

The environmental case for retaining (and not scrapping) Air Departure Tax

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I Introduction and background

Air Departure Tax (ADT)¹ is the devolved, Scottish, version of the UK's Air Passenger Duty (APD), a tax charged on passengers departing from UK airports. In recent years, the Scottish Government was planning to cut ADT by 50%, and abolish it in the long run, in order to boost the competitiveness and connectivity of Scottish airports.

During the Scottish Government's consultation on halving ADT, concerns were raised that the tax cut would act to increase greenhouse gas emissions from air travel by increasing aviation activity at Scottish airports. In the consultation², which took place between June and September of 2017, the majority (70%) of respondents rejected the proposed ADT cut, highlighting, among other things, the adverse environmental impact of the policy and its inconsistency with the Government's climate targets. In response to these concerns and to its announcement of a 'Climate Emergency', the Scottish Government has recently scrapped the policy to cut ADT, claiming it was no longer compatible with its climate targets. The announcement was heavily criticised by industry participants who cited the benefits the ADT cut would have delivered to the Scottish economy.

In a previous Fraser of Allander blog³, the author reviewed the economic case for cutting ADT in Scotland and argued that it was questionable whether the policy could generate the desired economic benefit of boosting connectivity. This short article focuses on ADT's environmental objectives. The author draws on theoretical and empirical contributions from the literature on aviation taxes to assess the merits of ADT as an environmental tax. The conclusion is that as currently designed ADT is an effective, albeit imperfect, tax instrument when it comes to its

¹ <https://www.gov.scot/policies/taxes/air-departure-tax/>

² <https://www.gov.scot/publications/air-departure-tax-scotland-consultation-overall-50-reduction-policy-plan/pages/0/>

³ <https://fraserofallander.org/scottish-economy/fiscal-policy/examining-the-economic-case-for-a-reduction-in-air-departure-tax/>

environmental efficacy, and that cutting it would have likely led to a reduction in the environmental benefits associated with the tax.

II The justification for having ADT

ADT, and similar taxes charged on airline passengers' travel, can be considered an environmental or 'Pigouvian' tax. The purpose of a Pigouvian tax is to correct market outcomes that are inefficient from a societal point of view. In the context of aviation, such taxes are necessary because air travel imposes costs on society that passengers might not consider (internalise) and do not pay for when they buy their tickets. Examples of these costs include noise pollution to communities living near airport runways; greenhouse gas emissions that contribute to climate change and congestion in or near airports. Airline passengers do not fully bear these costs themselves but as they are incurred by others, society is worse off as a whole – and the demand for air travel will therefore be higher than what is optimal for society. ADT, by making flight tickets more expensive, incentivises passengers to internalise the external costs of air travel, hence reducing their demand and bringing emissions levels closer to the socially optimal one. In so far as ADT is successful in reducing overall demand for air travel, leading to fewer flights, it should act to reduce overall emissions from aviation.

III The environmental footprint of air travel in the UK

The environmental footprint of a single flight depends on a variety of factors, including the type of aircraft used, the service level, the distance of the flight, and freight load⁴. The UK Government provides emission conversion factors annually to calculate the greenhouse emissions, per passenger, from each type of air travel⁵. For instance, an average passenger on a flight from Glasgow to London contributes to the emission of roughly 142 kilograms (313 pounds) of CO₂ into the atmosphere⁶. In recent years, overall UK emissions from the aviation sector has plateaued somewhat, after a steep increase in the early 2000s (see Figure 1). In 2016, total

⁴ Jardine, C.N., 2009. Calculating the carbon dioxide emissions of flights. *Final report by the Environmental Change Institute*.

⁵ <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2019>

⁶ Calculation is based on the conversion factor of 0.25355 kg CO₂ per passenger kilometre for domestic flights within the UK.

greenhouse gas emissions from aviation was roughly 34 million metric tons. On the other hand, the aviation sector's contribution to overall emissions has risen consistently over time in the UK and was nearly 7% of total emissions in 2016 (see Figure 2)⁷. Globally, emissions from the aviation sector are also expected to rise in future years because of the steady growth in international tourism, and it is widely accepted that policy measures are needed to reduce the environmental burden of air travel⁸.

Figure 1. Total greenhouse gas emissions from the UK aviation sector, 1999 – 2016, 000's of tons



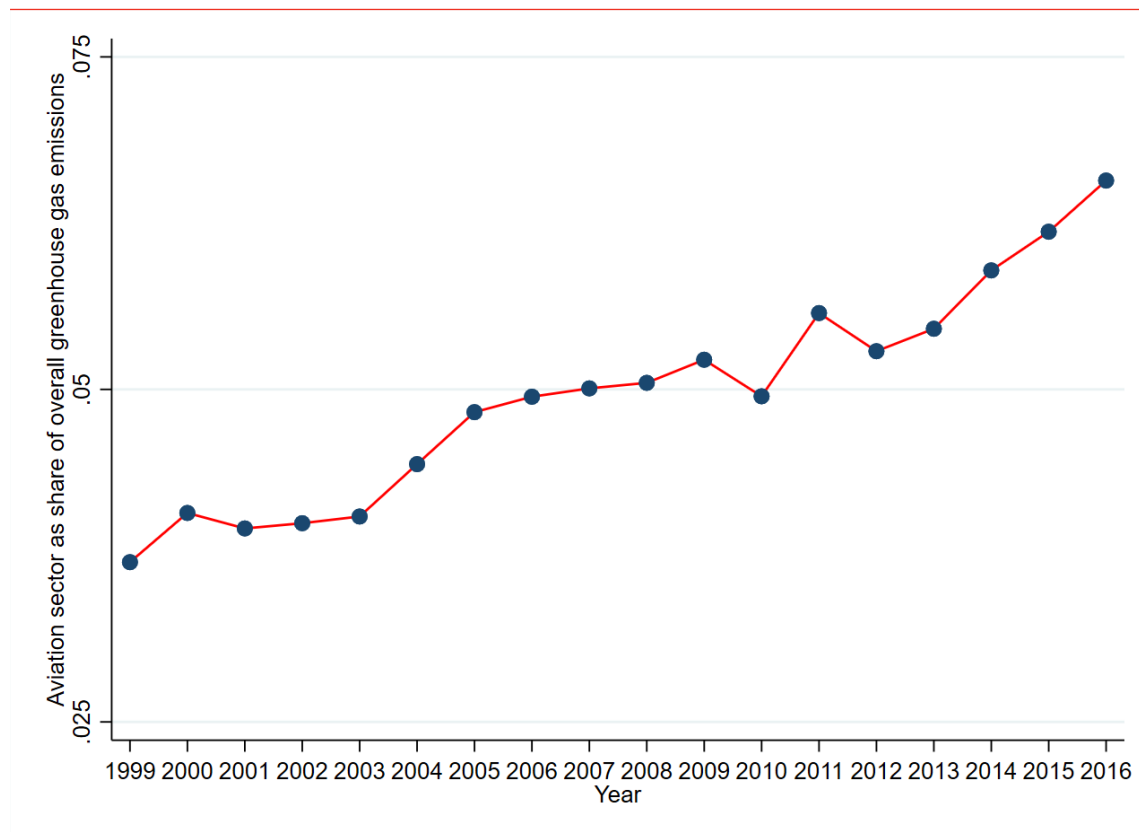
Source: Eurostat database⁹.

⁷ Data for both figures are from Eurostat. Data for later years are not available.

⁸ Kantanbacher, J., Hanna, P., Cohen, S., Miller, G. and Scarles, C., 2018. Public attitudes about climate policy options for aviation. *Environmental science & policy*, 81, pp.46-53.

⁹ See <https://ec.europa.eu/eurostat/data/database>.

Figure 2. Share of aviation sector of all UK greenhouse gas emissions, 1999-2016



Source: Eurostat database.

IV Is ADT well-designed to meet environmental objectives?

In short, the answer is both yes and no. Some features of ADT increase its efficacy as an environmental tax while others render its tax design suboptimal. I will briefly describe and explain each of these features in this section.

1. *Rates set to offset the external costs of aviation:* As a Pigouvian tax, the rates of ADT should be set to exactly offset the environmental/societal cost each flight passenger imposes by engaging in air travel. Based on some prior estimates in the aviation tax literature, the external marginal costs of air travel are roughly equal to £9.43 per passenger on short-haul flights; and £28.28 on long-haul flights¹⁰. Some researchers

¹⁰ In current prices. Estimates are from Wit, R.C., Davidson, M.D. and Dings, J.M., 2003. *Meeting external costs in the aviation industry*. CE, Solutions for environment, economy and technology. The initial estimates of €10 and €30, for short and long-haul flights, respectively, have been converted to current prices in £ using the 2003 EUR to GBP exchange rate and the UK GDP deflator.

claim that the initial calculations these cost estimates are based on are too conservative and underestimate the true cost of emissions from air travel¹¹. Even then, current ADT rates (see Table 1) are substantially higher than cost estimates, indicating that they should more than compensate for the external costs flight tickets impose on society and the environment.

Table 1 Proposed ADT (APD) rates from April 2019

Destination bands	Reduced Rate	Standard Rate	Higher Rate
Band A (<2000 miles)	£13	£26	£78
Band B (>2000 miles)	£78	£172	£515

Source: UK Government¹².

2. *Service level differentiation*: Another important feature of ADT is that it is differentiated based on service level - whether a passenger is liable to pay a reduced, standard or higher rate of ADT depends on the service level and seating arrangement (seat pitch) of the flight. This feature of ADT makes it more efficient from an environmental perspective: premium (business or first-class) flights are more carbon intensive on a per passenger basis as such seats use more floor space in comparison to economy seats.
3. *Tax harmonisation*: A useful feature of the original UK based APD¹³ was that its rates were harmonised across the UK, limiting the effects of harmful tax competition on environmental objectives¹⁴. Cross-border differences in any – in the case aviation - tax rates can lead to tax avoidance and a displacement of passengers to tax-free airports¹⁵, incentivising downward competition in tax rates between countries that are trying to maintain their tax base. Given the relatively sparsely populated border regions between England and Scotland it is possible that limited cross-border effects would have

¹¹ See Leicester, A. and O’Dea, C., 2008. Aviation taxes. *IFS Green Budget*.

¹² See <https://www.gov.uk/guidance/rates-and-allowances-for-air-passenger-duty>.

¹³ Through the Scotland Act 2016, APD was devolved to the Scottish Parliament as part of the Smith Commission recommendations and renamed ADT by the Scottish Government. The first year the Scottish Government will collect revenues from the devolved tax is 2018/19.

¹⁴ Apart from the ADT-exempt airports of the Highlands and Islands region of Scotland.

¹⁵ <http://publicaties.minienm.nl/documenten/effects-of-the-air-passenger-tax-behavioural-responses-of-passen>

materialised if the Scottish Government had implemented its policy of cutting ADT¹⁶. Nonetheless, in a scenario where the implementation of the policy was followed by a substantial displacement of passengers from English to Scottish airports, English authorities would have had the incentive to cut aviation taxes at domestic airports, potentially lowering APD rates to below the socially optimal one. From this perspective, the Scottish Government's plan to deviate from a standardised UK APD rate and reduce ADT by 50% and then abolish it in order to make Scottish airports more attractive was not an environmentally conscious policy. Not only would it have led to an increase in aviation activity and emissions, but it would have led to an effective environmental tax competition between Scotland and the rest of the UK.

4. *Differentiation based on distance*: ADT rates are differentiated based on the distance of the flight, with passengers on flights to destinations more than 2,000 miles away from London paying considerably higher rates. This is not optimal, as a well-designed aviation tax should punish both very short and very long flights, these being the most fuel intensive¹⁷. Furthermore, the specification of the distance bands creates a discontinuity in passengers' flying costs as a function of distance: the marginal costs of flying an extra mile are very high for passengers near the threshold of 2,000 miles and decreasing as they travel further. Since ticket prices are likely to increase with distance, effective tax rates fall, and very long flights which are more damaging to the environment are incentivised.
5. *Incentives for airlines*: Perhaps the most significant issue with ADT (and similar flight ticket taxes) is that it does not incentivise airlines to use fuel more efficiently or to maximise aircraft capacity. The tax works on the demand side, reducing effective demand for travel but does nothing to impact on the supply side in terms of incentivising airlines to use more environmentally friendly aircraft or fuel types.

¹⁶ Perhaps aside from leakage from Newcastle and the North East of England to Edinburgh, and perhaps Glasgow airports.

¹⁷ Keen, M., Parry, I. and Strand, J., 2012. *Market-based instruments for international aviation and shipping as a source of climate finance*. The World Bank.

V Are there more efficient ways to tax aviation?

As mentioned above, the two main concerns regarding the environmental efficacy of ADT-type taxes on aviation are that they: 1) do not incentivise airlines to reduce emissions and 2) have only a very rough relation to the emissions intensity of flights. Taxes on aviation fuel might be better instruments to reduce carbon emissions, as they incentivise airlines to use emissions intensive kerosene more efficiently. Fuel taxes are however difficult to implement due to international legal obstacles and currently aviation fuel is not taxed in the UK. Indeed the IMF and the EU recognise that the transport sector is undertaxed from an environmental point of view.¹⁸

For this reason, a carbon-based flight ticket tax, where tax rates payable are directly proportional to the carbon intensity of an individual flight, might be the most environmentally effective way to tax air travel¹⁹. A carbon-based tax will incentivise airlines to use fuel more efficiently; reduce the overall number of flights and maximise aircraft loads to avoid higher per-passenger fuel costs as well as to change the fuel mix to make it less carbon-intensive. If carbon-based taxes are passed on to passengers in the form of higher prices, they should be able to reduce demand for flights overall, and demand for very short and very long-distance flights especially. On the other hand, lack of international or regional tax coordination would hamper the effectiveness of carbon-based ticket taxes, as countries might be reluctant to introduce them in fear of substantial cross-border tax avoidance responses by passengers and/or airlines.

VI Conclusions

In conclusion, it can be said that in its current form ADT is a good, albeit flawed tax instrument for reducing the environmental impact of the aviation sector. While the current high rates of ADT, along with their progressiveness with respect to service level are sound features of its design, the rough differentiation of rates based on distance and the lack of incentives for airlines to use fuel more efficiently make the tax less effective in contributing towards environmental goals.

¹⁸ See <https://www.ft.com/content/1ce24798-733b-11e9-bbfb-5c68069fbd15>.

¹⁹ See Krenek, A. and Schratzenstaller, M., 2017. Sustainability-oriented tax-based own resources for the European Union: a European carbon-based flight ticket tax. *Empirica*, 44(4), pp.665-686.

Nonetheless, the recent scrapping of the policy to cut ADT in Scotland will likely be beneficial from an environmental perspective: lower tax rates would likely have led to higher demand for air travel and increased emissions; while different tax rates within the UK could have risked introducing harmful downward tax competition in ADT (APD) rates.

However there are ways to improve ADT to increase its positive impact on the environment, if that is now seen as a key objective. One possibility discussed here is to make the tax carbon-based so that rates vary to reflect the carbon intensity of individual flights. Regardless of the future policies implemented, after devolution of the tax, policy coordination between Scotland and the rest of the UK will be very important to ensure that any tax rates that are set, are in accordance with environmental objectives and not used as instruments for competitive rent-seeking.

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