

**International Taxes to Finance International “Green” Climate
Fund (GCF)---Application to Aviation Taxes**

An Analytical Review

by

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8 August, 2011

Foreword & Summary

We are pleased to provide the attached first Working Paper & Review. It was undertaken to analytically assess the usefulness of Aviation Taxes as a way of funding the proposed Green Climate Fund, within the overall context of such an approach being increasingly advocated by some---such as the Advisory Group to the UN Secretary-General, and more recently, a proposal by the EU to impose such charges unilaterally (to flights passing through, with an offset for countries that have similar charges nationally). The intent is to bring out to an internal policy and administrative audience, the complex analytical issues sometimes involved.

However, given the practical import of the topic, and its urgency, three policy conclusions are derived---as economic guidance from the Climate Finance Unit of the Ministry of Finance. Other views may emerge from the civil aviation sector or others.

1) First, a unilateral imposition of such charges by any Contracting State member of the ICAO is likely a violation of relevant international (ICAO) or bilateral treaties and guidelines. Therefore, however desirable or economically justifiable they may be, India should not provide consent, nor should it seek to impose a similar aviation tax, whether as a reciprocity or as an offset. The first principle is to take this step to the ICAO for resolution, and for bilateral discussion under relevant bilateral agreements.

2) Second, if agreed at such a suitable forum, there may be economic merit nevertheless for such an Aviation Emissions Charge or Tax, but: (a) compensatory mechanisms have to be found to offset the impact on aviation traffic originating from or directed to developing countries, such as India; and (b) The proceeds in a large part should be directed towards meeting the financing needs of the Green Climate Fund.

3) Third, such a specific Aviation Tax is much inferior, in both practice and in theory, to a broader Carbon Tax that should be the first option in developed countries---both for efficiency and equity reasons. A broader Carbon Tax is also far superior to a Cap-and-Trade Carbon Emissions Trading Alternative, because the latter remains impractical, even if attractive theoretically.

We welcome comments. We will also be preparing more such Working Paper Reviews in the months ahead.

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Introduction

At the Cancun UNFCCC climate change summit in 2010, a Green Climate Fund (GCF) with a corpus of US\$100 billion a year was agreed---to be funded by the advanced countries for climate mitigation and adaptation efforts in developing countries. There are three broad ways by which such funding was/is envisaged, as noted, for example, in the recommendations put forward by the Advisory Group report to the UN Secretary General (AG, 2010)ⁱ.

- Through general taxes in advanced countries and greater resources allocated from national Budgets to fund such an international GCF. This includes more specifically extension to a general carbon taxⁱⁱ. “Based on a carbon price of US\$20-US\$25 per ton of CO₂ equivalent, auctions of emission allowances and domestic carbon taxes in developed countries with up to 10 per cent of total revenues allocated for international climate action could potentially mobilize around US\$30 billion annually” (AG, 2010).
- Through specific taxes on sectors and commodities in national and international trade, that are good candidates for such taxation because of their contribution to adverse global climate change. “Without underestimating the difficulties to be resolved, particularly in terms of national sovereignty and incidence on developing countries, approximately US\$10 billion annually could be raised from carbon pricing international transportation, assuming no net incidence on developing countries and earmarking between 25 and 50 per cent of total revenues” (AG, 2010).
- By leveraging private sector funds through some form of public financial support financial mechanisms, such as guarantees and bonds and carbon markets. “A carbon price of US\$20-US\$25 could generate around US\$100 billion to US\$200 billion of gross private capital flows; and private net flows in the range of US\$10 billion to US\$20 billion. Carbon markets could generate US\$20-30 billion annually. In addition, the multilateral development banks, in collaboration with the United Nations system,

could play a significant multiplier role and leverage additional green investments, upto US\$11 billion in net transfers” (AG, 2010).

This paper focuses on the efficiency and equity aspects of the second option above, with an examination of specific current proposals for taxing the international aviation sector. There are three reasons for pursuing and understanding this question in some analytical depth: (1) The first is that, given difficult circumstances in the overall fiscal envelopes in many if not most advanced economies at this point of time, many observers assess the feasibility of higher general taxes in national budgets to fund greater expenditures on establishing an international GCF obligation as very difficult; (2) The second is that some advanced countries or groups have already started to propose to impose such specific taxes within their national borders, but which has cross-border impacts, such as taxes on aviation as in a recent EU proposal and directive; (3) The third reason, at the heart of this paper, is that the analytical questions surrounding the efficiency, equity and incidence of such specific taxes also deserve scrutiny---especially in large and faster-growing developing countries such as India (and Brazil, China and others).

The efficiency question, for example, requires an assessment of whether higher rates of climate taxes on a specific sector (such as global aviation) may have large and differential “deadweight” welfare loss consequences for developing countries presumed to be benefited by such taxes?

The equity question is related to where the incidence of such taxes fall, and if they fall on developing countries, to consideration of questions of design of compensatory mechanisms---since the entire agreed purpose of such taxes is to ensure that richer countries fund the GCF through their own contributions for the past and current accumulation of green-house gases (GHGs), that is largely a consequence of rich country consumption modes in the past and now (and not impose additional financing burdens on poor countries who are just starting their development process).

We also need to consider and contrast sector specific tax approaches with two other alternatives: (a) a more general Carbon Tax in developed countries, both as

a means to address their fiscal adjustment in their economies---and to spur alternative technologies and innovations; and (b) a second alternative of a Cap-and-Trade Carbon Emissions scheme across borders.

We take up briefly these issues in this paper to illustrate the possible pros and cons of these alternatives, with some discussion of the practical approaches taken so far, and lessons of successes and failures, where relevant.

A. The Design Efficacy of Specific Taxes—Economic Principles and Issues

Aviation taxes is a particular and important example, since the industry is growing massively---expected from 200 to 500 million passengers a year by 2030-50---with an expected doubling of carbon emissions from the current levels of about 7%ⁱⁱⁱ of global emissions to about 15%. Every other large sector, such as power, domestic, industrial, commercial and surface transport are expected to decrease their emissions^{iv}. Moreover, the aviation emissions are judged to be more damaging to climate, because of release of carbon at high altitudes.

Most countries exclude aviation from fuel taxes for international flights by treaty (ICAO), although some include it on domestic travel (e.g., USA and India). Specific taxes on the aviation sector have thus emerged as a big priority in most official fora and in countries and regions such as the EU for the possible application of a specific industry tax.

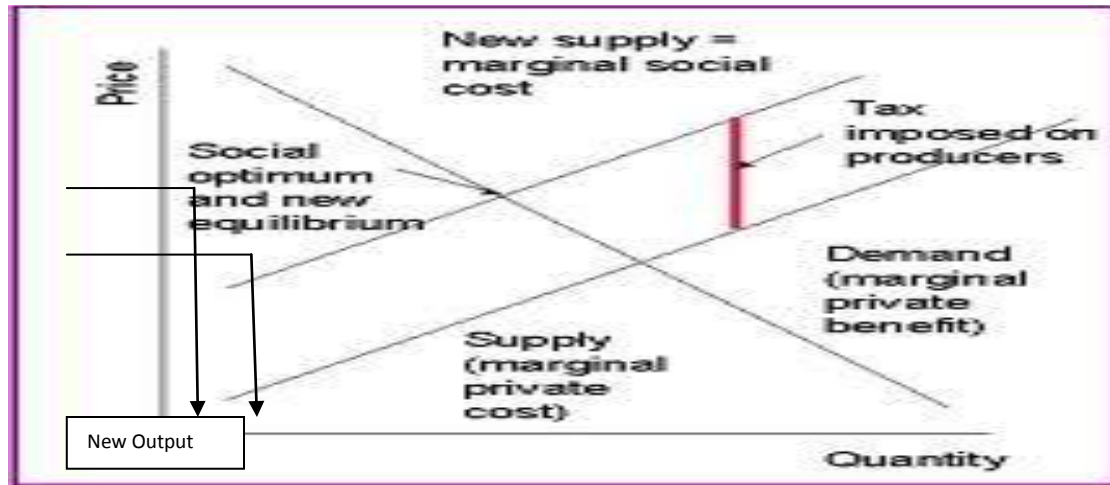
It is important to note, however, the industry view that ICAO pollution standards have been tightened and emissions per passenger kilometer have fallen by some 70% over the past forty years because of more efficient engines^v. Airlines are also globally suffering from the consequences of high international oil prices and severe competition, with airlines perennially losing money, and therefore, not in a position to sustain tax increases.

Nevertheless, a reason to consider such aviation tax is also because it generally enjoys so far a zero fuel taxation in most countries. Aviation taxes has also been favored in many rich countries because it is seen as avoiding the negative outflows because of tourism and expenditures by their residents abroad

(especially in small countries). Generally, large countries with substantial internal travel, such as the United States, disfavor such aviation taxes over that in small countries, as in Europe. Brazil and Chile are also advocating such an initiative. In the long-term, a global tax on aviation is becoming a possibility, setting aside revenues from such a source to fund international assistance in climate mitigation. The Kyoto protocol tasked the ICAO to look at worldwide aviation tax, since picked-up in the UN Secretary General's task Force to fund the Green Fund. EU wants to apply a fuel tax on all EU flights and extend to non-EU flights that go through EU. The ICAO prefers a cap and trade system option.

The Case for Pigovian Taxes. A Pigovian tax is a tax placed on a negative externality, such as air pollution, to correct a market failure, such as preventing such destruction of the 'commons'. The arguments for imposing specific taxes on commodities or sectors that are contributing most to the burden of GHGs is straight-forward. In general, any tax in principle distorts welfare, because such taxes otherwise reduce consumer welfare^{vi}. The marginal cost of funds (MCF) is the size of distortion that accompanies the last unit of revenue, which increases as the amount of tax rises. Any tax has such a distortionary element. However, when the production and consumption of such a sector or commodity contributes to a dis-externality, such as the contribution of fossil fuels (carbon) to GHGs (carbon dioxide), the taxation of such sectors and commodities (direct carbon taxes, such as on fossil fuels) to correct for such externalities---a Pigovian tax---is efficient^{vii}. The Pigovian tax^{viii} is also 'doubly' efficient, because it not only reduces the negative externality, but also generates revenues to the Government, allowing the funding of other activities in a non-distortionary (tax) fashion, such as the climate fund. Note, however, that all taxes will introduce a "deadweight loss", whose size is essentially determined by the relative tax rates envisaged and the demand and supply elasticities, with inelastic supply or demand producing fewest deadweight losses. Note too, that to the extent aviation is highly elastic to prices and taxes, it raises the potential for such dead-weight losses.^{ix}

Figure 1: Effects of A Pigovian Tax



Source: John Abowd, Public Choice, Lectures.

<http://courses.cit.cornell.edu/econ101-dl/lecture-public-choice.html>

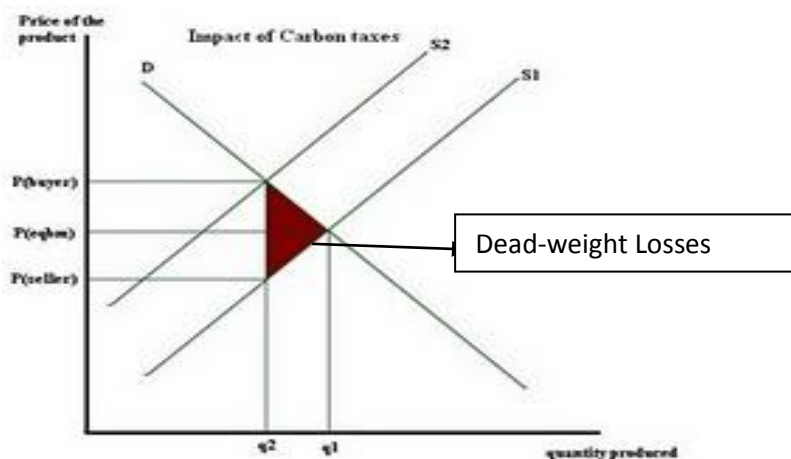
B. The Case for a Broader Carbon Tax

The broader alternative to a specific sector tax is a more general carbon tax to be applied in national jurisdictions in developed countries and permit a broader resource mobilization through such taxes, while encouraging reduced carbon emissions across the board. It is therefore no different in principle from a specific sector Pigovian tax, except that its' application is much broader and covers all sectors where carbon is used and emitted. Once in place, a certain proportion would then be set aside to fund the GCF. It is evident to most that a generalised Carbon Tax that cuts across all sectors and directly addresses the Pigovian principle in all developed countries would appear to make the most efficient tax sense. With a carbon price, the government taxes each tonne of carbon pollution released when fossil fuels are burned. The carbon price is a tax rate set by the government. When such general tax is raised, the issue of sub-sector distortions are reduced and the principle is simple and easily seen---to reduce the environmental costs.

Difficulties. However, because it is akin to general taxes, the objections against these Carbon Taxes are equally large. Many countries impose such energy taxes.

Nevertheless, Australia has moved furthest most recently, and imposed such a general Carbon Tax with effect from 2011.500 of Australia's biggest polluters will have to start paying a tax of A\$23 (\$24) a tonne on their own carbon emissions^x. However, it has said the price will be fixed for a period of three to five years. The tax will include the stationary energy sector, the transport sector, and the industrial processes sector. Agriculture will not be included in the scheme. The Australian government plans to move to an emissions trading system three to five years after a carbon tax is introduced. The government will spend half the revenue from the carbon tax compensating households for higher electricity and other living costs that polluters pass on. Another 40% of revenue will help businesses and industry to adjust, and to switch to cleaner forms of energy. On a per capita basis, Australia's emissions are the largest of any rich country, largely because it generates about 80% of its electricity from coal, one of the dirtiest sources of energy as measured by greenhouse emissions^{xi}.

Figure 2: Effects of Carbon Taxes and “Dead-Weight” Losses



Source: <http://gulzar05.blogspot.com/2009/10/cap-and-trade-vs-carbon-taxes-debate.html>

Box 1: Carbon Taxes Across the World

India introduced a levy on coal producers in 2010. India expected to raise \$535 million from the tax, the first measure used by the subcontinent to reduce companies' use of fossil fuels. **Finland** introduced the world's first carbon tax in 1990. Initially, the tax exempted few industries and fuels. In 2010 Finland's price on carbon was €20 per tonne of CO₂. Natural gas has a reduced tax rate, while peat was exempted between 2005-2010. Taxation of liquid fuels and coal takes account of both their energy content and carbon dioxide emissions, and also emissions into the local environment that have adverse health effects. **The Netherlands** levies a general fuel tax on all fossil fuels. Fuels used as raw materials are not subject to the tax. Tax rates are based on both the energy and carbon contents of fuels. **Sweden** enacted a carbon tax in 1991. With Sweden raising prices on fossil fuels since enacting the carbon tax, it cut its carbon pollution by 9 per cent between 1990 and 2006. **Norway** in 1991 introduced a tax on carbon. However, its carbon emissions increased by 43m per cent per capita between 1991 and 2008. **Denmark** enacted in 1992, a carbon tax that applies to all energy users, which includes the industrial sector. But industrial companies are taxed differently depending on the process the energy is used for, and whether or not the company has entered into a voluntary agreement to apply energy efficiency measures. Denmark's per capita carbon dioxide emissions were nearly 15% lower in 2005 than in 1990. **Switzerland introduced** a carbon incentive tax was introduced in Switzerland in 2008. It includes all fossil fuels, unless they are used for energy. Swiss companies can be exempted from the tax if they participate in the country's emissions trading system. Overall, greenhouse gas emissions in Switzerland remained stable between 1990 and 2007. **Ireland introduced** a tax on oil and gas in 2010. It was estimated to add around €43 to filling a 1000 litre oil tank and €41 to the average annual gas bill. **Costa Rica** enacted a tax in 1991 on carbon pollution, set at 3.5 per cent of the market value of fossil fuels. The revenue raised from this goes into a national forest fund which pays indigenous communities for protecting the forests around them. **Quebec, Boulder** - The Canadian province of Quebec, and the US city of Boulder have also implemented carbon taxes.

Source: FactBox: Carbon Taxes Around the World,

<http://www.sbs.com.au/news/article/1492651/carbon-taxes-around-the-world>

C. Other Efficiency Problems and Issues with Pigovian specific Taxes, as on Aviation

Informationally Costly Design. The problem, however, is that determining the exact size of the efficient Pigovian tax to be imposed is not easy and is informationally quite costly. The reason is that the while the logic is clear---say, to reduce the quantity of GHGs contributed by that sector, say aviation, by x% by imposing a Pigovian tax of y%---we do not know how much these rates x and y need to be.

Differentiated Tax Rates? Moreover, the rates may need to be differential by type of users, or impose additional distortions---such as, differential rates by a

sub-sector, such as small regional aviation travel versus long-distance international aviation, or by size of planes, or by even better, the amount of GHGs released by each flight^{xii} (informationally the costliest)^{xiii}. The point is that if we get the tax rates wrong, it can introduce all other sorts of distortions that result in sub-optimal outcomes.

Developing Country Design Issues. In designing optimal Pigovian taxes, we also need to consider the very different circumstances in developing countries. For example, the social purposes, and therefore, return to air travel in developing countries may be very different from that in developed ones. For example, air travel which is surging in many developing countries such as India may be much more heavily shaped by lack of alternative physical connectivity---as dispersed regions lack the physical alternatives of low GHG transport, such as railways, or unavoidable, such as relative speed, or even more GHG intensive (personal cars on slow and congested roads over long distance)---versus the choices in developed countries, which may have purposes with lower social opportunity cost (say, leisure), and many more low-cost alternatives to air travel (rail to buses). The point, therefore is, that the same Pigovian tax may lead to very different rates for developing countries versus developed ones; this is not surprising, considering that given air travel costs are already a much higher proportion of average incomes in developing countries than in developed ones, and therefore, already may reflect very different marginal social opportunity costs and welfare consequences for differentiated customers in these two categories.

Issues Arising from Effects on Cross-Border Migration, Unique Tourism and Business Travel for Developing Countries. As far as international travel is concerned, aviation to and from developing countries are also likely to have very different characteristics from that which dominate travel to and from developed countries. Specifically, a significant part of travel to developing countries originates from migration, unique tourism and business (as these countries become more integrated with the global economy), than from general leisure or general business travel that characterizes developed country travel. Because the former have huge and rising significance, or socially very different returns, than in developed country travel, then a uniform aviation tax is likely to be additionally

distortionary for developing countries than for developed ones. Again, this is a case for differential design of any aviation tax that is also likely to be informationally costly.

ICAO Views on Imposition of Aviation Taxes. Some presentations at the ICAO suggest the following^{xiv}:

- Distinguishes between a Tax and a Charge. A tax would have serious difficulties because of existing bilateral agreements and a ICAO agreement between Contracting States that have a legal international character.
- An environmental Charge would be better, such as an en-route emissions charge “returned in the first instance to the aviation sector for emissions reduction”.
- Discourages unilateral imposition by Contracting States of such charges
- Some proposals floated, such as a US\$6 per economy ticket and US\$62 per business class ticket that might produce some US\$8-10 billion revenues (floated by Maldives and in discussion with UNFCCC).
- But also raises questions about whether the proposed measures are directed at reducing aviation emissions, or at simply funding climate change finances?

ICAO Statements on Aviation Charges

The [Kyoto Protocol](#) which was adopted by the Conference of the Parties to the UNFCCC in December 1997 entered into force in 16 February 2005, calls for developed countries (Annex I parties) to pursue limitation or reduction of greenhouse gases from "aviation bunker fuels" working through ICAO (Article 2.2 of the Protocol). Further, the ICAO official stance remains the following:

International aviation currently has no dedicated financial mechanism related to climate change. Because international aviation is not covered by the Kyoto Protocol, it has no access to any of the Kyoto flexible financing instruments such as CIF or CDM. The absence of a structured mechanism does not mean that there are no initiatives or specific examples of financial contributions to support aviation climate change actions.

In the context of the current debate on the possible inclusion of international aviation in a future UNFCCC international agreement, ICAO is actively investigating the appropriate market-based measures and hence mechanisms to meet the goals associated with the aviation sector.

Although international aviation is prepared to implement measures for reducing its climate change impact, it should not be singled out or treated in a discriminatory manner. Any aviation financing mechanism should primarily serve the interests of the sector. This would ensure equity and non-discrimination since international aviation would be responsible for its real impact on climate change.

The ICAO High Level Meeting (see [HLM-ENV/09](#)) in October 2009 agreed on, “further elaboration on measures to assist developing States and to facilitate access to financial resources, technology transfer and capacity building”. ICAO is the appropriate institution to deal with aviation financing, as it can adapt the financial instruments to aviation specific goals and at the same time assist developing countries, not only financially, but also through technology transfer and capacity building.

One of the principal findings is that an [emissions-trading system](#) is a system whereby the total amount of emissions is capped and allowances, in the form of permits to emit CO₂, can be bought and sold to meet emission reduction objectives. Such a system could serve as a cost-effective measure to limit or reduce CO₂ emitted by civil aviation in the long term, provided that it is open to all economic sectors.

The Assembly consequently endorsed the development of an open emissions trading system for international aviation. It requested the Council to develop as a matter of priority the guidelines for open emissions trading, focussing on establishing the structural and legal basis for aviation's participation in an open trading system, and including key elements such as reporting, monitoring, and compliance, while providing flexibility to the maximum extent possible consistent with the UNFCCC process. A draft guidance on the use of emissions trading has been published by ICAO. [*Guidance on the use of Emissions Trading for Aviation* (Doc 9885)].

ICAO has also developed separate policy guidance to States on taxation (ICAO's [Policies on Taxation in the Field of International Air Transport](#), Doc 8632), which recommends the reciprocal exemption from all taxes levied on fuel purchased for international flights, a policy implemented in practice in the vast majority of bilateral air services agreements, and also calls on States to reduce or eliminate taxes related to the sale or use of international air transport.

In December 1996, the ICAO Council adopted a [policy statement](#) in the form of a resolution, concerning the use of emission-related levies. While the Council considered that the development of an internationally agreed environmental charge or tax that all States would be expected to impose would appear not to be practicable at that time, given the differing views of States and the significant organizational and practical implementation problems that would be likely to arise, the Council strongly recommended that environmental levies that States may introduce should be in the form of charges rather than taxes and that the funds collected should be applied in the first instance to mitigating the environmental impact of aircraft engine emissions. Such charges should be based on the costs of mitigating this impact, to the extent that such costs can be properly identified and directly attributed to air transport.

The Assembly recognized the continuing validity of the 1996 policy regarding emission-related levies, which urged States to refrain from unilateral action to introduce emission-related levies inconsistent with the current guidance, and called for the Council to carry out further studies and develop further guidance on the subject.”

Source ICAO Website.

D. The Alternative Cap-and-Trade Carbon Emissions Trade Approach

Market-Friendly and Informationally Less Demanding Design: Emission “Trading Rights”. If, because of these various considerations, it can be contentious and/or informationally costly to design the “perfect” Pigovian specific commodity tax on product such as aviation, especially across many taxing jurisdictions and circumstances, then the alternative is likely to be creating some limits of total

negative externality (total aviation GHG) and then create a market for rights to generate this specific externality---say aviation travel pollution rights----then allocating them by prior rules and allowing them to generate revenues through auctions which by design reward the more efficient and/or socially more appropriate uses (e.g., poor country air travel). In such “emissions trading” a central authority sets a cap on how much a pollutant such as CO₂ may be emitted. The cap is allocated to companies in the form of emissions permits, which give them the right to emit a certain amount of the pollutant. Firms are required to hold a number of permits equivalent to their emissions. The total number of permits issued to all companies cannot exceed the emissions cap, limiting total emissions to that level. Firms that need to increase their emission permits must buy them from companies that require fewer permits. This means permit buyers are paying a charge for polluting more, while sellers are being rewarded for reducing emissions.

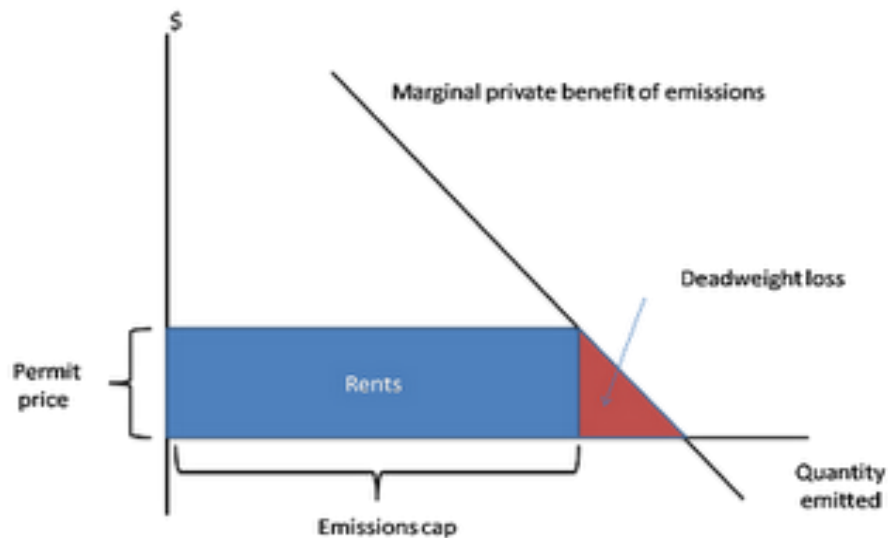
Difficulties. However, some observers believe that emissions trading regime is less effective than straight-forward Pigovian taxes, because the former is more difficult to negotiate up-front with distributional issues at the fore-front, and lobbying effects that can distort such emissions trading schemes. Second, emissions trading systems also do not directly raise revenues; they only confer benefits to users. Thus, it may take a very long time for developing countries to see substantial impact or resources flowing to them. Third, the proposed system has severe international regulatory issues and enforcement issues across borders. For example:

- Who is to monitor and ensure that a specified polluter stays within the specified limits of their permits, especially in countries with weak systems? Would firms have incentives to ‘game’ the system to derive benefits?
- How would the permits be traded across borders? Who would determine the eligibility for new projects to benefit from carbon credits?
- And, who or what agency would be empowered to resolve such disputes? If even setting up a national cap-and-trade system has proven difficult to

establish, then the problems of an international one would be considerably more severe.

- National systems might be prone to predatory behavior from private sector players, and regulatory capture and failures, while international harmonization would be quite difficult, even as international bureaucratic solutions are no answer since they raise difficult sovereignty issues.
- Possible big swings in cap-and-trade permit values, with such price volatility will create uncertainty.

Figure 3: Effects of Carbon Emissions Cap & Trade and “Dead-weight” losses



Source: <http://gulzar05.blogspot.com/2009/10/cap-and-trade-vs-carbon-taxes-debate.html>

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^{ix} Deadweight losses are in part a fiscal notion: the loss is lower with more inelastic supply and demand. With perfectly vertical and inelastic supply curve, there would be no deadweight loss, as in case of land. See also Dixit Avinash and Lambertini, 2003. Interactions of Commitment and Discretion in Monetary and Fiscal Policies , American Economic Review, Vol 93, No.5.

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