

## **Planes, Ships, and Taxes: Charging for International Aviation and Maritime Emissions**

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### **DISCUSSION**

This paper raises attention on an important issue – the anomalous treatment of international aviation and maritime transport both in terms of mitigation schemes and taxation - that has not received enough consideration so far, at least outside the circle of environmental experts.

In order to tackle this problem the paper proposes to introduce fuel taxes and, importantly, discusses with great care several aspects concerning the implementation of such a charge: the point in the supply chain where to impose the tax; the choice of the institution that should collect the revenues (national administrations vs. a central body); the determination of the tax rates and the need to agree on their revision and verification, etc. These features need to be seriously taken into account and handled carefully so as to make policy interventions in these areas effective. The paper does so and makes a number of reasonable proposals to address the practicalities associated with the introduction of fuel charges. The important message of this discussion is that, even though it will not be a trivial exercise, there are not insurmountable obstacles to the introduction of these charges.

In sum there is a lot to learn from this paper and from the insightful discussion of the several facets involved in this issue. What I did not find entirely convincing in the paper is the quantification exercise. More precisely, performing this exercise requires a number of restrictive assumptions that I will describe more extensively next. I do not believe that this exercise adds much to the discussion and that it is necessary to convince the reader of the fact that the proposed solution is reasonable and desirable.

First, the paper assumes that the social cost of carbon - i.e. the environmental damage per ton of CO<sub>2</sub> emissions - amounts to 25\$. This is the key parameter to compute the corrective (Pigouvian) fuel charge. Even though this figure has been proposed by a study by multiple US government agencies, one has to bear in mind that the quantification of environmental damages is at least controversial for their intrinsic long term nature. It is quite hard to figure out today what are actual damages that current emissions will produce in the future and that will be born by future generations. Coming up with a precise number – that represents the basis for a quantification of the welfare effects – seems quite hard to me.

Second, the quantification exercise does not take into account the general equilibrium effects of the introduction of the fuel charges. In particular, the increase in the price of air and maritime travel services is likely to increase the costs of firms, particularly of those that make an intensive use of these inputs, thereby affecting their profits and the price of their products. The consideration of these effects should have an impact on the quantification of the welfare effects.

Third, the paper makes very specific assumptions on the incidence of the fuel charge. To start with, it assumes that fuel charges are fully passed on into the fuel prices paid by purchasers. This assumption represents one extreme in the range of possible assumptions. At the other extreme, by taking into account that crude oil and hydrocarbons are fixed in supply, one would obtain the opposite result that the tax is fully born by suppliers, with no effect on the fuel price paid by purchasers and on the demand of fuel. The paper does not justify why such an assumption is more reasonable than the others. Furthermore, the paper assumes that the increase in fuel prices is fully passed on into the prices of air and maritime travel services. The industrial organization literature has well established that the extent to which increases in input costs are transferred to final prices depends on the competitive conditions, i.e. on the mode and on the degree of competition: a 100% pass-through requires the market to be perfectly competitive, whereas the more concentrated the market, the weaker product market competition, the lower the pass-through rate. I do not

think that competition in international aviation and maritime transport is so strong to justify a 100% pass-through. Of course, the choice made in terms of incidence of the fuel charge and of pass-through affects the magnitude of the estimated effects.

Finally the paper has to assign numerical values to a number of parameters. In few cases this is done by referring to studies that estimate such a parameter, as in the case of the price elasticity of air travel. In most of the cases ad-hoc studies are not available and the numerical value is assigned by judgment. Needless to say, the choice of the numerical value affects the results of the quantification exercise, as shown by Table 2.

These remarks are not aimed at limiting the value of the paper. Rather I believe that the paper proposes a solution whose validity and relevance can be demonstrated without the quantification exercise.

To conclude, the paper shows that, at least for international aviation, most of the welfare gains come from the reduction of the fiscal distortions due to its anomalous treatment. If this is the case, why do not we tackle the problem at its very roots, including international aviation in the VAT system that normally applies to goods and services? The paper states that this is impossible because the VAT is a tax on consumption and only final consumers should be taxed. Then, a seller of airline tickets should apply a different rate depending on the place where the buyer resides. I agree that including international aviation in the VAT system would be complex. But is sustaining an agreement on the introduction of a new charge, on the level of such a charge, on its revision (these are issues raised in the paper) easier than agreeing to eliminate VAT exemption for international aviation? Moreover, does not the same problem arise with on-line sales of any kind of product? How is it addressed in that case? Concerning international maritime services, there exist alternative technologies, such a liquefied natural gas, that would limit or eliminate the use of bunker fuel, a fuel that is extremely pollutant. So, if the problem is emissions, why not imposing a ban on the use of bunker fuel (an issue that currently seems to be discussed at the European level)? if instead the problem is tax distortions, why not removing the favorable tax treatment of international maritime services?