

A new basis for aviation taxation

A briefing on the introduction of an aviation tax
based on a per-plane duty

Simon Dresner

Policy Studies Institute

June 2010

'A new basis for aviation taxation: A briefing on the introduction of an aviation tax based on a per-plane duty' was written by Dr Simon Dresner, edited by Ben Shaw and published by Policy Studies Institute.

Simon Dresner is a Research Fellow in the Environment Group at Policy Studies Institute and Ben Shaw is Head of the Environment Group at Policy Studies Institute.

This briefing has been produced as a part of a joint project between Policy Studies Institute and Green Alliance to develop the findings of the Green Fiscal Commission which were published in its final report 'The Case for Green Fiscal Reform' in October 2010. Policy Studies Institute provided the Secretariat for the Green Fiscal Commission and full details of the Commission's work are available from:

www.greenfiscalcommission.org.uk.

Policy Studies Institute

50 Hanson Street
London
W1W 6UP

020 7911 7500

www.psi.org.uk

Green Alliance

36 Buckingham Palace Road
London
SW1W 0RE

020 7233 7433

www.green-alliance.org.uk

© 2010 Policy Studies Institute

We are grateful for the support this work has received from the Esmée Fairbairn Foundation and Ashden Trust.



Contents

Introduction	2
Green tax reform	2
The new government's commitment to per-plane duty	3
Aviation's tax privileges.....	3
Aviation and the EU Emissions Trading Scheme.....	4
The distributional impact of increasing the cost of aviation.....	4
Per Plane Duty and Air Passenger Duty	4
Effects of PPD on fares.....	5
Effect of increasing taxes on aviation.....	6
The basis of PPD	7
Basing PPD on NO _x emissions or maximum take-off weight	7
Charging for distance	8
PPD and fuel duty	9
Conclusion	9
References.....	10
Annex 1	12

A new basis for aviation taxation:

A briefing on the introduction of an aviation tax based on a per-plane duty

Introduction

Aviation as a sector is currently under-taxed, both in comparison to the amount that other sectors contribute to public finances and also given its large and growing environmental impacts. The new Coalition government has indicated its desire to introduce an aviation tax based on a per plane duty. At a time when the two central public policy challenges to be addressed are, first, the state of the public finances and, second, taking firm action to meet our climate change targets this briefing outlines how changing the basis of aviation taxation could result in greater revenues for government and a clearer environmental signal to aviation operators and passengers. The briefing is written in the context of the work of the Green Fiscal Commission that published its final report *The Case for Green Fiscal Reform* in October 2009. The headline message of this work was that green fiscal reform is a crucial policy to get the UK on a low-carbon trajectory; help develop the new industries that will both keep it there and provide competitive advantage for the UK in the future; and contribute to restoring UK fiscal stability after the recession. It is a key to future environmental sustainability and low-carbon prosperity.

This briefing, published in advance of the Emergency Budget, outlines the contribution that taxes on aviation could make. We will make further recommendations for other green taxes later this year. Green Alliance has produced a shorter political briefing that does not discuss the technical details of the proposal.

Green tax reform

The concept of a green tax shift is simple: taxes on the things that are valued by society; like jobs, incomes and profits; are reduced and the lost revenue is replaced by taxes on things society does not like, such as pollution and environmental degradation. 'Pay as you burn, not pay as you earn' as one political formulation has put it. This shift not only reduces pollution, but is a more economically efficient way of raising necessary tax revenues. Taxes on labour at their current level, for example, distort the economy and reduce its efficiency and output. The same considerations suggest that, at times when taxes need to be increased to stabilize the public finances, green taxes should play a larger role in the increase than other taxes.

The Green Fiscal Commission reported last year on the economic, social and environmental implications of a major green tax shift for the UK, such

that revenues from environmental taxes would more than double their current 7 per cent share in overall tax revenues by 2020 (GFC 2009). The results suggest that a large-scale green tax shift would be economically sensible and environmentally effective. If implemented with appropriate complementary measures, it could also be socially acceptable, especially as increasing numbers of people come to realise the imperative of reducing carbon emissions and climate change.

The new government's commitment to per-plane duty

The new Conservative-Liberal Democrat government has stated in the Coalition Agreement that it wishes to change the basis of aviation taxation from a per-passenger to a per-plane duty, and will ensure that a proportion of any increased revenues over time will be used to help fund increases in the personal allowance for income tax (HM Government 2010). It thus proposes to introduce a clear green tax reform.

The Conservatives did not make public detailed proposals before the election, but the Liberal Democrats proposed a modified system of aviation taxation intended to raise an additional £3 billion next year by replacing Air Passenger Duty (APD) with per-plane duty (PPD). This would give much clearer signals for airlines to reduce the environmental impact of aviation. We broadly support this proposal, but caution that to avoid leakage of long-haul passengers flying via hubs on mainland Europe there may be a case for retaining an element of APD on long-haul tickets.

Aviation's tax privileges

Aviation enjoys many tax privileges that other sectors do not. Aviation pays around £2 billion a year in APD, but if it was taxed to the same extent as trains and coaches are on fuel it would pay £8.5 billion a year (Eagle 2008), an additional £6.5 billion a year. Under the Chicago Convention, it is exempt from fuel duty on international flights, although the government could introduce fuel duty on domestic flights without international agreement – the United States and Germany are among the countries which already do that. All airline ticket sales are exempt from VAT. If VAT was charged on tickets at the standard rate of 17.5 per cent that would bring in £2.3 billion a year (House of Commons Transport Committee 2010). Aviation also benefits from not having to pay VAT on new aircraft purchases and other expenses and an effective subsidy from duty-free shops that bring the total tax privileges for the sector to around £10 billion a year.

International air tickets are exempt from VAT and there are duty-free shops at airports under EU rules, so the government cannot change them without EU agreement. However, it could introduce VAT on domestic

tickets and on aircraft purchases if it chose to. Train and bus tickets are exempt from VAT, but fuel for private cars of course is subject to VAT. For example, the tax and VAT on petrol consumed by an average car driving from London to Newquay in Cornwall is about £25. The tax on diesel consumed by a train doing the same journey is about £5 per passenger. The APD for a passenger flying the journey in economy class is £11. Air travel consumes more fuel per passenger mile than a car with only one person in it does. It would send more consistent signals to consumers if air travel was subject to VAT as well as fuel duty. It is also important to note that the climate change impacts of fuel use in aviation are amplified compared to other forms of transport due to the effects of non-CO₂ emissions at altitude.

Aviation and the EU Emissions Trading Scheme

In 2012 the aviation sector will enter the EU Emissions Trading Scheme (ETS), which means airlines will need carbon permits to reflect their emissions. However, the terms on which the sector will join the scheme are generous and the overall cap for the EU ETS is not yet sufficient to deliver the reductions in greenhouse gas emissions required to prevent dangerous climate change. The price of carbon in the ETS is expected to be much too low to have much effect on the growth of emissions from aviation, the economic sector that will be the most technically difficult to decarbonise. It does not seem a good idea to encourage the sector to grow when it will later be so difficult to fit it within the planned 80 per cent reduction in carbon emissions by 2050.

The distributional impact of increasing the cost of aviation

Because most air travel is by the wealthiest 20 per cent of the population (CAA 2006) and people with low incomes fly very little, increasing the price of air travel would have progressive distributional effects as it would enable other taxes which are not so progressive to be lower than they would otherwise have to be. The increase in income tax allowance which the government proposes that PPD would help fund is an example of that.

Per Plane Duty and Air Passenger Duty

The advantages of PPD over APD are that it correlates better to environmental impact, gives clearer signals to airlines, encouraging them to fly their planes full and to use more efficient planes, and it includes freight and transfer passengers, which are currently untaxed, in the tax base. The disadvantages of PPD are that it gives a less clear signal to passengers and it is possible for passengers to avoid it by using European hubs which could therefore limit the level of aviation taxation that can be sustained.

We recommend that APD is increased in November as already announced by the last government and that in the Emergency Budget it should be announced that there will be further reform of aviation taxation involving PPD by April 2011 to raise substantially more revenue. Because of the potential risk of long-haul passengers avoiding PPD by changing planes on mainland Europe, we advise that the government considers retaining at least an element of APD for long-haul flights while introducing PPD. We consider that it would be feasible to increase the total revenue from aviation taxation by the £3 billion a year the Liberal Democrats propose by 2012.

The previous government announced in 2008 that there would be a switch to PPD, which they called aviation duty and consulted on it (HM Treasury 2008a), but during the banking crisis at the end of that year they decided not to go ahead with the proposal (HM Treasury 2008b). They were concerned about the stability of tax revenues and the effect of a change in the system at a time of such uncertainty.

Effects of PPD on fares

Our calculations about the likely effect on actual fares of a change to PPD, that was more proportional to actual emissions than APD is, indicate that if PPD was raising similar amounts of revenue to now, the typical effect on fares would be relatively marginal except for flights of well over 6000 miles. It is worth noting that while premium passengers currently pay twice the rate of APD that economy passengers do, business-class and first-class passengers on long-haul flights are paying less per unit of space they occupy than economy and premium-economy passengers. Defra (2009) estimates that compared to economy-class passengers, premium-economy passengers on average have 1.6 times the impact factor, business-class passengers have 2.9 times and first-class passengers have 4 times the impact factor. Of course, business-class and first-class fares are even larger multiples of economy fares than that. It is therefore likely that as PPD is increased airlines will place more of the additional burden on business-class and first-class fares, although the degree to which the tax is passed on to passengers and the allocation between different classes of ticket is a matter for the airlines.

PPD can also be used to raise revenue from freight which APD cannot. Freight-only flights would be subject to PPD and operators of passenger flights carrying freight could pass an element of the PPD onto freight customers. Short-haul freight travels almost exclusively on dedicated cargo planes, which account for around 1.5 per cent of aviation's emissions (CAA 2006). Long-haul freight travels predominantly in the hold of passenger flights. We estimate based on official figures that in total freight accounts for about 8 per cent of aviation's emissions (see Annex 1 for details).

A potential problem with PPD is that because it is based on the destination of the plane rather than the passenger, whereas APD is based on the destination of the passenger, it may encourage long-haul passengers to fly to a hub airport abroad and change planes there. If passengers chose to split a long-haul flight by changing planes abroad, then they may only be liable for PPD on the first flight, to say, Amsterdam, and not the second, to a long haul destination as they would under APD. It would probably not be a very significant problem at present revenue levels as tax avoidance savings for economy-class passengers would typically be in the order of 10-15 per cent of the fare, not enough to outweigh the inconvenience for most people. It could become a serious problem as PPD increased since there would potentially be savings of a few hundred pounds to be made on the longest flights by changing planes at a hub in mainland Europe.

We have considered a number of possible ways to deal with the problem. The Treasury suggested in the consultation on aviation duty that banding could be used to prevent PPD being proportional to emissions. Another suggestion was that distance could be raised to an exponent less than one, such as the square root of the distance. These measures could be effective if total revenue raised was not much higher than at present, but the differential between short-haul and long-haul flights would have to be relatively small. Such a flat tax would undermine the environmental signals of PPD – a central motivation behind the change from APD to PPD – and the level of tax on short-haul flights could become disproportionately high by comparison and so hard to justify to the public.

Another way to resolve the problem would be to retain APD on a complementary basis to PPD. One option would be to introduce PPD, but retain APD for long-haul flights while having PPD at a lower rate per mile for long-haul flights than for short-haul flights. That would bring the environmental advantages of PPD while limiting the potential for tax avoidance. If that was regarded as too complicated, then PPD could be introduced for short-haul flights while APD could be increased for long-haul flights and made more proportional to distance.

Effect of increasing taxes on aviation

There have been only a few studies of air fare elasticities for the UK, that is the degree to which demand for flights is affected by changes in price, and they have only been for leisure air fares, which are expected to have higher elasticity than business air travel. So price appears to be more important for leisure travellers than business travellers. Graham (2000) estimated the income elasticity for UK leisure travel of about 2 (i.e. that a given percentage increase in income leads to approximately twice as much increase in leisure travel), but found no significant relationship between demand and air fares. Dargay and Hanly (2001) used a pooled time-series cross-section data which covered the years 1989–1998. They estimated a long-run income elasticity for UK outbound traffic of about +1 and a fares elasticity of about -0.6. This means that as incomes increase

(or decrease) demand for aviation changes by the same proportion but that if fares increase by a certain percentage, demand for leisure air travel decreases by about 0.6 times as much. Njegovan (2006) used quarterly data for the 11-year period 1993-2004. He estimated a price elasticity for air fares of about -0.7.

Since there are no publicly available estimates for the elasticity of demand for business air travel, it is not possible to make a robust estimate for the effect on demand. As a worst-case scenario, raising taxes on aviation to collect an extra £3 billion of revenue, taking into account the reduction in demand, would increase fares by around 24 per cent and reduce demand by around 13-14 per cent.

As there is a £15 billion a year trade deficit on tourism, any reduction in demand for flying will be counterbalanced by increases in leisure travel and holidays in the UK which will provide economic benefits for the country in ways more consistent with developing a low carbon economy.

The basis of PPD

Ideally PPD would be directly proportional to the emissions from the flight concerned. However, basing PPD on fuel used or a carbon emission factor is not compatible with the Chicago Convention. Other bases are therefore required for PPD and these are discussed below.

Basing PPD on NO_x emissions or maximum take-off weight

We agree with the Liberal Democrats (2010) that it would ideally be preferable to base the tax on NO_x landing and take-off (LTO) emissions. The Treasury had suggested in the 2008 consultation on aviation duty that it would not be possible to use NO_x because the Corinair dataset about aircraft NO_x LTO emissions is not comprehensive, so it would be necessary to use maximum take-off weight (MTOW) instead. The CAA (2008) pointed out that the ICAO dataset of NO_x LTO emissions of *engines* is more comprehensive, although it still only covers turbojet and turbofan engines. The Liberal Democrats suggested that since Sweden has had an environmental charge based on NO_x since 1998 and Heathrow and Gatwick now have an NO_x charge the data and administrative barriers may not be insuperable. We have found that the Swedish Aeronautical Institute has compiled a dataset covering some turboprop engines as well as the turbojet and turbofan engines the ICAO dataset contains. The data is available to interested parties with the permission of the manufacturers. Sweden applies the charge to planes of 5.7 tonnes and above MTOW using all sixteen Swedavia (formerly LFV) state-owned airports (CE Delft 2008).

This suggests that the data may be comprehensive enough to support a tax based on NO_x. If it is possible that would be worth doing both because it would better reflect the environmental impact than MTOW and, perhaps even more importantly, it would greatly increase its public credibility as an environmental tax. Our calculations indicate that although LTO NO_x emissions are certainly not a perfect proxy for other emissions such as CO₂, it is a rather better indicator than MTOW, which does not reflect the improved efficiency of more modern planes and would not give the same incentive for airlines to fly more modern, efficient planes. The higher operating pressures and efficiencies of more modern engines do create higher NO_x emissions relative to CO₂ emissions, but capturing the higher efficiencies of more modern engines appears to outweigh that. The Liberal Democrat proposal to base the tax on an algorithm using NO_x LTO emissions, the number of engines and MTOW seems like a good way to make the tax most reflective of the environmental impact with the cohorts of data available and within the legal restrictions on the taxation of aviation.

We should stress that if it is not possible to base the tax on NO_x, a tax on MTOW would still be worthwhile and an improvement on APD. Since it is very important for public acceptance that there is an incentive for airlines to fly more efficient planes, we support the suggestions by both the CAA and the Aviation Environment Federation in the consultation on aviation duty that there should be a factor in the tax based on a proxy for the emissions of the plane if NO_x data is not comprehensive enough. Both organisations suggested using the age of the plane in combination with MTOW as a proxy for emissions.

Charging for distance

We support the Liberal Democrat proposal to reflect distance in PPD on a per-mile basis rather than by band. Banding is simpler administratively, but it reduces the environmental signal. The present system of banding APD by distance is a big improvement on its predecessor, but it creates anomalies when flights to two countries close together attract very different levels of APD. For example, Libya is in Band A and APD for an economy-class passenger is £11, while Egypt is in Band B and APD is £45. Simplifications like these are understandable when APD has to be charged to each passenger, but when airlines are being charged per plane they would be less acceptable and could be used to undermine public support for PPD. We also agree that PPD should be charged for the great circle distance between each of the flight's stops until its final destination at which the last passengers or freight leave the plane, rather than the first landing outside the UK.

We agree with the CAA that there should be an element in the tax which acts as a proxy for the emissions of the landing and take-off cycle. They suggested a factor of about 110 miles should be added to the distance to account for that.

PPD and fuel duty

We support the Treasury's original proposal in the consultation on aviation duty that it should be applied to all fixed-wing planes of 5.7 tonnes and above, while fuel duty is applied for planes below that weight regardless of whether the flight is for business or pleasure. We disagree with the Liberal Democrats' proposal to have the threshold at 10 tonnes like it is for APD at present. That would create anomalies which would be used to criticise the measure. In particular, because it would be possible to reclaim the duty on fuel used for international flights, that would mean that such flights by most private jets would be tax free (as they are at present). It is politically important for PPD to be perceived as fair and people who are able to afford to fly in private jets should not be able to still fly tax-free. There are a few private jets which are below 5.7 tonnes, but most are above that weight.

Conclusion

We welcome the Coalition government's commitment to PPD and to use part of the revenue from increasing the taxes on aviation to increase personal allowances as well as to contribute to reducing the public deficit. This approach seems to be economically and environmentally justified, is consistent with the principles and benefits of green fiscal reform and the Coalition's stated intention to increase the proportion of tax revenue accounted for by environmental taxes. Aviation is an under-taxed sector that benefits from enormous tax privileges and effective subsidies at the expense of the rest of the economy. We hope the Coalition will press forward with action in this area in the Emergency Budget as an early indication of its commitment to environmental and fiscal stability and will develop further measures during the course of this Parliament.

References

CE Delft (2008) Lower NO_x at Higher Altitudes: Policies to Reduce the Climate

Impact of Aviation NO_x Emission. European Commission.

http://ec.europa.eu/transport/air/studies/doc/environment/oct_2008_nox_final_report.pdf

Civil Aviation Authority (2006) CAA Airport Statistics 2006

<http://www.caa.co.uk/default.aspx?catid=80&pagetype=88&sglid=3&fld=2006Annual>

Civil Aviation Authority (2008) CAA Response to HM Treasury Consultation on Aviation Duty

<http://www.caa.co.uk/docs/5/20080424CAAResponseOnAviationDutyFinal.pdf>

Dargay, J. and Hanly, M. 2001. The determinants of the demand for international air travel to and from the UK. Paper presented at the 9th World Conference on Transport Research. Cited in Njegovan (2006).

Defra (2009) 2009 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting: Methodology Paper for Emission Factors

<http://www.defra.gov.uk/environment/business/reporting/pdf/091013-guidelines-ghg-conversion-factors-method-paper.pdf>

Department for Transport (2007) UK Air Passenger Demand and CO₂ Forecasts

<http://webarchive.nationalarchives.gov.uk/+http://www.dft.gov.uk/pgr/aviation/environmentalissues/ukairdemandandco2forecasts/airpassdemandfullreport.pdf>

Eagle, Angela (2008) House of Commons Debate 10 June 2008 cc177-8W.

Graham, A. (2000) Demand for leisure travel and limits to growth, *Journal of Air Transport Management* 6, pp. 109–118.

Green Fiscal Commission (2009) The Case for Green Fiscal Reform: Final Report of the UK Green Fiscal Commission.

http://www.greenfiscalcommission.org.uk/images/uploads/GFC_FinalReport.pdf

HM Government (2010) The Coalition: our programme for government.

http://www.cabinetoffice.gov.uk/media/409088/pfg_coalition.pdf

House of Commons Transport Committee (2010) The future of aviation: Government response to the Committee's First Report of Session 2009–10. HC 388.

<http://www.publications.parliament.uk/pa/cm200910/cmselect/cmtran/388/388.pdf>

Liberal Democrats (2010) Aviation Tax reforms: Technical note. February 2010

Njegovan, N. (2006) Elasticities of demand for leisure air travel: A system modelling approach, *Journal of Air Transport Management* 12 (1), pp. 33-39.

Annex 1

Emissions from air freight can be derived from published statistics.

Emissions from dedicated cargo flights were 0.5 MT CO₂ in 2005, about 1.5 per cent of the 35.5 MT CO₂ emissions from aviation in 2005 (Department for Transport 2007).

Approximately 35 per cent of freight carried is on cargo flights and 65 per cent in the belly-hold of scheduled flights (CAA 2006), but freight carried on scheduled flights is almost entirely long haul.

Defra (2009) estimates that if emissions from freight are attributed equivalently between dedicated cargo services and freight carried on passenger services then 88.4 per cent of emissions from long-haul passenger flights can be attributed to passengers and 11.6 per cent to freight. Only 0.5 per cent of emissions from short-haul passenger flights and 0.3 per cent of emissions from domestic passenger flights can be attributed to freight. That means that 2.4 MT CO₂ from passenger services can be attributed to freight. Together with 0.5 MT CO₂ from dedicated cargo flights, that gives a total of 2.9 MT CO₂ from freight, or about 8 per cent.

In practice, most of the freight is being imported rather than exported. Dedicated cargo flights will have to cover the cost of the largely empty flight one way, but passenger flights from the UK will not be charged for the freight flown in on the other leg.

PSI is a research institute at the University of Westminster
50 Hanson Street, London, W1W 6UP
Tel +44(0)20 7911 7500 Fax +44(0)20 7911 7501
www.psi.org.uk



The University of Westminster is a charity and a company limited by guarantee. Registration number: 977818 England. Registered Office: 309 Regent Street, London W1B 2UW.