



Estimated revenues of VAT and fuel tax on aviation

Paper
Delft, July 2013

Author(s):
Marisa Korteland
Jasper Faber



Publication Data

Bibliographical data:

Marisa Korteland, Jasper Faber

Estimated revenues of VAT and fuel tax on aviation

Delft, CE Delft, July 2013

Aviation / Fuel tax / Environmental-friendly behaviour

Publication code: 13.7B52.49

CE publications are available from www.cedelft.eu

Commissioned by: European Federation for Transport & Environment.

Further information on this study can be obtained from the contact person, Jasper Faber.

© copyright, CE Delft, Delft

CE Delft

Committed to the Environment

CE Delft is an independent research and consultancy organisation specialised in developing structural and innovative solutions to environmental problems.

CE Delft's solutions are characterised in being politically feasible, technologically sound, economically prudent and socially equitable.



1 Introduction

Over the years, governments have developed various types of taxation. Some of them are primarily implemented in order to gain revenue, others (also) aim to stimulate more environmental-friendly behaviour or aim to raise funds for development goals.

Many aspects of aviation are currently not taxed, although the sector denies that this results in a low tax burden (see for example IATA, 2005). Regardless of this debate, this study will consider two types of taxes that aviation has mostly been relieved/excluded from:

- Consumption/sales taxes, also called Value added tax (VAT) in the EU. With rates of up to 27% (Hungary), it is levied on the consumption of goods and services in most countries around the world. There is no VAT issued on international airline tickets in EU Member States. However, some Member States charge VAT on domestic air travel.
- Fuel tax. This is an exercise duty on the sale of fuel. Fuel taxes on road transportation are mandatory within EU, while taxes on international aviation are not allowed under various bilateral agreements and under Council Directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity.

Subsequently, the question is what the public revenue would be if VAT or a fuel tax would be (fully) introduced in the aviation sector in the EU, i.e. what is the estimated revenue shortfall in Europe at the moment?

In the next two sections, we calculate these figures and find a shortfall estimated at € 7.1 billion for VAT on total airline revenues and € 20 to € 32 billion for fuel taxes per year. In case 20% VAT would be issued on jet fuel¹ consumption, tax revenues would additionally increase by a minimum of € 10 billion yearly. However, where VAT was imposed on all inputs and outputs in the aviation industry this would not be additional but rather could be deducted by the airlines against the VAT receipts from airline tickets.

Please note that these results should be interpreted as rough estimates. In our simplified approach we assume that the current situation in the aviation sector is unchanged after a tax is introduced (except for existing taxation schemes that might be altered in response). This is also called the ‘ceteris paribus’ assumption. In fact, behaviour is expected to change due to the introduction of a tax as airline ticket prices will presumably increase. Demand will thus decrease to a certain degree, i.e. the tax base will diminish. More extensive research on price elasticity and other relevant factors is needed in order to come up with more detailed analyses and more precise revenue estimates. This falls outside the scope of this note.

¹ Jet Fuel is the fuel most widely used in aviation, both to power jets and turboprops. Very small aircraft such as recreational aircraft sometimes use aviation gasoline (Avgas).



2 Estimations

2.1 Value added tax (VAT)

VAT is levied at each stage of the lifecycle of services and products. The tax base is the value added in that particular stage. It is computed as revenue minus expenses, also known as 'operational profit'. In the current case, however, we are interested in the total amount of VAT that would be paid by the aviation sector. Therefore, it suffices to know the total revenues of the airlines². Then, we need to know which part is leisure passenger based spending. Freight transport and business passenger expenditure is not relevant here as input VAT payments would be deductible (or partially deductible) for companies.

The total revenue of system-wide global commercial airlines is € 517 billion of which € 412 billion concerns passenger transport (IATA, 2013)³. Since European aviation accounts for approximately 30% of the world market⁴ and roughly half of passenger transport revenues is leisure⁵, the total turnover that would be subject to VAT is nearly € 62 billion annually. When we assume an average VAT⁶ of 20%, the tax revenue (ceteris paribus) would be € 12.4 billion.

However, the shortfall in European public revenues is less than € 12.4 billion as VAT is being charged on domestic air travel in some countries (among which Germany, France, Italy and Spain) and several large aviation-specific taxes are imposed in some countries. In the event that VAT was imposed on aviation across the EU, it would be likely that these taxes would be abolished or reduced as a number of them are imposed partially in response to the lack of VAT in the industry. Therefore it could be argued that the revenue from these taxes should be deducted from the revenue shortfall calculated here.

We arrive at a required deduction of € 5.5 billion:

- IATA (2006) estimated that EU VAT receipts from domestic air travel totalled € 965 million in 2004⁷. If we assume that this tax burden grows proportional to EU 27 aviation turnover growth, the VAT burden for airlines is estimated to be nearly € 1.1 billion in 2011⁸.
- Available ticket tax revenue estimates are (CE Delft et al., 2012):
 - the Air Passenger Duty (APD) in the UK: € 2.98 billion (2011);
 - the Solidarity tax in France: € 173 million (2012);
 - the Luftverkehrssteuer in Germany: € 905 million (2011);

² The expenses of airlines are revenues for their suppliers, whose expenses are then revenues for their suppliers, etc.

³ Exchange rate of 1,30 is used.

⁴ In 2009 total turnover of aviation in EU 27 was € 111 billion (EC, 2012) whereas world revenues accounted for € 362 billion (IATA, 2013). This implicates a market share of 30%. It is assumed that this figure holds for both passenger as freight transport 2012.

⁵ Data on US passengers (Travel horizons, 2009) and forecasts made by Boston Consulting Group on global spending on business vs. leisure in 2020 (Press Release March, 18, 2013).

⁶ This is a conservative figure for average VAT across the EU as only 5 Member States have a VAT rate below 20% (Germany at 19%, France at 19.6%, Malta at 18%, Cyprus at 18% and Luxembourg at 15%) while 16 Member States have a VAT rate above 20%.

⁷ In IATA (2006) no specification of these VAT revenues is given. To our knowledge no VAT is levied on jet fuel, although some countries levy VAT on aviation gasoline.

⁸ Turnover by air transport in EU 27 was € 95,534 million in 2004 (EC, 2006) and € 111,662 million in 2009 (EC, 2012). This is a growth of 16.9%.



- the Flugabgabe in Austria: € 59 million (2011);
- the Air Travel Tax (ATT) in Ireland: € 48 million (2011).

These figures sum up to € 4.2 billion.

Thus to find the final figure for the yearly VAT shortfall in the EU, we subtract this € 5.3 billion domestic VAT and ticket taxes from the overall € 12.4 billion with the result being € 7.1 billion.

2.2 Fuel tax

A fuel tax on kerosene would be based on the usage of this fuel in cubic metres (m³). Therefore total energy consumption figures, given in megaton of oil equivalent (mtoe), must be converted to m³.

In 2011, EU 27 energy consumption was 44.5 mtoe for international aviation and 6.0 mtoe for domestic aviation. Total use of aviation fuel is thus 50.5 mtoe (Eurostat, 2013). Since 1 toe represents 11.63 MWh, the total energy content used is 587 GWh. When we consider the energy efficiency of an average jet (A1), which is 9,600 kWh/m³, it follows that the total fuel uplifted in the EU is 61,196,818 m³.

If the existing EU minimum kerosene tax of € 330 per m³ would be applied on all fuel use⁹, the tax bonus would be almost € 20 billion. When the EU 2011 average petrol/diesel tax of € 530 per m³ would be applied (CE Delft, 2013), the tax bonus rises to over € 32 billion per year.

When VAT would be charged on jet fuel, this tax would be based on the average price of jet fuel. In 2011, this price is € 97.14 per barrel (IATA, 2013b). Given an average European jet fuel consumption of 1.4 million barrels per day¹⁰ (EIA, 2013), total expenses on jet fuel would be € 50 billion per year. When we assume an average VAT of 20%, the tax revenue (ceteris paribus) would be € 10 billion per year. In case VAT is raised on the average fuel price plus the above mentioned fuel tax/excise (adding up to yearly € 20-32 billion), VAT revenues would rise to € 14-16.5 billion.

3 Conclusion

If the EU decided to introduce VAT on air travel in all countries or fuel taxation in the aviation sector, it would raise tax revenues of billions of Euros per year:

- Assuming an average 20% VAT and an abolishment of other aviation taxes, additional revenues are estimated to be € 7.1 billion.
- Assuming a fuel tax of € 330-530 per m³, revenue estimates amount € 20 to € 32 billion.

⁹ Currently, there is a mandatory tax exemption for aircraft fuel. However there are provisions in the 2003 Directive which allow Member States to tax aviation fuel for domestic flights and, by means of bilateral agreements, fuel used for intra-Community flights. In such cases, Member States may apply a level of taxation below the minimum level set out in this Directive (EC, 2013).

¹⁰ Kerosene and naphta-type jet fuel included.



- Assuming an average 20% VAT on jet fuel, revenues are estimated to be € 10 billion (based on current fuel prices) up to € 14-16.5 billion (prices plus fuel tax). However, where VAT was imposed on all inputs and outputs in the aviation industry this would not be additional but rather could be deducted by the airlines against the VAT receipts from airline tickets. Note that these figures only hold ‘ceteris paribus’ (see Introduction).



4 References

BCG, 2013

Millennial Spending to Boom in Coming Years - Are Travel and Tourism Companies Ready?

Press release, March, 18, 2013

At: <http://www.bcg.com/media/PressReleaseDetails.aspx?id=tcm:12-130054>

CE Delft et al., 2012

Huib van Essen (CE Delft), Dagmar Nelissen (CE Delft), Martine Smit (CE Delft), Anouk van Grinsven (CE Delft), Sanne Aarnink (CE Delft), Tim Breemersch (TML), Angelo Martino (TRT), Caterina Rosa (TRT), Riccardo Parolin (TRT), Jorrit Harmsen (TNO)

An inventory of measures for internalising external costs in transport

Delft : CE Delft, 2013

CE Delft, 2013

Eelco den Boer et al.

Fuel prices database

Version: June 2013

Delft : CE Delft, 2013

EC, 2006

Energy and transport in figures 2006

Part 3: transport

At: http://ec.europa.eu/dgs/energy_transport/figures/pocketbook/doc/2006/2006_transport_en.pdf

EC, 2012

European commission

EU Transport in figures

Statistical pocketbook 2012

At: <http://ec.europa.eu/transport/facts-fundings/statistics/doc/2012/pocketbook2012.pdf>

EC, 2013

European Commission

Taxation and customs union

Taxation of aircraft fuel

At: http://ec.europa.eu/taxation_customs/taxation/excise_duties/energy_products/aircraft_fuel/index_en.htm

EIA, 2013

US Energy Information Administration data provided by

At: <http://www.indexmundi.com/energy.aspx?region=eu&product=jet-fuel&graph=consumption>

Eurostat, 2013

Energy consumption of transport, by mode

At: <http://epp.eurostat.ec.europa.eu/tgm/refreshTableAction.do?tab=table&plugin=1&pcode=tsdtr250&language=en>



IATA, 2005

Aviation taxes and charges

Contrary to the general perception, airlines are not under taxed.

IATA Economics briefing No. 2, November 2005

At: http://www.iata.org/SiteCollectionDocuments/890500_Aviation_Taxes_ChargesSummary_Report.pdf

IATA, 2006

IATA Economic Briefing

European Aviation taxes

June 2006

At: <http://www.iata.org/pressroom/documents/impact-9-11-aviation.pdf>

IATA, 2010

The Impact of September 11 2001 on Aviation

At: <http://www.iata.org/pressroom/documents/impact-9-11-aviation.pdf>

IATA, 2013a

Financial Forecast

Performance Improving Despite conditions

June 2013

At: <http://www.iata.org/whatwedo/Documents/economics/Industry-Outlook-Financial-Forecast-June-2013.pdf>

IATA, 2013b

IATA data provided by http://www.airportwatch.org.uk/?page_id=2092

ICAO, 2010

Aviation outlook

At: http://legacy.icao.int/icao/en/env2010/Pubs/EnvReport2010/ICAO_EnvReport10-Outlook_en.pdf

US travel association, 2009

Travel facts and statistics

Figure derived from Travel Horizons

At: <http://www.ustravel.org/news/press-kit/travel-facts-and-statistics>

