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# *Some considerations on fairness and efficiency in environmentally related taxation*[1]

## Resumo

This paper argues that the adoption of coherent environmental tax instruments has been hindered by insufficient fairness consideration and an ambiguous theoretical underpin. Such incoherence has led to low environmental effectiveness and consequent public opposition. Next the critical analysis of a set of aspects as they have usually been approached in textbooks is provided. After considering the rationale underpinning environmental taxation, it is argued that, in some cases, if equity concerns are brought together with efficiency ones, the decision-making process might lead to options different from the ones commonly suggested by the literature, namely in the following domains, in the decision about who is the polluter and where the responsibility cut should be drawn, as well as in possible uses for tax revenues, the admissibility of special regimes (exemptions and restrictions to tax liability) and the acceptability of subsidies*.

*"[T]he conviction that the economy must be autonomous, that it must be shielded from "influences" of a moral character, has led man to abuse the economic process in a thoroughly destructive way. In the long term, these convictions have led to economic, social and political systems that trample upon personal and social freedom, and are therefore unable to deliver the justice that they promise. As I said in my Encyclical Letter Spe Salvi, history is thereby deprived of Christian hope, deprived of a powerful social resource at the service of integral human development, sought in freedom and in justice."*

Encyclical Letter Caritas in Veritate, Supreme Pontiff Benedict XVI, 29 June 2009, 34

In spite of being theoretically praised and empirically effective in several occasions, since the middle of the 1990s environmentally related taxation has been facing increasing opposition from the citizens. At times this has hampered the political feasibility of environmentally related tax reforms all together. The popularity of any public measure is utterly relevant in its adoption and maintenance. Polls show environmentally related taxes tend to be perceived mainly as sources of public revenues (PETRAS Project, 2002). Therefore, citizens often demand their revenues are earmarked for environmental purposes, since this is the only opportunity for environmental improvement they perceive as being associated to these taxes. But earmarking raises issues of efficiency (Soares, 2011). Improved theoretical coherence and fairness considerations in the design, adoption and implementation of these taxes might be a better way to underpin their political feasibility.

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* Com este trabalho gostaria de prestar uma homenagem ao meu Mestre, Senhor Professor J. J. Gomes Canotilho, expressando-lhe a minha gratidão por tudo o que me ensinou.

Environmentally related taxes aimed at pollution abatement are mainly adopted for efficiency reasons. However, they produce redistribution and today they tend to be perceived by the citizens as Ramsey taxes. So being, fairness considerations should be cornerstones in their adoption and application, since their efficacy and feasibility depend on such considerations. Citizens tend to oppose fiercely taxes that they perceive as unfair. And politicians might jeopardise the incentive effect of the tax whilst designing it or using its revenues to promote the acceptability of the tax measures. Furthermore, sometimes these taxes produce large redistributions. So being, and because of their widespread use, it is important to assess whether environmentally related taxes are fair.

Fairness considerations might be, together with self-interest, the most important considerations that influence public support for a tax scheme (Kalbekken, 2008). Even if Pigouvian taxes have been proposed based on efficiency grounds, their fairness must be assessed. In order to do it, it is necessary to choose a theory of justice that provides us a concept of equality to be used as reference as far as environmentally related taxes are concerned. Liberal egalitarianism is among the several possible ways available. 'Redistributive justice', 'distributive justice' and 'corrective justice' comprised in the concept of justice can inform further a decisional process fairness-concerned.

Liberal egalitarianism accepts unequal treatment as far as this is explained by discretionary variables, i.e., factors that are under individual control. Inequalities due to exogenous variables, i.e., factors that are outside the individual control must be eliminated as far as possible. The variant of Liberal egalitarian theories able to be applied to environmentally related taxation is the Accountability Principle that Konow (1996) defines as: "The entitlement varies in direct proportion to the value of the subject's relevant discretionary variables, ignoring other variables, but does not hold a subject accountable for differences in the values of exogenous variables".

Applying the Accountability Principle lead us to accept inequalities proportional to the discretionary input and, as far as environmentally related taxation is concerned, to make polluters pay compensations in proportion to their discretionary input to creating the externality. This rule is relevant both for how the tax is levied and for the use of its revenues. According to the textbook, Pigouvian taxpayers should pay abatement costs plus a tax on all remaining emissions. So being, Pigouvian taxes impose on the polluter an unfair burden according to the Accountability Principle. However, the guidelines provided by the Polluter Pays Principle (hereafter also PPP) lead to a different calculus of the tax payment.

Applying Pigouvian taxes aimed at pollution abatement is firstly a matter of efficiency rather than fairness. Still, the redistribution operated by these taxes can threaten both the policy feasibility, since people will oppose taxes that they perceive as unfair, and the incentive effect, if revenues are wrongly used to boast the popularity of the measure. Regarding consumers, one can differentiate between subsistence emissions and luxury emissions. This division entails necessarily a political and cultural decision (Kalbekken, 2008). As far as producers are concerned, alternative technologies (including BATNEC[2]) and processes should be considered.

Once we have set who is responsible for the pollution we should identify the responsibility cut. This should be set taking into consideration the variables that are under the discretionary control of the polluter and should lead towards the tax rate. If the social optimum is beyond the responsibility cut of the polluter, though the tax should be set in order to reach the social optimum, the polluter should pay less than such amount. The polluter should pay in direct proportion to his/her responsibility, i.e., the individual degree of control over the level of emissions.

2 Best available technology not entailing excessive costs.

His/her payment above such threshold should be subsidised or reimbursed (ibidem). Such cost should be borne by the society as a whole rather than the polluter. The specificity of the threshold influences the tax fairness but it is also conditioned by practicability considerations.

To deal with the fairness issue Kalbekken (2008) suggests three possible ways, namely a Pigouvian threshold tax, a Pigouvian tax with earmarking of (some of) the revenues or an emissions trading scheme with some grandfathering of permits. If a tax due to fairness considerations ends up being inefficient, due to tax exemptions and reductions or the way its revenues are used or despite all the efforts taken in its design and implementation, it might be better not to adopt the tax at all since there are better means to operate redistribution than Pigouvian taxes.

All these considerations should be relevant in the instrument design, adoption and implementation. However, not only textbooks often do not take them into consideration when elaborating on environmentally related taxation but also the main theories underpinning environmentally related taxation lead to incoherent or insufficient guidelines in such decision-making processes. In the following sections, the literature is critically analysed in order to assess contradictions and lacunae and to provide some guidance on the fair use of environmentally related taxes. Regarding the fairness analysis, this is however a very brief approach on environmentally related taxes from an intragenerational perspective with focus on some relevant issues rather than an intensive research on how fairness can inform the decision making process on the adoption and design of these instruments. The intergenerational perspective, though a *conditio sine qua non* for sustainable development, is left out of this analysis.

## 1. Theoretical incompletness

It is necessary to clarify the most adequate design for an 'environmental tax'. Answers provided to referential questions by main theories supporting the use of pollution taxes should be scrutinized with such objective. The rationale supporting an environmental tax intervention shall be a general guiding line for its design. Moreover, by answering to 'who is the polluter?' and 'what shall (s)he pay for?' information is provided on the choice of the taxpayer and the tax rate. Further relevant aspects are the use given to tax revenues and whether more favourable tax regimes and subsidies shall be accepted.

As questions posed get more detailed, answers provided also become more scant. But even at the general level of policy objectives there is some vagueness. Various environmental objectives can be accommodated by economic theories, being options left partially open to the policymaker. For instance, whilst the Pigouvian theory aims at the internalization of external costs setting pollution tax payments according to this rule, the Polluter Pays Principle refers tax payments to precise environmental objective.

Some literature does not understand the lack of a specific environmental objective to be an impediment for taxes to reach efficient pollution abatement (*e.g.*, Hahn, 1989: 13-14, Hahn and Stavins, 1991: 8). However, the application of a theory which does not set explicit environmental objectives to their achievement might create problems. Moreover, Sagoff (1981: 1396) affirms it is doomed to fail the application of an economic theory aimed at economic efficiency as a base of environmental law.

Environmental protection involves a choice about the sort of nature we want (Jacobs, 1991: 63). Thus, an option about the object of protection takes precedence over the choice of the instrument to carry on such protection. Tax instruments are not adequate to protect every kind of environmental element. Environmental taxes work within the realms of a cost-benefit approach, which is unable to embrace all environmental values. Likewise, the

impact of environmental disruption on future generations and other living beings, as well as the decisions about who should own a property right over the environment and whether environmental costs should be measured by individual's willingness to pay cannot be dealt with via economic analysis.

The theoretical framework supporting environmental taxation is therefore incomplete. Moreover, despite having a strong economic component, such framework is characterised by multifariousness with theories, which though not being necessarily mutually exclusive, express different concerns. The Polluter Pays Principle shall be an especially recurrent object of the analysis performed next, since it is the most minute and frequently used theoretical underpin for the referred regulatory intervention, as well as the most environmentally-aimed one.

**The sketchy and patchy Polluter Pays Principle**

Despite its enunciation based on an economic rationale, the Polluter Pays Principle was from the outset envisaged as a broad and vague principle, which could not supply guidance on the content of national or international environmental law without further definition (Nash, 2000: 472, Birnie and Boyle, 2002: 95). The OECD (1975b: 25) defined it as a rule of economic, legal and political common sense. Among the aspects open to discussion was 'who is the polluter?', 'when is there an obligation to pay?', 'how should the polluter pay?', 'what should he pay for?', 'when can he be released from the obligation to pay?', being the debate mainly centred on the first and fourth question.

The referred institution, the literature and, in particular, the European Commission have endeavoured on a constructive interpretation of this principle. These results are relevant to assess whether a tax instrument is complying with the guidelines set by environmental policy, since the PPP is a milestone reference of the latter. But though the contours of the PPP have evolved over the years, they still remain amorphous and dissenting (Milne, 2003: 5, also Opschoor and Vos, 1989: 29-30, Määttä, 1997: 19-20).

Along the time the PPP was object of different readings, which resulted in diverse answers to the same question and frequent incoherent regulation. Actors cannot share principles and norms and know what they want and how they should achieve it when they follow the 'scripts' of world-views (Braun, 1999: 15) put out by the PPP. It might be questioned if this is not a result of the PPP serving conflicting purposes and being therefore unhelpful as a guide to action (Alder and Wilkinson, 1999: 187). Whilst the economic rational subjacent to the PPP aims to maximise well-being, its ethical rationale pursuits justice. Utilitarianism cannot work as a basis for ethics. Associated to such conflict must be an inevitable incoherency and diversity of tax instruments theoretically supported by the PPP.

The PPP lacks the degree of coherence with regard to its internal structure (last principles, values, norms, and especially goals and techniques to be used) required to turn it into a paradigm. A paradigm comprises beliefs, values and techniques shared by members of a scientific (or any other) community (Bernstein, 1976: 89), supplying coherence to problem perception as it 'interlocks' the different matters in a coherent way (Hall, 1992: 91, Braun, 1999: 15). It is therefore a construction able to "specify how the problems facing [decision-makers] are to be perceived, which goal must be attained through policy and what sorts of techniques can be used to reach those goals" (Hall, 1992: 91).

There are, however, some recurrent elements in the multiple enunciations of the principle. The polluter should pay in order to improve the environment. And more efficient use of natural resources should be stimulated through the allocation of external costs. One takes both these elements to define the essence of the principle as instrumental to efficient preventative environmental protection. However, real world instruments using the PPP as theoretical support do not always respect such core feature.

Efficiency resultant from underlining prevention is an advantage of the PPP over a mere civil liability regime. Moreover, increased efficiency and redistributive equity associated to the election of the 'polluter-pays' rule as criterion for cost allocation favour the PPP over fiscal instruments to deal with environmental problems. Therefore, whenever prevention and a reasonable degree of application of the 'polluter-pays' rule are absent from instruments theoretically supported by the PPP, some issues arise. First, the potential this principle entails as underpin of environmental policy instruments is wasted, and, second, its distinctiveness is missing.

## 2. The rationales

Apart from the economic rationale (internalisation of externalities), it is possible to find in the Polluter Pays Principle one other main rationale, the ethical rationale (fairness). Each of them shapes the principle's content and allows us to derive several consequences for the design of environmental taxes both on the 'pre-charge' phase and on the 'revenues use' phase, blending into what we call the normative rationale (principle of responsibility). The normative rational is a methodological construction that allows us to explore further the content of the PPP.

It can, however, be questioned whether the 'normative rationale' is in fact autonomous from the 'economic rationale' and the 'ethical rational' or it is only the result of their intersection. Alder and Wilkinson (1999: 171) identify in the PPP just two distinct rationales, one based on economic theory and another based on notions of justice. We do not build up an argument in favour of a third autonomous rationale, since we understand there are no innovative contributions associated to the latter, but rather a development of accumulated contributions from the other two rationales. This accumulation sometimes results in contradictory or unclear policy advices.

### 2.1. The economic rationale: to internalise externalities to provide efficient environmental protection

The economic rationale, premised on welfare maximisation, feeds the Pigouvian theory. It was historically the first version of the PPP and it is still its dominant interpretation. According to this rationale the PPP is presented as an economic principle based on the philosophy of utilitarianism (Alder and Wilkinson, 1999: 171), which aims to create a uniform and fair world trading system (Birnie and Boyle, 1992: 109) and can be found on the OECD 1972 recommendation. More than directly concerned with the environment, the PPP was thought as a means to allow national governments to develop environmental policies without causing market distortions.

Economics typically justify environmental taxes as a way to internalize negative externalities, and thus provide efficient environmental protection. Environmental resources are in general limited and their use in production and consumption activities may lead to their deterioration. Public measures are required when the cost of this deterioration is not adequately taken into account in the price system (externalities), *i.e.*, the market fails to reflect the scarcity of such resources both at national and international levels.

Under such rationale, external costs internalization is a means to attain economic efficiency, conditioning the decision-making process of economic agents, compelling a demand shift, followed by a production shift and technological development. Furthermore, environmental harm is a cost which requires internalization only as far as it is necessary to attain efficiency, since this rationale does not entail any moral judgement over the polluter's behaviour and takes as an exogenous variable the legal assignment of property rights or, in the absence of the former, the existing *de facto* power distribution over resources (Sousa Santos, 2002: 379-84, on forms of power).

This logic is similar to the one subjacent to the least cost abatement argument, the difference between the two theoretical justifications for the use of environmental taxes lays on the focus of the discourse. The least costs abatement argument explains such use based on the more efficient attainment of a specific environmental objective through taxes rather than other instruments. Under this argument the emphasis is put on the relevance of the efficiency criterion for the choice of environmental policy instruments. The economic rationale of the PPP, on the other hand, focuses on the efficient attainment of environmental improvements, being the latter a precise environmental objective or an overall betterment of environmental parameters.

The economic rationale requires environmental taxes to forefend economic agents from engaging in too much environmentally damaging activity due to lack of full cost consideration. It is assumed a close connection between the tax and the decisions having an impact on the environmental objective (Duff, 2003: 8). This logic is the reference point to set the amount of the tax. From an economic perspective and in the Pigouvian version, the tax should hence be levied at a rate equal to the marginal environmental cost caused by the activity (Pigou, 2002).

This theoretical model is, however, difficult to implement in practice due to incomplete information. To overcome this problem, some suggested an iterative process ('trial and error approach') attending to price elasticities, where the tax would be set at a certain level and then progressively adjusted according to the effects obtained until the desired pollution level was reached (Baumol and Oates, 1971: 43-46, 1982: 163-164).

Cost internalisation is a means and not an end in itself and the level of internalisation required to achieve efficiently specific environmental protection will often fall short of full cost internalisation. In many circumstances, in order to ensure that the environment is in an acceptable state, the reduction of pollution beyond a certain level will not be practical or even necessary in view of the costs involved (OECD, 1972). Though, both the economic version of the Polluter Pays Principle and the Pigouvian theory accept that any form of subsidisation runs against the logic of the economic rationale as it distorts price signals forefending an efficient resource allocation, the referred theoretical arguments differ in the level of cost internalisation they demand.

### 2.2. The ethical rationale: fairly allocate environmental control and remediation costs

The 'environmental justice' movement beliefs that the 'environment' is no more than a particular form of the goods and bads that society must divide among its members and that such distribution is done according to the 'ability to pay' (Dobson, 1998: 20). Therefore, in the absence of State intervention, those who can afford protection ('privileged') will reduce their vulnerability by insulating themselves from environmental problems, whilst the others ('poor and marginalised') will endure the harm and bear the brunt of pollution and resource degradation (Pulido, 1996: xv-xvi).

The PPP envisages a correction of the resource allocation performed by the market, which results in prevalence of the interests of the stronger over the weaker. To make the polluter pay will satisfy some notion of (environmental) justice. The PPP expresses the idea that in the absence of some legal intervention individual benefit maximisers, left to themselves, may not be sufficiently altruistic to avoid putting costs on to others (Alder and Wilkinson, 1999: 30). To analyse the PPP from an ethical perspective it is necessary to understand the concept of justice beyond the idea 'give to each individual his/her deserts'.

The concept of justice can comprise 'redistributive justice', 'distributive justice' and 'corrective justice'. Redistributive justice concerns the imposition of a proper punishment on one who has committed a wrong in order to exact some measure of societal redistribution aiming to redress economic inequalities. Taking the PPP as a measure of redistributive justice will

assign importance to fault[3] and this clashes with economic welfare (Alder and Wilkinson, 1999: 173). The high importance assigned by the principle to efficiency leads us to minimise this version of justice with reference to the PPP.

Distributive justice, on its turn, concerns the correct distribution of social goods and bads in the political community. And, unlike redistributive justice, it is more directly connected to the problem of social inequity than the imposition of blame or punishment. The PPP contains elements of distributive justice. It abstracts from fault whilst asserting that, between humans, resources used to compensate for environmental damage must be the polluter's own and not taken from the common stock or other person (Alder and Wilkinson, 1999: 173). It refers to the "morally proper apportionment of benefits and burdens among society's members" (Shrader-Frechette, 2002: 24).

Corrective justice, also known as 'restorative justice' or 'commutative justice', requires one who causes harm to make amends by 'correcting' (remedying) or 'equalising' (compensating) the harm done and the one who puts some good at risk to pay to avoid the materialisation of the harm. The PPP is not always able to deliver corrective justice, since it does not say anything about how the revenues from a pollution tax should be used. If the payment has a preventative impact, it is necessarily used to benefit the environment ('correction' is automatically achieved – Alder and Wilkinson, 1999: 174). Emphasising the preventative dimension of the PPP will bring forward its ethical rationale as corrective justice.

A pollution tax with a behavioural impact carries on corrective justice, whilst a tax with a mere fiscal result will only deliver corrective justice if its revenues are used to remedy or compensate environmental damage caused. Earmarking tax revenues to environmental programmes can conciliate a pollution tax unable to forefend pollution with the ethical rationale of the PPP. In the absence of earmarking, these taxes can perform distributive justice. This will be the case if they lay the pollution costs mainly on those who are most able to pay, namely economic agents who benefited from the environment.

The PPP expresses an option concerning the distribution of property rights over the environment. It assigns such right to the society ('asserting a common ownership of the resource', Hoerner, 1998: 9) and forces the polluter to compensate the latter for interfering with its right. Furthermore, as a legal rule this principle is informed by moral values, *i.e.,* according to it the ones causing environmental harm are ethically (and legally) obliged to remedy or compensate damages caused ('responsabilisation of the acting agent', Gaines, 1991: 485).

The emphasis is now on a curative responsibility lead by equity concerns, in contrast with the economic rationale strongly associated to a preventive responsibility and targeted at efficiency objectives. It is fair that those who create pollution, are able to control it or directly benefit from a polluting activity also bare the costs thereof rather than the victims of the pollution, the taxpayers or any other individuals randomly chosen. An idea of justice expressed in the old Roman rule *'ubi emolumentum, ibi onus'* or *'ubi commoda, ibi incommoda',* which also supports strict liability regimes (risk profit and risk of activity[4]).

[3] The extreme content of the ethical rationale is in the 'polluter-is-punished' version of the principle. Under a criminal law understanding, the principle means that the polluter is guilty and should therefore be punished (OECD, 1977: 22).
[4] There is an EU commitment on environmental strict liability in COM(2001) 264 final, 15.05.2001, article 3/8 of the Common position adopted by the Council on 17.09.2001 with a view to the adoption of a Decision of the European Parliament and of the Council laying down the Sixth Community Environment Action Programme, the Commission's Sustainable Development Strategy, COM(2002) 17 final, 19.02.2002, and COM(2004) 55 final, 26.01.2004.

This position was voiced, *e.g.,* by the European Commission (1999: 5). As a moral doctrine, the PPP pursues a fair distribution of the burdens of past and current pollution, being cost internalisation via pollution charges a means to achieve such goal and efficiency resulting thereof ancillary to the first mentioned main purpose (Hoerner, 1998: 9-11). This perspective expresses a social concern which contrasts with, but also complements, the liberal ideology behind the economic rationale. It aims at improving welfare with respect for social justice.

Barde and Gerelli (1975) opposed an ethical version of the PPP. In their opinion, this principle was void of any ethical consideration, not aiming at fulfilling justice but rather at achieving efficient environmental protection. The PPP would not be a principle of equity but only of economic effectiveness. These authors used such argument to minimise the problem raised by the economic shift of the pollution cost payment from polluters to other individuals. The transference of the financial burden away from the polluter does not ease the pressure for static and dynamic efficiency. But it can raise equity issues as the actual payer might not be the one causing pollution or the one able to forefend its occurrence.

Fairness might not require full internalisation of the external costs. Prices can be 'environmentally correct' without being 'environmentally corrected' in the Pigouvian perspective (Martinez-Alier, 1993: 105). In Duff's words, "[w]here environmental harms represent regrettable consequences of economic development (...), the polluter pays principle seems inappropriately individualistic" (Duff, 2003:16).

Cost benefit analysis tend to focus only on the regulated sector. This bares the costs of the regulation, however the benefits from environmental regulation spread around (Barnett, 1994: 225, mentions the example of the chemical industry). Economic agents are therefore forced to support higher costs than the ones they impose on the society as a whole (Gomes Canotilho, 1994: 401). Moreover, the economic system cannot function within an 'environmental purity' context. Sub-evaluation of the benefits following from polluting activities can also lead to inefficient investment decisions (Henshaw, Aalders and Molander, 1998: 40-41).

Another aspect to consider is the administrative cost of tax compliance. Only if this cost is supported by the tax administration the PPP legitimises a tax rate which goes over the external cost caused by polluting emissions (Polinsky and Shavell, 1982: 386). Moreover, emissions produced within the rim of the assimilative capacity of the environment do not cause external costs (Pezzey, 1988: 196-242, Hahn and Noll, 1990: 359, Hodge, 1995: 91).[5] Thus, a pollution tax charged per every single unit of emission produced might impose on the polluter a higher cost than the one (s)he generates for the society.

### 2.3. The normative rationale (principle of responsibility)

The normative rationale of the PPP shapes it as a principle of responsibility. As such it is a rule of conduct comprising a double role: on one hand it seeks remedy for the concrete case, on the other hand, it seeks general and individual prevention for the future. Therefore, it involves environmental damage prevention and remediation (Gaines, 1991: 485), being the latter risk-based rather than fault- or negligence-based (Butti, 1990: 414).

[5] Lindmark, 1994: 17, argued, however, that this is not necessarily true, rather environmental costs may exist even though the residual production is not exceeding the limits set by sustainable development within which the key concept of assimilative capacity of the environment is included. Imputed costs can exist and rise with increasing residual production, although the limit for sustainability is not exceeded, for two reasons. Costs may be rising when the residual production is approaching the limit for sustainability. The marginal unit of emissions would then represent a cost and the residuals up to this marginal emission could be given an imputed cost which rises when the marginal waste production is approached. Furthermore, imputed costs can exist within the limits of residual production since whenever the residual produced is causing an external effect it also represents a cost. The existence of an externality requires a direct effect on peoples' production or consumption through other ways than market prices.

This is a more recent dimension of the principle which adds on to the original economic one assigning it new dimensions. Concerns over an effective public intervention have hindered the equivalence of the PPP to a mere principle of civil liability (*e.g.,* R. Stewart, 1981: 1337, Leite de Campos, 1982: 721, G. Martin, 1989: 83-86, Menezes Cordeiro, 1994: 388-390, Gomes Canotilho, 1995: 25). Identifying the responsible for the pollution is not the core issue of environmental policy, since public authorities should be left free to choose the most effective level of intervention (Barde and Gerelli, 1975: 142, Krämer, 1992: 257). The normative rationale is inseparable from the substance of the PPP, but does not exhaust it (as defended by Duren, 1988: 146). Therefore, it is problematic the qualification of the PPP as an instrument of civil liability (Meli, 1989: 221).

This rationale, like the economic rationale, requires market price corrections to condition individuals' behaviours. Though, the focus now is more on compensating present damages and avoiding future damages, with a concern on both equity and efficiency. Rather than a strict and exclusive emphasis on any of the latter, this dimension of the PPP combines, and is informed, by both of them. This rationale does not require the desired level of pollution to be set only based on economic variables but rather on a broader spectrum of variables.

Likewise the ethical rationale, the normative rationale takes a moral perspective, assuming the 'common resource' nature of the environment and environmental harms as regrettable and avoidable consequences of economic development. Thus, under this rationale environmental harm is not a mere cost but an injury which requires compensation and avoidance. And environmental taxes pursue the above-mentioned objectives operating income redistribution, conveying information ('soft signals' – EEA, 2000a: 9) and providing price signals which foster a change in attitudes.

The normative rationale of the PPP is expressed in the civil law regime of liability for environmental damages (Giampietro, 1988: 332, Duren, 1988: 144, Remond-Gouilloud, 1994: 209, who understands the PPP as a development of the civil liability regime when applied to risk creating activities). But the normative rationale projects its influence also over economic instruments.

Though, subsidising the polluter contradicts the PPP as a principle of responsibility, this perspective is not an obstacle to earmarking, since damage remediation and prevention might be better served when environmental tax revenues are dedicated to special funds. Duff (2003: 13) justifies the agreement of the PPP with earmarking based on the understanding of environmental taxes as "fees for the use of a common resource". However, the moral judgment involved in the PPP embeds it with a normative value, which hinders a 'trade-off' logic. Also under the economic rationale earmarking is traditionally opposed based on efficiency grounds. Hoerner's explanation ("earmarking can ensure that taxation is proportional to or sufficient to remedy, harm caused to the public", Hoerner, 1998: 10) is helpful in justifying earmarking. But whenever possible the tax level should be fine-tuned at a previous stage, *i.e.,* when the tax rate and other elements influencing the amount of tax paid are designed.

### 3. 'Who is the polluter?'

Point 3 of the European Council Recommendation 75/436/Euratom defined 'polluter' based on an economic rationale. The definition was built on two criteria: economic and administrative efficiency and ability to internalise the costs. Therefore, the 'polluter' was the person who directly or indirectly damaged the environment or created the conditions leading to such damage. In a pollution chain, the 'polluter' should be the 'best-payer', *i.e.,* the point of the pollution chain easier to control and where there is lower resistance to the charge, the pollution control is more effective and market distortions are easier to avoid.

Identifying the polluter with the 'best-payer' can not lead to making the ones who should pay for pollution in fact pay for it. The referred conditions are better fulfilled when the regulator acts over a restrict number of 'polluters' who are in a privileged condition to avoid environ-

mental damage. This pragmatic approach might not be fair. For instance, big polluters can be totally or partially exempted from paying the costs they cause merely due to administrative difficulties in charging them or their strong resistance power.

The PPP does not intend to punish ('backward looking') but rather to avoid future pollution ('forward looking') (Aragão, 1997: 137, 142). Therefore, the amount paid by the polluter should be set with reference to prevention requirements rather than to the environmental damage caused. Moreover, a definition of 'polluter' which serves the preventative concern embedded in the PPP identifies the polluter with the one who has power over conditions creating pollution. The entity creating and controlling the cause *sine qua non* of the pollution is the only one able to forefend it. Therefore, a behavioural stimulus will only be effective if directed at such entity.

To lay the biggest burden of energy taxation on households and subsidise industrial energy consumption is an example of what it was just said. In spite of not qualifying as the best able to avoid pollution, households tend to pay the lion share of environmental costs caused by energy production and consumption which are allocated through the tax system with environmentally related taxes. Taking the Commissions' definition of 'polluter' as the 'best-payer' will lead to a regulatory intervention which falls short of the PPP. Internalisation will not be done in the best possible way to prevent pollution and not all external costs allocated will lay on their causer.

A non-earmarked energy tax mainly raised on households based on their consumption of electricity obtained from traditional fuels, which is unable to prevent environmental damage because it does not affect the decision-making process of the energy producers and providers neither is high enough to reduce final energy consumption can hardly be theoretically justified by the PPP.

On one hand, cost allocation will not maximise welfare due to insufficient levels of internalisation. Environmental protection will not be performed efficiently because the cost of environmental deterioration will keep on not being adequately taken into account in the price system. The choice done regarding the tax level and the taxpayer will keep the tax instrument from helping the market to reflect the excess of polluting air emissions.

Furthermore, such a tax design is not in agreement with the ethical rationale of the PPP, since the ones causing the harm are not correcting or equalising it and the polluters most able to pay (*i.e.,* the industry) will not pay. Moreover, resources from the common stock will be required to pay for part of the harm caused. Finally, no punishment will be inflicted, first because a tax is not a criminal penalty and, second, because the low levels charged inhibit any kind of economic penalisation for the taxpayer. The tax instrument will not comply with the core of the PPP theory, since its design does not reflect the economic rationale or the ethical rationale of the principle.

Multiple reasons might explain a partial deviation of the financial burden away from the polluter (cross-subsidisation). Environmental costs might not be completely imposed on the polluter for instance due to competitiveness issues and income distribution concerns. This might be justifiable as long as the motives evoked are real and relevant. Though, protection of other interests will be done at the cost of a reduction in environmental effectiveness. In any case, shifting such costs to a non-polluter tends to breach the PPP and should not be accepted unless in exceptional cases.

### 4. 'What shall the polluter pay for?'

The reason explaining the importance assigned to cost allocation varies depending "upon the point in time in the evolution of the principle, the institution espousing the principle, the words one chooses to emphasize in any given formulation of the principle and the legal instrument being used to execute the principle" (Milne, 2003: 5). It is, however, possible to identify cost allocation as the hard core of the Polluter Pays Principle, creating an economic incentive to consider economic consequences.

Furthermore, in all the three referred rationalities informing the PPP it is possible to find two basic characteristics. First, cost internalisation is a means and not an end in itself. The PPP aims at conditioning individuals' behaviour both by economic and moral reasons, setting a rule about how environmental costs should be allocated in order to attain efficiency in agreement with a particular conception of fairness (*'ubi commoda, ibi incommoda'*).

The main purpose of environmental taxes is, thus, not to internalize costs or assign blame for environmental harms, but to foster environmental protection via increased awareness and shared responsibility (Duff, 2003: 7). From an international perspective, trade distortion avoidance is also a relevant motivation supporting cost allocation. Second, full cost internalisation might not be necessary to achieve the goal pursued by the PPP in any of its dimensions.

Complexity involved in the answer to 'what shall the polluter pay for?' increases with the rigour of the compliance with the PPP and depends on how the latter is understood. There seems to be an agreement over the inclusion of costs of measures to reduce (OECD, 1989: 27), prevent and control pollution (OECD, 2001f: 16), as well as costs of environmental cleanup and associated monitoring and compliance costs. But this agreement does not provide a full answer to the question above.

A tax instrument which is merely aimed at internalising a certain (partial) amount of external costs is easier to design than one directed at preventing pollution. And the latter involves fewer difficulties than another intended at reaching a precise environmental goal. Simplification is more compatible with a revenue raising tax than with an incentive tax. These facts and the lack of precise and uniform guiding rules concerning this aspect contribute to the absence of an 'environmental tax' model.

Furthermore, defining what the polluter shall pay for raises a myriad of subsidiary questions. According to the PPP, cost allocation should be a means (instrumental to the attainment of more sustainable behaviour) rather than an end in itself, because the PPP is not a mere reflection of the Pigouvian proposal to internalise external costs but rather a more complex construction with inputs from other concerns. Therefore, the objective pursued by the environmental tax can range from a broader economic approach that aims at the maximisation of social welfare to a strict environmental concern directed at the achievement of a precise environmental objective.

### 4.1. Policy objective aimed versus criteria used to set the tax rate

The amount imposed on the polluter might be set with reference to a precise regulatory function, consisting on damage prevention, remedying or compensation. Of these three functions, the PPP seems to prioritise prevention. Using cost internalisation to fulfil a precise regulatory objective will tend to divert the amount paid by the polluter from a single-criterion calculated sum. In alternative to a regulatory function the polluter's payment might be defined in order to reach a substantive policy objective. The 1972 OECD Recommendation supports an understanding of the PPP as imposing on the polluter the costs of achieving a specific environmental goal. This is not necessarily the same as imposing on the polluter the costs of preventing, controlling and remedying pollution.

The variety of possible criteria to set the amount to be paid by the polluter causes the emergence in real world of diverse instruments not all of them compatible with the PPP. This compatibility requires that there is at least a connection between the payment and the amount of pollution (Commission's communication annexed to Recommendation 75/436, point 4.b).

It might be necessary to raise a tax higher than prevention/control/remedy costs to attain the desired environmental quality, as well as it might be enough to set a tax rate lower than the referred costs. The explanation for this fact lays, for instance, in the interaction between the tax and other pre-existent regulatory instruments (Smith, 1999: 509-511). In any case the

tax will not violate the PPP as long as the tax itself is "the means of achieving the specific goal with the guarantee that the polluters are paying the cost of meeting that goal, even though the cost of meeting the goal may be higher than the actual marginal prevention and control costs assumed by those who do not pay the tax" (Milne, 2003: 16).

The PPP might require the payment of the costs of pollution damage if it is linked to a broader economic theory of environmental protection, such as the Pigouvian one, in which the internalisation of costs is viewed as a technique for maximisation of social welfare. And the latter, from an economic perspective, does not require zero pollution but rather the equalization at the margin of social benefits and social costs. Therefore, for economists the ideal level of pollution is not zero but the one maximising social benefits. This requires economic agents to decide on their pollution level taking into consideration not only prevention and control costs but also the costs of the damages following from pollution.

The touchstone is that a pollution tax rate must be explained by the attainment of a specific environmental goal in order to be an environmental policy instrument (the tax purpose test). And this is true either the tax rate reflects the pollution costs or not, though there will be a heavier burden of proof when a correspondence is absent. In any case the choice of the precise environmental goal to pursue or costs to allocate within the possible spectrum has to be a political one, since also for this aspect there is not a single answer from the Polluter Pays Principle.

The choice of a specific environmental objective can lead to different tax rates. Two different tax rates will arise depending on whether the tax is keyed to achieve a precise environmental quality standard at the individual economic agent level or at the aggregate level of the whole industry. Furthermore, a tax rate able to allocate prevention costs might not be proper to allocate control costs or restoration costs and vice-versa.

Prevention requirements included in the PPP argue in the direction that the polluter should pay according to what is required to avoid pollution and not necessarily only with reference to the amount of damage caused. Those requirements are directly influenced by the characteristics of the pollution and the cost incurred to avoid it. Among the aspects to consider are the probability of occurrence and potential amount of environmental damage resulting from certain behaviour, as well as the degree of harmfulness associated to it. Furthermore, the higher the profits from the environmentally harmful activity are, the higher the tax levels must be to be effective, since profits affect the polluter's choice between 'polluting and paying the tax' and 'controlling emissions and paying for environmental measures'.

### 4.2. Categories of costs

The costs the polluter might be forced to pay for according to the PPP can be broken down into several categories. Concerning the kind of costs involved, these can be costs of pollution control, prevention and restoration, as well as the associated administrative costs and the costs of residual emissions.

Taking as criterion the amount of costs covered, three main categories are possible: 1) the costs of pollution control and prevention, either a) the costs of pollution control and prevention at individual facilities, or b) the costs of collective measures on behalf of a whole group of polluters, 2) the costs of pollution control, prevention and restoration of damages not prevented, and 3) all of the costs just mentioned plus the costs of any residual damage resulting from less-than-full prevention and control. In all mentioned hypothesis, the associated administrative costs are included as well. The PPP also seeks to apportion administrative and other ancillary expenses of a public environmental protection system, to the extent that such costs can be linked to pollution control and preventative measures (Council Recommendation 75/436, 3, OECD, 1975a: 25).

Furthermore, the kind of costs allocated to polluters, as well as the instruments used to perform such allocation, is influenced by the debate on the identification of the individuals to which the costs might otherwise be allocated, *i.e.,* 'the polluter should pay instead of whom?'. The answer to this question depends on whether the costs are being shifted from the government or the society as a whole (Milne, 2003: 8-9). On the first hypothesis, and going from the narrowest to the broadest version, polluter payments can replace a) direct governmental subsidies to polluters or b) public expenditure expressed in environmental actions taken by public authorities at taxpayers' expenses.

If polluters should pay instead of the government, they can only be imposed pollution prevention, control, and reparation costs, and this cost allocation requires the previous existence of a legal duty to take pollution preventative or remedial action. On the second hypothesis, polluter payments substitute implicit societal subsidies arising from individual use of the environment. Under this approach polluters can also be forced to take the costs of residual emissions, as well as the costs of levelling the playing field for environmentally friendly products, either by means of economic instruments or, *e.g.,* regulatory requirements and liability regimes.

Under the narrowest version of the first hypothesis, the PPP does not require the use of environmental taxes. The idea is to make the polluter pay instead of subsidising him/her, thus the PPP will not require environmental taxes but withdrawal or forbearance of direct governmental payments. Under the broadest version of the first hypothesis, the PPP can be satisfied via tax instruments comprising either a fiscal effect or a behavioural effect.

A fiscal tax can implement the PPP as a revenue recycling mechanism, compensating for public expenditure caused by the polluter. For instance, due to technical reasons, it can be more efficient to develop a publicly financed multi-municipal system of wastewater treatment instead of imposing that each company invests in an individual cleansing system. In such context a tax can be used to apply the PPP if it is raised on the polluters according to the costs they cause and earmarked to finance the public system.

On the other hand, both when polluters pay instead of the society and when they pay to avoid the adoption of governmental environmental programmes, the PPP can be fulfilled by tax instruments that work as instruments of environmental improvement. Here the polluter can pay for pollution either by paying the tax or the cost of avoiding the tax. The amount of the tax levied on the polluter will, however, vary depending on the response to the question 'the polluter should pay instead of whom?'. If the polluter pays instead of the society as a whole, there will be a greater amount of costs the tax can account for than when the polluter is only allocated possible governmental costs.

### 4.3. Contrasting the Polluter Pays Principle with the Pigouvian theory

Also concerning the costs to be covered we can contrast the Polluter Pays Principle with the Pigouvian theory, though both enquire who should pay for pollution. The referred principle comprises two (three, if the normative rational is considered a rationale in itself) different rationalities. But even if analysed in its economic rationale, the economic concerns found within the principle might not be the same as the ones voiced by the theory of internalization of external costs (Pigouvian theory). Therefore, payments required also lack such coincidence. Only the broadest version of the PPP, *i.e.,* the one requiring the polluter to pay instead of the society as a whole allows full internalisation of pollution costs, whilst the Pigouvian theory always requires full internalisation.

The difference is explained by the distinct rationale underpinning each of the theories even if we take as reference point the economic rationale in the PPP. The Pigouvian theory aims at maximizing total welfare, hence demanding an accurate allocation of external costs. This is a difficult task to fulfil in real world. Influenced by neoclassical economics, the Pigouvian

theory does not consider the institutional context. Its simplified approach to reality makes it mainly theoretical, making difficult its application.

The PPP, on the other hand, takes on board contributions from different fields of knowledge, which feed into the objective pursued. Unlike the Pigouvian theory, the PPP does not assign a single and clear content to environmental taxes. It is, however, possible to identify two fundamental concerns common to all several dimensions of the principle: preventing trade distortions and promoting efficiency. These objectives can be pursued without rigorous internalization of the externalities.

Price correction can be implemented via differentiated taxation according to the environmental performance of products, as well as the simultaneous use of several other economic instruments. The latter can take not only a tax form but also other forms. Thus, the PPP does not require full internalisation but market price correction, which is a more feasible approach than the one proposed by the Pigouvian theory.

These concerns are voiced by the European Commission in the following terms: "(...) it will neither be straightforward to identify the true external costs of products and their inputs nor always easy to design broadly accepted policy options to implement the polluter pays principle. Therefore, it will be necessary to make simplifications in order to achieve the broader goal of effective and simple measures to correct market failures that can also be administrated. (...) Care must be taken that such measures properly reflect differences in external costs linked to products and that they do not lead to artificial pricing structures that might hamper competition within the Internal Market." – COM (2001) 68 final, p. 11.

### 4.4. Tax payment versus behavioural change

The environmental effect of a tax raised on a polluting base depends on the fulfilment of certain characteristics (EEA, 1996: 17, 28), which are not always found in real taxes for a variety of reasons. Taxes levied on non-polluting bases that observe certain conditions can have a positive environmental impact. Among these conditions are, *e.g.,* the existence of substitutes for the polluting good or behaviour (elastic demand), the clear link between the tax and the environmental problem as far as the taxpayer is concerned, as well as a tax rate high enough to make pollution more expensive than its avoidance. Thus, the two concepts, 'environmentally related tax' and 'environmental tax', do not completely overlap.

It is not enough to implement a tax shift from environmental goods into environmental harms to have a behavioural change and consequently an environmental improvement. Other factors influence the occurrence of such change. For instance, if notwithstanding the tax shift the disposable income is not reduced, the level of consumption will tend to not be reduced as well. Furthermore, if there are obstacles to a more friendly environmental behaviour, then the level of environmental harm attached to consumption will remain unchanged due to unbothered habits.

This might be the case, *e.g.,* when no information is provided to consumers on the environmental impact of the several options offered in the market. The same behavioural persistence might occur when the market fails to pass the price signal given by the tax to the agent able to modify the *status quo* in terms of environmental protection. If both referred conditions ('no income reduction' and 'no change on the pattern of behaviour') simultaneously hold, environmental damage will not be reduced. On the other hand, if there are other instruments in place providing extra stimulus for behavioural change, it might not be necessary for the tax to be levied on the amount of the marginal external costs, *i.e.,* full internalisation might induce excessive pollution control.

In spite of the pointed differences between the two theoretical substrata, i.e. the Pigouvian theory and the Polluter Pays Principle, both take cost internalisation as a means to attain

increased efficiency. Efficiency, expressed in welfare maximisation in the first case and less international trade distortions and better use of natural resources in the second, is expected as a result of behavioural changes induced by external costs allocation.

### 4.5. Expansion of costs covered

One shall now approach directly and historically-based the issue of 'what should the polluter pay for?'. Ruled by a trade rationale and an efficiency rationale, initially the OECD did not require the PPP to provide full internalisation, but the level of internalisation necessary to reach an "acceptable state" of the environment ("the reduction of pollution beyond a certain level will not be practical or even necessary in view of the costs" – points a.3. and 4 of Annex to OECD 1972 Recommendation). As a cost allocation principle and not a 'principle of compensation for damage' (OECD, 1975; this analysis was not officially adopted by the OECD – Milne, 2003: 16), the initial version of the PPP only covered the costs of pollution control and prevention.

Levelling the playing field via internalisation of externalities, which increases the competitiveness of green products, would be in agreement with the trade rationale, since externalities are implicit subsidies distorting national and international markets (Posner, 1971: 23, Pearson, 1994: 560, Templet, 1995: 142-143, Runge and Jones, 1996: 7-8, Barg, 1996: 28). Initially, the trade rationale used by the OECD to justify the use of environmental taxes was a narrow one. Along the time costs covered by the principle expanded, but costs of pollution control equipment or other preventative measures at individual facilities still lay at the very heart of the principle (OECD, 2002: 2, Bugge, 1996: 77). These are costs that, unanimously, the facility itself should bear, without direct or indirect subsidy of the public treasury.

EU regulation has endorsed the obligation of the polluter to pay also for preventative measures in the Directive on the transfrontier shipment of hazardous waste, Council Directive 84/631/EEC, 06.12.1984, (Kiss and Shelton, 2000: 267): "In accordance with the 'polluter pays' principle, the cost of implementing the notification and supervision procedure, including the necessary analyses and controls, shall be chargeable to the holder and/or the producer of the waste by the Member State concerned" (art. 10).

By 'the holder of the waste' it was meant the producer of the waste or any other person or undertaking who or which proposed to carry out or to have carried out a transfrontier shipment of waste (art. 2/1, d). Payment was required from holders of waste or waste generators for waste control costs. Thus, polluters and potential polluters were forced to pay for effective harm and for preventative measures to deal with the increased risk necessitating supervision and control of hazardous waste.

The European Community had adopted this same approach in 1975 (Council Recommendation 75/436, p. 2). By then the person responsible for the pollution was only required to pay the costs of measures necessary to eliminate or reduce pollution to comply with limits set directly (quality standards) or indirectly (imposed measures) by public authorities. This position was restated in 1987 by the Council whilst endorsing the development of environmental taxes as means to implement the PPP (European Council, 1987: 15).

The OECD in its 1975 recommendation did not consider full internalisation as inconsistent with the PPP and accepted the inclusion of restoration costs (Pearson, 1994: 556-557). This opened the way to an enlargement of the amount of costs public authorities might impose on polluters. Enlargement of which there are signs in the 1981 recommendation (OECD, OECD/GD(92)81, Foreword, paragraph 1.1(c)). The internalization of damages was suggested also in 1991 by the OECD (Recommendation of the Council on the Use of Economic Instruments in Environmental Policy).

The expansion undergone by the PPP has thus affected the costs the polluter should cover. Later inclusion of costs of restoration of environmental damage and costs of residual

emissions brought the PPP to a full cost internalisation principle (against a reading of the PPP according to full internalisation, see Rehbinder, 1993: 61 and Hoerner, 1998: 1203). This evolution might be connected to the emergence of diffuse pollution as a major environmental problem, since on its limited version the Polluter Pays Principle functions well as a remedy when actors are easily definable.

Signatories to the Rio Declaration on Environment and Development, adopted by the United Nations Conference on Environment and Development (14 June 1992), officially adopted the PPP in Principle 16. In this document it is possible to find the broader version of the PPP: "National authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment".

The use of the PPP in a discourse aimed not only at cost allocation but mainly at compensation for damage contributed to enlarge its content. At the European Union level, and within such compensation rationale, it is possible to find some documents embracing a broader version of the PPP than the one initially adopted. These documents are, in 1989, the Commission Proposal for a Council Directive on Civil Liability for Damage Caused by Waste (OJ n. C 251, p. 4), in 2000, the Opinion of the Economic and Social Committee on the White Paper on Environmental Liability (OJ n. C 268, p. 19) and the White Paper on Environmental Liability presented by the European Commission (COM(2000)66 final, pp. 13-14), and, in 2002, the Commission Proposal for a Directive of the European Parliament and of the Council on Environmental Liability with Regard to the Prevention and Restoration of Environmental Damage (COM(2002)17 final, pp. 3, 32, 34).

Both two latter documents, as well as the Commission's technical paper on the application of PPP from 6 December1999[6], imposed on the polluter restoration costs. The European Community has also used the broadest version of the PPP (*i.e.,* including costs of residual emissions and restoration) associated to environmental taxation in two other documents: the Communication from the Commission to the Council, European Parliament and Economic Social Committee: Tax Policy in the European Union – Priorities for the Years Ahead, COM(2001) 260 final, p. 14, and the Proposal for a Council Directive Amending Directive 92/81/EEC and Directive 92/82/EEC to Introduce Special Tax Arrangements for Diesel Fuel Used for Commercial Purpose and to Align the Excise Duties on Petrol and Diesel Fuel, OJ C 291, 2002, E221, E222, E227.

Summing up, in its most limited version, the PPP requires the government to restrain itself from financing legally compulsory environmental actions taken by the polluter. This 'minimum limit' can be found in the 2001 Guidelines on State Aid for Environmental Protection. Member-States are allowed to subsidise producers under certain conditions, but subsidies can never be granted to comply with legal obligations, being this reference point taken from the most demanding law applicable to the case, the national one or the Union one.

But along the time the European Commission has been embracing the broadest version of the principle concerning the costs the polluter should pay. On the Green Paper on Integrated Product Policy, COM(2001), 68 final, 07.02.2001, the Commission recognized that an integrated policy for products will probably need to be based on a mixture of the instruments, among them market price correction – "The most powerful instrument to transform the market in favour of more environmentally friendly products and services is to correct these market failures according to the polluter pays principle by ensuring that the true environmental

[6] European Commission, The New Programming Period 2000-2006, Technical Paper 1: Application of the Polluter Pays Principle, Differentiating the Rates of Community Assistance for Structural Funds, Cohesion Fund and ISPA Infrastructure Operation, 06.12.1999, p. 5.

cost during the life cycle of products is integrated into the product price. (...) The associated external costs shall be quantified as far as possible" (point 4.1.).

Both at the OECD and the European Communities level, there seems to be unanimity over the PPP lower limit and complacency with its upper limit. In spite of the vagueness experienced concerning the total amount of costs to be paid by the polluter, due to obstacles found in real world, it is possible to notice a progressive evolution towards the broadest version of the principle. The aspect of the PPP about which there is unanimity does not necessarily demand the use of environmental taxes. Thus, the response to 'what shall the polluter pay for?' has contributed to leave the discussion open on what is an environmental tax, due to the evolving nature of the issue.

The enlargement of the PPP, namely as far as the costs to be paid by the polluter are considered, made it more demanding (Bergkamp, 2001: 259). The financial burden put on the taxpayer has grown with the evolution of the principle into a full cost internalisation version, which brings it closer to the Pigouvian version. We link this enlargement to several factors.

The new challenges brought in by the relevance gained by some kinds of environmental problem (*v.g.*, diffuse pollution), as well as the growing public environmental awareness and consequent political power obtained by the environmental lobby contributed actively to shift the rights in favour of the society and away from the polluter. Furthermore, the rationale developed *supra* under the classification 'ethical rationale', which draws more on equity concerns than merely on economic ones, has also contributed to the enlargement of the principle.

**5. Revenue use**

Decisions about the use given to revenues from environmentally related taxes can help to place more emphasis on the preventive dimension of the PPP or on its remedying feature. The latter involves the costs of eliminating and/or compensating environmental damages, both costs directly incurred for such purpose and costs generated by the adoption of connected administrative measures.

Concerning the use of the revenues, there were different positions when the issue was discussed in the meeting of OECD Environment Ministers in 1974. Whilst the German delegation proposed earmarking (OECD, 1975a: 72-73), other participants understood the latter did not need to be associated to the PPP (OECD, 1975a: 80-81), reflecting the traditional resistance from economists to the use of such technique. The second position seems to have prevailed in the end, but the use of a 'principle of revenue recycling' as complementary to the PPP was already suggested (OECD, 1977: 52).

The European Council's 1975 Recommendation Regarding Cost Allocation accepts the use of the revenues from charges reflecting the PPP to finance collective measures taken by public authorities being the excess diverted to environmental projects. Though, since its foundation the PPP itself has continuously banned any use of the revenues to subsidise prevention and control measures imposed on the polluter (*inter alia,* OECD's 1972 Recommendation, European Council's 1975 Recommendation, European Commission's 2001 Guidelines on State Aids).

Furthermore, the European Commission tends to associate the use of pollution taxes to a tax neutral approach via the double dividend argument (*e.g.*, COM (2001) 260 final, p. 13). This position supports dissociation between the PPP and earmarking since the way proposed by the Commission depends on public authorities enjoying freedom concerning the use of tax revenues. Taking into consideration the positions voiced in some official meetings and reference documents and, on the other hand, a reading of the PPP based on its purpose, it is possible to conclude that there is a unidirectional rather than bidirectional relationship. Dedication of resources can be considered compatible with the PPP (Vos, 2002: 284), but the latter does not require earmarking.

If the pollution tax is aimed at internalising externalities, its objective will be fulfilled by setting the tax rate at the adequate level to reduce pollution in the desired amount and reach a better allocation of resources. In this case earmarking will not be required by the PPP, since or there are no external costs because the polluter is below the emission level chosen by the regulator or such costs exist and the payment of the tax is enough to accomplish their internalisation.

It is, however, possible to imagine an alternative situation where the society bears the cost of residual emissions (*i.e.,* emissions produced below the control level envisaged by the regulator), whilst the polluter does not pay the price that reflects those costs. Under such hypothesis earmarking will be required to correct the deficient design of the tax rather than by the content of the principle itself.

This logic is valid if cost internalisation is considered a means of compensating the society for the costs imposed on it by the polluter, according to an ethical rule which deems fair to impose the costs on those who cause them and benefit from them. But this same logic is also valid when cost internalisation is taken as a normative rule, being a principle of responsibility directed at the achievement of behavioural changes.

In both cases the mere payment of the tax should be enough to attain the desired result, being earmarking required only when the tax rate was not set at the necessary level to reach such result. The accomplishment of the objective pursued by the PPP is done by the imposition of the tax designed according to its requirements and not by the expenditure of the revenues raised.

Even when the PPP is understood as requiring the polluter to pay for restoration costs, earmarking does not seem to be a necessary development of such principle (with a different view, Milne, 2003: 21-22). By paying a tax set according to the PPP the polluter is compensating the society for the costs (s)he imposed on it. Individual compensation of the pollutees is not required since the PPP is not a principle of strict liability. A liability regime for environmental damages like a pollution tax has its roots in the principle of responsibility which finds in the PPP one of its expression. The two instruments are however distinct, comprising each one its own identity.

Thus, from the need to perform specific damage remedying which represents the purpose of the liability regime (COM (2000) 66 final, paragraph 2.1.) can not be derived a similar obligation under a pollution tax regime. Furthermore, there are no reasons inferred from the PPP itself compelling to the dedication of revenues raised to specific projects. Resources obtained with the pollution tax can be put to the general public budget, being left to the political decision-maker how they should be used. Their application in the compensation of the victims created by the taxed activity is just one of the possibilities available.

### 6. Exceptions and limits

It is acceptable to wave the application of the PPP under certain conditions. On one hand, socio-economic reasons might require exemptions to the PPP, on the other hand, the principle's rationales involve themselves limits. The European Council Recommendation 75/436, in articles 6 and 7, accepted this dichotomy. In any case, to make someone else but the polluter pay for pollution is the exception rather than the rule and therefore only admitted under very strict conditions (Gaines, 1991: 476). Analysis of real world environmentally related taxes shows, however, a different reality. Payment by non-polluters is frequent and not seldom a broad proportion of potential tax bases is covered by reduced tax rates and exemptions of the tax instrument.

Derogations to the principle are necessary to make compatible colliding public interests. In these cases there is a kind of immanent limit to the principle that allows pollution costs to lay on some other entity different from the polluter. Among the most common motives evoked to justify the limitation of the PPP are national competitiveness, employment, distribution impact and regional development. The first three arguments are recurrent in energy taxes around

the world to explain lower rates or tax exemptions to industry. The fourth is also common in countries with asymmetric regional development and strong energy needs, like, *e.g.,* Sweden.

Exceptions to the PPP occur when other public interests on a specific situation conflict with environmental interests and are more valued than the latter. Therefore, the social benefits obtained have to supersede the social costs involved. The 1975 European Council Recommendation accepted exceptions on two cases, when full application of the PPP could cause severe economic crisis and when the principle's contradiction resulted from indirect benefits from other common policies.

### 6.1. Exemptions and environmental effectiveness

Numerous exemptions and a complicate structure may reduce environmental effectiveness of pollution taxes (OECD, 2001g: 10, 51). Exemptions and rebates create inefficiencies in pollution abatement as they tend to 'lock in' polluting processes and thus perpetuate harmful effects on the economy and threaten the dynamic incentive associated to pollution taxes. The pattern of environmental improvement undertaken will tend to be inefficient as many low-cost improvement options available in the biggest polluting sectors (*e.g.,* energy intensive industry) will fall outside the scope of the tax.

Environmental interest groups might tend to perceive a low environmental effectiveness in proposals to tax polluting bases that embrace several exemptions and offer polluters excessive flexibility. Therefore, this kind of tax proposals may fail to capture enough support to get through the legislative process. This might help to explain, for instance, the weak enthusiasm shown by environmentalists towards the proposals made by the European Commission to introduce a carbon/energy tax along the 1990s (Jachtenfuchs, 1996, Schlegelmilch, 1999: 3-8, on the watering of the Commission's proposals).

Some studies mention a potential 20 pct increase in the cost of attaining a certain environmental goal when potential exemptions are considered (Böhringer and Rutherford, 1997). Under the assumption that carbon leakage rates are low, a $CO_2$ tax with exemptions was even classified as a 'blunt instrument' *(idem)*. Administrative costs associated to a complex system of tax rebates and refunds are also relevant. In the Danish case these were estimated around 1-2 pct of the tax revenue for $CO_2$ taxes levied on businesses (OECD, 2001g: 92). Moreover, exempted sectors will tend to attract capital investment with the consequent expansion of the polluting industry (Baumol and Oates, 1982: 207-229, Pearce and Turner, 1990: 107-109, Lewis, 1994: 35-37, Laffont, 1994: 39-66, Crocker, 1996: 61-86, Hanley, Shogren and White, 1997: 73-75).

### 6.2. Guidelines for especial regimes

Especially favourable regimes within pollution taxes might be a concession of justice to efficiency, which would not be accepted by Rawls (1990: 75, 181-186, 1999: 62). But this is all the more problematic since, as referred above, in many cases more favourable treatment is given to the largest polluters without any efficiency gains. So being, these tax measures not only raise efficiency concerns but also fairness-related ones (OECD, 2001g: 79). Furthermore, exemptions to pollution taxes undermine the application of the PPP. And the non-application of the PPP shall be designed as a preparatory way to reach its full application in the long-term and not as a permanent restriction to it.

Therefore, restrictions have not only to be justified by effective and relevant public interests, but also follow certain guidelines. They should be selective, transitory, applied within clearly defined periods and conditioned to the adoption of some kind of effort by the beneficiaries to comply with the principle ('efficient mitigation measures' – OECD, 2001g: 72).

Moreover, they should only partially cover the costs caused by the polluter (*i.e.,* tax reductions rather than tax exemptions) and not be successively prorogued. Furthermore, any limits to the PPP should be necessary, adequate and proportional to the interests on which they are based.

Apart from these general rules, others are set in OECD recommendation C(74)223 and Community guidelines. The EU framework is substantially more detailed than the OECD one. The EU legally binding framework has been directly influenced by the OECD *soft law*. It builds up on the general regime for state aids established by article 87 of the EC Treaty and has been developed on several documents, being the most relevant COM(97) 9 final, 26.03.1997, and 1994[7] 2001[8] and 2008[9] Community guidelines on State aid for environmental protection. The OECD and the European Commission, as well as the EC Treaty (art. 93), have set procedural rules to be followed when national governments depart from the PPP.

These documents emphasise the criteria to justify the non-application of the PPP already mentioned and some others, such as the importance of not causing trade distortions (environmental dumping) and being more rigorous with new firms. Public measures which alleviate the polluter's burden and do not comply with the requirements set for an immanent limit are in breach with the PPP. And a regulatory intervention which assigns especial treatment to certain polluters without respect for the referred guidelines contradicts the principle's rationales.

The introduction of environmentally related taxes is often made possible thanks to exemptions or mitigation measures provided to taxpayers who would otherwise support a heavy tax burden. Furthermore, to set the tax rates at levels which are high enough to be effective usually depends on whether especial treatment is given to the individuals most affected by the tax. This can happen due to political reasons ('potentially big taxpayers' have enough power to block or disturb the implementation of the tax), to equity reasons (the tax has a regressive impact on income) and/or economic reasons (important national economic sectors competing in the international market are badly hit by the tax). Exemptions and mitigation regimes are especially relevant within energy taxation due to the socio-economic impact of energy prices.

### 6.3. Especial regimes in energy taxes

In open sectors or economies the recommended strategy to deal with competitiveness impacts, *i.e.,* gradual implementation of energy taxes, creates in the economic agents an awareness regarding future cost-increase. Therefore, tax relieves granted to the industry have taken up a crucial position with respect to the mitigation of competitive disadvantages (Hoerner and Muller, 1997: 153, Määttä, 1997: 178). With a view to future tax burdens on energy consumption, industry is expected to adapt during a transitory period whilst it benefits from more favourable regimes.

Today a major environmental problem is global warming, which is associated to greenhouse gases, among which is carbon dioxide. Energy taxes are commonly referred by governments in their environmental programs as a means to address the problem of carbon emission. Carbon taxes usually take the form of taxes on the carbon content of fuels, intended to proxy for the carbon emissions which result from the combustion of such fuels.

The stable and close relationship between carbon content and eventual carbon emissions is in part explained by the lack of availability of end-of-pipe emission-cleaning solutions. However, considering the logical connection brought forward between carbon emissions and fuel taxes, we can conclude that levying a carbon tax on a non-fuel application stresses the fiscal nature of the tax and causes its departure from a normative carbon tax (Määttä, 1997: 301).

[7] OJ C 72, 10.03.1994.
[8] OJ C 37, 03.02.2001.
[9] OJ C 82, 01.4.2008.

Denmark and Sweden are among the few countries which have introduced carbon taxes.[10] Despite the high environmental awareness and concern experienced in these countries and the apparent adequacy of energy taxes raised on the carbon content of fuels to deal with carbon emissions, instruments found in these countries fell short of their full potential. The optimal tax design would be one where tax rates were defined separately for each fuel, in terms of fuel quantities, and relative tax levels on different fuels were set so as to equate the implicit rate of tax per unit of carbon across fuels (Smith, 1999: 507).

These characteristics were, however, absent from instruments observed. In Sweden the level of tax varied across types of energy users, despite the lack of relationship between this aspect and the damage caused by a unit of carbon. In this country lower tax rates applied to industrial energy users than to private households. Furthermore, tax exemptions were frequent. Several arguments were used to support the deviation from the ideal tax design. The compatibility of these arguments with the rationale of the theories underpinning pollution taxes needs to be addressed.

Exemptions are introduced with several concerns in mind, such as competitiveness and distribution impact of pollution tax, but they tend to reduce the environmental effectiveness of such taxes (OECD, 2003b: 21). Depending on what is considered the objective to be fulfilled by environmental taxes, the technique consisting on assigning exemptions to the individuals most strongly affected by the tax can be acceptable or not. If one aims at a betterment of the environmental performance, exemptions will be defensible as long as there is no space for improvement. Under such conditions, there will be a lawful motive to discriminate in favour of more unsustainable behaviours without breaching the equality principle neither the regulatory rationale.

According to some authors (*v.g.,* Klaus Bräunig, Federation of German Industry, in OECD, 2003b: 35), there is only an apparent contradiction between tax relieves granted to energy-intensive firms and the ability of the taxes to perform their intended controlling function, since taxes should be raised in accordance with consumption efficiency and not mere absolute values of consumption. The objective of achieving a sustainable climate policy would require companies to be penalised not for using energy but for "environmentally-harmful squandering" of energy resources.

Penalties are only worthwhile in cases where energy savings are possible or likely to be possible even after account has been taken of economically-acceptable marginal avoidance costs and prevailing conditions of competition. Otherwise, when savings are exhausted due to technological or economic limitations, following the argument, it is economically and environmentally pointless to levy energy taxes.

This approach underlines the relevance of the behavioural effect of the tax: "With the introduction of eco-taxes, energy intensive firms are therefore faced with a dilemma insofar as intelligent alternative course of action, which the taxes are supposed to encourage, are simply not open to them" (*ibidem,* 35). Against this argument it is, however, possible to argue that price signals are able to pressure for an expansion in technological limits, as the Japanese and German reactions to the oil crisis of the 1970s show. Bräunig (*ibidem,* 36) himself refers that the cement industry has successfully reduced its specific fuel requirements by more than 60 pct since 1950 due to the high costs associated with energy. Moreover, some studies indicate the number of patents for energy-efficient products increase with the level of energy prices (OECD, 2003b: 21).

[10] Norway, together with Finland, was among the first countries to introduce a carbon tax. In 1992, the Norwegian Green Tax Commission has expressly proposed that the tax should be differentiated according to the carbon content of various fuels in order to reflect the CO2 emissions from the various types of combustion. The Norwegian government failure to follow this advice took Määttä (1997: 289) to consider that the carbon tax in Norway constituted a clear tax departure from a normative carbon tax.

On the other hand, if policy emphasis is on internalisation of external costs, it might be difficult to explain the exemption of the biggest cost producers. A tax which design and motivation allow the conclusion that it is raised to internalise external costs caused by pollution cannot exempt the main polluters without infringing the equality principle. The same applies to a fiscal tax raised on a polluting tax base. It is, however, possible to accept such delimitation of the tax incidence based on the principle of proportionality. If full taxation involves more costs (*e.g.,* regressive impact, loss of competitiveness) than benefits (*e.g.,* higher environmental quality and equity) for the society, exemptions can be based on the principle of proportionality *lato sensu*.

### 7. Subsidies

Subsidies to polluters provide another example of how the rationales informing the Polluter Pays Principle can conflict. These instruments fulfil economic purposes similar to the ones obtained with pollution taxes. In the short term, the economic rationale of the PPP expressed in the maximisation of social welfare is compatible with the assignment of subsidies (Alder and Wilkinson, 1999: 184). From an economic perspective, the optimal level of pollution is not zero and subsidising the polluter can help the society reaching the point where social benefits equal social costs. However, in the long term, this might not be the case due to the expansion of the polluting industry induced by the attractiveness played by the subsidy.

Moreover, providing subsidies to polluters is an aspect where the economic rationale (welfare issues) conflicts with the ethic rational (issues of justice). The ones paying would not necessarily be the ones causing the harm or even those who are most able to pay, unless subsidies are fed with revenues obtained from the polluters themselves. Theoretically, this will be the case if subsidies are paid from a fund financed with contributions from polluters according to their polluting potential. These contributions can be voluntary or not but they cannot be paid for harms already caused otherwise the problem subsists, i.e. the ones who should pay for environmental damages will not pay. The lack of rigour in the calculus of the payment required from potential polluters can however raise an issue.

Lets analyse the example provided by the Swedish system to deal with $NO_x$ emissions. Polluters paid for the harm caused by emissions, or a proxy of it, through the tax and the investment done in pollution control measures. When they were returned part of the amount paid according to their level of pollution control, the amount they paid to remedy the harm caused by their $NO_x$ emissions was partially recovered. Even with revenue recycling within the same sector, the result was 'polluters only paid for part of the harm they caused with $NO_x$ emissions'. Corrective justice was thus not delivered, since corrective justice requires the ones who caused or might cause harm to correct that state of affairs by restitutional remedies or prevention.

The Swedish case performed well in environmental terms. Important environmental improvements have been accepted as following from the $NO_x$ tax. The economic rationale of the PPP also seems to have been fulfilled since environmental improvement was attained in an efficient way. But issues of justice can be raised as part of the harm was not supported by the causer but by others. This example shows how hard it is to comply all the way with the PPP. Even an instrument apparently very well designed to respond in a positive way simultaneously to several concerns (namely the PPP, environmental protection, competitiveness and respect for the market structure) as the Swedish $NO_x$ tax was is not able to pass the compliance test all the way through.

Furthermore, subsidies involve problems even among the several versions of justice the PPP comprises. Whilst corrective justice rules out subsidies because they reward rather than force polluters to remedy or compensate for the costs they cause, distributive justice might allow them. For instance, the latter might justify subsidies paid by developed countries to

developing states to enable the latter to comply with the Vienna Convention on Protection of the Ozone layer, since ozone-depleting substances (ODS) are a product of developed countries who also are the major beneficiaries of ODS technologies (Alder and Wilkinson, 1999: 215).

Furthermore, as far as the provision of environmental services is concerned, formally, full cost recovery is only required by the PPP under specific conditions. Costs of pollution control (relevant for the 'full cost recovery' or 'zero public subsidisation' of environmental projects' rule) are only equal to the charge for environmental damage on polluters (as required by the PPP) when marginal environmental benefits of additional pollution control are equal to marginal costs of providing the additional level of pollution control.

For instance, assuming that a specific standard delivers environmental benefits greater or equal to the costs of meeting the standard, the full cost recovery of meeting the standard represents a minimum estimate of the charge for environmental damage, which the polluter should pay, according to the PPP's version that argues 'the polluter should bear the costs of measures to reduce pollution decided upon by public authorities to ensure that the environment is in an acceptable state' (Commission, 2000b: 15).

Some subsidies are justified under an environmental justice argument and do not conflict with the PPP. Justice is usually served when the public pays for the benefits that it receives (Wenz, 1988: 334). Therefore, when an investment brings benefits both to the investor and the society, it is considered fair that the costs are shared between the two. Furthermore, efficiency is encouraged to its maximum level when society pays the full price of the benefits it receives (Wenz, 1988: 334).

Investment credits in energy-related improvements were already authorized under such logic. For instance, under the Carter administration, in 1980, the United States accepted this reasoning to authorize a tax credit of 40 pct of the cost of some solar energy-related home improvements. A study done by the Harvard Business School has, however, concluded that paying people for the full benefits to society of such investment would require a tax credit of around 60 pct (Barbour *et al,* 1982: 110-1).

**Concluding remarks**

It is argued the adoption of coherent environmental tax instruments has been hindered by insufficient fairness consideration and an ambiguous theoretical underpin. Such incoherence has led to low environmental effectiveness and consequent public opposition. This paper addresses critically a set of aspects as they have usually been approached in textbooks. After considering the rationale underpinning environmental taxation, it is argued that, in some cases, if equity concerns are brought together with efficiency ones, the decision-making process might lead to options different from the ones commonly suggested by the literature, namely in the following domains, in the decision about who is the polluter and where the responsibility cut should be drawn, as well as in possible uses for tax revenues, the admissibility of special regimes (exemptions and restrictions to tax liability) and the acceptability of subsidies.

A tax is effective when it reaches its goal. An 'environmental tax' is a regulatory instrument able to directly deliver positive environmental effects by the way it impacts on agents' behaviour. However, vagueness and incompleteness in its theoretical framework often does not allow a clear statement as far as its goal is concerned. Even the most developed theory used to support the employment of pollution charges within environmental policy, i.e., the Polluter Pays Principle, has been introduced in broad terms and involves potentially conflicting rationales and ambiguity (Sadeleer, 2002:59).

The literature is ambiguous about the aim pursued by 'environmental taxes' and institutional practices often develop into real world tax instruments with an incoherent design.

Moreover, they conflict with possible ethical references, such as the Accountability Principle drawn from Liberal egalitarianism and the concepts of 'redistributive justice', 'distributive justice' and 'corrective justice' comprised in the concept of justice. This *status quo* evidences the importance of having a theoretical support sufficiently clear and detailed to provide the regulator with consistent guidelines. In the absence of the latter several issues emerge. Terminological inaccuracy, which is inevitably associated with a frail theoretical background, is expected to ignite a relevant set of problems in terms of legitimacy and effectiveness.

Following from this theoretical incoherence, environmental ineffectiveness and equity issues have led to public resistance to environmentally related taxes. To address the increasing public opposition to their adoption politicians have diverted their design and application from the theoretical model. This, though promoting their feasibility in the short and medium term, has further hampered their effectiveness. Such move might undermine the use of these instruments in the long run.

At times, earmarking of environmentally related taxes revenues to environmental goals has been proposed to overcome such lack of trust. However, this might not be sufficient or be even wrong in many cases. The way might rather be theoretical clarification with further focus on fairness considerations. Though these taxes have been defended in the literature based on efficiency concerns, fairness considerations should cross any design and implementation decision as far as these instruments are concerned for moral reasons. They might also be helpful in dealing with the decreasing popularity these taxes have been experienced since the early 1990s and in overcoming effectiveness costs associated with political strategies aimed at raising their popularity.

To deal with the fairness issue Kalbekken (2008) suggests three possible ways, namely a Pigouvian threshold tax, a Pigouvian tax with earmarking of (some of) the revenues or an emissions trading scheme with some grandfathering of permits. There are better means to operate redistribution than Pigouvian taxes. Therefore, if a tax due to fairness considerations ends up being inefficient, due to tax exemptions and reductions or the way its revenues are used or despite all the efforts taken in its design and implementation, it might be better not to adopt the tax at all. All these considerations should be relevant in the instrument design, adoption and implementation. However, textbooks often do not take them into consideration when elaborating on environmentally related taxation.

**Keywords:** Accountability Principle; Polluter Pays Principle; economic rationale; ethical rationale; normative rationale; concept of justice; cost allocation; Pigouvian theory; behavioural change; subsidies to polluters.

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