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# ***The economic impact of Air Passenger Duty***

## ***A study by PwC***

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*February 2013*

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# *Executive summary*

## *Overview*

PricewaterhouseCoopers LLP (PwC) has been commissioned by a consortium of UK and Irish airline operators – British Airways Plc, Virgin Atlantic Airways Ltd, Ryanair Ltd, and easyJet Airline Company Limited – to provide an evidence-based assessment of the role of Air Passenger Duty (APD) in the UK economy, and its contribution to the public finances. Whilst the consortium commissioned and financed the work, and commented on our draft reports, the final reports represent the independent analysis of PwC.

Our findings are presented in two reports. This report is an abridged version, covering our key findings and a summary of the underlying analysis. A full report is available separately from the client and covers in more detail the methodology and background data underlying our findings.

This report has been prepared by PwC for the four airlines under the terms of our engagement letter dated 20<sup>th</sup> July 2012.

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## *Key findings*

The main analysis in this report relates to the impact on the economy and Government tax revenues if APD were to be abolished. Our assessment has been carried out within a framework laid out by the UK Treasury Select Committee (TSC)<sup>1</sup> in its 2010 review of the fundamental principles of tax policy making (in broad terms these principles relate to competitiveness, fairness and effective collection of taxes). Underpinning our approach consistent with this framework is a dynamic economic impact model known technically as a Computable General Equilibrium (CGE) model. This model was developed by PwC to assess the economic consequences of APD abolition. The detail behind the methodology and the TSC principles can be found in our full report.

**Our key findings relate to a scenario where we consider the abolition of APD at the 2013 Budget:**

- 1) Our modelling suggests that the abolition of APD could **provide an initial short-term boost to the level of UK GDP of around 0.45 percent in the first 12 months, averaging at just under 0.3 percent per annum between 2013 and 2015.** This GDP increase would raise the level of UK

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<sup>1</sup> Treasury Committee, Eighth Report of Session 2010-12, Principles of Tax Policy, HC 753.

economic output permanently. On this basis, between 2013 and 2015 we might expect the economy to be around £16bn larger than it otherwise would have been under the current APD regime.

- 2) Underlying this increase in output, the model suggests an expansion in investment and exports. The results imply investment rising by around 6 percent in total between 2013 and 2015 and exports (including earnings from foreign tourism) rising by 5 percent over the same period.
- 3) While the abolition of APD would benefit UK consumers and foreign tourists visiting the UK, the biggest gain could be for British businesses which, given access to cheaper airfares, might be able to spend more time with key overseas customers. Our model suggests this could lead to business expansion and an increase in productivity.
- 4) Should the rise in output associated with APD abolition materialise as our modelling suggests, then it could be possible that **almost 60,000 jobs could be created between now and 2020**.
- 5) Based on published Government data,<sup>2</sup> the direct costs to the Exchequer of APD abolition would be around £3-£4 billion per annum through lost APD revenues. Using a cautious set of assumptions, PwC's analysis shows that receipts from other taxes would be expected to offsetting the direct Exchequer cost.
- 6) This leads to an average net positive **gain** of £0.25 bn per annum for the Government. Our modelling therefore suggests that **abolishing APD could pay for itself**. These additional sources of Government revenue primarily come from increased UK business growth achieved through better trade linkages and more employment in the UK economy.

This finding, whilst unusual, is not unprecedented<sup>3</sup> – it is uncommon but not implausible for tax cuts to pay for themselves. The results in this report have been checked carefully and rationalised alongside wider economic studies of air travel and the airline industry. The properties of APD as a tax are also considered against those of other taxes in order to benchmark our analysis.

Our modelling finds that in the case of APD the nature of the tax itself and its context within the UK economy combine in a way which produces such a result. Our analysis suggests that APD is at least as damaging to the economy – and probably more so – than corporation tax and fuel duty. Key factors underlying this finding are as follows:

- 1) APD is the highest tax of its type in the world by some considerable margin and this is a key driver of our modelling results. This outcome is particularly true for long haul flights. Our analysis shows that by removing APD UK competitiveness as a whole benefits, not just that of the airline sector. Historic comparisons suggest that growth in the airline industry and GDP are strongly correlated, not just in the UK, but globally.
- 2) All passengers flying from the UK on UK airlines pay APD except where passengers transfer through the UK on the same ticket. Non-UK based airlines carry higher proportions of passengers on routes that are unaffected by APD and this means they gain a competitive advantage. In some instances, non-UK European airlines operating in the UK could be paying one quarter less in APD as a proportion of their total revenues than a UK airline. This gives non-UK European airlines more strategic pricing flexibility and a potential opportunity to price UK airlines off key routes.
- 3) Our estimates suggest that UK businesses in aggregate pay around £500m in APD each year. This is a substantial business cost. Leading academic evidence suggests that such a cost burden can distort production decisions leading to inefficiencies in business decision making. Abolishing APD has the potential to reduce the cost of flying, making it cheaper for businesses to maintain relationships with overseas customers. In this sense APD could be regarded as a tax on exports. Abolishing it could lead to increased trade and growth in demand for UK exports. This wider business benefit is critical to our modelled result. A broad range of evidence reviewed in our report suggests that growth in airline usage

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<sup>2</sup> <https://www.uktradeinfo.com/Statistics/Pages/TaxAndDutybulletins.aspx>

<sup>3</sup> An early and highly influential example of this type of literature can be found at: Auerbach, A.H. and L.H. Kotlikoff (1982) “*Investment versus savings incentives: The size of the bang for buck and the potential for self-financing business tax cuts*” NBER Working Papers No. 1027

by UK businesses has contributed significantly to UK GDP growth over the past 20 years which in turn can lead to higher tax revenues.

- 4) We have conducted extensive sensitivity analysis on our modelling. These tests suggest that the benefits associated with an APD cut could also occur through alternative sources other than the business productivity gains described above. For instance, additional benefits might be realised through increased foreign tourism, particularly in terms of high spending overseas visitors. Alternatively, if an APD cut were to lead to an expansion in either airline sector output or output from other sectors then this could lead to increased opportunities for job creation. In turn it may then be possible that its effect could be enhanced when considered alongside the current relatively high levels of unemployment. On balance we would expect the take-up of new employment vacancies offered in response to any economic expansion to be higher than if the economy was operating at full capacity. This range of outcomes is not comprehensive and the likely outcome is that the benefits of APD abolition would be realised through some combination of all of the channels listed above, or some others that have not been included in this report.

In considering the abolition of APD, it is important to acknowledge the fiscal environment at the time this report has been written. The issues relating to the UK public finances and the current UK economic outlook are well documented. Sensitivity testing on our analysis suggests that our central tax revenue neutral finding would likely occur regardless of economic circumstances or the fiscal outlook. However, some elements of the potential reaction to APD abolition are not captured in our economic modelling. Two key issues are:

- The perception of APD abolition by bond ratings agencies and its impact on the UK's credit rating has not been included as it is not clear how the ratings agencies might perceive the cut in the context of the wider fiscal position.
- On balance we do find that a cut in APD would be expected to lead to an improvement in the UK tourism balance of payments (the amount of money spent in the UK by foreign tourists netted against the amount of money that UK residents spend on their foreign holidays). However, we also observe a net positive inflow of foreign tourists who have higher spending capacity than UK outbound tourists. In our central scenario, our modelling does not attempt to capture any increase in foreign tourism inflows that might occur due to new airline routes being established. Any foreign tourism inflows are augmented by tourism demand elasticities that have not been estimated based on evidence of major structural change in tourism taxation so may underestimate the consumer response to the abolition of APD. Analysis of potential foreign tourism increases has been restricted to sensitivity tests of the model and could provide a key channel through which the benefits of APD abolition might be realised, particularly as foreign tourists spend considerably more per night in the UK than domestic tourists. Airlines are increasingly linking to long-haul destinations with significant trade potential. These routes could also generate income for UK businesses through the tourists they bring to the UK.

Our analysis of APD is separate and distinct from that of the current UK debate on airport capacity. While we have not modelled airport capacity in the UK in detail, we have considered carefully whether the most constrained UK airports might be able to cope with the extra capacity associated with an increase in demand for flights. Our assessment is that this increased demand could be met within the UK's current airport infrastructure, but airlines may need to invest in new, larger planes in the next 3 to 5 years.

As well as examining the economic impact of APD, in line with our approach of applying the framework set out by the TSC we also consider the issue of fairness of APD as a tax. We find that APD is a regressive tax and impacts disproportionately on poorer households. While there is an argument that APD is progressive in the sense that it taxes those that can afford foreign travel, this overlooks the sacrifices that many households make in order to save for an overseas holiday. While £52 in APD charges to take a family of four on a short-haul holiday in Europe may not appear expensive, £52 represents 28 percent of one week's income for the poorest household groups.

We group the remainder of the tax principles raised by the TSC as procedural principles. These relate to issues such as stability, coherence, practicality and coherence. We also consider the role of APD in emissions abatement. Our assessment is that generally, APD is a relatively easy tax to operate and collect and performs well against these criteria. There is a looming compliance issue in the form of multi-ticketing. Our analysis suggests that as APD rises people flying from the UK may choose to multi-ticket to cut their APD bill. By splitting a journey into two legs – the first from a UK airport to a short distance non-UK hub, and then the second from the hub to the final destination – and purchasing two tickets and transferring physically through the hub, rather than staying on the plane, it is possible to avoid paying APD on the second leg of the flight. This

behaviour carries risks if connections are missed, but is nonetheless an increasing phenomenon in airline travel. If APD rates continue to rise there is potential for multi-ticketing to increase and threaten the tax base.

We also consider the role of APD in emissions abatement. Overall we find its effects on the environment to be secondary and that there are better targeted tools available to reduce airline emissions at much lower cost to the industry and consumers.

# Background and approach

## Background to UK APD

Air Passenger Duty (APD) was first introduced in 1994 as a flat charge of £5 or £10 per passenger depending on class of seat purchased. Since then, the structure of the tax has been reformed and the rates have increased. APD is currently between £13 and £184 per passenger.

To evaluate the competitiveness of the UK's air passenger taxes, we have benchmarked the tax rates paid by carriers operating from UK airports against their European and international competitors using data collated by the IATA charges monitor which captures all global airline taxes. At a regional level, we found that the majority of EU nations apply no air passenger taxes at all. For those that do apply, the UK has the highest rate in the EU for all four types of route analysed (see Figure 1 below).

Figure 1: Benchmarking of air passenger taxes (GBP per passenger)<sup>4</sup>

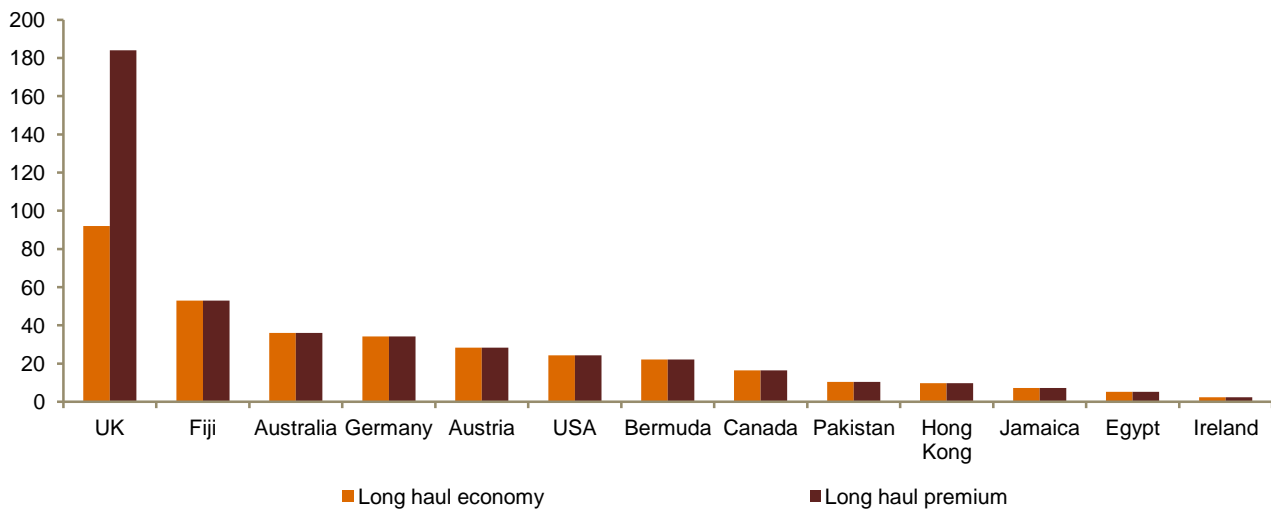


Source: IATA Charges Monitor, PwC analysis

<sup>4</sup> Note: EU countries not shown in the chart do not have a comparable air passenger tax (i.e. a tax that is charged on a per passenger basis) as at October 2012. (1) France also has an airport tax (in addition to their airport passenger charges) which varies by airport. As this is an airport related charge and not a national tax, this has been excluded in this analysis. (2) Greece's tax is also classified as an airport tax (separate to passenger service charge) and is applied at most Greek airports. (3) Italy's air passenger tax is applied to both arriving and departing passengers and has been doubled for the purposes of comparison. \* Min and max applies to the longer haul tax bands (i.e. Bands B, C and D for UK, Anlage 2 zum LuftVStG and all other countries for Germany and Medium-Range and Long-Range for Austria). Other countries do not have this additional breakdown in their passenger tax structure. Source: IATA Charges Monitor – current as at September 2012, Oanda exchange rates (based on average for January – September 2012)

We have also benchmarked the long-haul passenger taxes applied in the UK to other countries around the world and based on the same data source as used in Figure 1, the UK applies the highest air passenger tax on these types of route globally (see Figure 2 below).

Figure 2: Benchmarking of air passenger taxes (GBP per passenger) on long-haul routes<sup>5</sup>



Source: IATA Charges Monitor – current as at September 2012, Loanda exchange rates (based on average for January – September 2012, PwC analysis)

As rates have risen, APD has increasingly become a source of contention. Airline operators argue that APD damages their competitiveness by limiting their ability to expand passenger routes both within and to and from the UK, and holds back growth in the tourism sector and, more generally, the UK economy. APD has been blamed by some airline operators for the closure of a number of cross-border routes from the UK in recent years.<sup>6</sup> Conversely, the Government sees APD as an important revenue-raising tool that replaces VAT in the airline sector. The Government reaffirmed this view in its 2011 Consultation into APD<sup>7</sup>.

There is relatively little existing economic evidence to support the arguments made by the two sides. For instance, the Government did not undertake an economic impact assessment into how APD affects the economy as part of the 2011 Consultation, and detailed costings of route closures have not been published by airlines. After extensive review, we found only two studies that have looked at the economic impact of APD,<sup>8</sup> neither of which used a dynamic modelling approach to examine the impacts. In 2011, Frontier Economics estimated the impact of each of the Government's proposed changes to APD as outlined in the Consultation, in terms of passenger volumes, employment, GDP and CO<sub>2</sub> emissions using elasticity and basic multiplier assumptions. In 2009, Oxera used input-output tables to simulate the impact of a large number of possible future scenarios for APD on passenger demand, fares, output and tax receipts. These approaches used static modelling structures to identify a relatively narrow definition of the "gross" economic impact of APD.

<sup>5</sup> Note: In South Korea, charges on international departing passengers are only levied at Seoul Incheon Airport, Honduras charges are 12% on an economy fare and 18% on a business/first fare, these figures are based on the one way average fare by cabin class departing from Honduras for 2011. US charges are doubled as taxes are levied on both arriving and departing passengers whereas other taxes are only on departure. Includes per passenger taxes similar to APD for international long-haul flights.

<sup>6</sup> For example; Virgin Atlantic's closure of the London-Nairobi route in 2012 (Available at: <http://www.reuters.com/article/2012/05/16/ozabs-virgin-atlantic-kenya-idAFJ0E84Fo8A20120516>); British Airway's closure of several London-Caribbean routes in 2011 (available at: [http://www.thesundaytimes.co.uk/sto/travel/Your\\_Travel/Travel\\_News/article777400.ece](http://www.thesundaytimes.co.uk/sto/travel/Your_Travel/Travel_News/article777400.ece)) and Ryanair axing four European routes from Liverpool in 2012 (available at: <http://www.airportwatch.org.uk/?p=1664>).

<sup>7</sup> "Reform of Air Passenger Duty: Response to Consultation", HM Treasury (December 2011).

<sup>8</sup> "What is the contribution of aviation to the UK economy?", Oxera, November 2009 and "The impacts of proposed changes in Air Passenger Duty", Frontier Economics, May 2011.



This study seeks to extend the past approaches, using a dynamic modelling approach to take account of the wider impact of the abolition of APD on the UK economy, through factors such as the effect on trade links, infrastructure investment and contribution to the overall tax take. In order to present a full view of the economic impact of APD abolition, the “gross” effect must be compared to the costs of using the airline sector for households and businesses, any potential tax loss and associated environmental damage.

## *Our approach*

In this report PwC has taken a two-step approach in estimating the economic impact of APD:

1. **Set a clear framework for assessment.** We assess APD against the six core principles of tax policy laid out by the TSC in March 2011<sup>9</sup> and an additional environmental principle. We categorise these principles into two economic principles and five procedural principles (see Table 1 below for an explanation of each of the TSC’s principles).
2. **Choose which analytical tools are most appropriate to use for each principle.** As described in Table 1, the most appropriate tools differ for each principle.

The environmental principle is not included in Table 1 as it covers the TSC principles only. To assess the environmental consequences we survey a range of published studies in this area.

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<sup>9</sup> Treasury Committee, Eighth Report of Session 2010-12, Principles of Tax Policy, HC 753.

Table 1: Explanation of assessment approach against each core Treasury tax principle

Core treasury* tax principle	What does this mean?	What tools do we use to assess APD against each principle?
<b>Economic principles</b>		
Supporting growth and encouraging competition	<p>The TSC splits this principle into two-parts:</p> <ol style="list-style-type: none"> <li>1 A tax should be internationally competitive</li> <li>2 Distortions resulting from a tax should be minimised</li> </ol>	<p>Correspondingly, our analysis has two distinct components:</p> <ol style="list-style-type: none"> <li>1 We conduct a detailed comparison of air passenger taxes globally on different types of route and fare class to examine the effect on international competitiveness of APD.</li> <li>2 We conduct an economic literature review into how taxation in general influences economic performance and relate these findings to APD. We then simulate an abolition of APD using a large-scale dynamic model of the UK economy designed to capture the key features of the UK economy and the aviation and tourism sectors.</li> </ol>
Basic fairness	There is no consensus agreement as to what constitutes fairness but a tax system without it will not have legitimacy.	We use a mix of quantitative and qualitative analysis to assess the impact of APD on households with different incomes.
<b>Procedural principles</b>		
Stability	Unexpected changes to tax policy are harmful to business. The tax base should be stable over time.	We use a mix of quantitative and qualitative analysis to assess APD against each of these procedural principles
Certainty	Tax should have legal certainty, simplicity and be properly targeted.	
Practicality	Compliance and administration burdens should be minimised.	
Coherence	New provisions should complement the existing tax system, not conflict with it.	

Source: Adapted from Treasury Committee, Eighth Report of Session 2010-12, Principles of Tax Policy, HC 753.

In the next section, we present our main findings from our analysis into the extent to which APD meets these principles of the tax system. We start by examining how far APD supports growth in the economy.

# Supporting growth and encouraging competition

## *The role of competitiveness and economic efficiency*

Given the globalised nature of the market for capital and labour, the TSC concluded that; “a tax system which is not competitive by international standards will not support growth”.<sup>10</sup>

The data presented in Figure 1 and Figure 2 suggests the UK levies the highest air passenger taxes in the world. If taxes are disproportionately high by international standards this can affect competitiveness and hence the level of GDP. Economic growth is not the only priority for tax policy makers, who may want to use the tax system to fulfil other objectives, for example, to disincentivise certain types of behaviour or redistribute income and wealth. These alternative objectives are considered in later sections of this report.

Competitiveness can be viewed from two perspectives:

- 1) Intra-airline competitiveness: APD is driven by airport usage and applies to both UK and non-UK airlines operating out of UK airports. The routes that different airlines offer will affect their overall competitiveness i.e. a non-UK airline will benefit from cost savings in its wider network where APD is not charged.
- 2) Whole of UK competitiveness: APD can affect the viability of airline routes and hence the extent of connections that between businesses both within the UK and between the UK and globally.

In this section we explore the relationships between APD, the airline sector and UK competitiveness. A key factor that augments competitiveness is the economic efficiency of APD as a tax i.e. how does the design of APD and the rate set affects the level of GDP? This concept of tax efficiency is well established in both Government and academic circles and is found to be a key driver of our modelling results.

## *The relationship between the airline industry and productivity*

There is a range of evidence produced by the airline industry authorities and academics which suggests that as business connectivity and trade routes expand; productivity and hence GDP increase.<sup>11</sup> A key finding emerging from these studies is the strong linkage that has been observed over the last 20 years between airline industry growth and GDP growth.

In the context of the airline sector, if the cost of purchasing an airline ticket falls in response to an APD cut, companies could accommodate more trips to visit customers and gain access to larger marketplaces.<sup>12</sup> Furthermore, a cut in APD might be expected to make more international routes from the UK viable, boosting connectivity and facilitating increased overseas trade. Higher business air usage can also improve the efficiency of existing production and supplier relationships and facilitate cross-border investment, again leading to more productive business outcomes.

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<sup>10</sup> Page 14, “Principles of Tax Policy”, Treasury Committee, Eighth Report of Session 2010-12, Principles of Tax Policy, HC 753.

<sup>11</sup> Three separate elements of how improved transport sector connectivity boosts productivity through its impact on business are set out in: “Transport infrastructure and regional economic growth: evidence from China”, *Transportation vol.38*, pp.737-752, Hong, Chu and Wang (June, 2011). A similar framework can also be found in; “Transportation and Economic Development”, Button and Reggiani, 2011. The impact of business travel on innovation levels is discussed in “International Business Travel: An Engine of Innovation?” Keller and Hovhannisyan (August, 2012).

<sup>12</sup> We would not expect a reduction in ticket costs to translate directly into an increase in demand as cost is not the only driver of the decision to fly, factors such as timing, business opportunities, communications networks and carbon footprints will also be important. This factor is reflected in later modelling.

Several studies have quantified the scale of this productivity gain.<sup>13</sup> They show that a 10 percent increase in business air usage, or air travel connectivity, leads to an increase in whole economy productivity of between 0.07 percent and 0.9 percent.<sup>14</sup> A key result comes from a 2006 Oxford Economics study that highlights the statistical linkage between business air usage and the level of GDP – in technical terms the study found that business air usage and Total Factor Productivity are cointegrating relationships. This is a relatively basic, but robust economic test. Their statistical analysis implies “*that, other things equal, a 10% increase in business air usage could raise GDP by 0.6% in the long run*”.<sup>15</sup>

The Oxford Economics approach is a top-down macro analysis that captures the wider benefits of aviation usage. A joint study by IATA/InterVISTAS (2010) looks at the issue from a bottom up perspective and focuses on the **separate** issue of “connectivity”. The term connectivity refers to an index of connections that a country has to the global air transport network.

The hypothesis behind the study is that “*greater connections to the global air transport network can boost the productivity and growth of economies by providing better access to markets, enhancing links within and between businesses and providing greater access to resources and to international capital markets*”. Their report finds that “*there is a statistically significant and positive link between connectivity and productivity. A 10% increase in connectivity, relative to GDP, can increase long-term productivity levels by 0.07%*”. The results from this study are less clear cut than those in the Oxford Economics study. The same style of cointegration test was applied but it was not possible to determine whether air transport caused growth in productivity or productivity caused growth in air transport.<sup>16</sup> Whereas in the Oxford Economics study suggests that growth in business passengers causes growth in GDP.

The range of studies reviewed all point to a link between whole economy productivity and airline sector output. Given the importance of this linkage it is incorporated directly into our economic modelling later in this section.

## *The economic efficiency of APD as a tax*

The TSC noted that taxation in general is “*likely to reduce economic efficiency by distorting price signals*”.<sup>17</sup> In economic theory, this is represented by the concept of a “deadweight loss” to society: an unrecoverable loss in

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<sup>13</sup> Sources include:

“The economic contribution of the Aviation Industry in the UK”, Oxford Economics (2006),

“Airline Network Benefits: measuring the additional benefits generated by airline networks for economic development”, IATA (2006) and Economic Impacts of Aviation: Catalytic Impacts, IATA/InterVISTAS (2010).

Tam, R. and Hansman, R.J. (2002) “Impact of air transportation on regional economic and social connectivity in the United States” International Center for Air Transportation Department of Aeronautics and Astronautics Massachusetts Institute of Technology Cambridge, Massachusetts, USA.  
[http://dspace.mit.edu/bitstream/handle/1721.1/35884/atiao\\_tamhansman.pdf](http://dspace.mit.edu/bitstream/handle/1721.1/35884/atiao_tamhansman.pdf)

Smyth, A. Christodoulou, G. Dennis, N. AL-Azzawi, M. Campbell, J. (2012) “*Is air transport a necessity for social inclusion and economic development?*”, Journal of Air Transport Management, Volume 22, July 2012, Pages 53-5

<sup>14</sup> The exact definition of this relationship differs slightly across the study specifications. For example, the Oxford Economics (2006) study estimates a relationship between business air usage and total factor productivity. Alternatively, IATA (2006) estimate a relationship between a proxy for connectivity (the number of flights from a given airport weighted by the importance of each of the destinations served) and GDP. However, each study has in common the finding of a significant relationship between expansion in airline activity and GDP – driven by an increase in productivity.

<sup>15</sup> In this study Oxford Economics also note that from a separate data source the following trend is also apparent: “The long-run relationship identified in that modelling implies that a 10% increase in output of air services would lift productivity and potential output by 0.56% in the long run – in line with our estimates for the UK. In terms of historical performance, the results imply that the rapid growth in air transport usage over the last decade has boosted long-run underlying productivity (i.e. TFP) by 2.0% across the EU25.”

<sup>16</sup> As the authors note, this finding is unsurprising as when the economy grows there will be improvements in air transport connectivity and seemingly vice versa.

<sup>17</sup> Page 11, “Principles of Tax Policy”, Treasury Committee, Eighth Report of Session 2010-12, Principles of Tax Policy, HC 753.

consumer and producer welfare that results from an application of a tax on a product.<sup>18</sup> However, some taxes are more distortive than others in terms of their effect on the level of GDP.

Two key causal factors in determining the economic efficiency are the level and type of taxation paid by the airlines. Auerbach and Hines (2002)<sup>19</sup> show that when the **level of taxation** is already high, additional increments in the level cause more economic distortion than when levels are low. A high level of taxation can also discourage companies from locating in a country.<sup>20</sup> As described above, APD is the highest tax in the world of its type.

In terms of the **type of taxation**, Diamond and Mirrlees (1971) illustrate that taxes on business are a particularly distortive type of tax as they affect both the production and the consumption decision.<sup>21</sup> Taxes on business inputs change the relative price of production components, which may lead to less usage of one of those components.<sup>22</sup> If their input prices change, firms might adjust their behaviour by using less or none of the taxed input. As inputs are not used in their most productive way (they are either re-allocated to other less productive firms or not used at all), productivity falls, which then feeds through into lower levels of output. The OECD, and wider academic evidence tends to concur with this result either directly or indirectly in that that taxes on businesses inputs (in this instance, APD paid by businesses) are amongst the most distortive types of tax and therefore, disproportionately damaging with respect to the level of GDP compared to other taxes.<sup>23</sup> We estimate that APD cost businesses located in the UK around £500m<sup>24</sup> in 2011/12. While APD is not the only driver of a business' decision to purchase a flight, the size of this figure suggests that the abolition of APD could have a significant impact on the economy through stimulating business travel and hence activity.

To examine the economic efficiency and productivity effects of APD we use a dynamic model of the UK economy. Details and analytical results from the model are provided below.

## *Simulating an abolition of APD using a large-scale dynamic model*

We have constructed a dynamic economic model, known formally as a Computable General Equilibrium (CGE) model, which captures the key features of the UK economy and the aviation and tourism sectors. It is a scenario based model and can be used to project the impact of the abolition of APD on key economic and fiscal variables over a 30 year time horizon. Given the inherent uncertainties with such long-term projections we place more emphasis on the model's results projected to the year 2020.

Two key features of our modelling approach are that it is dynamic and that it measures the “net” effect on key economic and fiscal variables. This differs from previous studies which focussed on static approaches that measured the gross effects (described in the previous section). Our approach also takes account of feedback mechanisms and dynamic linkages in the economy that may have the effect of counteracting or augmenting the gross effects from the abolition of APD. The IMF, World Bank, OECD and several national governments (including the UK) use similar models to quantify the impact of policy changes.

<sup>18</sup> See our main report for a fuller description – findings based on Varian (2010), *Microeconomic Analysis*,

<sup>19</sup> Auerbach, A. and Hines, J (2002) “*Taxation and Economic Efficiency*”, *Handbook of Public Economics*, Volume 3, Chapter 21 pages 1347 to 1421. Edited by A. Auerbach and M. Feldstien, Elsevier.

<sup>20</sup> For example, De Mooij, R. and Ederveen, S. (2008) “*Corporate Tax Elasticities: A Reader's Guide to Empirical Findings*”, Oxford University Centre for Business Taxation. This study found that a 1 percent increase in a foreign investment tax measure in a domestic location reduces foreign capital by 2.9 percent.

<sup>21</sup> Diamond, P. A. and Mirrlees, J.A. (1971) “*Optimal Taxation and Public Production I: Production Efficiency*”, *The American Economic Review*, Vol. 61, No.1 (Mar 1971), pp.8-27

<sup>22</sup> ‘OECD Tax Policy Studies: Tax Policy Reform and Economic Growth’, OECD, 2010.

<sup>23</sup> Sources include: “OECD Tax Policy Studies : Tax Policy Reform and Economic Growth”, OECD, 2010; Mirlees Review (2011) *Reforming the tax system for the 21<sup>st</sup> century*; Y. Lee and R. H. Gordon (2005) *Tax structure and economic growth*, *Journal of Public Economics*, Volume 89, Issue 5, June 2005, Pages 1027-1043; R. Kneller, M. F. Bleaney, N. Gemmell (1999) *Fiscal policy and growth: evidence from OECD countries*, *Journal of Public Economics*, Volume 74, Issue 2, Pages 171-190, November 1999; J. M. Arnold, B. Brys, C. Heady, Å. Johansson, C. Schweltnus and L. Vartia (2011) *Tax Policy for Economic Recovery and Growth*, *Economic Journal*, Royal Economic Society, vol. 121(550), pages F59-F80, February 2011.

<sup>24</sup> This figure has been derived by splitting HMRC tax receipts data for HMRC by Civil Aviation Authority (CAA) data by passenger type.

Our CGE model was specifically constructed for the purpose of modelling APD – we have made several additions to a standard version of a large-scale dynamic model to reflect the underlying economic characteristics of the tourism and aviation sectors (see Figure 3, overleaf).

Figure 3: Our application of a standard PwC dynamic model for analysing APD



The model was specifically designed to enable us to examine the impact of the abolition of APD on the UK economy, using credible assumptions in order to present a balanced view. Scenarios we considered were defined by: (i) the chosen policy option for APD and (ii) other variables included in the model that would be affected by a cut in APD. For the purposes of this report we consider a scenario where APD is abolished in Budget 2013.

In addition, we add to our scenario a **positive productivity gain associated with an increase in business air usage. Based on the evidence of a causal relationship for the impact of aviation expansion on productivity we make an explicit link in our modelling to account for this relationship.** Given the range of quantitative estimates we were able to obtain we have chosen a reasonably conservative point estimate. The assumption we impose on the model is that a 10 percent increase in business air usage would lead to an increase in whole economy productivity of 0.2 percent.<sup>25</sup>

### *What is the impact on GDP from a reduction in APD?*

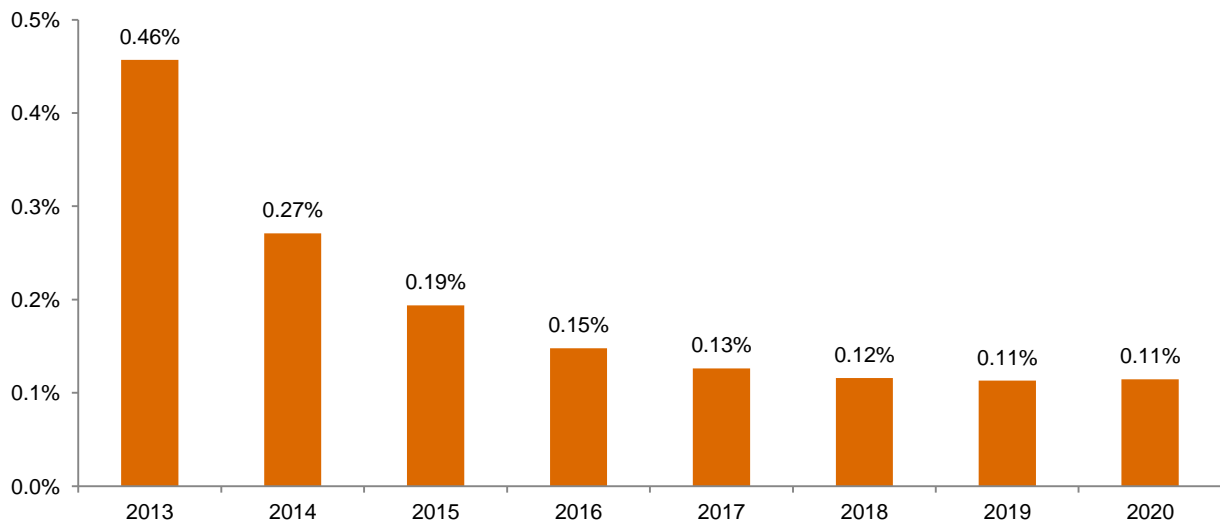
In our scenario we model the complete abolition of APD and examine its direct and indirect economic consequences. Our analysis found that this could have a positive impact on the level of UK GDP, compared to a baseline case of no policy change (see Figure 4, below). In 2013, the policy could produce a positive stimulus to the economy of just under 0.5 percent of GDP. Over time, this effect would be expected to dissipate but the economy would still experience a small but positive longer-term gain of around 0.1 percent on the level of GDP. The results show an average gain to the economy of 0.3 percent between 2013 and 2015. The difficulty in predicting the precise trajectory of GDP in the early years of the models is that it is dependent on the pace at which both airlines and non-airline sector business are willing to invest. Nonetheless, we might expect the economic response to be front loaded as any cut in APD would most likely pass through to airline ticket prices relatively quickly.

All gains to the economy are shown to be permanent in the model. In the 7 years to 2020 the output of the economy could be around 1.5 percent bigger than it otherwise would have been without the abolition of APD.

<sup>25</sup> This choice is governed by the range of quantitative estimates discussed above. The lower end of the range is the IATA/Intervistas study which deals explicitly with connectivity and concludes that “a 10% increase in connectivity, relative to GDP, can increase long-term productivity levels by 0.07%” and at the upper end a separate IATA study carries a similar coefficient equal to 0.9%.



Figure 4: Impact on level of real GDP from the abolition of APD (percent change from the base case)



Note: The GDP impact of 0.15 percent in 2016 should be interpreted as: the level of real GDP in the economy will be 0.15 percent higher with an abolition of APD compared to the base case of no abolition.

Source: PwC Analysis

## What drives this result?

The initial stimulus that occurs in the first full year of the policy's implementation is driven by:

- An increase in industry investment in the aviation sector, which could comprise re-routing, the fast-tracking of aircraft upgrades and purchases, airline marketing spend or infrastructural improvements.
- A behavioural reaction, as UK and non-UK consumers purchase more flight tickets due to their lower relative price for both business and leisure purposes. This effect is accentuated by the current high-level of APD compared with international air travel taxes. As a result, there is a net tourism inflow and a net tourism expenditure (and hence, net exports) increase.
- A small UK-wide productivity gain associated with business air usage. However, this effect is felt more strongly in later years as it takes time for businesses to build new international relationships. Any short-term gain is likely to materialise through more effective delivery of planned work or securing new short-term contracts.

Over the longer-term, the economy will experience a **small but permanent GDP gain**. This is characterised by:

- Firms having time to develop stronger international business relationships and raise productivity to meet increased demand. Household consumption and exports are modelled to increase through this period. Our results show modest increases in output across the majority of business sectors in our model. There would be increased job creation as well through this period and this would have positive second round effects on both consumption and investment as the additional employees spend their salaries. Estimates from the model suggest that that almost 60,000 jobs could be created between now and 2020.
- Investment by airlines is front-loaded, displacing a proportion of investment that might have occurred in later years.
- The volume of net foreign inbound tourism passengers is 7 percent higher by 2020 compared to the baseline where APD continues to rise in line with current announced plans. This 7 percent figure can be broken down into inbound and outbound tourists. Notably, inbound household and business passenger travel are modelled which increase by 11 percent and 10 percent respectively.

- A negative effect from the expenditure patterns of foreign and UK consumers limits the growth benefits over this period. This is a complex outcome. Over time, as UK consumers become wealthier, they demand more foreign holidays, for which they substitute away from domestic goods and services. This outflow is partially offset by expenditure from foreign inbound tourists, as described above. However, the positive effects of increased foreign tourism spending have weaker linkages with the rest of the economy. Foreign tourists tend to purchase a more limited range of lower value-added goods and services than domestic consumers. The net effect is a reduction in domestic production and consumption.

Overall, the economy benefits as the development of business linkages, the investment by the airlines sector and the volume of foreign tourism increases outlined above are modelled to outweigh the negative effect from a lower domestic expenditure multiplier.

Another key driver of the results is the level and type of taxation as described in the section above. Table 2 shows that the pre-existing tax burden on the airline sector is higher than perhaps previously understood, particularly with respect to the wider economy.

Table 2 provides a computation of different Average Effective Tax Rates (AETR) for the ‘Passenger Airline Sector’ which is the sector that represents the airline industry in Government economic statistics.<sup>26</sup> This particular AETR measures only the APD paid by the airline sector as a proportion of its direct contribution to the economy. In this case the measure of economic contribution used is Gross Value Added (GVA).<sup>27</sup> Dividing APD receipts, by GVA yields the AETR, which can be seen to have risen from 36 percent in 2008 to almost 56 percent in 2011/12.

We have calculated a comparative figure for 2011/12 that takes into account **all taxes paid** for the whole economy and is computed on the basis of total tax and national insurance contributions divided by whole economy GVA. The all taxes paid calculation differs from the calculation that specifically looks at the AETR for the air passenger sector as it covers the full range of taxes in the UK economy. However, the comparative figure from the all taxes paid calculation is also almost 56 percent.

This initial high level of taxation coupled with the previously discussed finding of Diamond and Mirrlees (1971) that suggests that taxes on business inputs are particularly distortive implies that APD is at the more distortive end of the tax spectrum and that the current tax itself and any further increases would have a disproportionately negative impact on economic output.

*Table 2: Comparing air transport sector Gross Value Added, APD receipts and whole economy taxes paid*

	APD Receipts	GVA Air Passenger Sector	AETR Air Transport Sector (APD only)	AETR VAT and Fuel Duty
<b>2008/09</b>	1,862	5,159	36.1%	10.7%
<b>2009/10</b>	1,856	4,826	38.5%	10.7%
<b>2010/11</b>	2,155	4,839	44.5%	11.8%
<b>2011/12</b>	2,607	4,680	55.7%	12.8%

*Source: ONS, HMRC, HM Treasury, PwC Calculations*

<sup>26</sup> This data is sourced from the Annual Business Survey (ABS) which is published annually by the Office of National Statistics.

<sup>27</sup> GVA is a sub-component of the more commonly used measure of economic output Gross Domestic Product (GDP). GVA is chosen as it is available at the more disaggregated level of the airline sector. GDP data includes wider elements of the air transport sector that are not directly subject to APD. There are measures of the airline sector’s contribution to the economy that would produce much larger numbers, but these measure direct and indirect effects and would capture parts of the industry not directly affected by APD.



A further comparison is also undertaken that relates to VAT and fuel duty given that APD is designed as a replacement for VAT and fuel taxes for commercial flights (HM Treasury, 2011).<sup>28</sup> The AETR for VAT and fuel duty adds together receipts data for these two taxes and then divides this total figure by whole economy GVA. There are issues with this comparison in that some sectors are VAT exempt, zero rated or have reduced rates and the calculations do not take into account the fuel intensity of the airline industry. Nonetheless, a comparison of the different year's data in This initial high level of taxation coupled with the previously discussed finding of Diamond and Mirrlees (1971) that suggests that taxes on business inputs are particularly distortive implies that APD is at the more distortive end of the tax spectrum and that the current tax itself and any further increases would have a disproportionately negative impact on economic output.

Table 2 shows that the differential between the AETR for VAT and fuel duty and the AETR for the airline sector is in the range of around 25 to 40 percent between 2008/09 and 2010/11. Which implies that the rate of APD charged could be higher than if fuel duties and VAT were directly levied on the industry.

## How plausible are the modelling results?

To check the plausibility of our result, we compared the 'fiscal multiplier' generated from our analysis with those derive in internationally recognised studies of the economic impact of taxation. A fiscal multiplier measures the change in GDP associated with a change in tax revenue. In the case of APD our model suggests that in the medium-term, after the initial adjustment from the abolition of APD has stabilised, the fiscal multiplier is approximately 0.5. This means that for every £1 cut in APD, GDP increases by 50 pence.

In their IMF paper, Spilembergo *et al.* (2009) collected data based on a comprehensive survey of fiscal multipliers over the previous decade. For tax cuts they suggest an average fiscal multiplier of 0.6. If this was applied to APD then it would suggest that for every £1 cut in APD, GDP would increase by 60 pence. In effect, our estimate is 20 percent lower than this average estimate, which in part reflects the cautious assumptions we have used in our study. Since the publication of this paper another IMF paper by Blanchard and Leigh (2013)<sup>29</sup> has cast doubt on the size of these multipliers arguing that in the context of current Government fiscal consolidations fiscal multipliers are arguably larger.

While the medium-term multiplier effect can be validated through comparison studies, the short-term boost to GDP that our model finds is less easily benchmarked through the use of external estimates. Extensive sensitivity testing of the model suggests that this effect is highly likely to occur. Although the overall profile might be flatter than in our preferred scenario, we would expect to see the same amount of GDP gain in the first 5 years of the model. So the magnitude of the GDP increase would be unchanged, although its profile could vary.

A modelled 6.5 percent increase in net inbound business passenger volumes by 2020 is an important source for the economic benefits we find from the abolition of APD. From our internal analysis, we conclude that this increase would be likely to be accommodated within current capacity constraints.

## What is the impact on the public finances from our main scenario?

The HM Treasury Policy Costings document<sup>30</sup> presents the economic assumptions that underpin the Government's calculation of the impacts of policy changes on the Exchequer's receipts and expenditure over a five-year horizon. It is a 'static' approach and estimates the effect of an APD policy change on APD receipts only. The method does not fully factor in the knock-on effects that one policy change will have on other tax receipts or spending requirements. Using this approach, the immediate loss to the Exchequer from the abolition of APD would be £2.9billion in FY2012-13, rising to £3.6billion in 2020-21.

An alternative 'dynamic' policy costing takes into account more detail relating to the potential economic response. For instance, it takes account of the economic growth effects on both receipts from other taxes and benefit spending from a change in policy. It therefore represents a more comprehensive approach to the expected impact on the public finances.

<sup>28</sup> "Reform of Air Passenger Duty: Response to Consultation" HM Treasury, 2011

<sup>29</sup> Blanchard, O. and Leigh, D. (2013) "Growth Forecast Errors and Fiscal Multipliers", IMF Working Paper, January.

<sup>30</sup> HM Treasury, 'Budget 2011 Policy Costings' (2011).

Using dynamic policy costing our model results show that the abolition of APD could well be self-financing – meaning that the initial loss of revenue to the Exchequer from cutting APD could be more than regained through additional receipts from other taxes<sup>31</sup> (see Table 3, below). The analysis suggests an abolition of APD could raise a net £500m in extra tax receipts in each of the first two fiscal years, falling to £100 million by 2017-18.

*Table 3: Impact of abolition of APD on the Governments net fiscal position – tax and benefit payments (£ billions, 2010 prices)*

	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21
<b>Static Costing</b>	-2.90	-2.98	-3.06	-3.15	-3.23	-3.32	-3.41	-3.51	-3.60
<b>Dynamic Costing</b>	0.48	0.51	0.31	0.23	0.14	0.10	0.07	0.05	0.04

*Source: PwC analysis*

This positive net benefit for the Exchequer in our modelling arises from:

- **Higher tax receipts from indirect taxes.** The increased consumption and production associated with the abolition of APD raises VAT and other indirect tax receipts.
- **Higher tax receipts from corporations.** As business costs fall, domestic business activity expands and more firms set up in the UK, increasing corporation tax receipts.
- **Higher tax receipts from individuals.** Expanding business activity boosts employment, so direct income tax receipts increase.
- **Small increases in benefit expenditure.** Higher employment reduces the number of benefit claimants and lowers Government welfare payments. However, the increased productivity associated with the rise in business growth leads to a slowing of wage growth meaning that workers claiming in work benefits must then be compensated. Overall, there is a small net increase in benefit spending but this is a minor offsetting effect.

### *How sensitive is our result to the assumptions made?*

The scale of the impact on the economy and the Exchequer of the abolition of APD is sensitive to the assumptions made:

- **The magnitude of the cut in APD.** Keeping all other assumptions constant, we repeated our analysis for a range of different APD cuts. The results suggest that the magnitude of the economic benefits is broadly proportionate to the scale of the cut. For instance, in the case of a 50 percent APD reduction the impact on the economy is consistent with the pattern resulting from abolition: a substantial short-term stimulus is followed by a small but positive impact over the longer-term. These economic benefits were found to be around half the size of a full abolition of APD, and an increase in other tax receipts still makes the cut self-financing for the Exchequer.
- **An assumed productivity gain from airline sector expansion.** As stated above, we have incorporated a positive productivity gain of 0.2 percent for every 10 percent increase in business air usage which as cited above is based on a prudent estimate taken from previous studies. The actual productivity effect could be smaller or larger than we have assumed. If we use a higher estimate of the productivity gain, the economic and fiscal benefits increase. We also looked at the sensitivity of our results to using the lower-end estimate suggested one previous study of a 0.07 percent rise in the level of GDP associated with an increase in route connectivity. **In this circumstance the abolition of APD would average out to be fiscally neutral for the Government over the next 5 years, but would not be positive in terms of Exchequer receipts in all years.** However, in both circumstances, the assumed productivity gain

<sup>31</sup> The model also suggests a small increase in benefit payments as while unemployment benefits fall, in work benefit payments will increase due to the changing distribution of types of people employed.

could be accompanied by other input assumptions that would positively impact on the economic outcomes associated with APD (see next bullet).

- **Other input assumptions.** Credible adjustments could be made to other input assumptions, such as the responsiveness of labour and tourism markets. We have examined the sensitivity of our results to such changes as follows:
  - i. *The level of the labour supply elasticity:* in the economic model we increase the responsiveness of workers to wage changes in the labour market. This assumption is made to relate the model more closely to the current situation in the UK labour market. Unemployment is at a relative high in the UK and household incomes amongst certain groups are falling and there is substantial spare capacity in the economy. On this basis we would expect any job vacancies that are created through the expansion in GDP associated with the abolition of APD would be filled more rapidly than in a situation where there is high employment.<sup>32</sup> On balance we would expect this to be an appropriate adjustment as the take up of new employment vacancies offered in response to any rise in the level of GDP will likely be higher than if the economy was operating at full capacity.
  - ii. *The level of tourism demand elasticity:* the degree of responsiveness of both UK and foreign tourists to price changes in airline tickets is often discussed in the context of APD. Should the price of a flight fall in response to a cut in APD then we would expect the demand for plane tickets to rise. The elasticity estimates used in the modelling are estimated on historic data and do not fully embody large changes in tourism taxation. On this basis there is a distinct possibility that these elasticities are underestimates and so we increase their values by 10 percent in the sensitivity test.
  - iii. *The presence of a foreign tourism shock:* for reasons of caution, the model scenario is designed purposefully not to capture the UK market gaining a substantial share of the global tourism market following the abolition of APD. It also does not account for new airline routes that may become viable once APD is not paid. Such an adjustment is appropriate as a sensitivity test.

We then estimate the impact of each adjustment compared to the level of GDP recorded in our main scenario. Our results are presented in Table 4, below, as the percentage difference in the level of GDP in 2013 and 2020 from our main scenario.

Table 4: Percentage difference in level of GDP from main scenario

Assumption	Main Scenario assumption	New assumption	Impact on GDP in 2013	Impact on GDP in 2020
Labour supply elasticity	0.5	1.0	+0.04%	+0.11%
Tourism demand elasticities	Minor adjustments were made to elasticities in a range of tourism markets (inbound, outbound, business etc)		+0.01%	+0.01%
Foreign demand shock	None assumed	+10% increase in foreign tourists	+0.06%	+0.01%

Source: PwC analysis

Overall the changes to tourism demand elasticities and foreign tourism demand, do not have major implications for the results presented in this analysis. The labour supply effect is much stronger. Given that these assumptions are potential likely outcomes from the abolition of APD then we might expect them to occur in addition to the productivity adjustment in our main scenario.

<sup>32</sup> Additional reasons for an increase in the labour supply elasticity might be a possible response to current live Government policy measures such as the Universal credit or the ambition to reach a £10,000 personal income tax allowance. On a particularly technical point the CGE model is operating with a 'micro' elasticity rather than the larger macro elasticity more normally associated with models of this scale. Rogerson (2010) provides a useful overview of the issues relating to macro and micro elasticities.

We also test a set of small upward adjustments to tourism demand elasticities across all market segments, given evidence suggesting that the underlying decision to travel by air may be more sensitive to changes in price than recorded in our model. This has a negligible effect on the level of GDP recorded in our main scenario. This is predominantly because the benefits from a higher inflow of foreign tourists are offset by a higher outflow of domestic consumers – the latter of whom are typically associated with a higher impact on UK GDP.

Table 4 also shows the results of a further sensitivity test. In this test a one-off positive foreign tourism demand shock is modelled to approximate the effect of UK airlines being able to reposition themselves structurally to capture a larger share of the global travel market following a disproportionate drop in their cost bases relative to those of their competitors. This has a larger positive impact on our central scenario than increasing the tourism demand elasticity as the inflow of foreign tourists produces an increase in domestic consumption, without being offset by a corresponding flow of tourists out of the UK.

### *How does the deadweight loss from APD compare to that associated with other types of tax?*

As we outlined earlier, economic theory demonstrates that the application of a tax on a product leads to a deadweight loss of welfare to society. There are several ways of measuring this deadweight loss. For instance, Varian (2010)<sup>33</sup> measures it as the value of output that is not sold due to the presence of the tax. We use the change in GDP to measure the deadweight loss associated with different taxes in our model as we consider it better reflects the net impact of a tax – incorporating the offsetting effects and feedback mechanisms that work to augment or reduce the gross impact recorded in a measure such as output.

We have used our standard CGE model<sup>34</sup> to investigate the impact on UK economic growth of cuts in different tax types in order to make comparisons of their relative economic efficiency. Table 5 below computes fiscal multipliers for a range of tax types.

*Table 5: Results from a CGE model simulation: How much extra GDP results from a £1 tax cut (median value over 30-year time horizon)*

VAT	Income Tax	NICs	CT	APD	Fuel Duty
£0.15	£0.25	£0.28	£0.55	£0.59	£0.63

Source: PwC analysis

There is a significant difference between two main groups of taxes:<sup>35</sup>

- i. **More efficient tax types** (including Income Tax, VAT and NICs) are less distortive and tend to be levied on consumers and employees. They boost growth by only between £0.15 and £0.28 when they are cut by £1; and,
- ii. **Less efficient tax types** (including Corporation Tax, APD and Fuel Duty) which are at the more distortive end of the spectrum and affect business costs and profitability. They boost growth by between £0.55 and £0.63 when they are cut by £1.

This result is broadly consistent with the findings from other major studies in this area. In particular, our ranking is consistent with the findings from the OECD study, ‘Tax and Economic Growth’, which concludes that the distortions associated with company taxes provide the basis for revenue-neutral (i.e. policies that do not affect the total amount of tax revenue) growth-orientated tax reform that would shift the tax revenue base away from more distortive taxes towards less distortive taxes.

<sup>33</sup> “Intermediate Microeconomics: A Modern Approach”, 8<sup>th</sup> Edition, Hal. R. Varian (2010).

<sup>34</sup> Our ‘standard CGE model’ has not been explicitly adjusted to account for the airline or the tourism sector. This particular estimation is designed to capture the impact of APD in its basic form in a manner of directly equivalent modelling for the other tax heads shown.

<sup>35</sup> Our analysis shows that at the margin all tax cuts will raise the level of GDP. However, there will be a point where corresponding spending cuts will become so substantive that tax cuts could potentially harm the economy if key public services can no longer be provided (e.g. Roads, Schools and Hospitals). However, given the scale of the tax cuts discussed here, this point is less relevant.

The conclusions this far is that APD is a relatively distortive tax and its abolition would most likely lead to a net revenue gain for the Government through to 2020. It is difficult to predict what might happen beyond this time frame, but it is likely that structural change in the airline sector could result in an increase in services in the airline sector, with further benefits.

# Wider tax policy principles

## Section Overview

The economic consequences of a tax are just one component for consideration in tax design. The ease of making tax payments and collecting receipts are also of fundamental importance when considering what constitutes a ‘good’ tax. Similarly, issues of fairness, stability and transparency are frequently cited in the policy debate. We discuss our findings into on the extent to which APD meets these principles, starting with fairness.

## Basic fairness

Fairness in the tax system is important as ‘*increased levels of avoidance and evasion*’ or even a ‘*loss of legitimacy*’ is increasingly likely without it.<sup>36</sup> Whilst there is a range of different interpretations and political opinions regarding what basic fairness constitutes in the tax system, the extent of progressivity is one measureable feature of a tax that can be evaluated. The extent of progressivity of APD is influenced by:

- The effective tax rate at different levels of the household income distribution; and
- The propensity to consume international air travel.

We find that low-income households are disproportionately affected by the regressive nature of APD. It costs more in taxes to fly a family of four on holiday originating from the UK than from any other European country (see Table 6, below).

Table 6: Comparative aviation tax rates for a family of four in economy-class seating (GBP)

Origin	To Europe	To USA	To Australia
From UK	52	260	368
From Germany	24	137	137
From Austria	26	114	114
From Ireland	10	10	10
From France	17	37	37
From Italy	15	15	15
From Greece	39	72	72
From Sweden	4	4	4
From Belgium	1	1	1

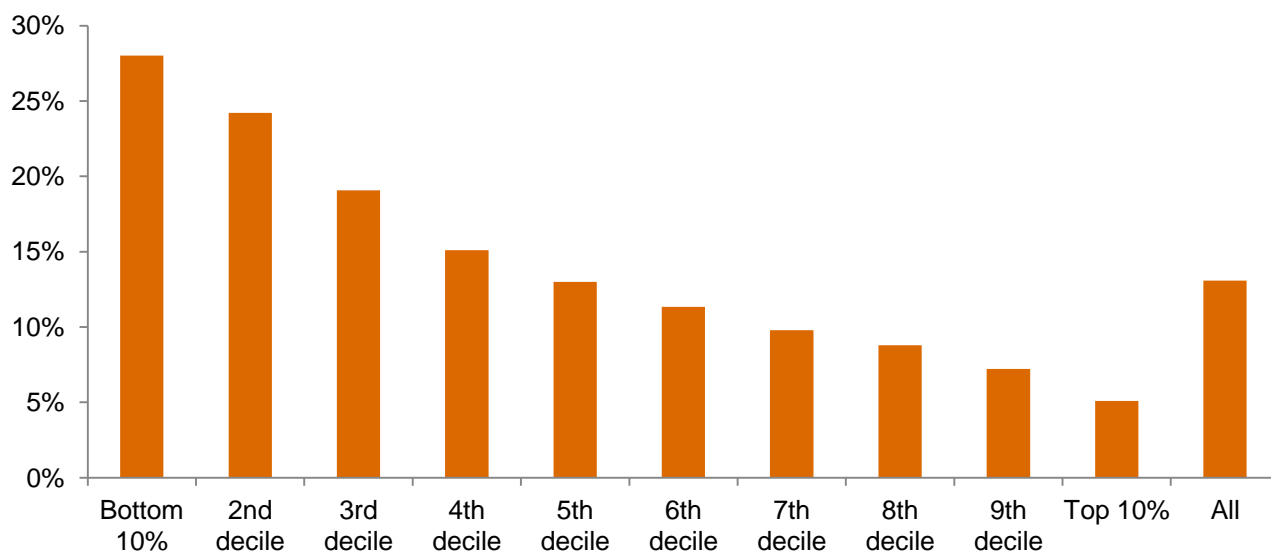
Source: IATA Charges Monitor – current as at September 2012, Oanda exchange rates (based on average for January – September 2012).

It is possible that APD payments could have a substantial impact on household consumption. For example, if a family of four from the lowest household income decile decided to make an overseas trip to a European destination on an economy class flight, then the APD payment would account for 28 percent of one week’s

<sup>36</sup> Page 10, ‘Principles of Tax Policy’, Treasury Committee, Eighth Report of Session 2010-12, Principles of Tax Policy, HC 753.

household expenditure,<sup>37</sup> compared to 5 percent of one week's household expenditure for the top decile (as displayed in Figure 5, below). This can make it difficult for such low-income households to afford foreign travel.

*Figure 5: Annual APD payments as a proportion of weekly household income (assuming a family of 2 adults and 2 children on a short-haul economy flight)*



*Source: ONS Family Expenditure Survey 2010, PwC analysis*

Whilst those in higher-income brackets tend to consume foreign air travel more frequently, APD was also paid on 34.6 million leisure trips in 2010 (45 percent of the total) where the passengers had below-average household income.<sup>38</sup> Social objectives relating to households taking overseas trips should not be discounted. Foreign holidays or being able to take overseas trips to visit friends and relatives are a contributor to general well-being, and have been found to have specific benefits for low-income families.<sup>39</sup> The recently national well-being index also cites the importance of holidays in generating well-being and improved quality of life.<sup>40</sup>

<sup>37</sup> Based on a family of four. For purposes of this assessment we used averaged pre tax household income of approximately £33,000.

<sup>38</sup> Based on PwC analysis of CAA survey data. CAA uses passenger data from 12 UK airports.

<sup>39</sup> "Briefing Paper for Policymakers: Evaluating Stated Needs for Support for Holidays", Christel De Haan Tourism and Travel Research Institute, the University of Nottingham.

<sup>40</sup> "Measuring National Well-being - What we do", Office for National Statistics (2012).



## Procedural principles

We also assessed APD against the procedural aspects of the tax system; stability, certainty, practicality and coherence. We present a summary of our analysis for each principle in Table 7, below.

Table 7: Assessment of APD against procedural tax principles

Economic objective of taxation	Positive aspects of APD	Negative aspects of APD
<b>Stability</b>	<ul style="list-style-type: none"> <li>APD revenue forecast to be a stable 0.2 percent of GDP over long-term horizon.</li> <li>APD accelerator with RPI has made tax changes more predictable.</li> </ul>	<ul style="list-style-type: none"> <li>APD is vulnerable to changes in political sentiment, which have resulted in large increases in the tax rate in the past.</li> <li>Undershooting passenger growth feeds directly into APD revenue base.</li> </ul>
<b>Certainty</b>	<ul style="list-style-type: none"> <li>Flat fee makes APD relatively simple to collect and administer.</li> <li>2011 Consultation ironed out uncertainties over the legal application of APD.</li> <li>Little evidence of non-compliance.</li> </ul>	<ul style="list-style-type: none"> <li>Northern Ireland exemption has cast into doubt the APD rate in other regions.</li> <li>Banding structure can make the tax rate applied on some journeys unintuitive.</li> <li>Customers may not always be aware how much APD they pay in their flight ticket.</li> <li>Increasing avoidance through multi-ticketing.</li> </ul>
<b>Practicality</b>	<ul style="list-style-type: none"> <li>Some application issues resolved in 2011 Consultation.</li> <li>Administrative costs associated with APD are relatively low.</li> </ul>	<ul style="list-style-type: none"> <li>Administrative burdens are significant when policy announcements on rate changes come into force without sufficient notice for operators to adjust.</li> </ul>
<b>Coherence</b>	<ul style="list-style-type: none"> <li>Primary role of APD is to replace VAT, which is consistent across most sovereign states.</li> </ul>	<ul style="list-style-type: none"> <li>The combination of the ETS and the secondary role of APD as an environmental tax may result in an excess tax burden on passenger tickets.</li> </ul>
<b>Environment</b>	<ul style="list-style-type: none"> <li>Discourages flying which in turn reduces CO<sub>2</sub></li> </ul>	<ul style="list-style-type: none"> <li>Not designed to be an environmental tax and environmental benefits are secondary. Does not have as strong an effect on emissions as other more targeted taxes.</li> </ul>

Source: PwC analysis



# Overall assessment

In March 2011, the TSC outlined four procedural principles (practicality, stability, certainty and coherence) and two fundamental principles (growth and fairness) that should be the benchmark for a well-designed tax. Overall, we find that APD scores relatively highly on the procedural principles of tax policy, but poorly on the fundamental principles of supporting growth and achieving basic fairness (see Table 8, below).

Table 8: PwC's assessment of APD against core tax principles

Core treasury* tax principle	PwC score for APD	Evaluation
<b>Economic principles</b>		
<b>Supporting growth and encouraging competition</b>	●	The UK has the highest rate of air passenger taxes in the world. It cost those using the UK as a place to do business £500m in 2010/11. Using our model to simulate a cut in six different UK taxes, APD was found to be in the group of more distortive taxes in the economy. Our main model scenario shows that an abolition of APD might boost growth by almost 0.5 percent in 2013 with the economy around 0.1 percent larger over the longer-term. Abolition might also increase net tourism inflows and improve productivity. It may also lead to higher receipts from other taxes, making the abolition self-financing for the Exchequer.
<b>Basic fairness</b>	●	It currently costs more in taxes to fly a family of four flying from the UK than in any other European country. APD also makes up a higher proportion of low-income households' weekly expenditure. Class and route banding improves progressivity, whilst higher income passengers have a higher propensity to travel.
<b>Procedural principles</b>		
<b>Stability</b>	●	The tax base is forecast to be stable over time, but there are other downside risks such as external demand shocks and capacity constraints that may not have been factored in.
<b>Certainty</b>	●	APD has legal clarity and is simple to collect and administer.
<b>Practicality</b>	●	Administration costs are low but there is evidence of avoidance through multi-ticketing.
<b>Coherence</b>	●	The primary role of APD to replace VAT is coherent with remainder of tax system.
<b>Environment</b>	●	Discourages flying, but better targeted taxes such as the EU ETS are shown to be more effective at reducing emissions.

*\*These are the principles used the Treasury Select Committee to assess tax policy: see Treasury Committee, Eighth Report of Session 2010-12, Principles of Tax Policy, HC 753*

Ultimately, whether any cut or abolition of APD can be justified depends on the objectives of policy makers. We also conclude that an abolition of APD would be difficult to justify on procedural and practicality grounds. It is a practical tax to collect and administer, has strong legal clarity, coherence with the rest of the tax system and has a relatively stable tax base. However, if the policymaker's main priorities are to bring about growth and improve fairness, our evidence suggests a cut or abolition of APD would achieve this, while remaining fiscally neutral.



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