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The economic impact of air taxes in Europe
Austria

October 2017

Contents

Executive Summary

This report is part of a broader set of reports commissioned by Airlines for Europe in which PricewaterhouseCoopers LLP provide an independent overview of the current air passenger taxes in Europe and an assessment of their economic impact. In this report we simulate two scenarios for the Austrian Air Transport Levy using a Computable General Equilibrium model. In the "half" scenario we simulate the impact of halving the Austrian Air Transport Levy as of January 2018, and in the "full" scenario we simulate the impact of abolishing the tax entirely in January 2018.

2.3 million
additional arrivals by 2020

1.6 million
extra inbound tourist arrivals by 2020

€460 million
additional tourism expenditure by 2020

€320 million
higher GDP in Austria per year in 2030, rising from €230 million per year in 2020.

€670 million
higher GDP across the EEA per year in 2030, rising from €276 million per year in 2020.

€160 million
larger air sector in Austria per year in 2030, rising from €130 million per year in 2020.

1,000
additional jobs across the Austrian economy in 2030, rising from 600 in 2020.

Our analysis suggests that there will be a significant increase in indirect tax revenue following the abolition of the Air Transport Levy. This increase in indirect tax income is greater than could be expected from reducing other taxes due to its highly distortive nature. Its abolition improves the level of the GDP disproportionately more than the abolition of other taxes, and therefore represents a relatively cheap method of boosting the economy.

Background to the study

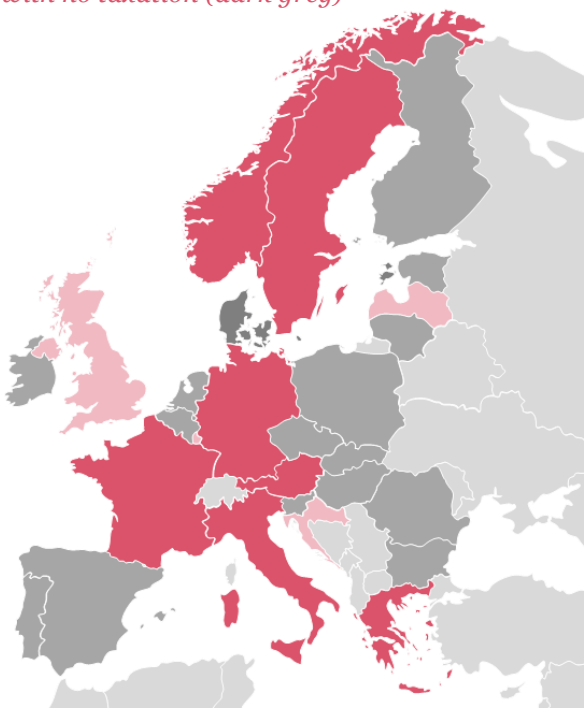
Background

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 are producing 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 an EEA report, for which we model a universal and multilateral abolition of air passenger taxes across the EEA (which amounts to abolishing passenger taxes in 10 EEA countries). 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 air passenger 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

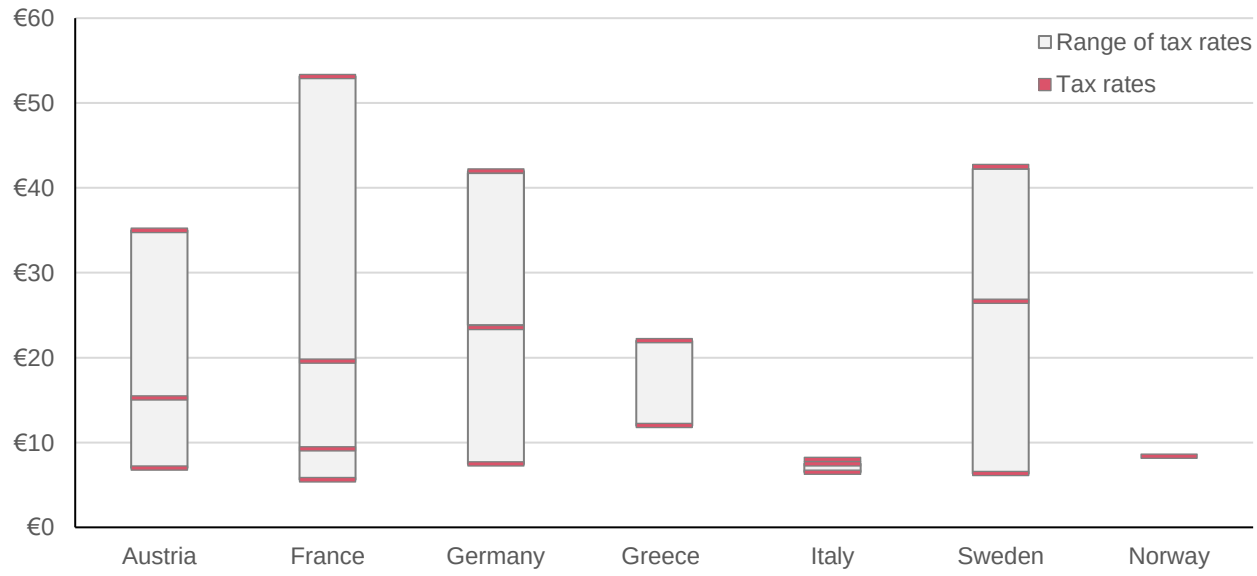
[1] PwC 2013, *The Economic Impact of Air Passenger Duty*

[2] Latvia, Luxembourg, Croatia and the United Kingdom are included in our model but will not have country-level reports.

- Greece – Air 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 countries under analysis 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 grey bars show the range. The full breakdown of taxes in each country can be found in Appendix 2. It is important to note that many countries charge no taxes, however, and so do not feature in the diagram.

Figure 3: Benchmarking analysis of air passenger tax rates in the 7 countries under analysis



Source: IATA, PwC analysis

This report covers the Austrian Air Transport Levy. This tax is levied on passengers departing on domestic and international flights, and is payable to the exchequer with the purpose of raising tax revenue.

The tax rates varies according to the distance of the flight. The rates per adult are as follows: [3]

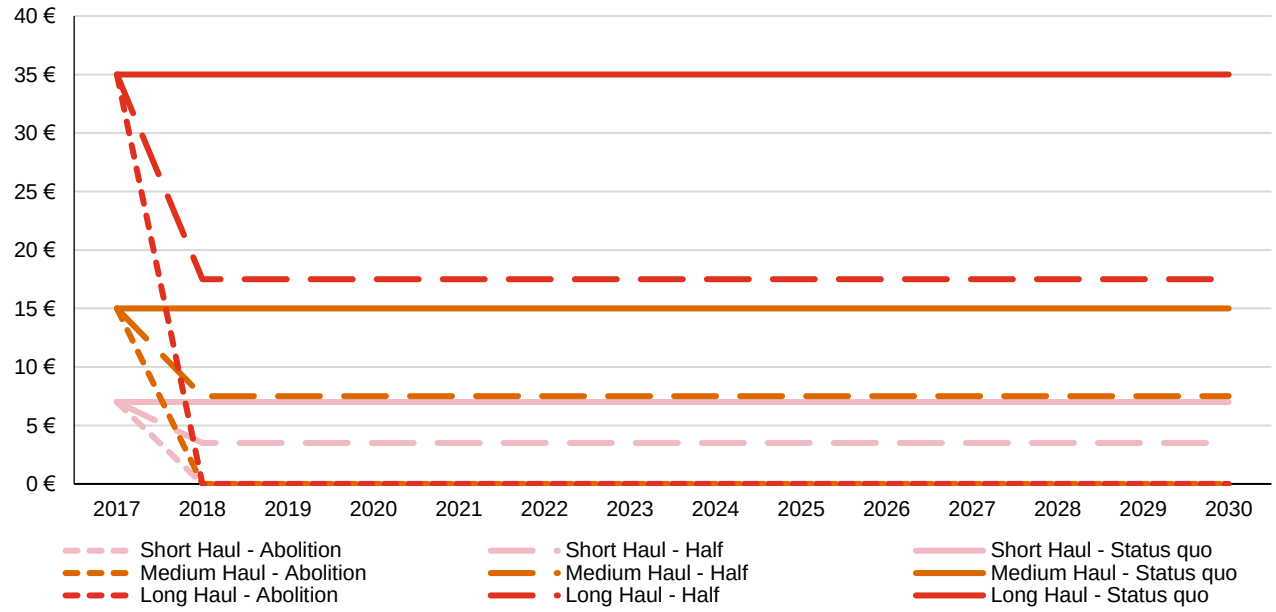
- €7.00 – Short Haul
- €15.00 – Medium Haul
- €35.00 – Long Haul

In this report we model the macroeconomic and fiscal effects of halving the current tax rates as well as modelling the effect of abolishing the tax entirely. We have initiated our simulations to start in January 2017

[3] Austrian Ministry of Finance 2012, *Federal Act Introducing an Air Transport Levy*

and run through to 2030, with the tax reductions taking effect in January 2018. Figure 4 shows the rate of Air Transport Tax under each of the scenarios.

Figure 4: Austrian Air Transport Levy rates under three scenarios



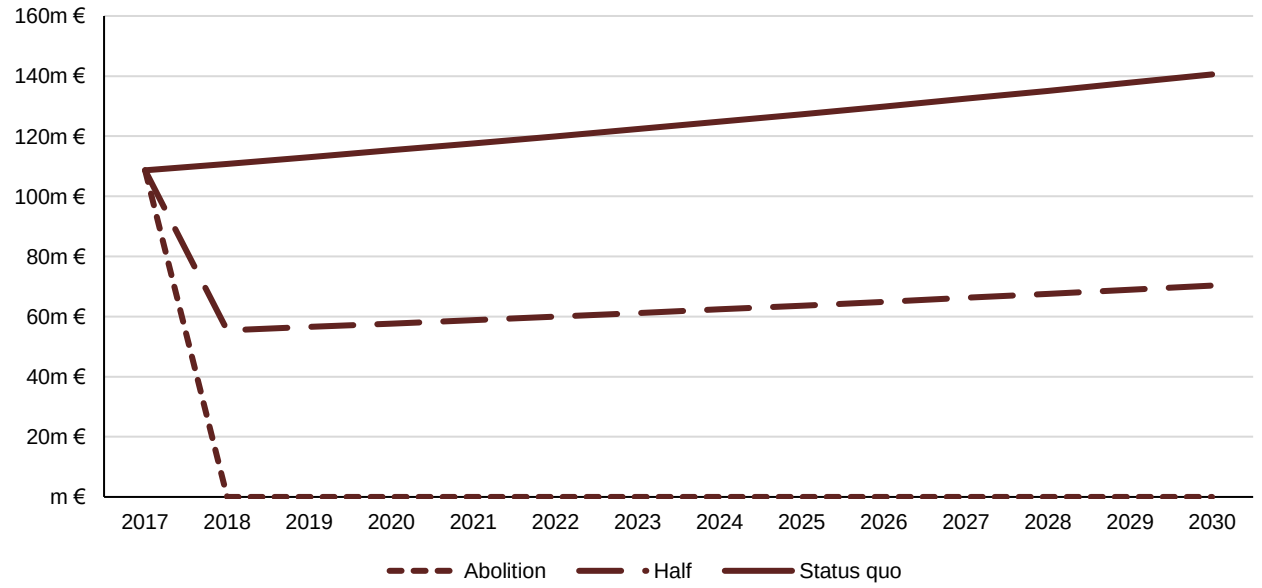
Source: IATA, PwC analysis

The implied revenue under three scenarios are show below in Figure 5. We have used official data from Statistik Austria, and then modelled the expected income for each of the scenarios, assuming that the reductions in tax rate occur in 2018, as per the proposal.[4]

The scenario of full abolition demonstrates the maximum economic benefit which could be unlocked through removal of the tax. Any reduction in the rate of tax from its current level could reasonably be expected to generate some positive economic impact below this level.

[4] Statistik Austria 2017, *Steuern und Sozialbeiträge in Österreich*

Figure 5: Forecast income from the Austrian Air Transport Levy under three scenarios



Source: Statistik Austria, PwC analysis

Additional taxes and charges

It is important to note that air passenger taxes are not the only fees that airlines in Europe are subject to. Other costs, such as service charges levied by airports, have not been included in the analysis in this report. However, it is important to recognise that these charges nonetheless represent a cost burden to airlines operating in Austria, and reflect the degree to which the aviation industry already contributes towards national infrastructure and assets. As described in the introduction to this report, the air passenger taxes modelled are purely those which are revenue raising, and are distinct from, and additional to, charges which are used to pay for a service.

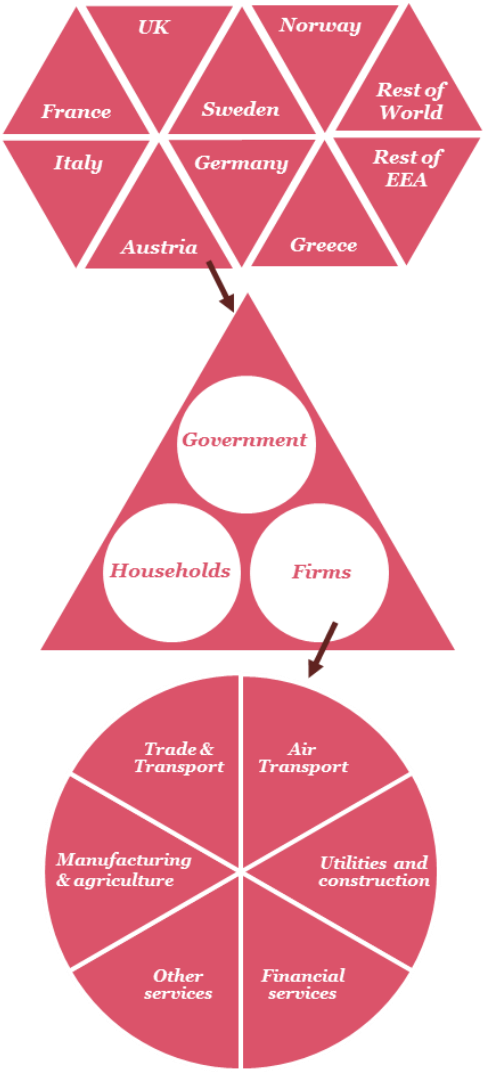
As an example, Austria also levies the Passenger Service Charge against all passengers (implemented similarly to Germany's charge), the amount of which varies depending upon the destination of the flight and the airport from which the flight is departing. It is important to acknowledge that in the presence of this charge, abolishing air taxes would not prevent the maintenance and upgrade of airport infrastructure.

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 6: High level structure of our multi-regional CGE model



Global level

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

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 shown in the diagram. Underlying each sector is GTAP data regarding the extent to which each sector in each country trades with each other sector.

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.

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

Results

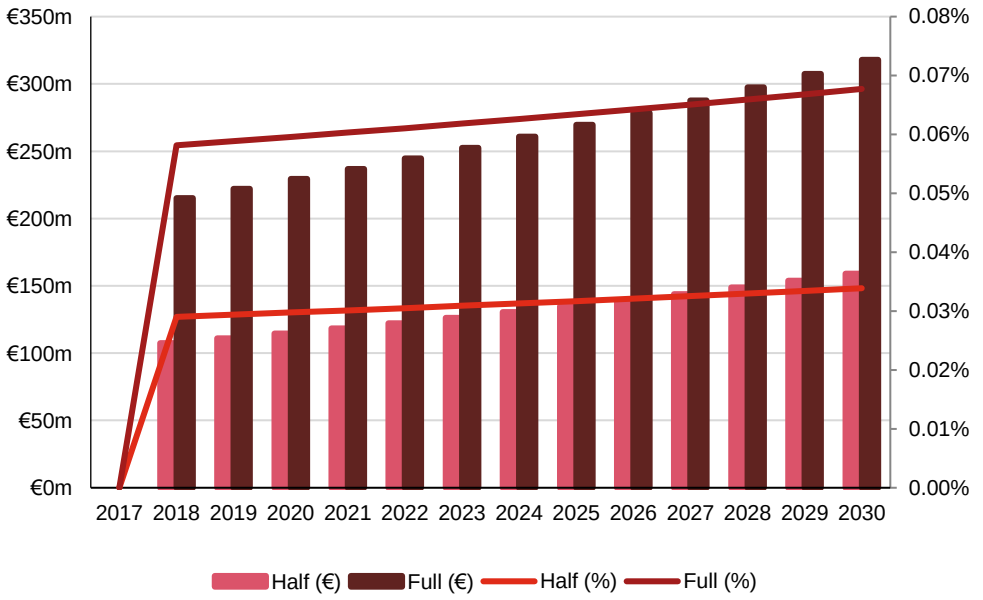
We have modelled the impact of our two scenarios on key macroeconomic indicators, both nationally and internationally, the results of which are outlined in this section. This section is intended to provide an overview of the key results from our analysis. For a deeper look into the mechanisms driving the results we refer the reader to PwC's UK APD study.[5]

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 terms, but we would not expect the overall conclusions of the study to be materially affected.

Impact on national real GDP

Under both and abolition and reduction scenarios, real GDP increases the year following the tax cut relative to the baseline scenario of no change. In the full scenario, real GDP increases by around 0.06% or €215 million, while in the half scenario GDP increases by €107 million or 0.03%. This uplift is sustained over the following years, with the percentage and absolute increase over the baseline rising each year. In the full scenario, more than 0.07%, equal to around €320 million, is added to GDP per year by 2030, as opposed to just under 0.04% higher under the half scenario.

Figure 7: Impact on real GDP compared to base level from the abolition of air taxes in Austria (percent change from the base case on right-hand axis, and impact in € on left-hand axis)



GDP will be
€320m
larger per year by 2030 by abolishing the Air Transport Levy

This increase in GDP is reflected across all sectors within the Austrian economy, with all expected to be impacted positively. The aviation sector experiences the most pronounced uplift in output, increasing 0.76% (€160 million per year) by 2030 in the full abolition scenario, or 0.38% in our halving of the tax rate scenario. Other sectors also experience improvement related to interaction effects with the aviation sector.

Although all sectors experience a positive impact in 2030 as a result of both scenarios, there is some variation in the magnitude of this positive effect. Under the full abolition scenario, for example, increases in output range from €3 million in the utilities and construction sector to €74 million in the transport sector. Typically, the sectors which benefit most substantially from the tax cut, beyond those directly affected, will be those which are

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

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.

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

Full	**2030**
Agriculture & manufacturing	€11m
Utilities & construction	€3m
Transport	€74m
Aviation	€160m
Financial Services	€6m
Other services	€63m
Total	*€318m*

Table 3: Impact on real GDP by sector compared to base level from the abolition of half of air taxes in Austria (change from the base case)

Half	**2030**
Agriculture & manufacturing	€6m
Utilities & construction	€2m
Transport	€37m
Aviation	€80m
Financial Services	€3m
Other services	€32m
Total	*€159m*

Tourism does not fit neatly alongside the other sectors in our model as it is a category of passenger rather than a sector. If a tourist purchases a bus ticket this would contribute to the Transport sector, if a tourist paid a fee on money exchange this would contribute to Financial Services. However, Tourist Satellite Account data suggests that approximately 80% of tourist expenditure would fall into Other Services, in the form of accommodation, cultural and leisure activities, cafes and restaurants etc. The remaining 20% is mostly split between various modes of travel, including aeroplanes.

Net tourism expenditure increases

€196m

per year in 2030

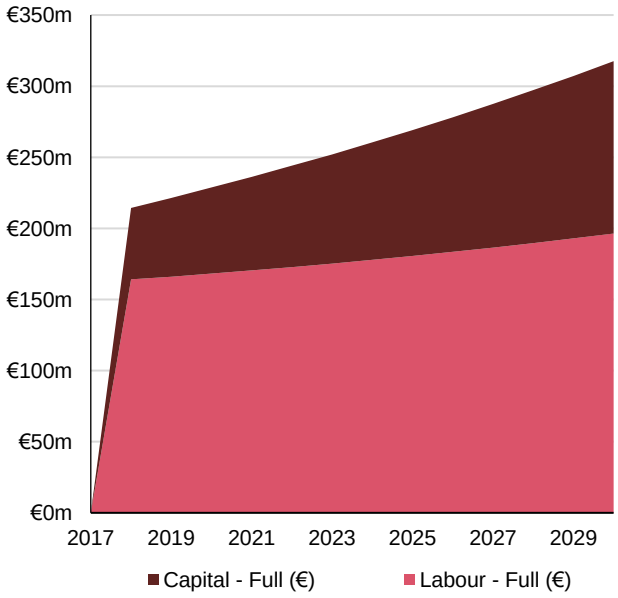
We estimate that the abolition of Austrian passenger tax would induce a net increase in tourist expenditure of €196 million per year in 2030, and the half scenario increase tourist expenditure by €91 million. This is relatively high compared with other countries due to the fact that 71% of the additional passengers are inbound tourists.

Increasing tourism expenditure along with an improving economy contribute to higher consumption, which is a major component of GDP. In 2020 we estimate that consumption will increase by €110 million per year under the full scenario and €55 million per year under the half scenario, rising to €151 million and €76 million, respectively, in 2030.

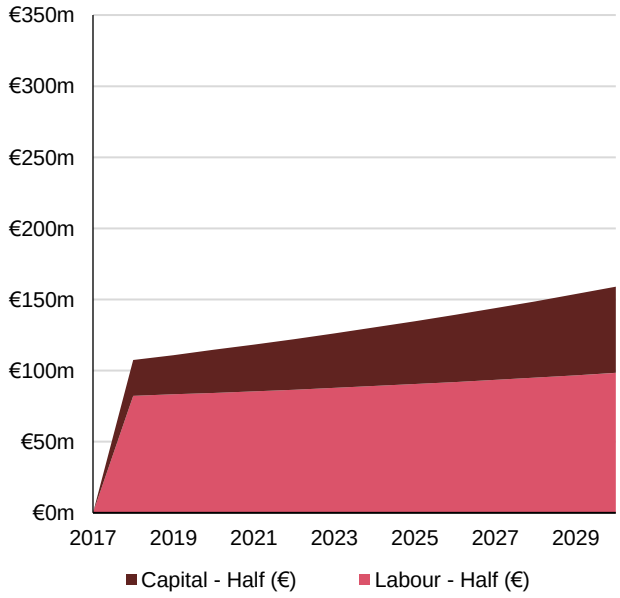
The change in GDP presented above and increase in consumption is driven by changes in income from both capital and households (i.e. increased profits and wages). Household income increases more than capital under both scenarios, with the gap diverging from the baseline over the period until 2030. In the full abolition scenario, household income increases by more than €164 million in the first year, while capital income increases by €50 million. The scenario under which taxes are reduced by half paints a similar picture, with household income increasing by €82 million while capital income increases by €25 million. Under both scenarios, capital as a proportion of GDP increases across the period. This is in line with expectations, as labour will quickly move into the sector following the tax abolition, before capital is accumulated in the medium term.

Figure 8: Impact on capital and household income compared to base level under each scenario (absolute change from the base case)

a) Full



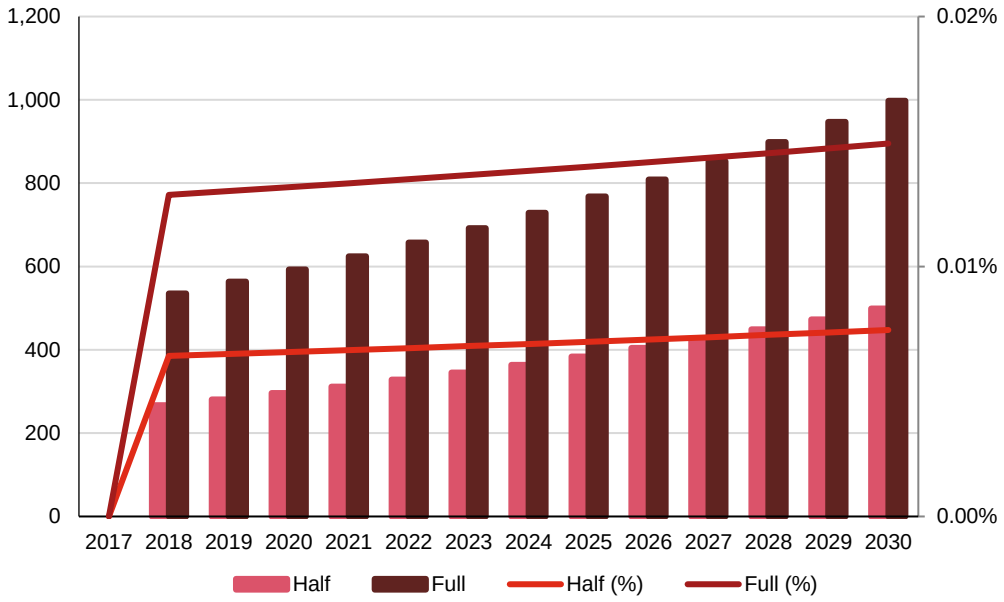
b) Half



Impact on national employment

Under the scenario where the Air Transport Levy is fully abolished, more than 500 jobs will be created in the year following the implementation, rising to a total of 1,000 by 2030. Fewer jobs are created in the scenario where taxes are reduced by a half, however there will still be around 500 additional jobs compared to the status quo.

Figure 9: Impact on total national employment compared to base level from the abolition of air taxes in Austria (percent change from the base case on right-hand axis, and impact in € on left-hand axis)



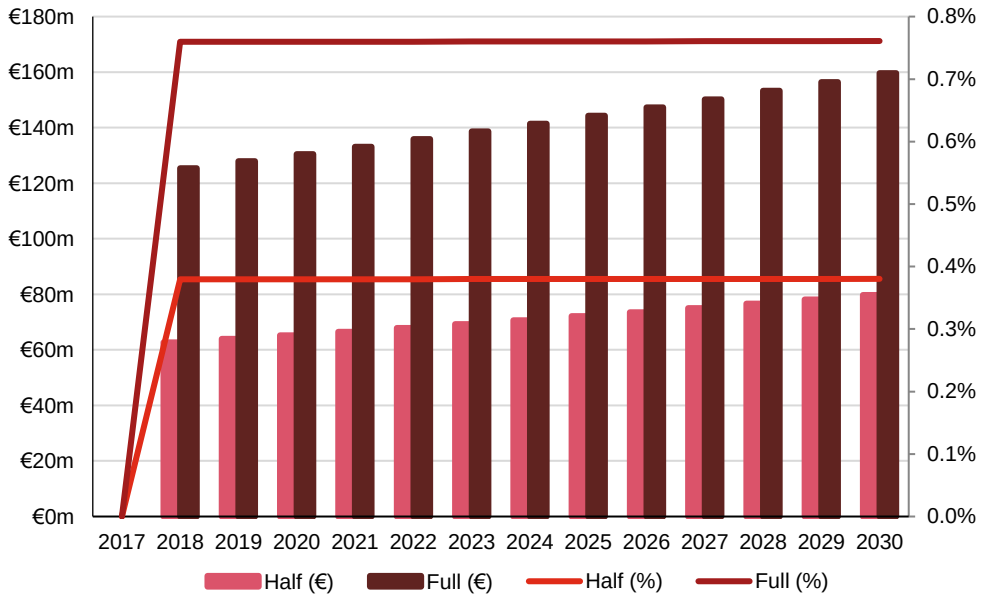
600

additional jobs will be created two years after abolishing the Air Transport Levy

Impact on national aviation sector GVA

The value of goods and services produced in Austria's aviation industry is forecast to be around 0.76% larger than the baseline forecast in 2018 under the scenario where the Air Transport Levy is fully abolished, adding more than €120 million to the sector.[6] A similar relative margin is maintained throughout the period until 2030, with the absolute uplift rising to €160 million by 2030. Reducing the rate of tax by half has a similar but less pronounced effect, improving GVA by just under 0.40% in 2018 compared to the baseline, and a similar amount each year following.

Figure 10: Impact on aviation GVA compared to base level from the abolition of air taxes in Austria (percent change from the base case on right-hand axis, and impact in € on left-hand axis)



The aviation sector would be

€130m

larger per year two years after the abolition of the Air Transport Levy

Impacts on passengers and tourism

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 an additional 0.72 million arrivals in 2020 over a baseline of 14 million (an increase of 5.2%), which is consistent with other studies.[7] This would mean an additional 2.3 million arrivals over the three years following the abolition (i.e. by 2020). The impact of halving all air passenger tax rates would be an increase of roughly 0.36 million arrivals.

2.3m

additional arrivals between 2018 and 2020 by abolishing the Air Transport Levy

[6] Note, we are using GTAP's definition of the aviation sector, which may be broader than other definitions.
[7] Oxford Economics 2012, *The economic impact of changing the Air Transport Levy in Austria*

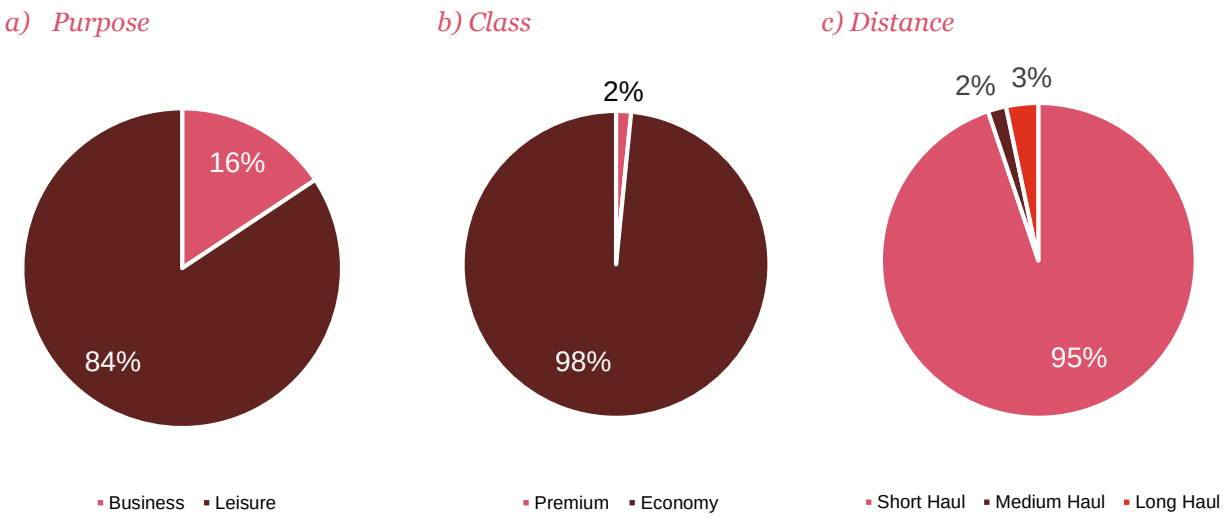
Of these passengers, we estimate that there will be an additional 0.52 million tourists flying into Austria in 2020, and a total of 1.6 million additional tourists in the period to 2020. Inbound tourism is recorded as an export as money from other countries flows into the Austrian economy, which supports GDP growth. However, it is important to recognise that abolishing the aviation tax will impact both inbound and outbound tourism. Outbound tourism is likely to increase as, among other factors, some Austrian citizens will be priced into taking overseas trips and substitute domestic travel with overseas travel. This is treated as an import and will lead to money flowing out of the Austrian economy which will offset some of the increase in expenditure by inbound tourists. As such, we forecast that the net increase to tourism expenditure (increase in exports minus the increase in imports) will be around €460 million in the three year period to 2020.

1.6m

additional tourists between 2018 and 2020 by abolishing the Air Transport Levy

We can extend this analysis, as shown in Figure 11, to give a breakdown of additional passenger numbers by class, distance and purpose. The chart reveals that the vast majority of passengers travel economy class on short haul flights. Approximately 84% of the additional passengers would come to Austria for leisure purposes versus 16% for business purposes, with the level and type of expenditure differing between these two groups.

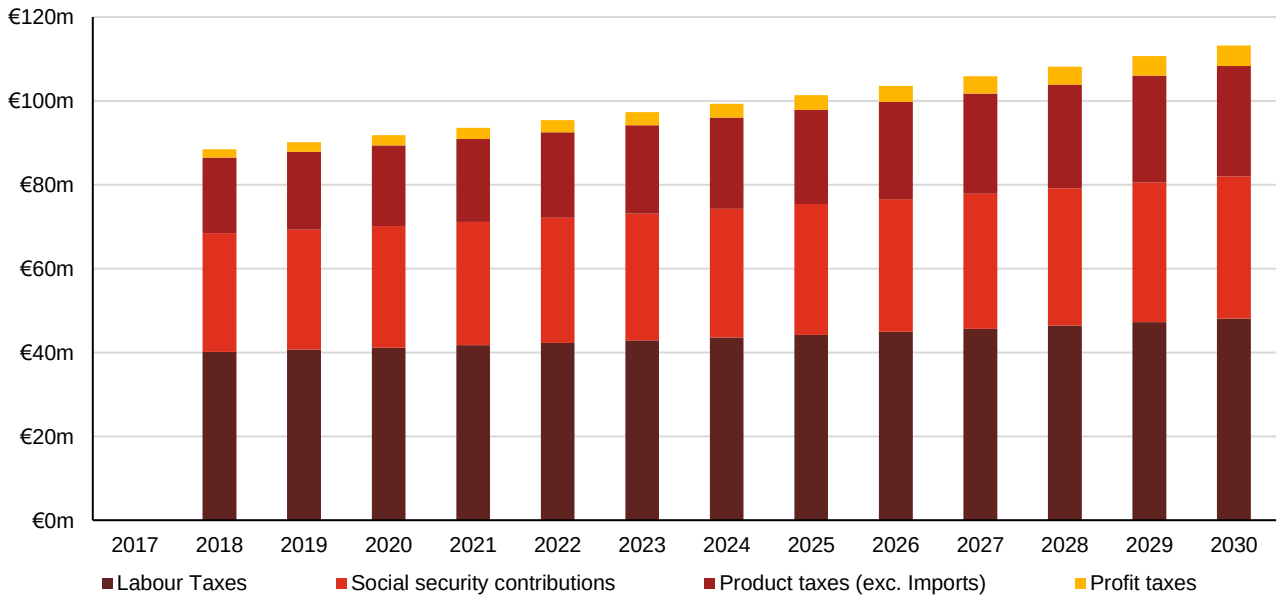
Figure 11: Additional passengers (arrivals) that would result from the tax cut, broken down by class, distance and purpose. Each segment is a proportion of the total increase in arrivals.



Impact on national tax income

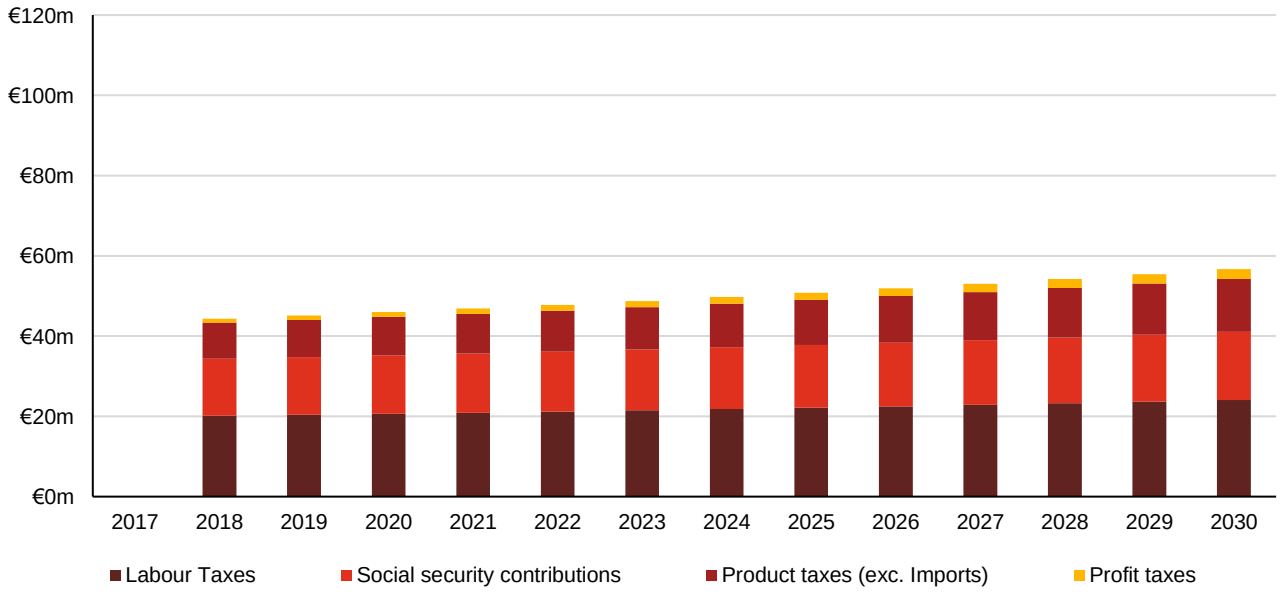
Whilst direct income from the Air Transport Levy will decline as the result of its reduction or abolition, government income from other taxes will increase. These indirect increases in government income are derived from labour taxes, social security contributions, product taxes, and profit taxes, and are a result of wider improvements in macroeconomic performance, including increases in employment, productivity, wages, and consumption. Completely abolishing the air passenger tax leads to increases in all categories of taxes. Labour taxes increase the most, followed by social security contributions, while profit taxes rise the least. 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 such, its abolition improves the level of the GDP disproportionately more than the abolition of other taxes, and as such represents a relatively cheap method of boosting the economy for the government.

Figure 12: Impact on tax income compared to base level from the full abolition of air taxes in Austria (absolute change from the base case)



Reducing taxes by a half also causes increases tax revenue across all four of the taxes analysed. The largest increase is associated with labour taxes, generating around €20 million in the first year after the reduction, while profit taxes see a smaller change from the baseline.

Figure 13: Impact on tax income compared to base level from the abolition of half of air taxes in Austria (absolute change from the base case)



Impact of Austrian tax abolition on global GDP

As shown in Table 4 and Table 5, under the scenario that the Air Transport Levy is completely abolished, all of the countries we have analysed experience an improvement in their real GDP by 2030 with Germany subject to the biggest uplift in relative terms and absolute terms. In the short term, Great Britain, Sweden, France and the aggregate of the rest of the EEA experience a small decline against baseline, before becoming positive by 2020.

Reducing taxes by half has a similar effect, although the timeframe over which the cut in tax has a positive impact on other countries is slightly prolonged. Once again, Great Britain, Sweden, France and the aggregate of the rest of the EEA experience a small decline against baseline, before all becoming positive by 2022. By 2030, Germany experiences the biggest absolute uplift over the baseline, while Italy experiences the greatest relative increase.

These improvements in the economic position of other countries – especially those close to Austria – are due to the reduced cost of flying allowing, among other things, knowledge to be transferred more freely between countries and Austrian residents to spend their money on goods and services in other countries. In addition, residents and businesses in countries outside of Austria will benefit from being able to make trips to Austria for a lower price.

Table 4: Impact on real GDP by country compared to base level from the full abolition of air taxes in Austria (change from the base case)

Full	**2030**
Austria	€318m
France	€39m
Germany	€91m
Italy	€41m
Sweden	€6m
Great Britain	€56m
Rest of EEA	€120m
Rest of World	€308m
Total	*€978m*

Table 5: Impact on real GDP by country compared to base level from the abolition of half of air taxes in Austria (change from the base case)

Half	**2030**
Austria	€159m
France	€18m
Germany	€40m
Italy	€25m
Sweden	€3m
Great Britain	€29m
Rest of EEA	€50m
Rest of World	€91m
Total	*€415m*

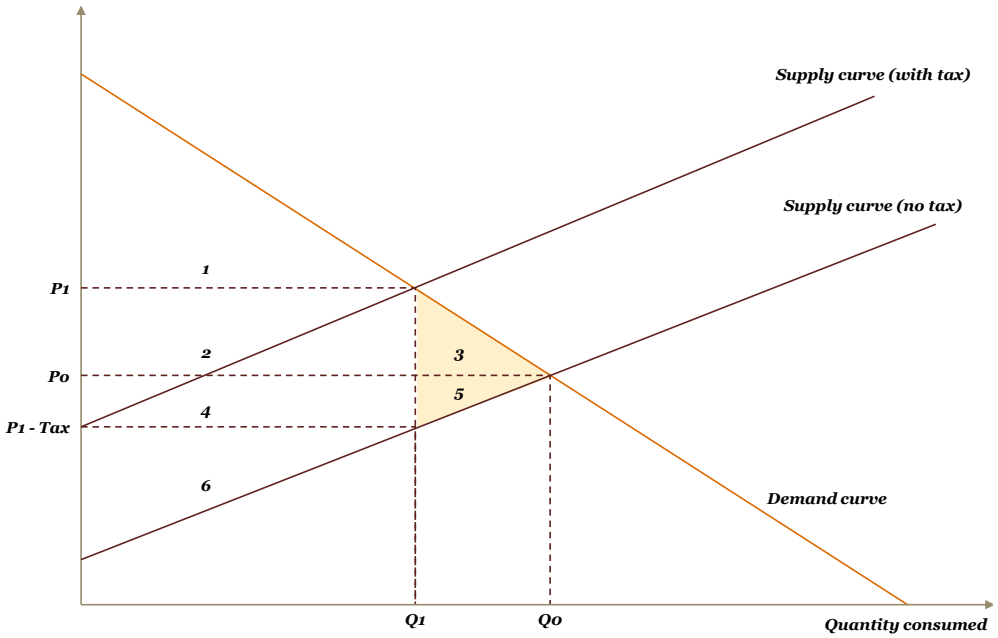
Appendix 1: Economic theory of indirect taxes

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[8]. We explain this concept with use of a supply and demand curve framework (see Figure 14 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 14. 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 14: Illustrative deadweight loss (as marked in yellow) caused through application of indirect tax



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

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

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	
Norway	Air Passenger Tax	NOK 82		
Sweden	N/A	Proposal for 1st of January 2018)		Figure 3 shows the proposed rates from January 2018.
		Within EU	SEK 60	
		Less than 6000km	SEK 250	
		More than 6000km	SEK 400	

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