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Abstract

The great inequality in the distribution of world resources is well represented by the co-existence of two opposite phenomena: the scarcity of resources that relegates billions of individuals in extreme poverty conditions, and the over-consumption of resources by a minority of inhabitants who waste and pollute the planet earth.

In addition to the serious ethical paradox produced by the combination of these negative forces, every year poverty and pollution cause severe economic losses, both directly and for negative externalities. Is it possible to reverse this ethical and economic paradox and find a joint solution to these two forms of world pollution?

This paper illustrates a simple model of earth basic income, which could serve as an easy solution to both problems: a taxation mechanism on waste production as a means to finance basic income.

Introduction

Poverty and earth pollution are two main problems that the world still faces in the 21st century. The advancement of civilization, economic growth, social and cultural progress, together with the diffusion of civil and political rights have not been sufficient to resolve these issues over the years.

Paradoxically, the attainment of ever greater wealth over time on a global scale and the increasing inequality of capital distribution highlight the persistence of over-consumption of resources by a minority of inhabitants of the planet – consequently producing great quantities of waste and acuting the lack of those resources for the majority of the world population.

Besides the serious ethical paradox caused by the simultaneous existence of these opposing phenomena, every year the negative externalities of poverty and pollution cause severe economic damage, both directly and indirectly.

According to the United Nations Environmental Program (UNEP), gas emissions from greenhouses, which are one factor of the planet's overheating, produce economic damage that can be estimated at around 150 billion dollars every year. Intangible damage of an ethical, environmental and natural kind should be obviously added to this figure.

Apart from being one of the 'evils' of our time, to use Beveridge's term, poverty causes serious ethical, social and economical damage: people die of hunger, children grow up in poverty with few opportunities for a better life, whole populations suffer dire hygienic and dietary conditions. The socio-economic circumstances in which poverty develops also give rise to other social 'evils': disease, illiteracy and crime.

In Western countries poverty develops in rich societies, thus causing further social and ethical problems such as wide social inequalities, social exclusion and marginalization, relational and familial fragility, and depression. In short, poverty causes direct damage to economic systems – as well as indirectly, this being though less visible but yet quantifiable.

If we add the damage caused by environmental pollution to that caused by poverty, which can be defined as a special form of 'social pollution', we find out that the world economic system yearly suffers considerable losses.

The paradoxical question addressed by this brief article is a very simple one: can these two 'types of damage' be converted into something positive?

The operation appears to be a rather complex one: the product of two elements with negative value is positive for mathematicians – this is, however, not the case for social scientists. But it is possible to propose a model of global basic income financed from environmental damage and, consequently, to derive solutions from 'the waste'.

The taxation of pollution in order to finance a basic income capable of defeating poverty may be the simple solution to this dual issue.

A simple simulation model

Approximately ten years ago, Michel Genet and Philippe Van Parijs suggested a model of basic income for all European citizens, the Eurogrant, which based on a direct financing from energy taxes (1). The authors ended their paper with several questions, one of which advocated the implementation of this instrument outside Europe.

The idea proposed in this paper reprises the central principle of Genet and Van Parijs's model – to finance basic income by means of an ecological tax –, but it gives the model global dimensions and uses a slightly different taxation system. Instead of an energy tax, the world basic income, termed 'Earth Basic Income' (EBI), could be financed by means of a tax on greenhouse gas emissions.

The main difference, however, is that in this case ecological taxation itself would be the goal of the model and not a mere financial instrument for basic income. In that way, a double result would be pursued: on the one hand, to finance EBI in order to fight poverty on the entire planet and, on the other, to encourage the achievement of a minimum level of greenhouse gas emissions so that earth pollution can be reduced.

Since both problems may possibly be solved by a taxation system that operates, in the former case, as a financing instrument and as a 'negative' incentivization policy in the latter, the issue must be considered a problem of optimal taxation with two constraints.

The ***first constraint*** concerns the level of pollution that can be 'tolerated' by the planet.

For convenience, pollution intensity is a value that can be based on the threshold magnitudes of greenhouse gas emissions established at the Kyoto Conference on Bio-Climatic Change in 1997. According to the Kyoto Protocol, industrialized countries and countries with transitional economies, such as the Eastern European countries, must effect a 5% reduction of their greenhouse gas emissions, with respect to values of 1990, from 2008 to 2012 (2).

This average percentage value is obtained, when considering the reductions of 8% in emissions by the European Union, 7% by the USA, and 6% by Japan. Other countries must only attempt to stabilize their emissions, and in the case of ***outstanding countries***, such as Iceland, they may even slightly increase them. Developing countries are exempted from this commitment so that limits are not imposed on their socio-economic development.

These reductions are in fact considerable – especially for the most industrialized countries such as the USA – because in the same period of time the production rate of these gases is expected to increase by about 20%: the net result would be therefore a potential 25% reduction of emissions. Not surprisingly, countries such as the USA and Australia have decided not to ratify the Treaty. However, concerns about the Treaty not entering into force dissolved this year as Russia announced its ratification. The requirements set out in section 25 (3) of the Treaty were consequently fulfilled; and the Kyoto Protocol legally came into force on 16th February 2005.

A commitment of this kind entails very high costs for the economic systems of some of the countries involved in the Kyoto negotiations, in particular for nations like the USA, Canada, Japan and New Zealand, whose production systems use very large amounts of energy; for them the costs of signing the Treaty would be relatively higher than, for example, for Europe (see table 1).

Table 1. CO2 emissions and costs of Kyoto Treaty

Country	CO2 emissions (millions of tons)	Emission reduction (Kyoto constraint)	GDP variation in 2010 (%)
USA	5410	7%	- 0.27
EU	3171	8%	- 0.17
Japan	1128	6%	- 0.03

Source: OCSE, 1999

It is at this point that the mechanism described in this paper could be implemented. Its central aim may be enlightened by the following questions: In the absence of a binding legislation, how can these costs be off-set for the industrialized countries? And, how can a virtuous behavior, which leads to better climatic conditions and economic advantages, be stimulated?

One way could be to tax a country that doesn't adopt a virtuous behavior proportionally to its deviation. This would motivate a government to set a limit on its emissions, in order to become exempt from the tax. Countries that do not comply with this restriction would be taxed on the value of gas emissions that exceed the established threshold:

1.) $T_i = (X_{Pi} - X_{Si})\ t$

The amount of ecological taxes (T_i) collected in country ‘i’ would therefore be proportional to the difference between the gas emissions established in Kyoto for this country (X_{Si}) and the gas emissions produced by it (X_{Pi}), multiplied by the ecological tax (t).

One possible hypothesis adjustable to the model presupposes each country to provide itself with monitoring systems able to distribute the taxation amount (T_i) among polluting enterprises according to the emissions they produce.

Under a second hypothesis, the tax does not determine secondary effects that may retroact on the model, for instance by decreasing wages or increasing commodity prices, and may partially bypass the effects of introducing a basic income. This could be controlled by means of a compensatory mechanism, for example, by eliminating other ecological taxes on enterprises in order to maintain prices and wages stable. The reduction of public revenue due to a lower ecological taxation could be off-set by the decrease of social expenditure on social assistance measures that would partially lose their purpose with the implementation of the EBI.

Having identified our first goal, i.e. the fulfillment of the Kyoto parameters for greenhouse gas emissions, let us now see how this could be related to financing a basic income.

The ***second constraint*** lays on the exogenously fixed amount of EBI.

The tax amount T_i in all the ‘k’ taxed countries can be used to finance the EBI for the entire world population, or at least part of it. Let us take as an example the population of age (pop):

2.) $EBI * pop = \sum_{i=1}^{k} T_i$

Nonetheless, two problems arise from this simple equation. The first involves an ethical issue. Indeed, it could be argued that in such a way the EBI would be financed, at the end, with money deriving indirectly from pollution. An instrument used to fight poverty would end up depending on the existence of greenhouse gas emissions that surpass the levels permitted. Yet, there is a straightforward answer for this objection: firstly, the money would derive from the fight against pollution, not from pollution itself; secondly, the fact that the model uses a constant exogenous value of EBI does not determine a variation in the sum of basic income account due to greenhouse gas emissions.

This gives rise to the second problem. The fact that the EBI is independent of the value of produced gases and that it is actually fixed exogenously, proposes a difficulty when calculating the taxation level. Or, in other words: how can ‘t’ be determined, being it a value dependant from a variable such as (X_{Pi}), which might, or better should, change over time?

The same issue also arises from a mathematical perspective if equation 2 is substituted by equation 1:

3.) $\sum t = \sum T_i / \sum (X_{Pi} - X_{Si}) = EBI * pop / \sum (X_{Pi} - X_{Si})$

There seem to be three different solutions to the problem of a temporally changing variable: to propose a different taxation system for each country; to choose a tax that varies over time; or to allow the total amount of taxes collected to finance the EBI, that is to say, letting '$\sum T_i$' vary.

In the first case, (t) would depend on the decisions taken by individual countries (t_i). At this point the summatory of (t) values would not be equal to the product of (t), multiplied by the number (k) of taxed countries:

4.) $\sum t = k * t \neq \sum t_i$

Each country would determine its own tax amount and taxation system (by adopting, for instance, a proportional system, or a progressive one, or by implementing other parameters), as long as the required amount (T_i) is achieved. A drawback may possibly be different taxation systems having evident and dangerous consequences on market mechanisms.

A second solution consists on choosing a tax (t) that is the same for all countries but varies over time. This could certainly ensure a constant flow of '$\sum T_i$' resources to the EBI for each time period taken up into consideration ($t_{t=0,1,2...n}$), independently of the values of greenhouse gases emitted above tolerable levels. At this point equation 3 should be modified as following:

5.) $t_{t=0,1,2...n} = \sum T_i / k * \sum (X_{Pi\ t=0,1,2...n} - X_{Si})$

In such a case the variability of (t) is strictly temporal: it depends on the emissions produced over the number of years (n) by the various countries ($X_{Pi\ t=0,1,2...n}$). The product of these two variabilities would ensure, besides, a constant flow of resources.

Still, the variability of (t) over time may be followed by two further problems. The first one regards the emergence of numerous opportunities for free riding. If the total amount of emissions (the denominator in equation 5) changes due to the virtuous (or vicious) behavior of a number of countries, the effects of (t) variations will affect too those countries that have kept out of action (4). The second problem suggests that the impossibility of knowing future (t) values could bring difficulties to economic systems, in which taxed enterprises operate.

It seems therefore that the only feasible option for solving the problem of variability is to determine a '$\sum T_i$' amount that varies over time. Evidently, this third solution may, however, cause distress as EBI financing may be in danger, should ecological taxes decrease.

This paradoxical scenario is dangerous both in ethical terms and in terms of the measure's financial efficacy. If the taxation and/or incentivization mechanism achieves the results expected, pollution levels could decrease; but in such case, the same would happen to the resources available for EBI financing. This seems at first sight to be a trade-off between the fight against poverty and the fight against pollution. Yet, in reality, this ethical dilemma can be easily avoided: as mentioned above, pollution and poverty produce economic as well as social damage. A reduction in the economic costs of these phenomena could therefore be used as added value for the operation, from which additional financial sources could be derived.

A Guarantee Fund (GF) could be activated for security reasons when introducing the EBI. In this way, should emission levels decrease significantly, the maintenance of the measure over time would remain ensured. Equation 2 would therefore change into:

6.) $EBI * pop + GF = \sum_{i=1}^{k} T_i$

The organization responsible for managing the EBI within, say, the United Nations could use the GF to assure activities related to the implementation and monitoring of EBI. These activities would include an analysis of the profits produced by the reduction of greenhouse gas emissions. This added value would be analogously produced by the mechanism introduced together with the EBI. The resources generated through this operation could be transferred to the GF in order to sustain it (5).

Conclusions

This short paper has not sought to describe a complete financing model of basic income. Its aim has been rather to raise some points for consideration. My intention, further on, is to 'fill' this simple theoretical model with data on the worldwide production of greenhouse gases; so that, as a result, the model's ability to implement basic income on a global scale becomes quantifiable.

I have raised at least two considerations that go beyond commonplaces on the possibility of financing basic income and on the strength of its ethical justifications:

- We can image a mechanism able to adjust a system of incentives and constraints and with which to attempt to solve two of the major issues of this century: poverty and earth pollution. The solution to both problems may be a mix of taxation on greenhouse gas emissions and a basic income for the entire world population financed with this tax. This highlights a basic principle of the EBI functioning mechanism: a minimum global re-distribution of the resources of the richest countries to the poorest ones – from those which most exploit the planet's resources (partially destroying the planet) to those which make less use of the same resources – seems ethically fair. Since the planet belongs to everybody, a minimum part of its resources should be destined to the worst-off.

- Finding a system to finance basic income on a world scale is certainly a difficult operation, yet it is not utopian. Likewise, the possible perverse effects exerted on the economic system by this financing system and by the introduction of this measure may be controlled and restrained with a series of compensatory mechanisms. I have sought in this paper to prove the existence of different taxation solutions for basic income. I have described a taxation system based on greenhouse gas emissions (and expressed my preference for a fixed-tax system). I believe that the real problem with implementing a basic income on a global scale (and also with reducing greenhouse gases) is not the devising of theoretical models that can be applied and sustained over time. The real problem is governance: Now, ***who*** might actually manage both, a revolutionary policy like the above exposed and the needed natural capacity and authority (political, juridical and legislative) still remains the main question.

Notes

1 Genet M./Van Parijs P.: "Eurogrant", in: ***Basic Income Research Group (BIRG)***, Bulletin no.15, July, 1992.

2 These gases are carbon dioxide (CO_2), methane (CH_4), nitrogen dioxide (N20), hydrofluoric carbon (HFC), perfluorated carbon (PFC) and sulfur hexafluoride (SF_6). Reference year is 1990 for the first three gases and 1995 for the remaining three.

3 Section 25 states that the Treaty will be effective only when it has been ratified by at least 55 industrialized countries, representing not less than 55% of CO_2 emissions (according to 1990 data).

4 Not only might the incentive produced by the taxation system disappear due to this mechanism, but it could also have the opposite effect. In order to maintain total resources constant, the more virtuous the average behavior (reduction of emissions), the higher the ecological tax (t) will be.

5 With the passing of time, the resources of the GF could be invested in economic activities to sustain specific programs for pollution reduction, especially in the poorest countries. The reduction of pollution may also reduce poverty by creating virtuous circles (on hygiene conditions, territorial development, etc.).