# DEFINING THE EFFICIENT RELATION BETWEEN DIFFERENT CLIMATE CHANGE POLICIES

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**Abstract**

The recent COP 21 conference in Paris outlined the need to find global policy instruments to face the phenomena of climate change, originated by greenhouse gas (GHG) emissions. In this paper, the issue of the comparison between environmental policies is revisited, starting from the consideration that the emissions of GHG create market failures and policy instruments may play a role in correcting these malfunctions and subsequent inefficiencies. In the Author's opinion the climate change issue calls for a new approach that takes into account the concept of "economic global public goods" and provide for a link between different environmental policy instruments.

The first paragraph revises the traditional analysis of the choice of environmental policies in the framework of "economic global public goods". The following part deals with the comparison between taxes and tradable permits as a question of "quantity" versus "price" control. The third paragraph is about the linkage of different environmental policy instruments, with a specific reference to the joint use of cap-and-trade system and taxation scheme. And, finally, some conclusive remarks are presented in relation to the COP 21 conference in Paris in the prospect of linking different policies in the future at a global level.

**Key Words**: climate change, environmental policy choice, greenhouse gasses, COP 21, price vs. quantity, linking, cap-and-trade, carbon tax.

**JEL Classification**: Q53; H23; H41; K32

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## Introduction

Climate change has been raised as a very important issue all over the world. The change in climate results from an increase in the earth's average atmospheric temperature, which is usually referred to as global warming. In response to increasing scientific evidence that greenhouse gas (GHG) emissions are contributing significantly to global climate change[2], decision makers are devoting considerable attention to public policies to prevent or reduce such change.

The policies span a range of regulatory approaches. The traditional alternative is between command and control (CAC) and market-based (MB) instruments; these last are essentially taxes, that are fees imposed on emitters proportionate to the total amount of emissions released into the environment, and cap-and-trade systems, that provide a number of permits equal to the allowed total emissions.

Given the traditional environmental policy choice theory, the climate change issue calls for a new approach that takes into account the concept of "economic global public goods" and provides for different relations between environmental policy instruments.

This paper aims to consider the opportunity in terms of efficiency to link a tradable permits system, such as the European Union Emission Trading Scheme (ETS), with carbon tax, considering the effects that could derive form a joint use of these two MB instruments.

In the first paragraph, we intend to revise the traditional analysis of the choice of environmental policies in the framework of climate as an "economic global public good". The following part deals with the comparison between taxes and tradable permits as a question of "quantity" versus "price" control. The third paragraph is about the linkage of different environmental policy instruments, with a specific reference to the joint use of a cap-and-trade system and a taxation scheme. And, finally, some conclusive remarks are presented in relation to the COP 21 conference in Paris in terms of linking policies in the future against GHG effects.

## 1. Climate change policies and the concept of "economic global public goods"

Following an economic approach, traditionally environmental policies originate from the presence of market failures: in our specific case, the environment appears as a "public good"

[2] For data see: IPCC (2014).

that may not be appropriated and has no market price; the damage to the environment is a case of "externality," in that it is fully or partly a social cost that is not internalized into the accounts of the parties causing it[3]. So the comparison of different instruments considers how they may play a role in correcting malfunction and subsequent inefficiencies.

But dealing with the issue of policy choice in the case of climate change implies a definition of "economic global public goods" that are goods with economic benefits that extend to all countries, people, and generations (Kaul et al., 2003).

Climate is clearly "global" in both causes and consequences; moreover, GHG emissions have effects on global warming independently of their location, and local climatic changes are completely linked with the world climate system. "Global warming is a *global* public-goods externality whose resolution requires an unprecedented degree of international cooperation and coordination" (Weitzman, 2016 p. 1).

In addition, global warming is characterized by other important features that imply some difficulties in the implementation of economic policy instruments. First, we cannot determine with certainty both the dimension and the timing of climate change and the costs of the abatement of emissions. Second, the effects of GHG concentration in the atmosphere on climate are intergenerational and persistent across time. Finally, it emerges a relevant equity issue among countries because industrialized countries have produced the majority of GHG emissions, but the effects of global warming will be much more severe on developing countries.

Consequently, the key economic issue is how to balance costs and benefits of global emission reductions: to decide what the distribution of emission reductions among countries should be and how the costs should be allocated, together with the need for differences among high- and low-income countries, high- and low-emitting countries, and high- and low-vulnerability countries.

Given the global nature of climate change, it is easy to understand the necessity to take into consideration that an action at international level is necessary in order to efficiently implement the different policy instruments and, in particular, we analyze the different environmental policies that could be applied.

The first kind of environmental instrument are the so-called Command-and-Control (CAC), characterized by a public agency that provides a definition of conduct rules and enforcement

[3] Economists consider environmental policies within the framework of the category of externalities, as evidenced by Cropper and Oates (1992): "The source of basic economic principles of environmental policy is to be found in the theory of externality".

system. CAC policies are divided into two phases as follows: "command", which sets a standard based on the maximum level of permissible emissions, and "control", which monitors and enforces the standard[4].

As to the US experience, the activity of the Environmental Protection Agency (EPA) provides a clear example of implementation of this kind of policies. In fact, this agency performs its tasks through the setting of preventive standards, the enforcement of polluting emission thresholds, and the performance of inspections and, possibly, of actions brought to the federal courts. For what concerns the European Community, a unified standard setting system has not been established[5], but it is defined at national level (Faure, 2010).

The choice to develop a CAC regulatory system is based on the fact that centralized agencies assure a cost-effectiveness calculation on the base of the expected damage and of the marginal cost of different level of preventive care. The centralized structure presents the advantage to provide a continual oversight of problems and a broad array of regulatory tools.

Command-and-control policies typically require polluters to take specific actions to reduce emissions by installing a particular technology or meeting a specific performance (emissions) standard. Command-and-control regulations have been criticized as not providing the flexibility to take into consideration that different plants face different compliance options and associated costs. Moreover, traditional regulations do not provide an incentive for firms to innovate by going beyond the reductions required by the standard.

On the other side, market-based options provide greater flexibility for firms and seem particularly appropriate in the context of policies to reduce GHG emissions.

The first kind of MB instruments are taxes, and particularly the so called "carbon tax" based on GHG emissions generated by burning fuels and biofuels, such as coal, oil, and natural gas. This charge has been introduced with the main goal to level the gap between carbon intensive (firms based on fossil fuels) and low carbon intensive (firms that adopt renewable energies) sectors. Due to the introduction of that form of tax, the relative prices of goods and services change; the emissions of intensive goods become more expensive, whereas the emissions of

[4] As Cropper and Oates (1992) explain "… The determination of environmental policy is taken to be a two-step process: first, standards or targets for environmental quality are set, and, second, a regulatory system is designed and put in place to achieve these standards. This is often the environmental decision making proceeds. Under the Clean Air Act, for example, the first task of the EPA was to set standards in the form of maximum permissible concentration of the major air pollutants. The next step was to design a regulatory plan to attain these standards air quality."

[5] European Environmental Agency (EEA) has only a very limited role. In fact EEA was set up as a legally independent community body under council regulation (EEC) 1210/90. The EEA's core task is to provide decision makers with the information needed for making sound and effective policies to protect the environment and support sustainable development.

less intensive goods become lower. Thus, carbon tax provides through prices a strong incentive for individuals and firms to adjust their conduct, resulting in a reduction of the emissions themselves. Hence, by reducing fuel emissions and adopting new technologies, both consumers and businesses can reduce the entire amount they pay in carbon tax[6].

The second kind is cap-and-trade permit system, defined as quantity-based environmental policy instrument. The regulatory authority stipulates the allowable total amount of emissions (cap) and the right to emit becomes a tradable commodity. Under a cap-and-trade system, prices are allowed to fluctuate according to market forces. Thus, the price of emissions is established indirectly and permits could be allocated to firms through auction or free allocation.

Each policy instrument presents advantages and drawbacks.

A well-functioning emission trading system allows emission reductions to take place wherever abatement costs are lowest, regardless of international borders. As costs associated with climate change have no correlation with the origin of carbon emissions, the rationale for this policy approach is that an emission trading system allows to fix a certain environmental outcome and the companies are called to pay a market price for the permits to pollute. This is the reason why an emission trading system is suitable for international environmental agreements, such as the Kyoto Protocol, specifically for the characteristic that a defined emission reduction level can be easily agreed between states.

On one hand, cap-and-trade system entails significant transaction costs, which include search costs, such as fees paid to brokers or exchange institutions to find trading partners; negotiating costs; approval costs; and insurance costs. Conversely, taxes involve little transaction cost over all stages of their lifetime[7]..

Carbon taxes are dynamic economic instruments that offer a continuum incentive to reduce emissions. In fact, technological and procedural improvements and their subsequent efficient diffusion lead to reductions in tax payment. In addition, trading systems are able to self-adjust because emission goals will be easier to meet; there will be a decrease in permits' demand and in their price but not as rapidly as taxes.

"The implementation of an emission trading system is very complicated and requires technical steps, including treatment of sinks, monitoring, and enforcement. On the other hand, taxation is a very well-known instrument by policy makers, not very costly because it does not require monitoring and enforcement organization" (Porrini, 2016, p. 31).

[6] Nordhaus (2007).
[7] Porrini (2005).

In the following Table, we have summarized the main differences among carbon tax, tradable permit system and CAC.

**CARBON TAX VERSUS CAP-AND-TRADE VERSUS COMMAND AND CONTROL**

| | $CO_2$ tax | Cap and trade | Traditional regulation (e.g., source-specific emissions standards) |
|---|---|---|---|
| Certainty over $CO_2$ price or cost? | Yes. The tax establishes a well-defined price. | No. But price volatility can be limited by design features, such as a safety valve (price cap) or borrowing. | No. |
| Certainty over emissions? | No. Emissions vary with prevailing energy demand and fuel prices. | Yes, in its traditional form (over capped emissions sources). No, with the use of additional cost containment mechanisms. | No; regulating the rate of emissions leaves the level uncertain. |
| Efficiently encourages least-cost emissions reductions? | Yes. | Yes. | No, but tradable standards are more efficient than non-tradable standards. |
| Ability to raise revenue? | Yes. Results in maximum revenue generation compared to other options (assuming cap-and-trade alternative includes substantial free allocation of allowances). | Traditionally—with a largely free allocation—no. Growing interest in a substantial allowance auction suggests opportunity to raise at least some revenue now and possibly transition to a complete auction that generates maximum revenue in the future. | No. |
| Incentives for R&D in clean technologies? | Yes. Stable $CO_2$ price is needed to induce innovation. | Yes. However, uncertainty over permit prices could weaken innovation incentives. | Yes and no. Standards encourage specific technologies, but not broad innovation. |
| Harm to competitiveness? | Yes, though if other taxes are reduced through revenue recycling, competitiveness of the broader economy can be improved. | Yes (as with a tax), but giving firms free allowances offsets potentially harmful effects on profitability. | Somewhat. Regulations increase the cost of manufacturing but, unlike taxes or tradable permits, do not raise the price of fossil energy. |
| Practical or political obstacles to implementation? | Yes. New taxes have been very unpopular. | Yes. Identifying a reasonable allocation and target is difficult. | Yes. Setting the level of the standard is difficult. |
| New institutional requirements? | Minimal. | Yes, but experience with existing trading programs suggests that markets (for trading permits and exchanging information across firms and time periods) arise quickly and relatively inexpensively. | Minimal (unless tradable). |

Source: Parry and Pizer (2007, p. 86).

In the next paragraph the two policy instruments, namely taxes and cap-and-trade, will be considered in the context of the debate about "price" versus "quantity" control.

2. **Carbon tax versus tradable permit system as a question of "quantity" versus "price" of GHG emissions**

Environmental taxes are defined as priced-based instruments for the correlated effects to increase the price of certain goods and services, thereby decreasing the quantity demanded.

On the other side, cap-and-trade permits are defined as quantity-based instruments for the feature to directly fix the quantity trough the number of permits. Although both policy instruments are MB, their implementation is different: carbon taxes fix the marginal cost for carbon emissions and allow quantities emitted to adjust, whereas tradable permits fix the total amount of carbon emitted and allow price levels to change according to market forces.

The literature describes as alternative instruments carbon tax and cap-and-trade system, the former as a price control instrument and the latter as a quantity control one.

Many contributions compare the relative performance of price and quantity instruments under uncertainty, started with a seminal contribution of Weitzman (1974), who analyzed the optimal instrument choice under a static partial equilibrium framework, consisting of a reduced form specification of abatement costs and benefits from abatement. The important character of his setup is that, a regulator issues either a single price order (fixed price) or a single quantity order (fixed quantity) before uncertainty is resolved and these fixed policies result in different expected social welfare outcomes under uncertainty. Specifically, Weitzman shows that under uncertainty about the abatement costs, the relative slopes of the marginal benefit (damage) function and the marginal cost functions determine whether one instrument is preferred to another. If the expected marginal benefit function from reducing emissions is at relative to the marginal cost of abatement, then a price control is preferred. If, however, the marginal benefit function is steeper, then a quantity control is preferred.

Kaplow and Shavell (2002) deal with the standard context of a single firm producing externality, but they consider also the case of non linear corrective tax and multiple firms jointly create an externality and affirm the superiority of taxes to permits.

So, for the issue of climate change, there are arguments to prefer price control. The first point is that climate change consequences generally depend on the stock of greenhouse gases in the atmosphere, rather than annual emissions. Greenhouse gases emitted today may remain in the atmosphere for hundreds of years. It is not the level of annual emissions that matters for climate change, but rather the total amount of carbon dioxide and other greenhouse gases that have accumulated in the atmosphere. The second point is that while scientists continue to argue over a wide range of climate change consequences, few advocate an immediate halt to further emission (Pizer, 1999).

Even if a carbon tax is preferable to a cap-and-trade system in terms of social costs and benefits, this policy obviously faces political opposition. Business companies oppose carbon taxes because of the transfer of revenue to the government; environmental groups oppose carbon taxes for an entirely different reason: they are unsatisfied with the prospect that a carbon tax, unlike a permit system, fails to guarantee a particular emission level.

On an economic efficiency point of view, considering the issue of climate change as a "global public goods", the two instruments should be considered in their "global" implementation.

The instruments based on tax mechanism would need a method of coordinating policies among countries (Faure, Weishaar, 2012). In the international context, it could assume the form of either an international tax or a harmonized domestic tax system. For example, in the case of an international tax, the nations (and not the firms) pay the tax to an international agency, which receives and redistributes the tax revenues. On the other hand, in the case of harmonized domestic tax, the international community should negotiate an agreed level of a domestic emission tax, establishing adequate compensation for the losing countries from the gaining countries[8].

Second, it is possible to establish an agreement that sets quantitative limits of emissions and allocates emission permits to firms (or States) but allows to trade among countries, in order to minimize abatement costs. The starting allocation of permits can be set through either an auction or a grandfather allocation. Under an auction, government (or the international community) sells the emission permits, whereas under the grandfather rule, the allocation of emission permits is based on historical records.

In the global warming context, quantitative limits set targets on the time path of GHG emissions of different countries. Countries then can administer these limits in their own fashion, and the mechanism may allow transfer of emission allowances among countries, as is the case under the Kyoto Protocol.

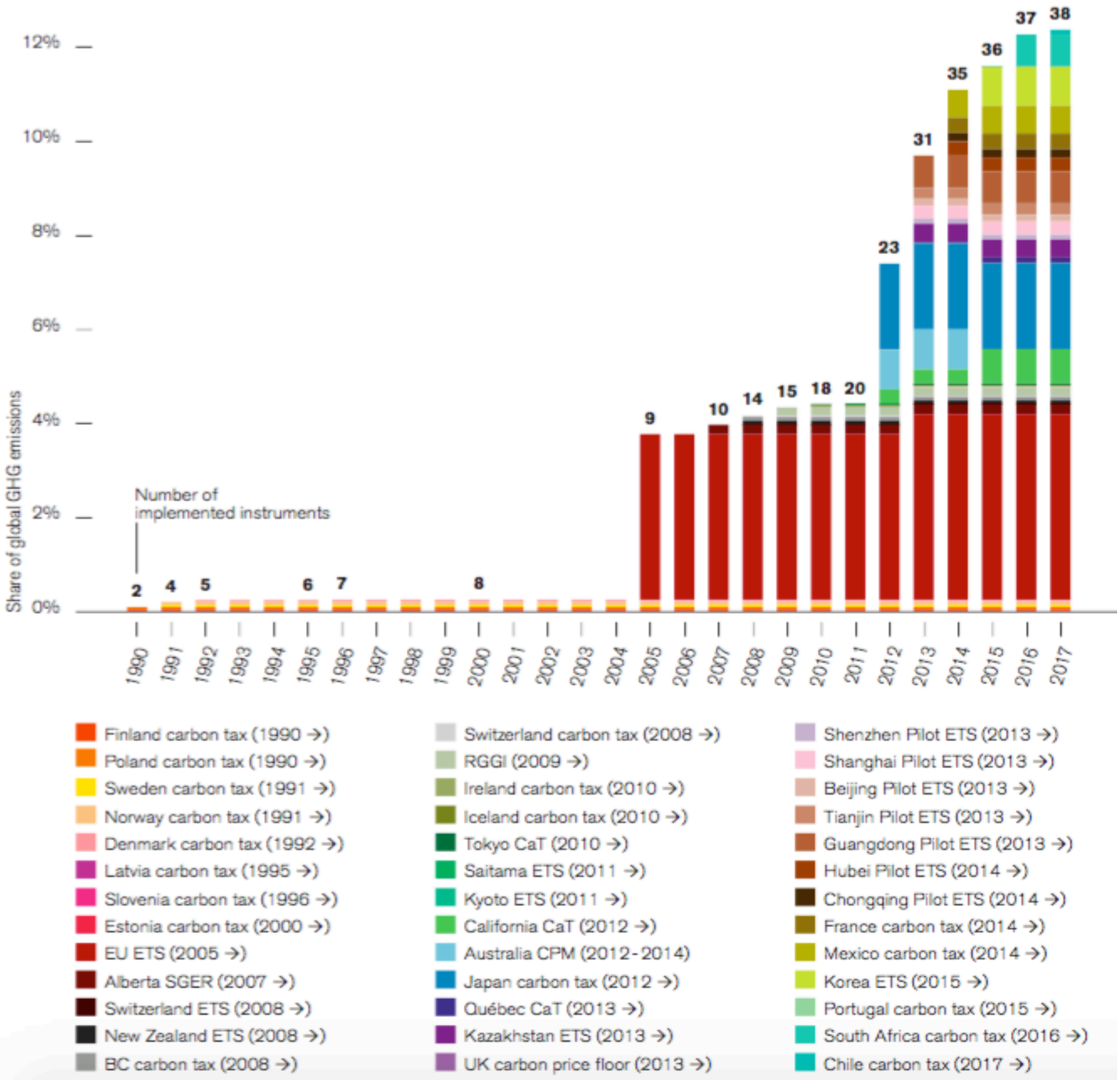
The European Union Emissions Trading Scheme (EU-ETS) is the world's most extensive cap-and-trade system and has now been in operation for 10 years. The EU-ETS was developed as a way of meeting the EU's GHG emission reduction targets in the most efficient and cost-effective manner. To do so, the EU-ETS sets a limit (a cap) on the total emissions; certain EU sectors (mostly heavy industry and aviation) are allowed to use during predefined trading periods. Permits are then distributed among polluters where one permit equals one ton of carbon dioxide equivalent. These permits can then be traded between market participants.

[8] Nordhaus (2006) hypothesizes the institution of an harmonized carbon tax (HCM), essentially equivalent to a "dynamic Pigouvian pollution tax for a global public good" and points out 10 different reasons to prefer it to a quantitative approach.

As such, the total amount of pollution is set by an external authority, but market participants determine the permit allocation, thereby optimizing efficiency[9].

There is a general increasing consensus at a international level that the issue of climate change should be dealt by using policy instruments based on quantity control (permits system) and price control (taxes) and over the past few years, more and more countries around the world have started implementing these kind of instruments, at national and supra-national levels, as we can see in the following Figure.

**NATIONAL SYSTEMS OF ETS AND CARBON TAX (1990-2017)**




Source: World Bank (2015, p. 12).

[9] For an analysis of the EU-ETS system: Ellerman, Buchner, Carraro (2011).

In a world that is implementing different market-based instruments, the possibility to link taxes and permits could be seen as a solution to face the climate change issue at a global level, as we will see in the following paragraph.

## 3. The issue of the linkage of different environmental policy instruments

There is a large literature on the importance of linking economic policies to face climate change consequences (Metcalf, Weisbach, 2010).

Most of the literature focuses on linking different cap-and-trade systems or different carbon taxes. "Initially separate cap-and-trade systems can be linked, and previously distinct carbon tax systems can be harmonized (that is, the rates can be set equal). Linkage and harmonization can yield cost savings. Linking separate emissions pricing programs yields greater abatement effort in the region with the initially lower emissions price and less abatement effort in the region with the initially higher emissions price, thus spurring equal abatement at overall lower costs. Linking once-separate cap-and-trade programs allows for further (cross-jurisdictional) reallocations of abatement effort and thereby yields further cost reductions beyond those generated by separate programs" (Goulder, Schein, 2013, p. 20).

Also the European Commission has indicated that linking the European Union Emissions Trading System (EU ETS) with other cap-and-trade systems "offers several potential benefits, including... supporting global cooperation on climate change" (European Commission, 2014).

In fact, since the launch of the EU ETS in 2005, emissions trading has spread rapidly around the world. Linking among ETSs refers to the acceptance of allowances and emissions-reduction credits from other systems for compliance in one's own. Links between existing ETSs have already been proposed and established on subnational and national levels, such as the bilateral link between California and Québec and the link currently being negotiated by the EU and Switzerland.

Some authors argue that the basic approach underlying emission reduction credit systems like the Kyoto Clean Development Mechanism (CDM) can be extended to create linkage opportunities in diverse emission control systems in ways that do not necessarily suffer from the shortfalls of the current CDM. Moreover, while emission reduction credit systems are designed to work with systems like tradable permits, they describe ways in which it can interact with tax systems as well as certain regulatory systems (Jaffe, Ranson, Stavins, 2009).

In this sense, less has been written about linking disparate systems, such as cap-and-trade together with tax system. As seminal contributions, some authors suggested the use of a “hybrid” permit policy (Weitzman 1978; Roberts and Spence 1976). This is a system where the government sell permits at a specified trigger price, the quantity of emissions are fixed as long as the marginal cost (e.g., the price of the permit) lies below the trigger price and works like a tax system by fixing marginal cost when marginal cost hits the trigger price. When the trigger is set high, such a combined mechanism functions like a pure permit system (since additional permits are never sold) and when the number of permits is set low, it functions like pure tax mechanism (since additional permits are always sold).

For example, firms that are subject to a carbon tax might be allowed to pay taxes at a higher level than they owe based on their emissions, and sell certified Emission Tax Payment Credits (ETPCs) to firms that are operating under a cap-and-trade program. Within the cap-and-trade program, firms could use ETPCs just as they would the equivalent quantity of allowances for purposes of compliance.

Conversely, firms under a cap-and-trade program could sell allowances to firms required to pay a carbon tax, allowing the purchasing firm to lower its tax obligation by the amount of allowances it submits for retirement[10].

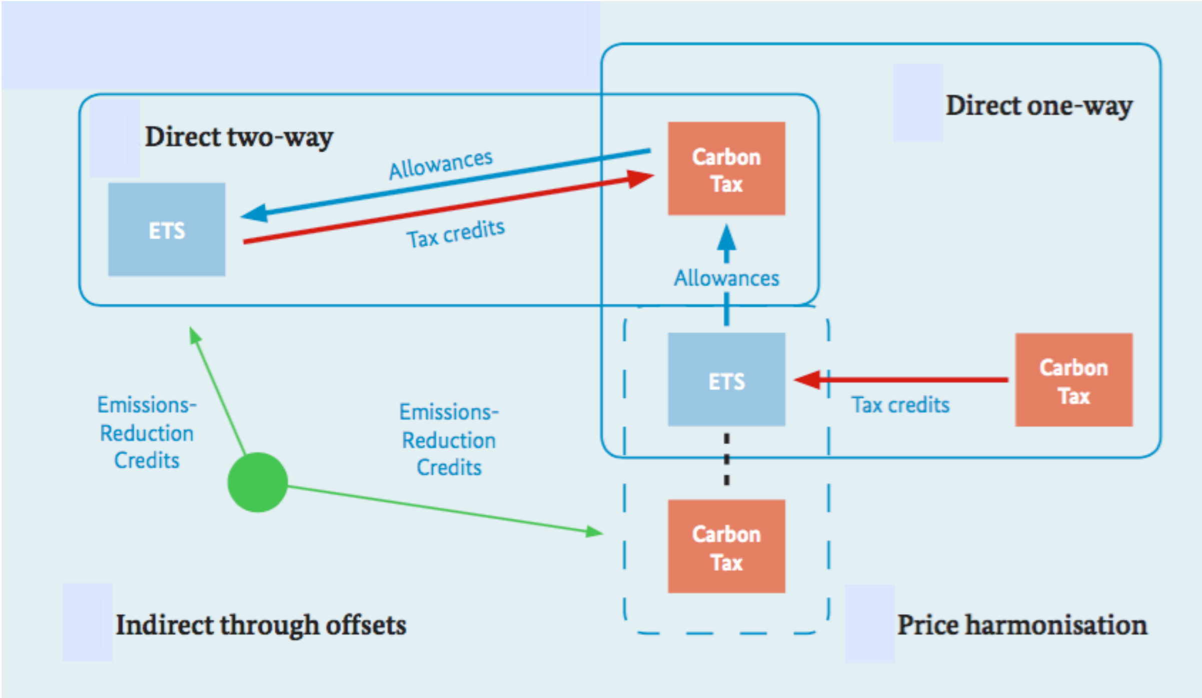
Likewise, either a carbon tax or a cap-and-trade system could be linked with policies that provide subsidies for emissions reductions, which could be traded like Emission Reduction Credit systems to be used in place of allowances to comply with a cap-and-trade program, or as ETPCs for compliance with a carbon tax.

Links can involve direct or indirect exchanges of units, and can be one-way or two-way (Bodansky et al., 2014). Both an ETS and a carbon tax can be designed to generate tradable units. In an ETS, tradable units are a built-in feature. In a carbon tax system, companies could theoretically be allowed to pay more than their compliance obligation and receive tradable carbon tax credits in return. The government could also decide to allocate a number of carbon tax credits for free to compensate households or certain industries. Carbon tax credits in excess of one’s own compliance needs could then be traded within the tax regime or with a different system such as an ETS.

So linking carbon tax with cap-and-trade based on ETSs regimes can take various forms, as we can see in the following Figure.

[10] About this Heindl et al. (2014) develop an economic model.

**LINKAGE SYSTEMS BETWEEN CARBON TAX AND CAP-AND-TRADE (ETS)**




Source: Haugh et al. (2015, p. 13)

We have some practical implementation of this kind of linkage.

In Ireland few years ago, the carbon tax has been introduced, specifically for those sectors outside of the EU ETS, as well as excluding most emissions from farming. Tax applies to petrol, heavy oil, auto-diesel, kerosene, liquid petroleum gas, fuel oil, natural gas, coal and peat, as well as aviation gasoline.

Since 1991, Sweden's carbon tax was predominantly introduced as part of energy sector reform, with the major taxed sectors including natural gas, gasoline, coal, light and heavy fuel oil, liquefied petroleum gas, and home heating oil. Over the years carbon tax exemptions have increased for installations under the EU ETS, with the most recent increase in exemption starting from 2014 for district heating plants participating in the EU ETS.

Another example is the Mexico's carbon tax introduced in 2012 that covers fossil fuel sales and imports by manufacturers, producers, and importers. This tax is not on the full carbon content of fuels, but rather on the additional amount of emissions that would be generated if the fossil fuel were used instead of natural gas. Companies liable to pay the tax may choose to pay the carbon tax with credits from CDM projects developed in Mexico, equivalent to the value of the credits at the time of paying the tax[11].

The linkage, that we have seen has been implemented in some countries, presents some economic advantages. These advantages are key motivating forces to try to develop these kind of link between different policy instruments also at a global level.

First of all, linkage allows for voluntary exchanges across different systems, and thereby facilitates cost-effectiveness, that is, achievement of the lowest-cost emissions reductions across the set of linked systems, minimizing both the costs for individual countries as well as the overall cost of meeting the collective cap.

Linked systems may also provide regulatory stability, attractive from the point of view of affected firms, in the sense that it may be more difficult to introduce changes in an emission-reduction scheme when those changes require some sort of coordination with other countries with linked emissions systems.

There are also administrative benefits from the linkage that come from sharing knowledge about the design and operation of a carbon-pricing system, but also from the reduction of administrative costs through the sharing of such costs and the avoidance of duplicative services.

Despite the above mentioned experiences and the economic advantages that we have just sketched, the economic literature have not till now addressed so much attention to theoretical model based on the joint use of the two MB instruments, taxes and cap-and trade system, that are still considered as alternative.

## 4. Final considerations post COP 21

Global climate policy faces a tension between the efficiency benefits of uniform global policy and national and regional variation in tastes for differing policies.

Recently, countries across the globe committed to create a new international climate agreement by the conclusion of the UN Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP21) in Paris in December 2015. Countries have agreed to publicly outline what post-2020 climate actions they intend to take under a new

[11] "Under Mexico's recently established carbon tax on fossil fuels (initially set at $3.50 per ton carbon dioxide equivalent [tCO2e]), firms may elect to use offset credits from CDM projects developed in Mexico to meet all or part of their tax liability. The precise form of the interaction between these two instruments is still being developed. South Africa also plans to allow offsets to be used in lieu of tax payments when its carbon tax goes into effect, currently planned for 2016" (Bodansky et al. 2015, p. 12).

international agreement, known as their Intended Nationally Determined Contributions (INDCs). The INDCs will largely determine whether the world achieves an ambitious 2015 agreement and is put on a path toward a low-carbon, climate-resilient future.

INDCs are the primary means for governments to communicate internationally the policy choice they will take to address climate change in their own countries. INDCs will reflect each country's ambition for reducing emissions, taking into account its domestic circumstances and capabilities.

We can derive that climate negotiations have a coordinated global policy as their goal, but we have been heading towards a low coordinated system of local, national, or regional policies where different countries are undertaking different policies ranging from market-based approaches, like greenhouse gas charges or cap-and-trade systems to CAC systems, with standards that follow a strictly regulatory approaches.

Whenever, at a national level, there is not coordination in the different regulatory tools, the target to coordinate different national system becomes even more difficult. In this sense, one important step could be to link environmental policies that till now have been considered as alternative, such as carbon taxes and cap-and-trade permits.

As we have analyzed in the paper, different countries could undertake different policies ranging from CAC to MB approaches, such as carbon tax and tradable permit systems, but still the target would be to reach an optimal degree of policy homogenization, given the nature of "global public good" that characterize the climate change issue.

As a conclusive remarks, in the near future, the challenge to reduce globally GHG emissions can be addressed on the linkage between heterogeneous climate policy instruments as a way to reach the solution of climate change issue in the long term. In fact, as INDCs may contain any combination of policy instruments, it would be wise to fashion the 2015 Paris agreement such that it would best advance linkage that can take place among heterogeneous policy instruments, such as carbon taxes and cap-and-trade systems.

In this direction more contributions in the theory of environmental policy choice is necessary.

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