Progressive consumption taxes to curb CO_2 emissions: the case of air transport

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1. Introduction

Rising global temperatures and a spike in extreme events, including floods, heatwaves and droughts, are finally convincing international organizations, national governments and local communities to take immediate action against climate change (UN, 2015).

At the heart of such action are measures aimed at curbing anthropogenic emissions of carbon dioxide and reducing its atmospheric concentration, which has recently surpassed the alarming 400 ppm mark (Schwartz, 2016).

In order to achieve substantial results in a reasonable timeframe, however, environmental policies should not just focus on the production sector, but increasingly target individual behaviours, discouraging the consumption of goods and services with a large carbon footprint by means of ad hoc charges and levies (OECD, 2008). This has been recently stressed by the European Green Deal, which calls for ambitious tax reforms that can boost economic growth and promote a fairer society (EC, 2019).

Consumption taxes on carbon-intensive goods and services – so-called "carbon taxes" – are relatively widely applied (e.g. carbon tax on gasoline) and regarded by many as an effective low-cost tool to fight climate change (Stapleton et al., 2006; Nordhaus, 2008).

Yet, fixed-rate consumption taxes present equity issues, which may hinder their applicability and effectiveness. On the one hand, they tend to be regressive, placing much of the burden on low-income people, for whom consumption is a major share of income (Grainger and Kolstad, 2010).

On the other hand, they are not consistent with the idea that the marginal benefits an individual derives from consuming additional units of a good are progressively smaller (i.e. decreasing marginal utility) and subsequently the related environmental impacts progressively less acceptable.

The solution may be a progressive consumption tax, namely a tax whose marginal rates increase as an individual's consumption of a given carbon-intensive good or service increases (Orsi, 2017).

Some would argue, however, that the implementation of such a tax would be thwarted by a rather practical issue: how to keep track of individual consumption patterns so as to calculate the correct tax rates?

In fact, digital technology may be the answer as the widespread use of internet services, smartphones and electronic payment tools (e.g. credit cards) already allows the monitoring of people's behaviour at an unprecedented level of accuracy.

2. A progressive consumption tax on air transport

Air transport is a major contributor of CO_2 emissions globally. In the European Union, it is estimated to account for about 4% and 14% of total and transport-related carbon emissions, respectively (EC, 2021). These numbers are worse than they look though, as airplanes release carbon dioxide in the upper layers of the atmosphere where it has a stronger effect on ozone generation (Sausen et al., 2005), and air traffic is projected to triple by 2050 compared with 2015 (ICAO, 2021).

While air transport is currently subject to various charges such as departure taxes, landing fees and jet fuel taxes, their effect on demand is strongly mitigated by a series of subsidies on manufacturers, infrastructure providers and airlines (Gössling et al., 2017). This, combined with aggressive business models (Lohmann and Koo, 2013), have ensured surprisingly cheap tickets in the past 10-15 years. The outcome of this situation, besides soaring passenger numbers in line with the above-mentioned figures, is that the aviation industry is essentially not held accountable for its huge contribution to climate change.

The introduction of a progressive consumption tax on airline passengers, also called a frequent flyer levy (FFL) (Devlin and Bernick, 2015), might successfully tackle this problem for at least two reasons: one related to equity and one to feasibility.

Flying is still an elite activity, with few people taking most of the flights and therefore being responsible for the lion's share of CO_2 emissions. In England, for example, a mere 10% of flyers took more than half of all international flights in 2018 and almost half of the whole population did not fly at all (Department for Transport, 2019).

Having frequent flyers pay progressively higher taxes on each additional flight they take would be an effective way to curb overall demand (and carbon emissions) while ensuring the right to fly and preventing a burden on lower-income people (who fly less, if at all).

From a feasibility point of view, implementing such a tax would be relatively straightforward as the purchase of flight tickets is a heavily regulated activity, which takes place through well-defined pathways (e.g. airline websites, travel agencies) and requires rather comprehensive passenger information, therefore ensuring a full control over individual consumption patterns.

The implementation of the proposed tax would rely on a digital system of accounting handled by an international agency (e.g. IATA) and requiring passengers to activate a personal account that would store all data regarding their flights, including origin and destination, travelled distance, class of travel, etc. The account number would constitute compulsory information to be provided when purchasing a new ticket.

Data extracted from the flight history stored in the account (e.g. distance travelled over the last 12 months weighted by class of travel) would then be used to compute the tax rate an individual should pay on his/her next flight. Tax rates would start low, including the possibility of not charging any fee on the first flight of the year, but would climb steeply as travelled distance and/or the number of flights taken increases.

Among the expected benefits of this tax, in addition to the reduction of overall carbon emissions, is the possibility to raise massive revenues that could be used, for example, to:

- finance research on environmentally friendly aircraft technology

- compensate the effects of carbon emissions through renaturation projects and
- subsidise greener public transportation modes.

Although the proposed system aims to promote a fairer society, one where taxes account for an individual's ecological footprint, it may still not be exempt from equity issues. In fact, unless such a taxation is adopted globally (or at least at the continental level), countries not adopting it may enjoy undeserved competitive advantages over neighbours that have adopted it. Moreover, geography matters: disincentives on frequent flying may be relatively "manageable" in easily accessible countries, but less so in countries where air transport is pretty much the only option to stay connected with economic partners.

3. Conclusion

Owing to its peculiar characteristics, the aviation industry may be a forerunner in progressive consumption taxation, but other sectors may follow suit.

As digital technologies become more and more pervasive, keeping track of the individual consumption of other goods and services with a large carbon footprint (e.g. meat, clothing) will get easier.

The EU may facilitate this process by, for example, imposing digital payment methods on such goods and services, and devising ad hoc tracking procedures to get a clearer picture of consumption patterns.

Ultimately, fiscal policy might shift from taxing individuals solely on their capital and income to charging them partly on these and partly on the consumption of goods and services that have detrimental consequences on the environment. This would be the practical implementation of the Polluter Pays Principle and a giant stride on the path to sustainability.

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