The economic impact of air travel at Schiphol airport

A NOTE PREPARED FOR EASYJET

This note has been prepared in the context of the current review of aviation measures at Schiphol Airport. We consider the impact of (i) introducing operating expense targets for Schiphol, (ii) introducing single till regulation and (iii) eliminating transfer discounts. The first two policies would result in lower airport charges for all passengers while the third one would reduce charges for O/D passengers while increasing them for transfer passengers. However, since O/D passengers are the main contributors to economic growth, all these policies have a positive impact on GDP and employment. We find that implementing all three measures simultaneously would increase traffic by 3.4% and would result in an annual gain to the Dutch economy of €1.7billion of GDP (a 0.28% increase), which corresponds to around 20,000 jobs.

Air traffic at Schiphol airport is a significant driver of economic growth in the Netherlands. There are currently a number of measures under consideration to enhance this economic impact, including airport investments, improvements to "network quality" and changes to the airport regulatory framework.

In this note we estimate the potential benefit to the Dutch economy of three particular policies:

- Introducing more stringent efficiency targets for operating expenditure.
- Switching the price cap regulation to a single till basis.
- Removing discounts on airport charges to transfer passengers.

Air travel has far-reaching connections with economic activity. It is estimated that €1.8 trillion (3.4% of global GDP) and 58 million jobs worldwide are facilitated by air travel, including direct, indirect and induced impacts.[1]

The economic impact of air traffic occurs through a variety of channels, including tourism and business face-to-face meetings. The economic impact of the latter is particularly important because business travel is a facilitator of increased levels of trade and FDI. While all these channels promote growth, the economic contribution of each is quantitatively different.

The contribution of air passenger traffic also depends on the type of travel. In particular, O/D passengers have a direct impact on the economy either by generating business or by promoting tourism. Transfer passengers, on the other

1 Air Transport Action Group "Benefits Beyond Borders", April 2014

hand, create limited *direct* benefits in the "host" country. However, they have an *indirect* contribution by enabling increased O/D traffic because the transfer traffic supports increased connectivity at a national hub. It is these indirect effects which are sometimes used to explain policy support for transfer traffic. Within O/D, short and long haul passengers also may have a different impact in quantitative terms.

Our approach

The starting point of our approach is the existing traffic pattern at Schiphol airport. In particular, this is characterised by the destinations available from Schiphol and the number of passengers flying on each of these links, including transfer passengers who neither start nor end their journey at Schiphol.[2]

We estimate the effect of each of the policies under study on airport charges and on airfares under the assumption that airlines pass through these charges. We further estimate the demand response to fare changes using price elasticities of demand that have been identified in the literature.

Passenger traffic is the main driver of economic value, not connectivity per se. We estimate the economic impact of the increase in passengers based on the links between passenger traffic and economic variables that have been identified in previous work. In particular, our calculations will determine the likely effect on tourism spending, trade (imports and exports) and foreign direct investment (FDI). Changes in trade and FDI have further knock-on benefits in terms of productivity which can increase GDP and employment. **Figure 1** provides a summary of the approach.

It should be stressed that these benefits accrue to the Netherlands as a whole and not just to the Amsterdam area. Schiphol acts as a hub to connect the Netherlands to the world for both business and tourism, with extensive regional links. Our model projects an increased demand in these regional links as well as in international flows. It is to be assumed that the economic benefits in terms of trade, investment and tourism would diffuse through the Dutch economy.

We have estimated the effect of lower airport charges on key economic variables based on existing travel patterns and the economic links between the Netherlands and other countries. As a consequence, our model distinguishes the differential effect that changes in aeronautical charges are likely to have on different types of traffic, including short haul and long haul and O/D and transfer passengers. We establish the change for these segments both in terms of passenger numbers but, more importantly, in terms of their corresponding wider economic impacts.

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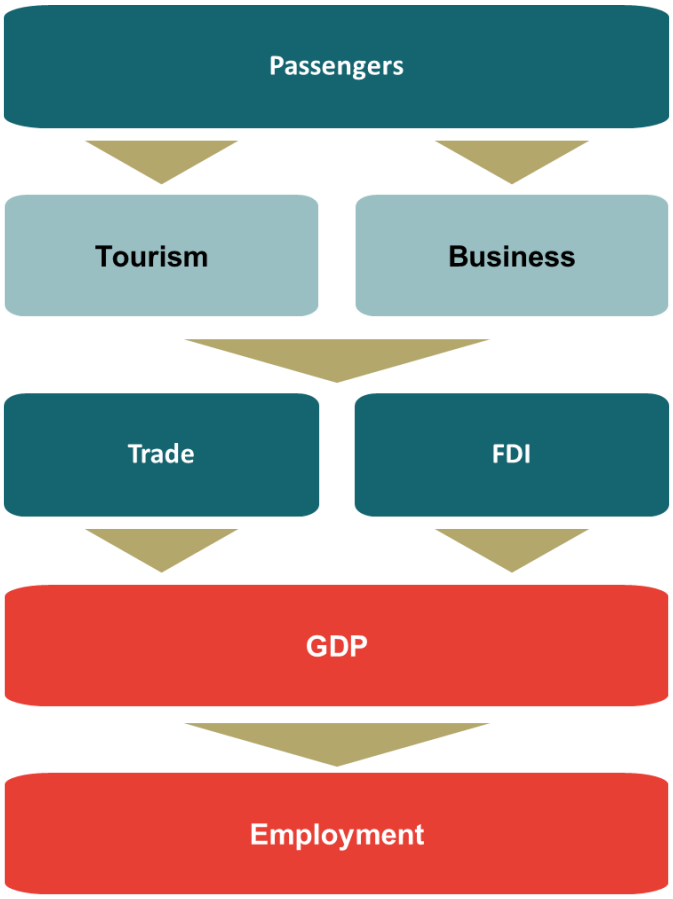
2 Our analysis is based on travel patterns as reported by IATA's PaxIS database.

A reduction in aeronautical charges can also make additional new routes economically viable for airlines that are not currently feasible. However, we have not included this effect on our modelling. Therefore, we consider that our results may err on the conservative side.

Figure 1. Overview of the economic impact of air travel



Source: Frontier Economics

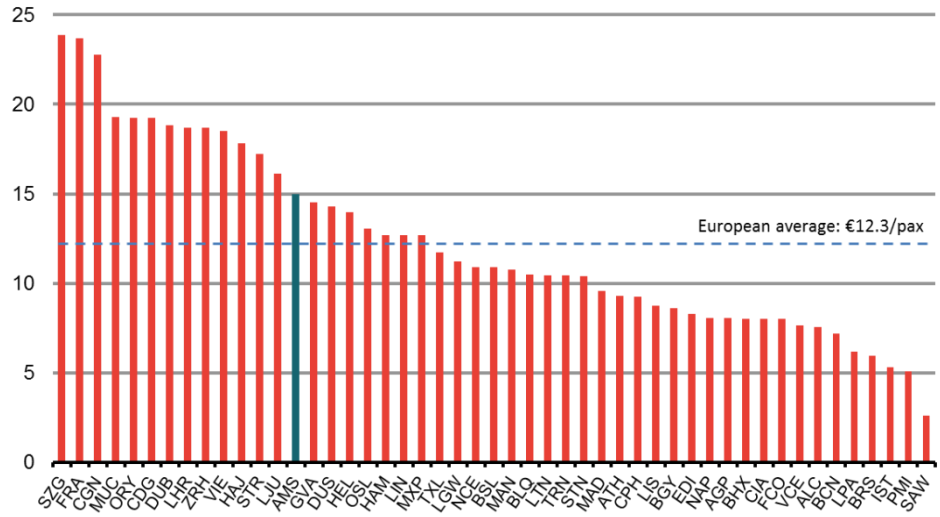
Policy 1: Opex efficiency

Schiphol does not have an explicit efficiency target built in its regulatory framework. Schiphol proposes its charges in a given year through a consultation process that airlines may challenge. However, the regulator does not impose ex-

ante targets as in other jurisdictions.[3] The absence of targets reduces the incentive to generate savings in operating spending.

International benchmarking studies suggest that Schiphol may underperform somewhat in terms of opex efficiency relative to peer airports.[4] **Figure 2** shows that Schiphol's costs of €15.0 per passenger (2012 data, ATRS) are well above the European average.

Figure 2. Opex per passenger at European Airports (€, 2012)

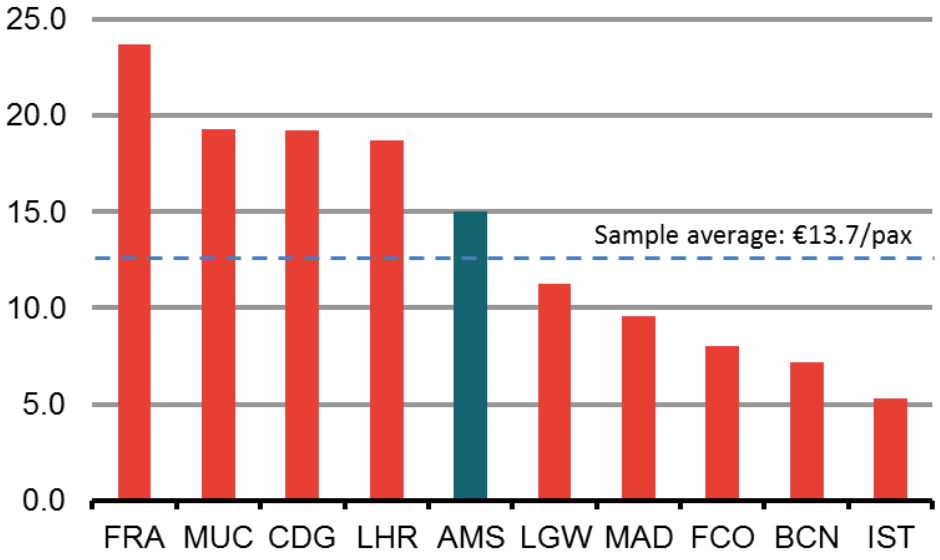


Source: Frontier Economics based on ATRS data.
Note: A list with the full name of the airports in the chart is provided at the end of the note.

3 For example, the UK CAA imposes targets for efficiency gains to all regulated airports in each five-year price control period.

4 See for example, CAA (2012) "Airport Operating Expenditure Benchmarking Report".

Figure 3. Opex per passenger at large European Airports (over 30 mppa, €, 2012)



Source: Frontier Economics based on ATRS data.
Note: A list with the full name of the airports in the chart is provided at the end of the note.

Figure 3 shows that, even when considering large airports (defined as having 30 mppa or more), Schiphol's opex per passenger is above average. Specifically, the sample average is 8.6% below Schiphol's own costs.

We therefore consider the potential economic impact of lower fares at Schiphol resulting from a reduction in airport charges consistent with opex efficiency improvements that would take Schiphol to the average of large European airports. These gains would imply a reduction in charges of €2.57 per departing passenger. It is in fact common for regulators to challenge the companies they oversee to aspire to achieve the best level of efficiency observed, not merely the average. In the Netherlands this aspiration is made explicit in the Aviation White Paper which says that Schiphol needs to be competitive. Istanbul is often seen as a key competitor. In this context we think that exploring the economic impact of such an efficiency target is reasonable.[5]

[5] Our analysis is based on 2012/13 data. We recognise however that Schiphol's charges have been reduced since April 2015 partially caused by lower operating costs. See "Letter final charges setting 1 April 2015", available at http://www.schiphol.nl/web/file?uuid=5efe4993-3627-40c9-872c-69d7204dadbd&owner=07177edb-5e28-4949-bb45-ae73498027bb

Policy 2: Single till regulation

Schiphol is currently regulated under a dual till framework, although there has been a limited, voluntary, contribution towards aeronautical costs from non-aeronautical revenues. Therefore, Schiphol's profits from non-aeronautical activities make very little contribution to recovering the costs of providing aeronautical services. Alternatively, under a single till framework the airport is allowed to recover total costs net of non-aeronautical revenues. Airport charges consequently tend to be higher under dual till than they would be under single till regulation.

There is evidence that airports earn a higher return when regulated under dual till. Frontier Economics estimated that airports under dual till regulation earn on average a return on capital employed of 1.8 percentage points higher than under single till based on ACI data.[6] In addition, Frontier estimated based on airport regulatory data that moving from single to dual till would increase RoCE by 1.8-2.2 percentage points in Spain and 1.9-2.5 percentage points in France. Finally, the Spanish Competition Authority estimated that dual till would increase charges by 18% or 2.6 percentage points of RoCE.[7]Capital employed at Schiphol airport is estimated at €4.8bn in 2013. Reducing the return on this capital would result in savings of €3.87 per departing passenger.[8]

Frontier Economics argues that the single-till approach mimics competition dynamics more accurately than dual-till and therefore leads to more economically efficient outcomes.[9]

Policy 3: eliminating transfer discounts

International hubs compete among each other for transfer passengers. However, these airports have market power in the O/D segment. Therefore, they have an incentive to introduce discounts whereby airport charges are lower for transfer passengers and higher for O/D passengers, leaving revenue unchanged.

Transfer discounts are, therefore, a way of using the proceeds of market power in O/D markets to compete more aggressively in transfer markets which penalises O/D traffic over transfer traffic. The direct contribution of O/D passengers to the domestic economy is larger than for transfer passengers. Therefore, the total

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6 Frontier Economics (2015) "Benefit of better regulation of airports in Europe"

7 CNMC (2015) "Acuerdo por el que se adoptan criterios sobre la separacion de los costes de las actividades aeroportuarias y comerciales de los aeropuertos de aena,"

8 We do note however that the WACC for Schiphol is relatively low by comparison to some other airports. We are not arguing here that the rate of return at Schiphol is excessive. We use the reduction in the rate of a return as a proxy for adjusting the regulation to single till.

9 Frontier Economics (2014) "Setting airport regulated charges: the choice between single-till and dual-till"

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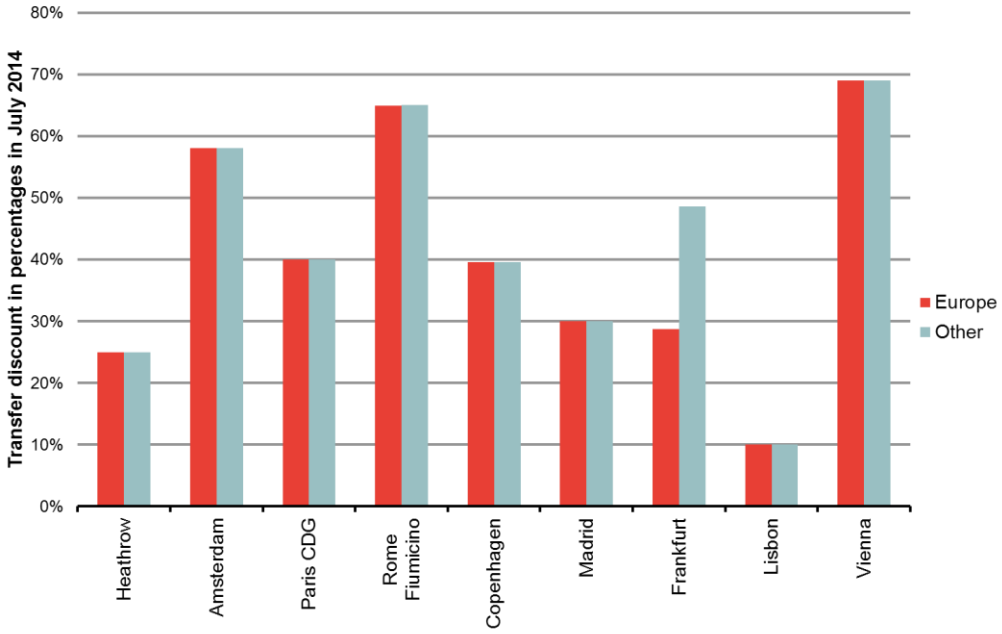
cost of these discounts may be higher than the benefit that they provide to the Netherlands.

Schiphol Airport has one of the highest discounts for transfer passengers in Europe. **Figure 4** shows that they are larger than 50% and are the third largest in Europe.

Figure 4. Transfer discounts at European hub airports



Source: Frontier Economics analysis, IATA charges database

Table 1. Airport charges with and without transfer discounts

	Band / passenger type	Airport charges (€, 2013)	Departing passengers in 2013 (m)	Airport revenue €m
With transfer discounts	O/D	24.0	10.92	347.71
	Transfer	11.6	7.67	118.29
	Total	18.9	18.58	466.00
Without transfer discounts	Equalised	18.9		

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Table 1 shows that eliminating transfer discounts will increase the cost for transfer passengers by €7.27 but decrease the cost of (departing) O/D passengers by €5.10. We have focussed our modelling on the effect of this change on the number of O/D passengers, since this drives the economic impact forecast of the change while transfer passengers do not generate a direct economic benefit for the Netherlands. We also note that we are not aware of any robust estimates of the elasticity of transfer passengers in the literature, making it hard to forecast the overall impact on passenger numbers. The removal of the transfer discount will affect the balance of long haul and short haul passengers, due to their differing elasticity. The final economic impact will be determined by the relative contribution to the economy of these two types of passengers.

We note that airport charges at Schiphol have decreased recently. However, the discount to transfer passengers has stayed constant proportionally. This note examines the effect of eliminating these discounts, which would increase the charges for transfer passengers and reduce them for O/D passengers. In this respect, our analysis remains valid.

Transfer passengers may indirectly generate benefits via making viable a larger number of routes which can be used by local O/D traffic.. However, based on a recent report by SEO, this effect is likely to be relatively small. Even in their "intermediate" scenario, where 20% of flights from the hub carrier disappear, around 3.3% of O/D passengers do not fly at all anymore. [10] The elimination of transfer discounts would have only a limited impact on route viability. Therefore, the impact on O/D traffic would only be a small fraction of SEO's estimate.

10 SEO Economics (2015) "The Economic Impact of the Hub Function at Schiphol", Table 5.4.

Summary

Table 2 summarises the changes in airport charges implied by the three proposed adjustments: opex efficiency, single till regulation and the elimination of discounts to transfer passengers. Taken together, these adjustments would imply a reduction in airport charges of €11.5 per departing O/D passenger and an increase of €0.8 for departing transfer passenger.

Table 2. Adjustments to airport charges per departing passenger

	O/D passengers		Transfer passengers	
		%		%
Original charges	€ 24.0		€ 11.6	
Adjustments				
Single till	-€ 3.9	-16.1%	-€ 3.9	-33.3%
Opex efficiency	-€ 2.6	-10.7%	-€ 2.6	-22.1%
Elimination of transfer discounts	-€ 5.1	-21.3%	€ 7.3	62.6%
Total adjustments	-€ 11.5	-48.1%	€ 0.8	7.2%

Source: IATA Airport, ATC and Fuel Charges Monitor and Frontier Economics calculations

Results

The results of implementing all three policies simultaneously are summarised in **Table 4**. We present separate tables for each of the policies in the Annex. The results are expressed as the total economic impact on the Dutch economy of introducing all three policies. The effect is broken down by the contribution of the incremental short and long haul passengers as a consequence of these policies.. In addition, it also expresses the effects in terms of impact per increment of 1 mppa. With the latter estimates, it is possible to assess the relative contribution to the economy of the different types of passengers.

Table 3 shows that the decrease in airport charges from implementing the three policies would decrease in the average airfare from € 256.72 to €247.8 (-3.5%).

Based on our modelling and the elasticities identified in the literature,[11] the lower airfares would increase the annual number of passengers by 1.4 million (3.4%).[12]

The change in airfares in percentage terms is higher for short haul (-5.3%) than for long haul (-0.9%). This is caused both by the elimination of transfer discounts and airport charges make up a larger proportion of the ticket price for short haul fares. Coupled with the higher price elasticity of demand, the proportional increase in demand is larger for short haul passengers.

Table 3. Overall reduction in airfares from introducing efficiency targets, single till regulation and eliminating transfer discounts (€, 2013)

	Fare status quo	Fare with policies	Change
All passengers	256.7	247.8	-3.5%
Short Haul			
	105.8	100.2	-5.3%
Long Haul	434.0	430.1	-0.9%

Source: Frontier Economics

The economic impact of this would be an increase in GDP of c. €1.7bn (0.28%) resulting from the productivity effect of greater trade and investment. The policies would be associated with an increase of employment of around 20,000 jobs. Tourism spending in the Netherlands would also increase by c. €0.9 bn.

11 Our calculations are based on an elasticity of -1.11 for short haul passengers and -0.65 for long haul. Based on the passenger mix at Schiphol, the results show an average elasticity of around -1.

12 Passengers are defined as one-way journeys from origin to destination. Unlike airport passenger accounting, this definition is independent of the number of passengers connecting at other airports.

Table 4. Summary of the economic impact of additional passengers as a consequence of all three policies combined (Euros, 2013)

	Total impact			Per mppa		
	O/D - Short haul	O/D - Long haul	Total O/D	O/D - Short haul	O/D - Long haul	Average
Additional passengers (mppa)	1.24	0.12	1.37			
Tourism spending (€bn)	0.9	0.0	0.9	0.72	0.27	0.68
Imports (€bn)	1.1	0.5	1.7	0.92	4.22	1.21
Exports (€bn)	1.7	0.3	2.1	1.39	2.67	1.50
FDI (€bn)	2.6	0.1	2.7	2.09	0.70	1.96
GDP (€bn)	1.3	0.4	1.7	1.05	2.91	1.22
Number of jobs ('000)	15.1	4.1	19.2	12.1	33.5	14.0

The overall impact of higher trade and investment on GDP amounts to €1.22bn per mppa, which is equivalent to an additional 14,000 jobs. Short haul passenger traffic results in a smaller impact on GDP, because trade is less dependent at the margin on business air travel. This is because the economies of the EU are already closely integrated.

Table 4 shows that increased short haul air travel results in an impact on tourism spending that amounts to c. €0.72bn per mppa. This impact is higher than the corresponding one for long haul passengers, €0.27bn per mppa. In addition, the FDI effect is larger for short haul passengers.[13] The impact on trade (imports and exports) GDP and employment, on the other hand, is higher for long haul passengers.

The more detailed tables in the annex show the separate contribution which each policy makes to the total shown above. We note that all three policies are independently positive in terms of their impact on the Dutch economy.

13 This result, however, is probably due to biases in the data, since Europe represents 94% and 84% of all inward and outward FDI in the Netherlands, respectively.

Indeed with the sole exception of the impact of transfer discounts on the number of long haul passengers at Schiphol, each policy makes a positive contribution to passenger throughput and to each category of benefit: employment, tourist spending, trade and investment.

Even in the latter case, although the removal of transfer discounts reduces total long haul passengers, the economic benefit from long haul *increases*. This is because the reduction in long haul traffic is for long haul transfer passengers, who make a very small contribution to the Dutch economy, so this loss of this traffic is very small in economic terms. On the other hand there is an increase long haul O/D traffic, which while smaller in passenger numbers, has a much more significant positive impact on the economy as a result of the tourist spending, trade and investment that this traffic brings.

Conclusion

Our analysis concludes that the Dutch economy would achieve material economic benefits from introducing three specific airport policies: opex efficiency targets, single till regulation and eliminating transfer discounts.

The resulting increase in traffic from these policies would be over 1.4m passengers (a 3.4% increase) at Schiphol due to lower airport charges. This increase in traffic would result in an increase in GDP of €1.7 billion and almost 20,000 additional jobs.

Our modelling demonstrates that the increase in short haul traffic has a particularly strong impact on tourism spending, although it also makes a material contribution to the GDP impact identified here.

Annex

We present the results from our analysis (summarised in **Table 4**) broken down by policy. **Table 5** contains the results of introducing single till regulation, **Table 6** of introducing opex efficiency targets resulting in an efficiency gain of 8.6% and **Table 7** of eliminating transfer discounts. These tables show how each of the three policies contribute to the overall increase in economic welfare.

The average effects per million passengers are identical for the single till and opex efficiency policies. This is because both policies lower the cost to all passengers segments by the same amount and therefore have the same impact per passenger.

Table 5. Summary of the economic impact of introducing single till regulation (€, 2013)

	Total impact			Per mppa		
	O/D - Short haul	O/D - Long haul	Total O/D	O/D - Short haul	O/D - Long haul	Average
Additional passengers (mppa)	0.42	0.04	0.46			
Tourism spending (€bn)	0.3	0.0	0.3	0.72	0.27	0.68
Imports (€bn)	0.4	0.2	0.6	0.92	4.22	1.21
Exports (€bn)	0.6	0.1	0.7	1.39	2.67	1.50
FDI (€bn)	0.9	0.0	0.9	2.09	0.70	1.96
GDP (€bn)	0.4	0.1	0.6	1.05	2.91	1.22
Number of jobs ('000)	5.0	1.4	6.4	12.1	33.5	14.0

Table 6. Summary of the economic impact of introducing opex efficiency targets (€, 2013)

	Total impact			Per mppa		
	O/D - Short haul	O/D - Long haul	Total O/D	O/D - Short haul	O/D - Long haul	Average
Additional passengers (mppa)	0.28	0.03	0.30			
Tourism spending (€bn)	0.2	0.0	0.2	0.72	0.27	0.68
Imports (€bn)	0.3	0.1	0.4	0.92	4.22	1.21
Exports (€bn)	0.4	0.1	0.5	1.39	2.67	1.50
FDI (€bn)	0.6	0.0	0.6	2.09	0.70	1.96
GDP (€bn)	0.3	0.1	0.4	1.05	2.91	1.22
Number of jobs ('000)	3.4	0.9	4.3	12.1	33.5	14.0

Annex

Table 7. Summary of the economic impact of eliminating transfer discounts (€, 2013)

	Total impact		
	O/D - Short haul	O/D - Long haul	Total O/D
Additional passengers (mppa)	0.55	0.05	0.60
Tourism spending (€bn)	0.4	0.0	0.4
Imports (€bn)	0.5	0.2	0.7
Exports (€bn)	0.8	0.1	0.9
FDI (€bn)	1.1	0.0	1.2
GDP (€bn)	0.6	0.2	0.7
Number of jobs ('000)	6.7	1.8	8.5

Glossary

Airport charges	Fees charged by airports on passengers and aircraft to recover their incurred costs. These are typically levied on airlines and are included in the ticket price
Capital employed	The value of investment total investment necessary for the airport to function. It is defined here as fixed assets plus working capital.
Dual till	Form of regulation where the airport is allowed to recover the costs of the aeronautical activities (not of non-aeronautical *costs).*
Foreign Direct Investment (FDI)	The value of the controlling ownership of an undertaking in a given country by investors based in another country
GDP	Gross domestic product It is the value of all goods and services produced in the economy in a given year.
Mppa	Million passengers per annum.
Opex	Operating expenditure. These are costs necessary to perform ongoing activities and distinct from capital expenditure.
O/D passengers	Origin/Destination passengers. These are passengers that originate or finalise their trip at the airport.
Price elasticity of demand	Percentage change in demand after a 1% increase in prices
Single till	Form of regulation where the airport is allowed to recover its costs net of non-aeronautical *revenues.*
Transfer discount	Discount on passenger service charges given to connecting traffic.
Transfer passengers	Passengers that connect flights at the airport, but of different origin and destination.

Annex

List of airports

Airport Code	Airport Name	City	Country
AGP	Malaga Airport	Malaga	Spain
ALC	Alicante Airport	Alicante	Spain
AMS	Schiphol	Amsterdam	Netherlands
ATH	Eleftherios Venizelos Airport	Athens	Greece
BCN	Barcelona	Barcelona	Spain
BGY	Orio Al Serio	Milan	Italy
BHX	Birmingham Airport	Birmingham	United Kingdom
BLQ	Guglielmo Marconi	Bologna	Italy
BRS	Bristol/Lulsgate	Bristol	United Kingdom
BSL	Euroairport	Basel/Mulhouse	Switzerland
CDG	Charles De Gaulle	Paris	France
CGN	Konrad Adenauer	Cologne-Bonn	Germany
CIA	Ciampino	Rome	Italy
CPH	Kastrup	Copenhagen	Denmark
DUB	Dublin	Dublin	Ireland
DUS	Dusseldorf	Duesseldorf	Germany
EDI	Turnhouse	Edinburgh	United Kingdom
FCO	Fiumicino	Rome	Italy
FRA	Frankfurt International Airport	Frankfurt	Germany
GVA	Geneva International Airport	Geneva	Switzerland
HAJ	Hannover	Hannover	Germany
HAM	Fuhlsbuettel	Hamburg	Germany
HEL	Helsinki-Vantaa	Helsinki	Finland
IST	Ataturk	Istanbul	Turkey
LGW	Gatwick	London	United Kingdom

Airport Code	Airport Name	City	Country
LHR	Heathrow	London	United Kingdom
LIN	Linate	Milan	Italy
LIS	Lisboa	Lisbon	Portugal
LJU	Brnik	Ljubljana	Slovenia
LPA	Gran Canaria	Gran Canaria	Spain
LTN	Luton International	London	United Kingdom
MAD	Barajas	Madrid	Spain
MAN	Manchester Airport	Manchester	United Kingdom
MUC	Franz Josef Strauss Airport	Munich	Germany
MXP	Malpensa	Milan	Italy
NAP	Capodichino	Naples	Italy
NCE	Cote D'Azur	Nice	France
ORY	Orly	Paris	France
OSL	Oslo Airport	Oslo	Norway
PMI	Palma De Mallorca	Palma de Mallorca	Spain
SAW	Sabiha Gokcen	Sabiha Gokcen	Turkey
STN	Stansted	London	United Kingdom
STR	Echterdingen Airport	Stuttgart	Germany
SZG	Salzburg	Salzburg	Austria
TRN	Citta Di Torino	Turin	Italy
TXL	Tegel	Berlin	Germany
VCE	Marco Polo	Venice	Italy
VIE	Vienna International	Vienna	Austria
ZRH	Zurich	Zurich	Switzerland

Annex