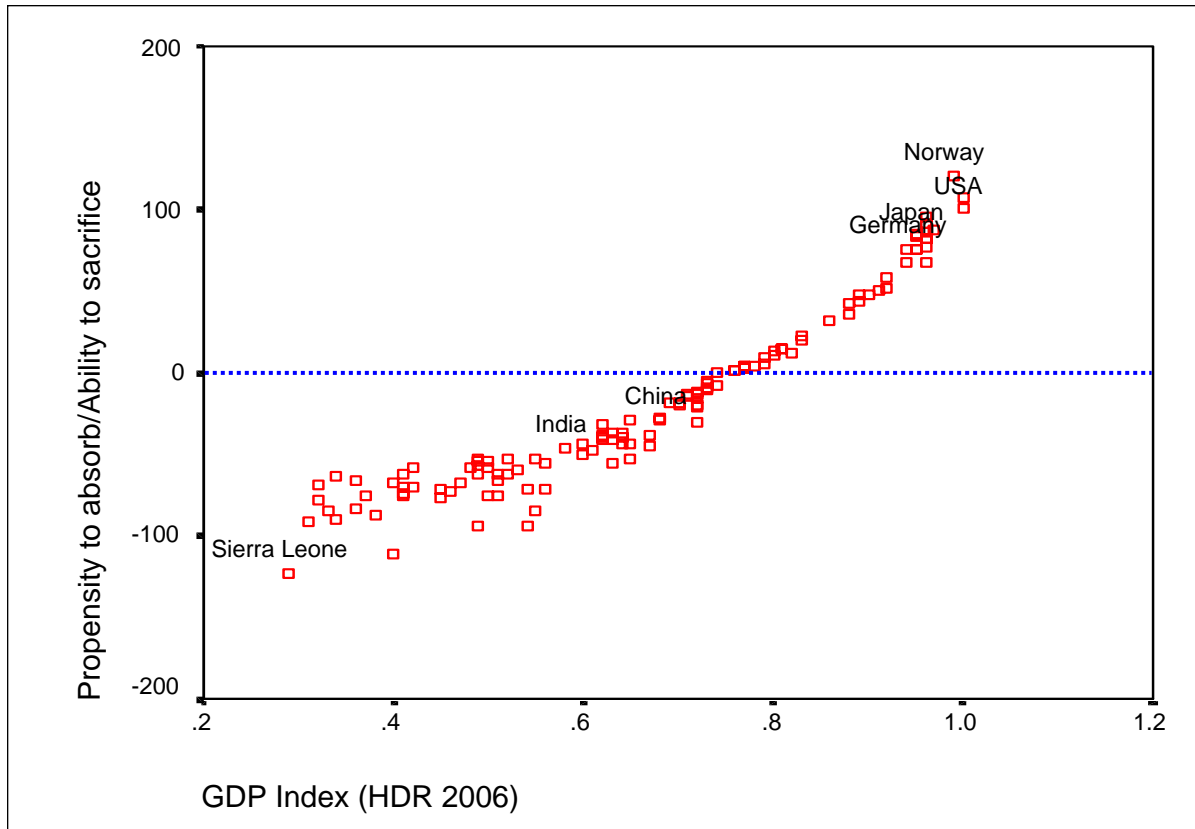


Figure 8. Distinctive country positions according to average principle (HDR 2006)

3.2. Total measures

Table 2 (in the appendix) shows scores and ranking of the countries according to total principle. We see that the United States is the most authoritative nation on this Earth in terms of power to sacrifice. It is the only nation, which is flying very high with distant followers like Japan, Germany, United Kingdom, France, Italy, and so on.

Figure 9 shows relationship between power to sacrifice and total amount of sacrifice in some selected countries (as in table 1 of the present paper, and table 17 of HDR 2006). The relationship is almost linear with a diminishing trend (as shown by the pink dotted line).

Figures 10 and 11 show relative global positions of the countries in terms of power to sacrifice (and / or command to absorb). Each rectangle in these figures (also in figures 9 and 10) may be considered as world. One may be too imaginative to consider that the world is divided into two equal halves. One may also imagine the blue dotted line as the surface of a sea ... or one may go further and become little bit unrealistic to consider it as the world poverty line or the line of prosperity... or may become extravagant to consider it as the most desired, calm, quite and the beautiful line – truth of all economic principles – the line of

perfect competition¹⁵. All living creatures – individually or in an organised way – try to float above that line. However (coming to the reality), we see that there are 44 countries, which are on and above the blue dotted line. Probably, they are in the better half of the world. There are 81 countries which remain below the blue dotted line. Probably, they are in the part of the world, which is worse off than the other. If we add the scores of all the countries in the two halves, we have +270 in one hand, and -638 on the other. These figures are important to have idea about the overall situation in the world.

After sketching the relative global positions of the countries in two parts of the world, let us do some simulation regarding those. The position of the United States is almost similar to that of the North Star. Its relative size of population will not change suddenly, and per capita GDP too will not increase sharply. So, its relative global position will remain almost unchanged¹⁶. If, however, inequality in income falls sharply (thanks to internal redistribution of resources), its power to sacrifice will increase significantly and so also the relative global position in the positive direction.

If we look at India, its position may change in three ways: (i) relative size of population will increase up to around 2050; (ii) per capita GDP is increasing faster; and (iii) inequality in income may come down to some extent. Other things remaining unchanged, the growth of population will pull down India's position. As per capita GDP of India is far below the world average level, and as it is growing faster, it may gradually raise India's position and take towards right faster. If inequality in income is reduced to some extent, it may push up India's position to some extent. Considering possible impacts of all these, we may comprehend that the position of India will change following an exponential path towards the United States from its current location. Chinese population will be stabilised earlier than the Indian one, its per capita GDP also is growing faster than that of the latter. However, inequality in income is quite high in China. So, there is enough scope for the Country to bring it (inequality) down to a reasonable level. Taking into account all these aspects, if things go well in favour of Chinese population, China will also move faster towards the United States mostly following a straight line from its current location. The dynamics will continue so long as light touches everybody without refraction. Till all these happenings indeed the world will be ruled by

¹⁵ These figures may be interpreted / imagined in numerous ways. Investors or entrepreneurs may imagine that if they invest or produce or add anything in the economies of China and India, it will be absorbed fast because of very high command to absorb. They won't face any depression (lack of demand) in near future. Is this one of the many reasons for which China and India became the ultimate destinations for Investors or entrepreneurs?

¹⁶ The same is true for Japan and other Western European countries.

little else. Similar other dynamism may become prominent after that fueled by knowledge and education. Hopefully, we look forward to such an era when the world will be nurtured by all together.

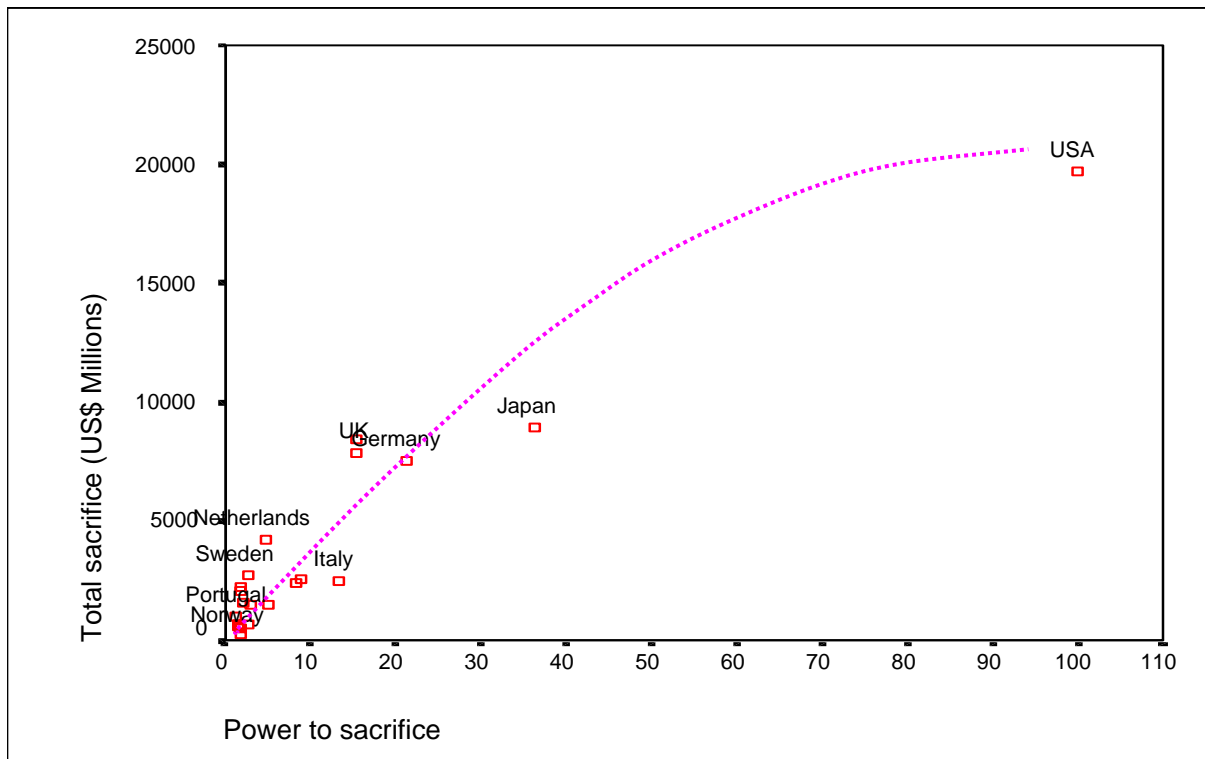


Figure 9. Power to sacrifice and total amount of sacrifice

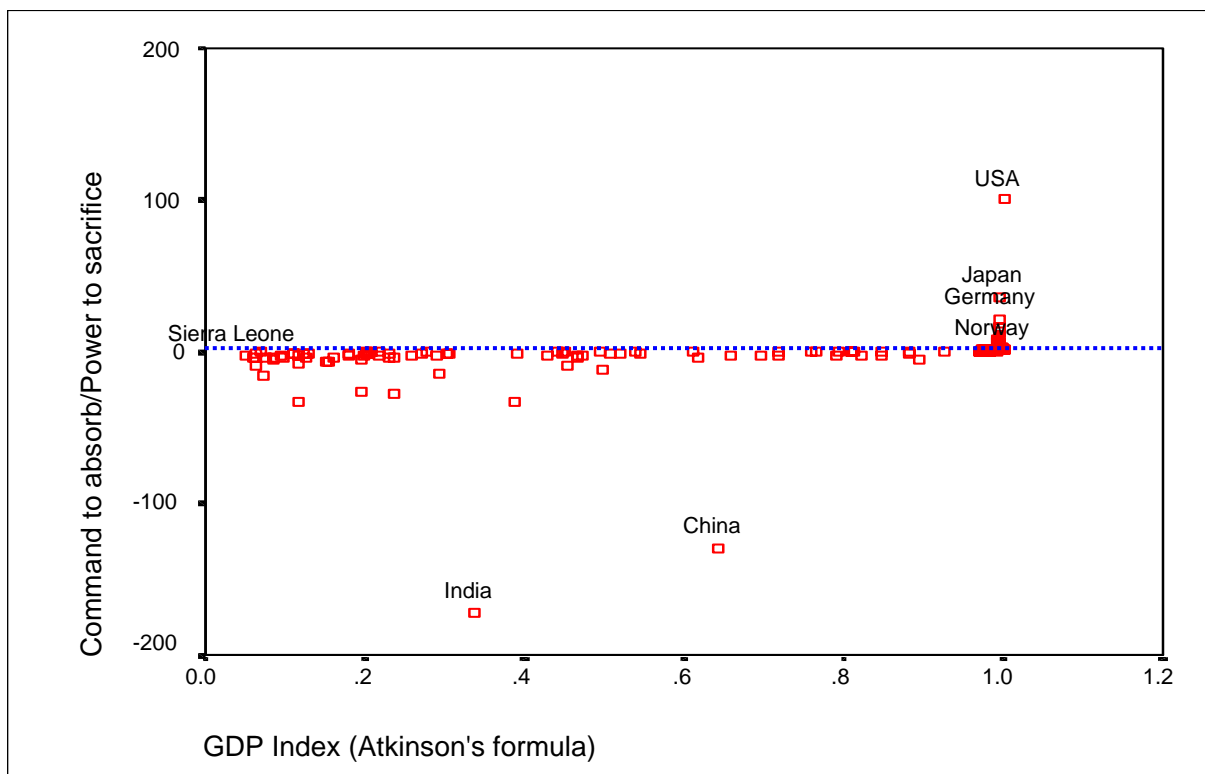


Figure 10. Relative global positions according to total principle (Atkinson's formula)

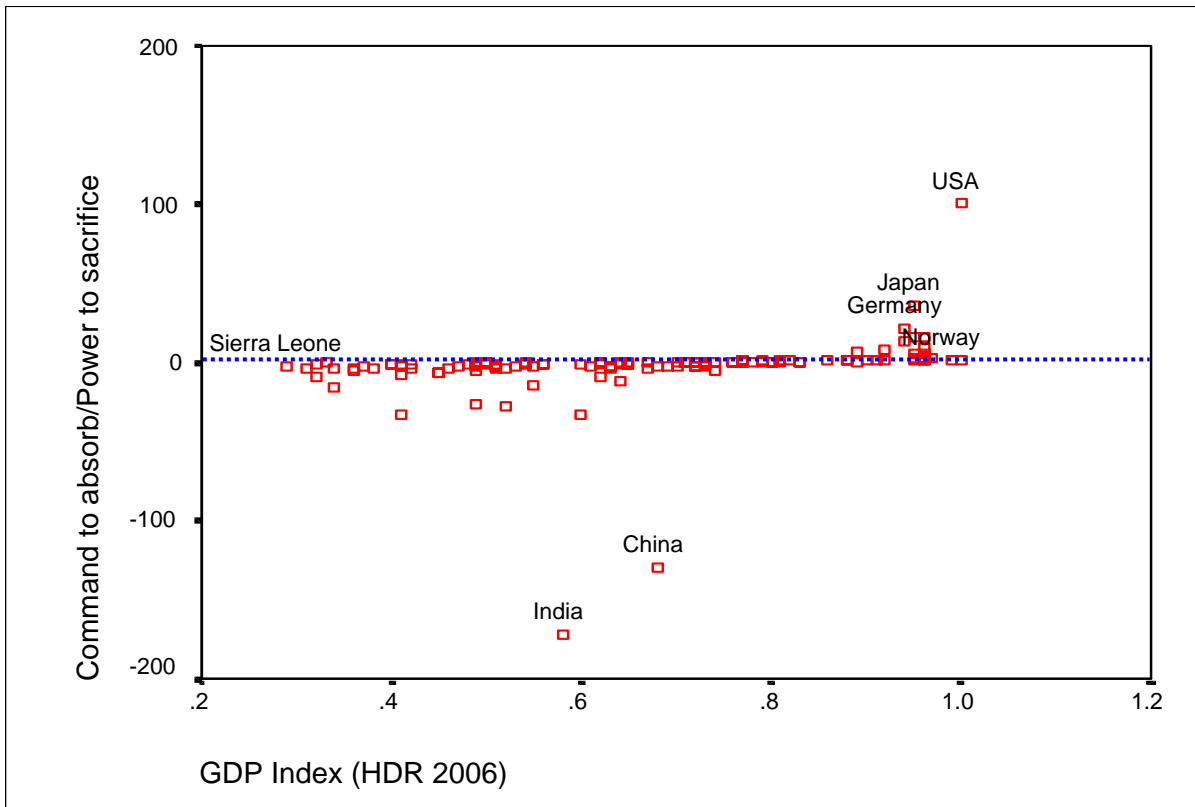


Figure 11. Relative global positions according to total principle (HDR 2006)

4. Conclusion

The paper is concluded here by presenting two paradoxes (without explaining those) as shown in figures 12 and 13. Let us do some reasoning on those!

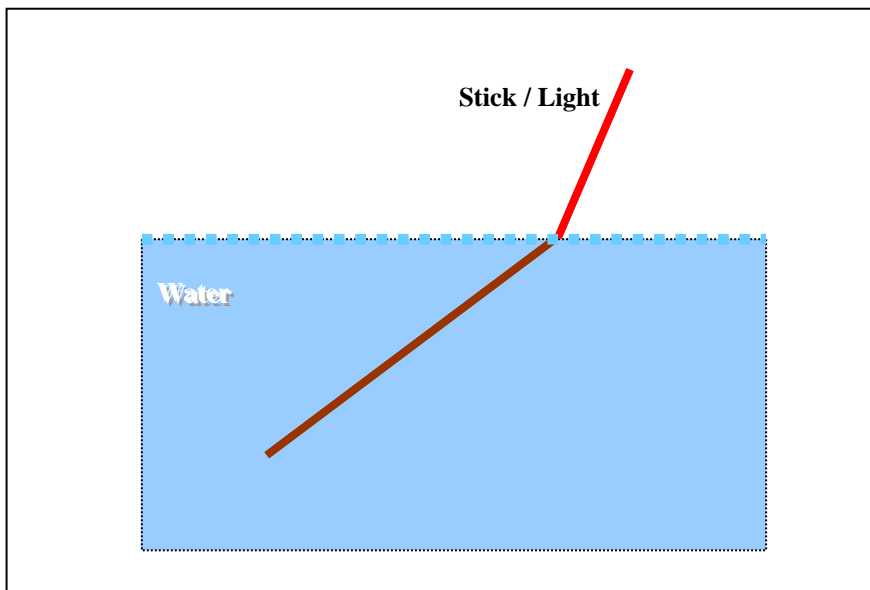


Figure 12. Paradox I (The Refraction Paradox?)

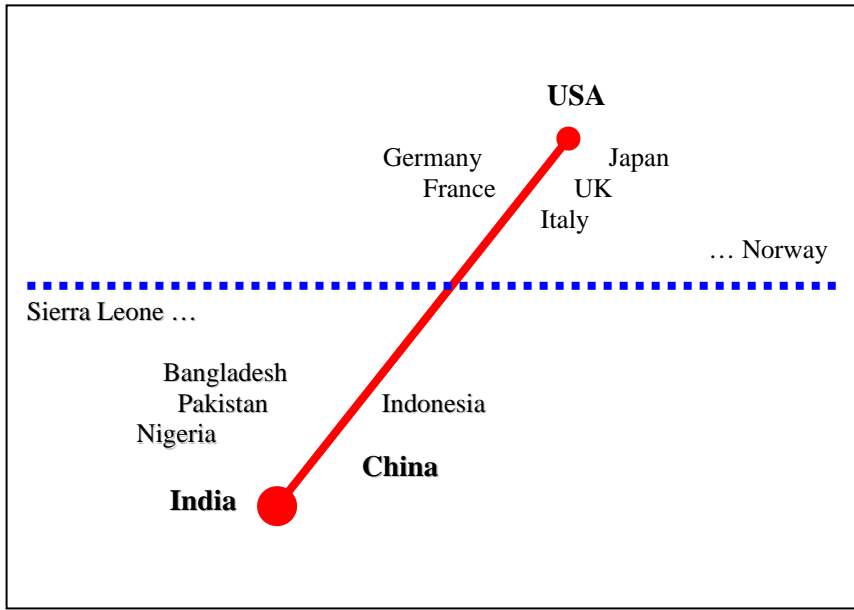


Figure 13. Paradox II (The Global balancing Paradox?)

Reference

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APPENDIX

Table 1. Net official development assistance (ODA) disbursed in some selected countries

Donor Country	GDP per capita PPP US\$		HDI		ODA (% of GNI)			ODA (Total US\$ Millions)	ODA per capita of donor country (2004 US\$)	
	2003	2004	2003	2004	1990	2003	2004	2004	1990	2004
Australia	29632	30331	0.955	0.957	0.34	0.25	0.25	1460	70	73
Austria	30094	32276	0.936	0.944	0.11	0.20	0.23	678	28	83
Belgium	28335	31096	0.945	0.945	0.46	0.60	0.41	1463	120	141
Canada	30677	31263	0.949	0.950	0.44	0.24	0.27	2599	103	81
Denmark	31465	31914	0.941	0.943	0.94	0.84	0.85	2037	305	377
Finland	27619	29951	0.941	0.947	0.65	0.35	0.37	680	174	130
France	27677	29300	0.938	0.942	0.60	0.41	0.41	8473	160	137
Germany	27756	28303	0.930	0.932	0.42	0.28	0.28	7534	124	91
Greece	19954	22205	0.912	0.921	-	0.21	0.23	465	-	42
Ireland	37738	38827	0.946	0.956	0.16	0.39	0.39	607	26	152
Italy	27119	28180	0.934	0.940	0.31	0.17	0.15	2462	75	43
Japan	27967	29251	0.943	0.949	0.31	0.20	0.19	8922	94	70
Luxembourg	62298	69961	0.949	0.945	0.21	0.81	0.83	236	101	524
Netherlands	29371	31789	0.943	0.947	0.92	0.80	0.73	4204	244	258
New Zealand	22582	23413	0.933	0.936	0.23	0.23	0.23	212	41	52
Norway	37670	38454	0.963	0.965	1.17	0.92	0.87	2199	396	477
Portugal	18126	19629	0.904	0.904	0.24	0.22	0.63	1031	25	100
Spain	22391	25047	0.928	0.938	0.20	0.23	0.24	2437	33	56
Sweden	26750	29541	0.949	0.951	0.91	0.79	0.78	2722	257	302
Switzerland	30552	33040	0.947	0.947	0.32	0.39	0.41	1545	149	210
United Kingdom	27147	30821	0.939	0.940	0.27	0.34	0.36	7883	70	131
United States	37562	39676	0.944	0.948	0.21	0.15	0.17	19705	61	67

Source: HDR 2006

Table 2. Ranking of the countries according to average and total principles

Rank	Average principle		Total principle	
	Ability to sacrifice (+ve) / propensity to absorb (-ve)		Power to sacrifice (+ve) / command to absorb (-ve)	
	Country	Scores*	Country	Scores*
1	Norway	120.33	The United States	100.00
2	Ireland	107.90	Japan	36.23
3	United States	100.00	Germany	21.29
4	Denmark	94.98	United Kingdom	15.48
5	Austria	90.85	France	15.35
6	Switzerland	87.76	Italy	13.26
7	Netherlands	86.69	Canada	8.95
8	Sweden	84.78	Spain	8.32
9	Finland	84.28	Korea, Rep. of	6.97
10	Japan	83.69	Australia	5.12
11	Canada	82.59	Netherlands	4.75
12	Belgium	81.49	Belgium	2.87
13	United Kingdom	76.87	Sweden	2.58
14	Germany	76.15	Austria	2.52
15	Australia	76.07	Switzerland	2.14
16	France	75.18	Poland	1.90
17	Hong Kong, China (SAR)	67.98	Norway	1.87
18	Italy	67.54	Greece	1.79
19	Spain	57.69	Denmark	1.74
20	Israel	51.49	Russian Federation	1.63
21	New Zealand	50.62	Hong Kong, China (SAR)	1.61
22	Greece	47.75	Ireland	1.50

23	Slovenia	47.04	Finland	1.48
24	Korea, Rep. of	43.28	Czech Republic	1.48
25	Czech Republic	42.73	Argentina	1.47
26	Portugal	35.97	Portugal	1.27
27	Hungary	31.56	Israel	1.15
28	Slovakia	23.15	Hungary	1.08
29	Estonia	19.79	Mexico	0.91
30	Lithuania	14.67	South Africa	0.84
31	Poland	14.54	New Zealand	0.69
32	Croatia	12.74	Slovakia	0.42
33	Argentina	11.31	Malaysia	0.32
34	Trinidad and Tobago	10.68	Slovenia	0.32
35	Latvia	9.35	Chile	0.25
36	South Africa	5.28	Croatia	0.19
37	Chile	4.63	Lithuania	0.17
38	Malaysia	3.84	Estonia	0.09
39	Russian Federation	3.34	Latvia	0.07
40	Mexico	2.54	Trinidad and Tobago	0.05
41	Botswana	2.14	Costa Rica	0.02
42	Costa Rica	1.66	Uruguay	0.02
43	Uruguay	1.64	Botswana	0.01
44	Romania	0.00	Romania	0.00
45	Bulgaria	-5.90	Macedonia, TFYR	-0.14
46	Thailand	-7.09	Swaziland	-0.15
47	Brazil	-8.41	Bulgaria	-0.16
48	Tunisia	-9.79	Bosnia and Herzegovina	-0.18
49	Turkey	-10.60	Namibia	-0.21
50	Kazakhstan	-11.66	Panama	-0.21
51	Iran, Islamic Rep. of	-12.70	Albania	-0.31
52	Bosnia and Herzegovina	-13.50	Tunisia	-0.33
53	Belarus	-14.66	Jamaica	-0.37
54	Dominican Republic	-15.86	Gambia	-0.39
55	Ukraine	-18.77	Armenia	-0.40
56	Algeria	-19.07	Guinea-Bissau	-0.43
57	Panama	-19.73	Dominican Republic	-0.47
58	Macedonia, TFYR	-20.16	Mongolia	-0.47
59	Colombia	-21.08	Belarus	-0.49
60	Venezuela, RB	-27.62	Lesotho	-0.57
61	China	-29.39	Kazakhstan	-0.58
62	Albania	-29.71	Mauritania	-0.63
63	Namibia	-30.47	Turkmenistan	-0.65
64	Azerbaijan	-31.97	Jordan	-0.71
65	Sri Lanka	-36.80	Moldova, Rep. of	-0.84
66	Jordan	-37.48	Georgia	-0.85
67	Peru	-38.45	Azerbaijan	-0.91
68	Egypt	-38.99	Nicaragua	-0.92
69	Armenia	-39.55	Kyrgyzstan	-0.96
70	Turkmenistan	-39.71	El Salvador	-1.01
71	Morocco	-41.38	Paraguay	-1.07
72	Jamaica	-41.61	Lao People's Dem. Rep.	-1.14
73	Philippines	-43.31	Tajikistan	-1.36

74	Indonesia	-44.00	Papua New Guinea	-1.39
75	El Salvador	-44.08	Central African Republic	-1.50
76	Swaziland	-45.21	Thailand	-1.53
77	India	-46.68	Honduras	-1.69
78	Ecuador	-47.86	Rwanda	-1.77
79	Nicaragua	-50.56	Benin	-1.87
80	Uzbekistan	-52.64	Guinea	-1.92
81	Pakistan	-52.69	Burundi	-1.94
82	Paraguay	-52.71	Algeria	-2.09
83	Viet Nam	-53.47	Ecuador	-2.11
84	Mongolia	-53.80	Sierra Leone	-2.21
85	Kyrgyzstan	-54.76	Guatemala	-2.32
86	Georgia	-55.60	Venezuela, RB	-2.46
87	Guatemala	-55.70	Sri Lanka	-2.57
88	Bangladesh	-56.49	Bolivia	-2.58
89	Lao People's Dem. Rep.	-58.20	Turkey	-2.59
90	Moldova, Rep. of	-58.84	Senegal	-2.59
91	Rwanda	-58.91	Haiti	-2.68
92	Cambodia	-59.51	Cambodia	-2.78
93	Ghana	-61.62	Zambia	-2.94
94	Guinea	-61.66	Iran, Islamic Rep. of	-2.96
95	Mauritania	-62.53	Ukraine	-2.99
96	Tajikistan	-62.65	Burkina Faso	-3.04
97	Ethiopia	-63.85	Colombia	-3.20
98	Yemen	-66.08	Zimbabwe	-3.28
99	Cameroon	-66.51	Peru	-3.59
100	Senegal	-67.12	Cameroon	-3.60
101	Benin	-67.46	Mali	-3.88
102	Tanzania, U. Rep. of	-69.03	Malawi	-3.89
103	Mozambique	-69.59	Niger	-4.11
104	Burkina Faso	-70.09	Morocco	-4.34
105	Papua New Guinea	-70.88	Côte d'Ivoire	-4.41
106	Honduras	-71.35	Ghana	-4.53
107	Uganda	-71.40	Yemen	-4.54
108	Côte d'Ivoire	-72.73	Mozambique	-4.57
109	Kenya	-74.03	Uzbekistan	-4.67
110	Zimbabwe	-75.05	Madagascar	-5.15
111	Zambia	-75.40	Brazil	-5.23
112	Nigeria	-75.47	Uganda	-6.72
113	Gambia	-76.02	Nepal	-6.93
114	Nepal	-76.95	Kenya	-8.40
115	Burundi	-78.35	Tanzania, U. Rep. of	-8.79
116	Madagascar	-84.06	Egypt	-9.58
117	Guinea-Bissau	-84.68	Philippines	-11.96
118	Bolivia	-84.77	Viet Nam	-15.04
119	Mali	-87.58	Ethiopia	-16.34
120	Niger	-90.03	Bangladesh	-26.62
121	Malawi	-91.15	Pakistan	-27.61
122	Lesotho	-93.43	Indonesia	-32.78
123	Haiti	-94.13	Nigeria	-32.88
124	Central African Republic	-110.65	China	-130.12
125	Sierra Leone	-123.37	India	-171.77

* Relative values in contrast to that of the United States (making the value of the United States = 100)