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The economic impact of air taxes in Europe

European Economic Area

October 2017

Contents

Executive Summary

This report is part of a broader set of reports commissioned by Airlines for Europe in which PricewaterhouseCoopers LLP (PwC) provide an independent overview of the current air passenger taxes in Europe and an assessment of their economic impact. In this report we simulate the scenario of abolishing air passenger taxes across the European Economic Area (EEA) using a Computable General Equilibrium model.

45.3 million
additional arrivals by 2020

25 million
extra inbound tourist arrivals by 2020

€12.5 billion
additional tourism expenditure by 2020

€25 billion
higher GDP across the EEA per year by 2030, rising from €12 billion per year in 2020.

€4.3 billion
larger air sector per year by 2030, rising from €3.5 billion per year in 2020.

110,000
additional jobs across the EEA economy in 2030, rising from 47,000 in 2020

Nearly full fiscal return

We estimate that total passenger taxes will raise €6 billion in 2017. Following the abolition of all taxes, our analysis suggests that for every 97% of this will be recouped in indirect tax income. This result is higher than we generally found when modelling unilateral reductions in passenger tax, and will induce significant other benefits to the economies of countries in the EEA. This is in line with the aims of the European Commission's Aviation Strategy for Europe, which aims to use aviation to stimulate economic growth and connectivity.

Background to the study

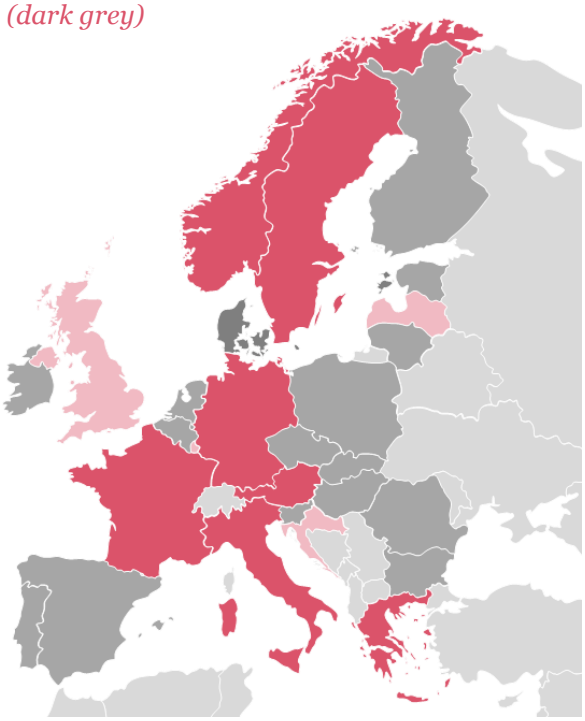
Background

PwC have been commissioned by Airlines for Europe, the representative body of various European airlines, to provide an overview of the current aviation taxes in Europe and an assessment of their economic impact. Whilst the consortium commissioned and financed the work, and commented on draft reports, the final reports represent the independent analysis of PwC.

We have produced 7 country reports which summarise the economic impact of a change in the level of air passenger tax, as projected by our multi-regional CGE model. This includes reports on the effect of reducing passenger tax in 6 countries (Austria, France, Germany, Greece, Italy and Norway) and a report on the effect of introducing passenger tax in Sweden in line with the proposal due to be implemented in 2018.

In addition to this we are producing a Europe level report, for which we model the effect of a multilateral abolition of air passenger tax in the 7 countries analysed in country-level reports, as well as Latvia, Croatia, and Luxembourg. This forward-looking analysis is complemented by 3 case studies (Ireland, Netherlands and Italy) in which we analyse the effects of historic changes in passenger tax.

Figure 2: Location of the 7 country reports (dark pink), countries with taxes but not under analysis (light pink), and EEA countries with no taxation (dark grey)



This analysis builds upon analysis undertaken by PwC in 2013 to assess the economic impact of Air Passenger Duty (APD) on the UK.[1] This analysis considered the potential positive impact of abolition of APD in order to aid an evidence-based assessment of the policy, and its contribution to UK public finances. This report found that abolishing APD would lead to a net positive gain to public finances through the economic activity it would stimulate, and accordingly concluded that such a tax cut would pay for itself.

Air passenger taxes in the European Economic Area

Air passenger taxation varies across Europe, in both the level and method of application. For the purpose of this study we have defined a passenger tax as one which is paid to federal government for revenue-raising purposes, as opposed to offsetting the cost of a service provided, as aligned to the IATA List of Ticket and Airport Taxes and Fees. The 10 countries in the EU/EEA with some form of passenger tax are as follows: [2]

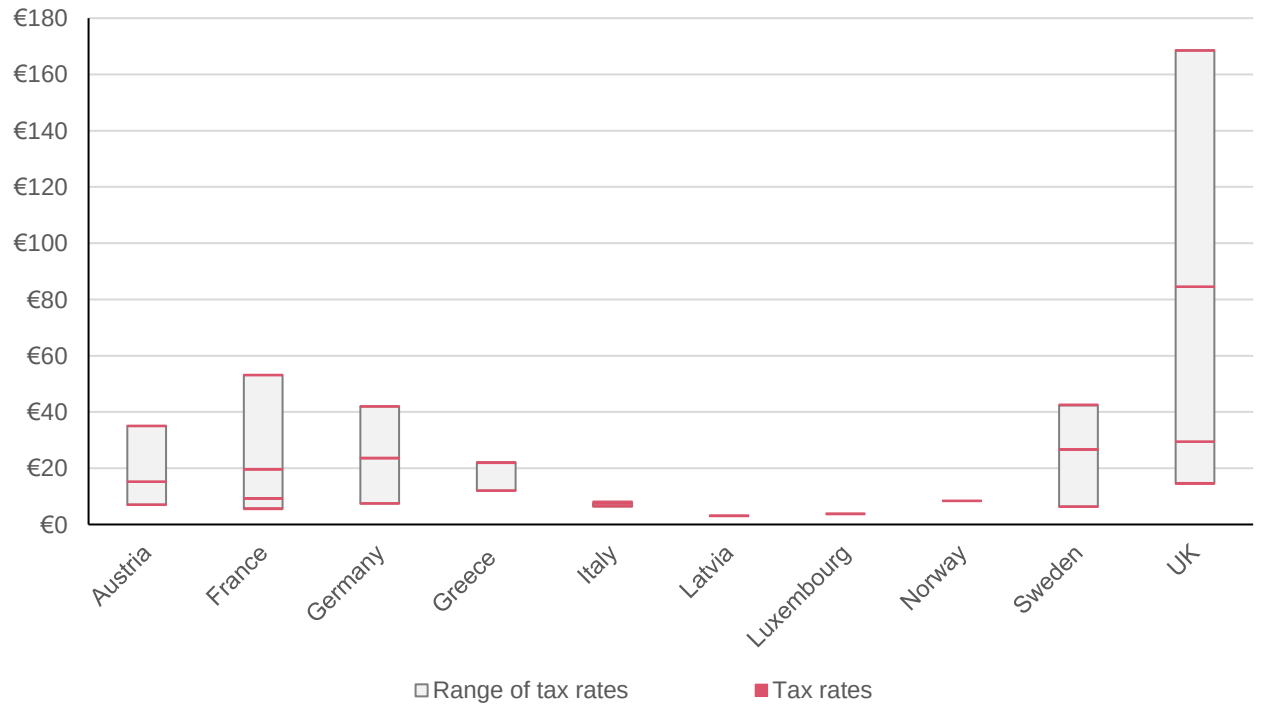
- Austria – Air Transport Levy
- Croatia – Civil Aviation Authority Tax
- France – Civil Aviation Tax, Solidarity Tax, Fiscal Tax (Corsica)
- Germany – Air Transport Tax

[1] PwC 2013, *The Economic Impact of Air Passenger Duty*. The analysis was subsequently updated in 2015.
[2] Latvia, Luxembourg, Croatia and the United Kingdom are included in our model but will not have country-level reports.

- Greece – Airport Development Charge
- Italy – Council City Tax
- Latvia – Passenger Service Charge
- Luxembourg – Passenger Service Charge
- Norway – Air Passenger Tax
- UK – Air Passenger Duty

The taxes are not easily compared between countries, as some taxes vary by destination country, others vary by airport, and some include transfers as well as departures. Nevertheless, Figure 3 benchmarks the rates across the European Economic Area against each other by including all different rates, regardless of how the taxes are banded. The pink dashes pick out the tax rates payable in each country, while the light grey bars show the range. The full breakdown of taxes in each country can be found in Appendix 2. The graph shows how both the range and level of taxation varies across these countries, but it is important to note that many charge no taxes and so do not feature in the diagram.

Figure 3: Benchmarking analysis of air passenger tax rates in the European Economic Area



Source: IATA, PwC analysis

In this report we take a holistic view of European passenger taxes. We model the scenario in which passenger taxes are abolished across all 10 of the above countries. Our estimates suggest that these taxes will raise around €6 billion in 2017 combined for the 10 countries in our assessment. Our simulations start in January 2017 and model the economic impacts out to 2030, with the abolition taking effect in January 2018.

We recognise that the multilateral abolition of air passenger tax across EEA in 2018 is not a realistic scenario. However, in the context of the European Commission's Aviation Strategy for Europe, we believe it is fruitful to understand the maximum economic benefit which could be unlocked through the removal of these taxes. For example, the modelling helps illustrate how the benefit of a harmonised tax system would be distributed. This is

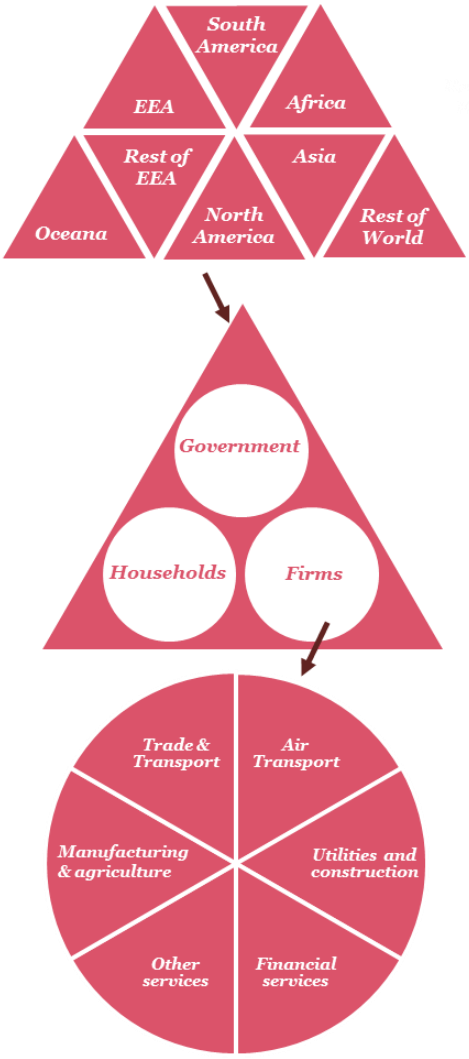
important in light of the European Commission's strategic priorities: tapping into growth markets and tackling limits to growth in the air and on the ground.[3]

Modelling Approach

To assess the economic impact of passenger taxes in Europe, we have built a multi-regional Computable General Equilibrium (CGE) model which captures the net economic impact of policy changes. This net analysis accounts for changes and displacements in the economy as it moves to a new equilibrium following the policy intervention.

CGE models are used by institutions such as the IMF, World Bank, OECD and several national governments to quantify the economic impact of policy changes. In essence, a CGE model captures the economic behaviours and interactions of all agents (consumers, producers, government, investors, etc.) in the economy. After a policy change (such as the abolition of air passenger taxes), these economic agents adjust to price changes until equilibrium is restored. A CGE model can be used to compare the differences between the baseline and policy shock scenarios to evaluate the economic impact.

Figure 4: High level structure of our multi-regional CGE model



Global level

We have developed a multi-regional, dynamic CGE model. Each region of interest is captured individually within the model, with all other regions combined into "Rest of World".

Country level

Within each country there is a government sector, a household sector, and an industry sector. In CGE models, government, households and businesses engage in repeated local microeconomic interactions. These in turn give rise to macroeconomic relationships affecting variables such as employment, investment and GDP growth.

Industry level

In order to apply a tax change to the aviation specifically, we have separated this sector from the general Trade & Transport sector. The sectors we have chosen to model for these preliminary results are listed to the right. Underlying each sector is GTAP data regarding the extent to which each sector in each country trades with each other sector.

[3] European Commission 2015, *An Aviation Strategy for Europe*

Table 1: Types of impact captured by the CGE model

Impact type	Description
Direct	GVA and employment directly attributable to changes in output in the aviation sector
Indirect	GVA and employment contribution attributable to any upstream business activities directly associated with the aviation sector
Induced	GVA generated through consumer spending by those directly or indirectly employed by the aviation sector and connected businesses.
Catalytic	The broader economic contribution of the aviation sector through stimulating changes in tourism expenditure and international connectivity

The model allows us to capture different types of impact. As the CGE model captures all changes in the economy simultaneously, these impact types cannot be broken out individually. We refer to economic impacts through changes in the level of Gross Value Added (GVA) at both a sectoral and national level. GVA is a measure of the value of goods and services produced which, at a national level, is broadly comparable to GDP. The model has been calibrated with Eurostat data to create a baseline view of the European economy.

Results

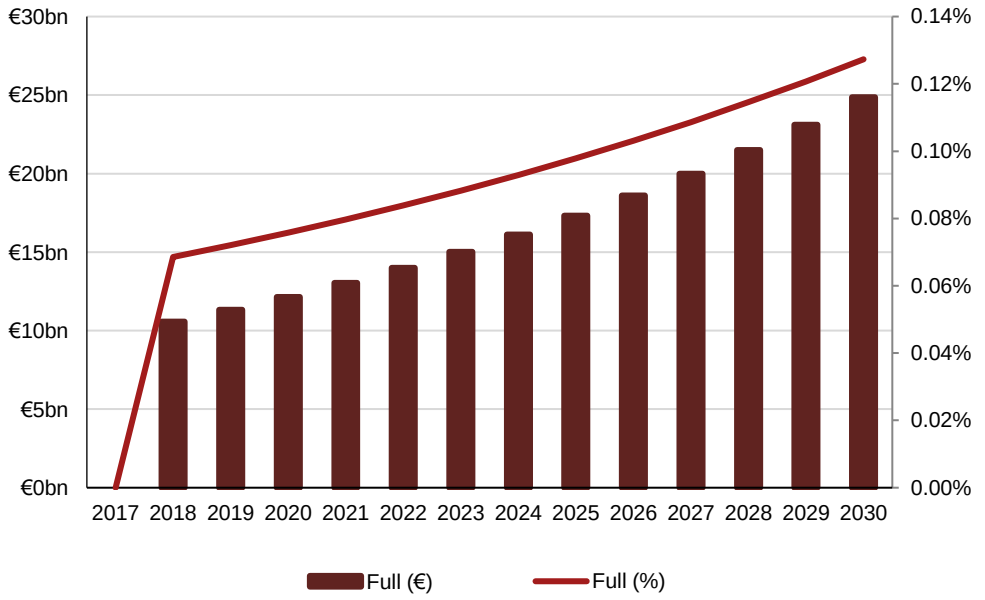
We have modelled the impact of our two scenarios on key macroeconomic indicators, the results of which are outlined in this section. This section is intended to provide an overview of the key results from our analysis. For a deeper look into the mechanisms driving the results we refer the reader to PwC's UK APD study.[4]

Our results are underpinned by a number of assumptions, and rely upon a long run growth rate in the European Economic Area of 2%. A growth rate lower than this could lead to different results in absolute or cash terms, but we would not expect the overall conclusions of the study to be materially affected.

Impact on regional real GDP

Following the abolition of all taxes in the EEA, real GDP would increase by 0.07% in 2018, equal to around €10.5 billion. This uplift over the baseline is sustained in both relative and absolute terms over the following years, growing to 0.13% or €24.9 billion per year by 2030.

Figure 5: Impact on real GDP compared to base level from the abolition of air taxes in the European Economic Area (percent change from the base case on right-hand axis, and impact in € on left-hand axis)



GDP will be
€24.9bn
larger per year by 2030 by abolishing all air passenger taxes

This increase in GDP is reflected across all sectors of the EEA economy, with all experiencing a positive impact as a result of the tax abolition. The aviation sector experiences the most pronounced uplift in output, growing 0.87% (over €4.3 billion) larger than our forecast baseline in the full abolition scenario in 2020.

All other sectors of the economy are positively impacted by the abolition of the tax, with the improvement over the annual baseline in 2030 presented in Table 2. The level of change over the baseline varies between sectors, for example, increases in output range from €470 million in the utilities and construction sector to €5.4 billion in the tourism sector. Typically, the sectors which benefit most substantially from the tax cut, beyond those directly affected, will be those which are the biggest consumers of air transport as a share of their total purchases. Following the tax change, one would typically expect the market price of air transport to fall, and hence those businesses for whom air transport makes up a substantial share of their spending will stand to benefit most materially.

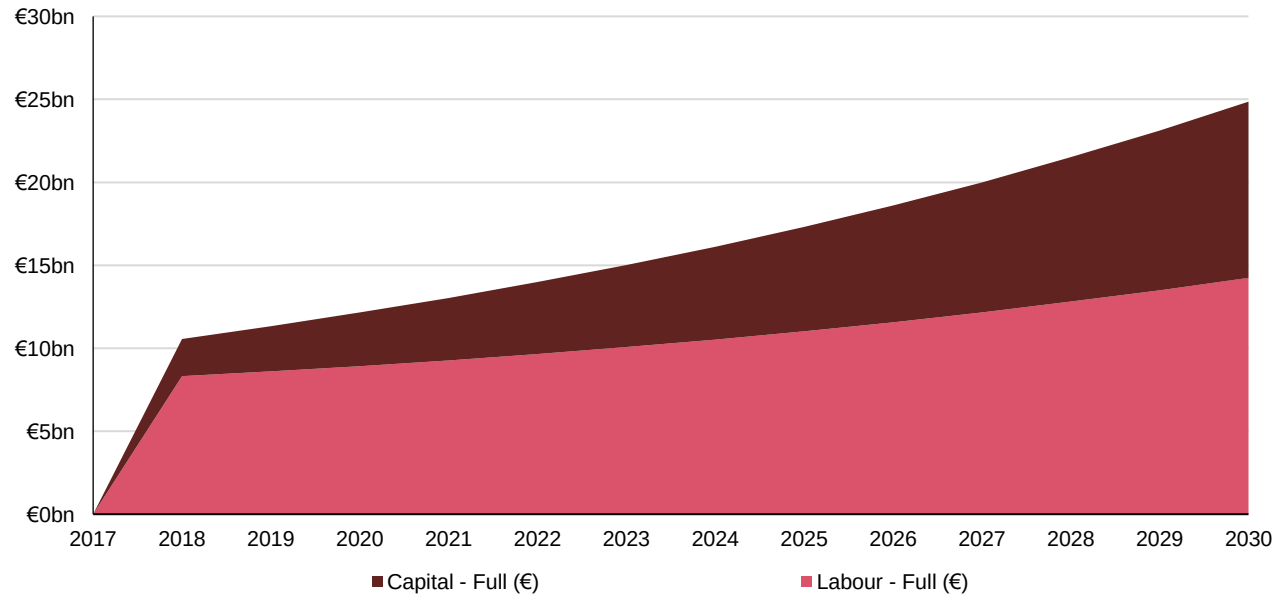
[4] PwC 2013, *The Economic Impact of Air Passenger Duty*

Table 2: Impact on real GDP by sector compared to base level from the full abolition of air taxes in the European Economic Area (change from the base case)

Full	**2030**
Agriculture & manufacturing	€4,390m
Utilities & construction	€470m
Transport	€3,719m
Aviation	€4,302m
Financial Services	€866m
Tourism	€5,400m
Other services	€5,714m
Total	*€24,862m*

The change in GDP presented above is driven by changes in income for both capital and households (i.e. increased profits and wages). Household income increases more than capital initially as labour moves into the aviation sector to support its growth, leading to an increase in consumption of around €7.1 billion in 2020. In the medium term, capital is accumulated and its contribution to GDP rises from 21% of the total change in GDP in 2018 to 43% in 2030.

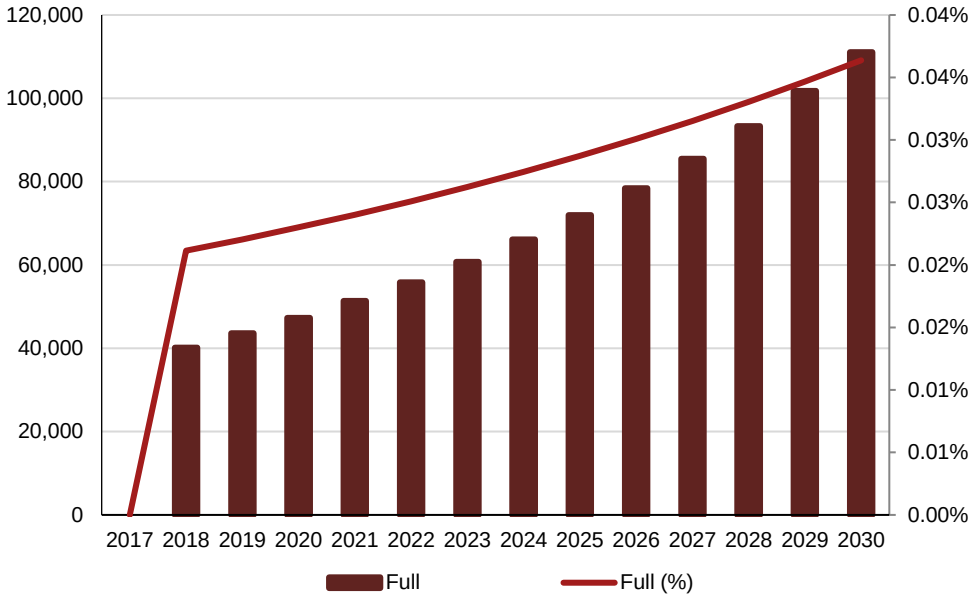
Figure 6: Impact on capital and labour income compared to base level from the full abolition of air taxes in the European Economic Area (absolute change from the base case)



Impact on employment

Under the scenario that air passenger taxes across the EEA are fully abolished, around 40,000 jobs will be created in the year following the implementation, and a total of 110,000 jobs will be created by 2030. These jobs are spread across sectors and countries, though the majority of the increases will be found in sectors related to tourism and in the countries that abolish their taxes.

Figure 7: Impact on total national employment compared to base level from the abolition of air taxes in the European Economic Area (change from the base case)

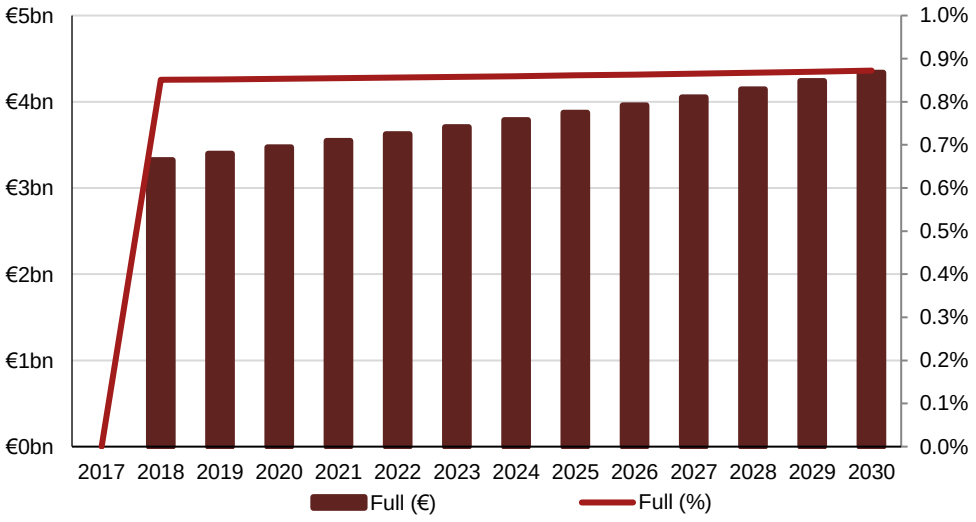


47,000
additional jobs will be created within two years of abolishing all air passenger taxes

Impact on regional aviation sector GVA

The value of goods and services produced in the EEA's aviation industry is forecast to be 0.87% larger than the baseline forecast in 2018 if all air passenger duties were to be abolished, adding more than €3.4 billion to the sector. The relative size of the uplift is maintained over the period under analysis, and GVA is €4.3 billion larger per year than the baseline by 2030.

Figure 8: Impact on aviation GVA compared to base level from the abolition of air taxes in the European Economic Area (percent change from the base case on right-hand axis, and impact in € on left-hand axis)



The aviation sector would grow
0.87%
following the abolition of all air passenger taxes

Impacts on passenger numbers

The CGE modelling approach captures the wider macroeconomic effects of the changes in tax rate. It is not able to provide a route-level analysis of the aviation sector, and accordingly it captures demand and capacity constraints only at an industry-wide level. However, if it is assumed that an increase in economic output of the aviation sector manifests itself in an increase in passenger numbers, then full abolition of all air passenger taxes could add around 16.1 million arrivals per year in 2020 over a baseline of 674 million (an increase of 2.5%). This would mean an additional 45 million arrivals over the three years following the abolition (i.e. by 2020).

45m
additional arrivals by 2020 by abolishing all air passenger taxes

Of these passengers, we estimate that there will be an additional 9 million tourists who fly per year in 2020, totalling 25.4 million passengers in the period to 2020. These additional passengers will originate from both outside the EEA and within, affecting the economy differently. Passengers from outside the EEA will inject money into the region's economy that would otherwise have been spent elsewhere, contributing to its GDP across all sectors and supporting an increase in employment. We estimate that these passengers will spend a total of €3.5 billion in the three years to 2020, and the total effect on the economy will be a multiplier of this due to catalytic and indirect effects. Lower prices will also increase intra-EEA travel, which may increase consumer expenditure, further improve connectivity and the flow of knowledge within the region, and support trade. We forecast that these passengers will contribute to an increase of tourism expenditure of around €8.9 billion by 2020, raising the total additional expenditure to €12.5 billion. However, this calculation includes tourists that may have otherwise used other means of transport to travel and lower prices may also lead to some citizens of the EEA taking trips outside of the region, leading to money flowing out of the economy. As such, the net increase in tourism expenditure will be somewhat smaller, as these effects will offset some of the benefits that arise from the increase in arrivals.

These results are supported by the analysis in the case studies on Ireland, Italy, and the Netherlands. The case studies showed that growth in passenger numbers slowed following the introduction of a tax, and increased once it had been abolished. The case studies also emphasise the flexibility with which low-cost airlines relocate their routes around the European aviation market and the relevance of supply-side as well as demand-side factors in driving passenger numbers.

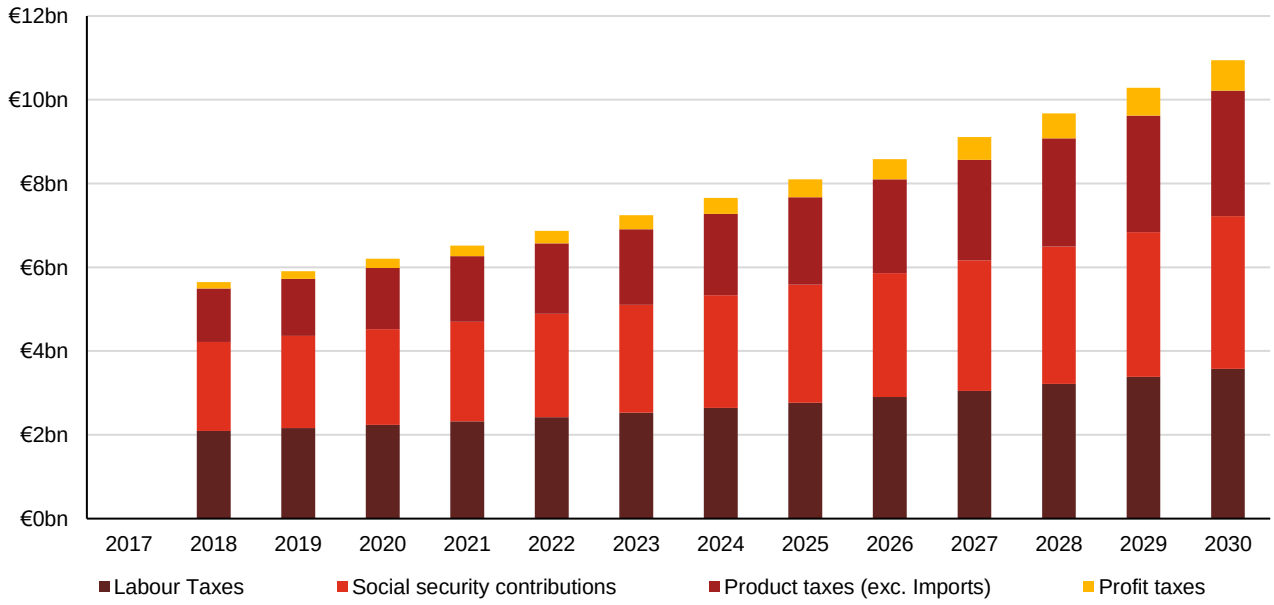
Impact on national tax income

Whilst countries will no longer receive tax revenue from air passenger taxes after it is abolished, the tax cuts will stimulate wider improvements in macroeconomic performance, including in employment, productivity, wages, and consumption. There are a number of mechanisms through which this occurs, including lower taxes potentially leading to lower prices and thus higher demand. These improvements to the economy will lead to an increase in revenue from labour taxes, social security contributions, product taxes, and profit taxes, offsetting the loss in direct tax revenue. According to our analysis, all of these tax revenues will increase as a result of the abolition, with labour taxes increasing the most, followed by social security contributions and product taxes, while profit taxes will rise the least.

Of the €6.36 billion that governments of EEA countries would have received in air passenger taxes in 2020, €6.2 billion is recouped in indirect tax revenue.[5] The implied fiscal return on air passenger tax in the region is 0.97, meaning that a €1.00 cut results in a €0.97 increase in indirect tax income. This increase in indirect tax income is greater than could be expected from reducing other taxes (for example, corporate tax income and VAT) due to its highly distortive nature. As a complete abolition also improves other indicators, such as GDP and employment, we can conclude that cutting air passenger taxes is a relatively cheap method of boosting the economy.

[5] It is important to note that this is our central case and is subject to a number of assumptions around the impact of tax on the wider economy. As such it is possible that the abolition of the aviation tax may have a differing impact on productivity, trade, and tourism than our analysis suggests, which would result in a different level of recuperation and economic impact.

Figure 9: Impact on tax income compared to base level from the full abolition of air taxes in the European Economic Area (absolute change from the base case)



97% of tax cut is recouped, mainly from labour taxes, social security & product taxes

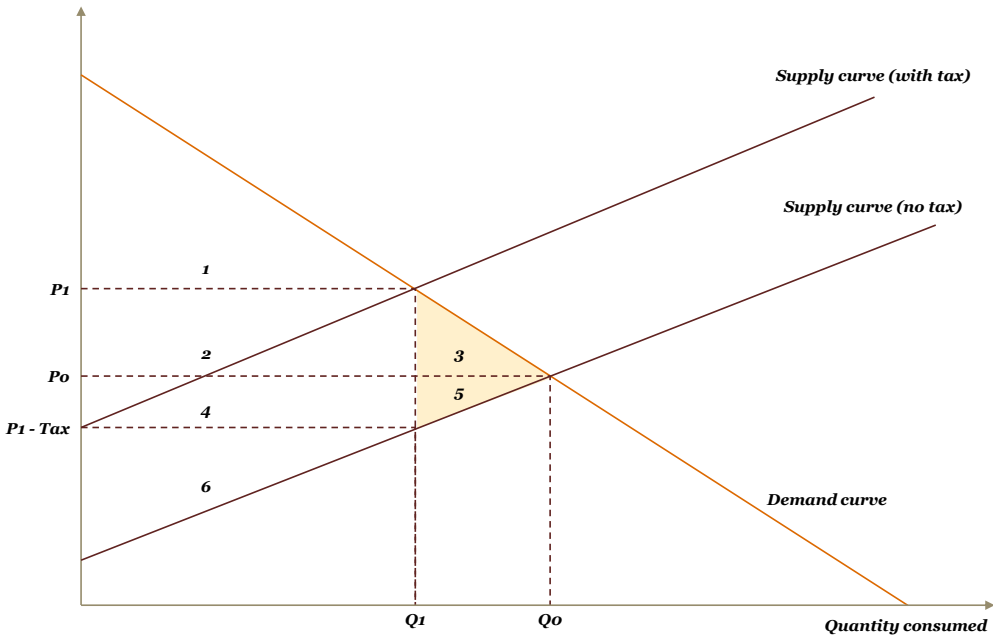
Appendix 1: Economic theory of indirect taxes

The tax system plays a crucial role in influencing the rate of short and long-term economic growth in the economy. In aggregate, the amount of tax raised, the type of tax raised, and its interaction with public spending will affect the long-term growth rate of the economy. However, individual tax policy measures are less likely to augment the rate of economic growth for any sustained period as they are smaller in scale, but they can affect the level of GDP.

Indirect taxes, such as air passenger taxes, create distortions in the market by increasing the price of the good or service to which the tax is charged (in this case, flights), leading businesses and households to adjust their behaviour to avoid paying the tax, resulting in a lower quantity sold. By reducing the amount purchased, consumers are worse off – the extent to which is defined as a deadweight loss of taxation[6]. We explain this concept with use of a supply and demand curve framework (see Figure 10 below).

The equilibrium price and quantity that prevails in the market for the product or service in question (i.e. a flight ticket) is determined by the intersection of the market demand and supply curves. However, with the application of an indirect tax (i.e. the respective air passenger tax), the quantity consumed in the market is represented by point Q1 in Figure 10: Deadweight loss (as marked in yellow) caused through application of indirect tax. Once the tax is removed, the market supply curve shifts downwards by the amount of the tax. The equilibrium price for consumers is now lower (P0), so they demand more of the product and as a result, the consumer surplus (a measure of consumer welfare) grows from Area 1 to Areas 1, 2 and 3. At the same time, the price received by the producer rises to P0 from P1-tax and the producer surplus (a measure of producer welfare) increases from Area 6 to Areas 4, 5 and 6. The Government loses some revenue as its portion of the consumer and producer surplus is removed (Areas 2 and 3), however the overall level of welfare in the economy grows – represented by Areas 3 and 5 and known as the deadweight loss.

Figure 10: Deadweight loss (as marked in yellow) caused through application of indirect tax



[6] 'Intermediate Microeconomics: A Modern Approach', 8th Edition, Hal. R. Varian (2010).

A common measure of the deadweight loss is the amount of GDP forgone per unit of revenue raised. As an example, if the deadweight loss were to be 0.5, this would be as 50 cents of GDP lost per €1 of tax revenue raised. Governments set tax policy to balance the need to minimize the deadweight loss to society with the imperative to use the proceeds of taxation to provide goods that would otherwise be underprovided by a free market and to correct other market failures.

The size of this deadweight loss is determined by both static and dynamics factors. In terms of static determinants, the absolute level of the tax imposed and the steepness of the supply and demand curves. In the case of the former, the higher the tax rate the further the supply curve shifts up in response and the associated deadweight loss becomes larger. For the latter, a steeper demand or supply curve reflects more inelastic supply and demand conditions in the market, and means that supply or demand is relatively insensitive to changes in price. Dynamic determinants include the extent to which air passenger tax acts as a tax on business inputs and the extent to which improving business air usage has a positive impact on GDP by boosting productivity.

Appendix 2: Aviation tax rates in the European Economic Area

Country	Tax	Rate		Notes for Figure 3
Austria	Air Transport Levy	Short haul	€7	
		Medium haul	€15	
		Long haul	€35	
France	Civil Aviation Tax	EU	€4.48	Pink dashes within Figure 3 are shown as the sum of the Civil Aviation Tax and Solidarity Tax. Fiscal Tax (Corsica) is excluded from Figure 3.
		Non-EU	€8.06	
	Solidarity Tax	EU	Economy: €1.13	
			Business: €11.27	
		Non - EU	Economy: €4.51	
			Business: €45.07	
	Fiscal Tax (Corsica)	€4.57		
Germany	German Air Transport Tax	EU and EFTA	€7.47	
		Countries not included in the EU and with a distance of not more than 6,000km	€23.32	
		Other countries	€41.99	
Greece	Airport Development Charge	€ 12 to Hellenic Civil Aviation Authority		
Italy	Council City Tax	Rome airport	€7.50	
		Other airports	€6.50	
Latvia	Passenger Service Charge	€3.10		
Luxembourg	Passenger Service Charge	€3.79		
Norway	Air Passenger Tax	NOK 82		
Sweden	N/A	Within EU	SEK 60	Figure 3 shows the proposed rates from January 2018.
		Less than 6000km	SEK 250	
		More than 6000km	SEK 400	
United Kingdom	Air Passenger Duty	Less than 2000 miles	Economy: £13	
			Business: £26	
		More than 2000 miles	Economy: £73	
			Business: £146	

Glossary

Computable General Equilibrium model	A model used by governments and international organisations to simulate the effect of changes in policy or other external factors.
Gross Value Added	The total value of goods and services produced in a specific sector or area of the economy
Deadweight Loss	The loss in the level of welfare/efficiency in the economy when the equilibrium for a good or service is not achieved.
Passenger tax	We have defined a passenger tax, as opposed to a charge, as being raised by a government body for the purpose of raising revenue, rather than covering a specific cost
Passenger charge	A charge is a fee levied by a private body and charged on a per passenger basis
Producer Surplus	The difference in the price between the amount a producer is willing to receive for a unit (e.g. a seat on a plane) and the amount the producer does in fact receive
Consumer Surplus	The difference between a consumer's willingness to pay and the amount the consumer actually paid
Economic spillovers	The economic effects on other countries from a shock in one economy. Net economic spillovers refer to the fact that we are including in our calculation all countries; both those that benefit and those that don't benefit from the tax shock.