

<b>Title:</b> <b>The Air Navigation Order (ANO) 2009 Changes as a result of EASA Air Operations Regulations</b>  <b>IA No:</b> CAAFO1  <b>Lead department or agency:</b> UK Civil Aviation Authority  <b>Other departments or agencies:</b>	<b>Impact Assessment (IA)</b>		
	<b>Date:</b> 10/07/2012		
	<b>Stage:</b> Final		
	<b>Source of intervention:</b> EU		
	<b>Type of measure:</b> Secondary legislation		
<b>Contact for enquiries:</b> Head Flight Operations Policy, CAA e-mail: FOP.Admin@caa.co.uk			

<b>Summary: Intervention and Options</b>	<b>RPC Opinion: Amber</b>
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Cost of Preferred (or more likely) Option			
Total Net Present Value	Business Net Present Value	Net cost to business per year (EANCB on 2009 prices)	In scope of One-In, Measure qualifies as One-Out?
0	0	0	No
			NA

**What is the problem under consideration? Why is government intervention necessary?**

The problem under consideration is the need to ensure that aviation is as safe as reasonably possible across the EU, so that UK citizens can trust that they are safe when flying on any airline in the EU. It is not reasonable to expect the general public to assess complex aviation risks outside their control, so aviation should be overseen by an organisation on behalf of the public. Only the government has the necessary authority to interact fully with the national and international bodies which regulate and oversee aviation safety, and only the government can legislate to fulfil the UK's international obligations.

**What are the policy objectives and the intended effects?**

The objective of the new harmonised European civil aviation regulations is to ensure a high and uniform level of protection of European citizens, through the adoption of common safety rules. The objective of the policy is to reconcile the existing UK legislation and the new European legislation so that compliance with the new European legislation is possible, in order that UK citizens and businesses are able to continue to undertake present activities lawfully. The intended effect of the policy is to have aviation legislation which can be complied with, is enforceable, and is clear in terms of which legislation applies to which legal entities.

**What policy options have been considered, including any alternatives to regulation? Please justify preferred option (further details in Evidence Base)**

The two options available are to amend the ANO and not to amend the ANO.

Not amending the ANO is not a valid option since it does not achieve the policy objectives. The ANO must be amended to designate the CAA as the competent authority for the purposes of the EASA Air Operations Regulations, in the same way as it is already designated as the competent authority for the EASA Airworthiness Regulations. If the CAA is not designated as the competent authority, UK air operators would not be able to meet their obligations under the EASA Air Operations Regulations to obtain approvals in order to fly, since there would be no organisation from which they could obtain these approvals.

Therefore the preferred option (and indeed only option) is to amend the ANO as described.

<b>Will the policy be reviewed?</b> It will not be reviewed. <b>If applicable, set review date:</b> Month/Year					
Does implementation go beyond minimum EU requirements?			No		
Are any of these organisations in scope? If Micros not exempted set out reason in Evidence Base.	<b>Micro</b> Yes	<b>&lt; 20</b> Yes	<b>Small</b> Yes	<b>Medium</b> Yes	<b>Large</b> Yes
What is the CO <sub>2</sub> equivalent change in greenhouse gas emissions? (Million tonnes CO <sub>2</sub> equivalent)			<b>Traded:</b> NQ	<b>Non-traded:</b> NQ	

***I have read the Impact Assessment and I am satisfied that (a) it represents a fair and reasonable view of the expected costs, benefits and impact of the policy, and (b) that the benefits justify the costs.***

Signed by the responsible Minister: \_\_\_\_\_ **Robert Goodwill** \_\_\_\_\_ Date: 04/12/2014

# Summary: Analysis & Evidence

# Policy Option 2

**Description:** Amend the ANO in order to implement mandatory EU regulations.

## FULL ECONOMIC ASSESSMENT

Price Base Year 2010	PV Base Year 2012	Time Period Years 10	Net Benefit (Present Value (PV)) (£m)		
			Low: 0	High: 0	Best Estimate: 0

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	0	0	0
High	0	0	0
Best Estimate	0	0	0

### Description and scale of key monetised costs by 'main affected groups'

None.

### Other key non-monetised costs by 'main affected groups'

None.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	0	0	0
High	0	0	0
Best Estimate	0	0	0

### Description and scale of key monetised benefits by 'main affected groups'

This option would allow flight operations to continue in the UK. This would be a major benefit to air operators, the Government, and businesses who use aircraft for the transport of goods or the travel of their staff. However, as compared to the 'do nothing' option where the EU Regulation does not exist, there is no change and therefore the benefits are zero.

### Other key non-monetised benefits by 'main affected groups'

Members of the public would continue to have access to the current range of travel options, which would be much reduced if flights were not legal.  
Members of the public also benefit from enhanced safety. If flights were not legally possible, some people could make illegal flights without any safety oversight from a competent authority, thereby putting the safety of the public at risk.

Key assumptions/sensitivities/risks	<b>Discount rate</b>	3.5
<p>It is assumed that EASA Air Operations Regulations will come into force in the second half of 2012, as specified on the EASA website.</p> <p>The biggest risk is that if the UK does not take steps to implement the EU Air Operations Regulations then most aviation within, to and from the UK will be forced to stop. It is assumed that the calculations in this Impact Assessment are as accurate as possible, given our knowledge of the data available.</p>		

## BUSINESS ASSESSMENT (Option 2)

<b>Direct impact on business (Equivalent Annual) £m:</b>			<b>In scope of OIOO?</b>	<b>Measure qualifies as</b>
Costs: 0	Benefits: 0	Net: 0	No	NA

# Evidence Base (for summary sheets)

## 1 Problem under Consideration

- 1.1 The problem under consideration is the need to ensure that aviation is as safe as reasonably possible. It is important for aviation to be safe so that members of the public (both on board aircraft and on the ground) can have trust in the aviation system without having to understand it for themselves. It is intended to apply the same aviation safety regulation across the EU, to ensure that UK citizens are as safe when they travel on other EU airlines as they are when they travel on UK airlines. It is desirable for the UK to continue to have a low aviation accident rate.
- 1.2 The frequency of the problem is difficult to determine, since over the past few decades the UK has had rigorous safety legislation in place in order to tackle the problem. There are various definitions of ‘accident’ that can be used, but focusing on commercial flights in aeroplanes and helicopters (since these are the flights which will be subject to European legislation first) the accident rates for the years 2000-2009 are as follows:

Reportable accident rate (per million flights)	10.1
Reportable accident rate (per million flying hours)	5.3
Fatal accident rate (per million flights)	0.5
Fatal accident rate (per million flying hours)	0.2

A more detailed explanation of these rates is given in Annex 1.

- 1.3 In this document the phrase ‘air operators’ refers to both commercial flights (e.g. airlines) and private pilots flying for pleasure. The phrase ‘air operations’ should be construed similarly.

## 2 Rationale for Intervention

- 2.1 Due to the complex nature of aviation and the fact that the risks are usually beyond the control of members of the public, it is not reasonable to expect the general public to be able to assess the risks of aviation fully. Therefore it is necessary for organisations to provide oversight of aviation on behalf of the public. It is necessary for the government to manage the problem because only the government has the ability to legislate to ensure that aviation is safe. In addition, only the government has the necessary authority to interact fully with the other national and international bodies which regulate and oversee aviation safety, such as the International Civil Aviation Organization (ICAO) and the European Aviation Safety Agency (EASA).
- 2.2 The government has already intervened to address the problem of ensuring aviation safety, first by introducing aviation legislation in the UK and more recently by committing the UK to abiding by European aviation safety regulation. The European Communities Act 1972 obliges the UK Government to incorporate into domestic law legislative acts of the European Community. European Community Regulations have "general application" that means they are binding on individuals and effectively form part of domestic law as soon as they are made. Regulation (EC) No. 216/2008 (‘the Basic EASA Regulation’) introduces requirements for aircraft operations. From some time in the second half of 2012 these requirements will supersede existing UK legislation.
- 2.3 The Basic EASA Regulation and the associated Essential Requirements and Implementing Rules are hereafter referred to as the ‘EASA Regulations’. The subset of them which relate to air operations are referred to as the ‘EASA Air Operations Regulations’.
- 2.4 As a member of ICAO the UK has an obligation to regulate and oversee the safety of its aviation. UK air operators are allowed to fly their aircraft into the airspace of other States only because the UK has sufficient oversight of aviation safety.

## 3 Policy Objective

- 3.1 The objective of the harmonised civil aviation European regulations is to ensure a high and uniform level of protection of European citizens, through the adoption of common safety rules and

by measures ensuring that products, persons and organisations in the EU comply with such rules. This facilitates the free movement of goods, persons and organisations within the EU. The European regulations are broadly equivalent to the existing UK regulations.

- 3.2 The objective of the policy is to reconcile the existing UK legislation and the new European legislation so that UK citizens and UK businesses are able to continue to undertake present activities lawfully. The Basic EASA Regulation establishing implementing rules for air operations introduces requirements for aircraft operations. An air operator to which the new Regulation applies must comply with that Regulation and not with the equivalent provision in the Air Navigation Order (ANO).
- 3.3 Currently, in accordance with the ANO, UK air operators have to obtain certificates and approvals from the CAA to demonstrate that they can operate safely. Under the European requirements air operators will have to obtain these certificates and approvals from their national 'competent authority'. An organisation will have to be designated as the UK competent authority for the purposes of the European Air Operations Regulations, otherwise it would be impossible for UK air operators to obtain the necessary certificates and approvals, so they would be unable to comply with the regulations, so they would be unable to fly legally.
- 3.4 Forcing UK air operators out of business in this way would put UK businesses at a competitive disadvantage relative to their EU counterparts, which is against the UK Government's principles of implementing EU laws. Furthermore, the UK would not have the necessary legal authority to check the safety of foreign air operators flying into the UK. The result of this would be either a reduction in the current level of safety, or the prohibition of most aviation in the UK. This would not be consistent with the aim of the European regulations of facilitating the free movement of goods, persons and organisations within the EU.
- 3.5 Another aspect of reconciling the UK and European legislation is the need to establish sanctions for breaches of specified provisions of the EASA Regulations so that compliance will be enforceable.
- 3.6 Finally, the ANO needs to avoid double-banking, so many existing provisions need to be amended to reflect the fact that for a significant proportion of air operations the EASA Air Operations Regulations will apply instead.

## **4 Description of Options Considered**

- 4.1 In the consultation stage Impact Assessment three options were considered. Since the second of these options was really the same as the third option but with some of the changes delayed, this would not have been in accordance with the guidance that double-banking (i.e. having UK legislation which overlaps or contradicts EU legislation) should be avoided. Since no commenter expressed a preference for this second option, the options here have been reduced to two by not considering this invalid option.
- 4.2 Option 1 is to do nothing. This assumes the EU Regulation does not exist and the regulatory framework continues unchanged.
- 4.3 The do nothing option considered originally assumed that the EASA Regulations will still come into force in the second half of 2012. In this case the CAA would not be empowered to administer the European regulations on behalf of EASA, and so the UK would not be able to fulfil its obligations as an ICAO member State. The UK would not be seen to have adequate oversight of aviation safety, so UK air operators would not be permitted to fly in the airspace of foreign States. Similarly, the UK would not have the legal competence to carry out safety checks on foreign operators flying into the UK, so almost all aviation in the UK would be curtailed. This would be in contradiction to objectives of the European regulations of facilitating the free movement of goods, persons and organisations within the EU. Furthermore, UK businesses would be put at a competitive disadvantage relative to their EU counterparts, since UK citizens and UK businesses would not be able to continue to undertake present activities lawfully. Therefore this situation is unacceptable.

- 4.4 Option 2 is to amend the ANO in order to facilitate the transition from UK to European law in such a way that air operations are not restricted unnecessarily. As described in paragraphs 3.2 to 3.6, the three aspects of the ANO that require amendment are that:
- an entity needs to be designated as the competent authority for the purposes of the EASA Air Operations Regulations;
  - the penalties in the ANO need to include sanctions for breaches of specified provisions in the EASA Air Operations Regulations, so that the European regulations are enforceable in the UK; and
  - many existing provisions need to be amended to reflect the fact that for a significant proportion of air operations the EASA Air Operations Regulations will apply instead.

The detailed changes are set out in the **Proposed Amendment to the ANO** document.

- 4.5 A public consultation on the issue was carried out in July-September 2011, and no objections were received to the proposed amendments to the ANO.
- 4.6 The choice is between amending the ANO so that it does not contradict the superseding European regulations or not amending the ANO. No other options have been considered, since they would involve not amending the ANO, which would not be in accordance with the principle that double-banking is avoided.

## **5 Costs and Benefits of Each Option**

### **5.1 General**

- 5.1.1 The estimates of costs and benefits used in the consultation stage Impact Assessment were rough estimates. During the consultation no feedback regarding the cost and benefit estimates was received from industry or the public.

### **5.2 Costs and Benefits of Option 1**

- 5.2.1 Option 1 is used as the baseline for comparison, so by definition the costs and benefits are zero.

### **5.3 Illustrative Costs and Benefits of Option 2 with a Baseline of UK not implementing the EU Regulation**

- 5.3.1 The original baseline described in paragraph 4.3 assumed the EU Regulation existed and the UK did not implement this. Under Option 2 there are costs associated with air operators needing to familiarise themselves with the European legislation and the revised ANO. Under the original baseline the European legislation still exists, so the same costs of familiarisation apply. It is likely that the cost of familiarisation with the revised ANO under Option 2 would be similar to the cost of understanding the inconsistencies between the unchanged ANO and the European legislation under the original baseline.
- 5.3.2 The main difference between the original baseline and Option 2 is that under Option 2 airlines are able to continue to operate. When airlines are able to operate, there is a cost to passengers and businesses in paying airlines for flights and to carry cargo; these costs to passengers and businesses are benefits to the airlines. In turn, there are costs to airlines such as buying fuel, paying their staff, paying for maintenance of their aircraft, paying tax and paying insurance. These costs to airlines are benefits to the fuel companies, staff, aircraft maintenance organisations, government and insurance companies. Therefore most of the transactions cancel out, and in fact continuing to operate is a net economic benefit (see paragraphs 5.3.6 to 5.3.15). Hence there are no costs for Option 2 relative to the original baseline.
- 5.3.3 The benefits of Option 2 relative to the original baseline are due to the fact that air operators would still be permitted to carry out their normal operations, so the losses due to a reduction in aviation would not be incurred. These losses are estimated below.
- 5.3.4 Under the original baseline UK air operators would be subject to regulations with which it would be impossible to comply, since no competent authority would exist to issue the required certificates and approvals. Therefore UK operators would not be able to operate legally. Since the UK operators would not be able to demonstrate to other States that their operations had the required oversight, other States would not allow them to fly into their airspace, so their international operations would be stopped. Within the UK, although the operators would not legally

be able to fly, they might be able to fly illegally since there would be no sanctions in UK law to punish infringements of the European regulations.

5.3.5 Under the original baseline it is possible that foreign operators could continue to operate into the UK as they do now. However, under the original baseline there would be no designated competent authority with the ability under the European regulations to carry out safety checks on foreign operators. If the government has no way to check that operators flying into UK airspace are safe then it is possible that the government would refuse to allow them to operate.

5.3.6 The economic impact of aviation is substantial, and the effect on the wider economy of not having aviation would be significant. The following examples are taken from the Executive Summary of a 2006 report by Oxford Economic Forecasting ([The Economic Contribution of the Aviation Industry in the UK](#)):

- The aviation industry generated £11.4 billion value-added in 2004 – in other words, it contributed £11.4 billion to GDP, 1.1% of the overall economy.
- Nearly three-quarters of international visitors to the UK arrive by air. Spending by visitors who arrive by air is equivalent to 1.1% of GDP.
- 55% of the UK’s exports of manufactured goods to countries outside the EU are transported by air.
- More than 60% of imports of machinery, mechanical appliances and electric equipment from outside the EU are carried by air.
- Nearly two-thirds of companies report that passenger services are either vital or very important for sales and marketing.
- 10% of companies say they would relocate some operations from the UK if next day international express delivery services – which rely on night flights from selected UK airports – ceased to be available.

5.3.7 A way of estimating the economic impact of most aviation in the UK becoming illegal using up-to-date data is to study the economic impact of the volcanic ash cloud which closed large parts of European airspace to commercial air transport during the week 15-21 April 2010. According to a report by Oxford Economics ([UK Economic Losses Due to Volcanic Ash Air Travel Restrictions](#)), the net impact on UK GDP for the period 15 April to 20 May 2010 is estimated to be a loss of £456.5 million (Section 5 of the report).

5.3.8 According to Section 3.1 and Figure 2-2 of the volcanic ash report, the impact on passenger numbers was as follows:

Aviation Sector	Number of Passengers Affected	Percentage UK Passenger Reductions	
		April 2010	May 2010
UK Inbound	547,276	22.0%	2.0%
UK Outbound	1,141,243	21.5%	2.5%
UK Domestic	290,784	28.0%	6.0%

The volcanic ash report states that air traffic resumed to near-normal on 22 April. Given the relatively small reductions in passenger levels in May, it is reasonable to assume that most of the economic effect occurred in the week 15-21 April, then reduced for the period 22-30 April, then reduced further for the period 1-20 May.

5.3.9 If it is assumed that the same proportion of the reduction occurred in the last nine days of April as in the first 20 days in May, then the following numbers of passengers were affected in the three time periods:

Aviation Sector	Number of Passengers Affected		
	15-21 April 2010	22-30 April 2010	1-20 May 2010
UK Inbound	456,064	45,606	45,606
UK Outbound	903,485	118,879	118,879
UK Domestic	188,154	51,315	51,315
Total	1,547,703	215,800	215,800

Note 1: Technically this also assumes that the passenger numbers for May are the same as for April, when in fact they are about 7% higher. However, this is of little significance when the original percentage passenger reductions are only given to the nearest 0.5% and the spread between the three time periods is only an estimate.

Note 2: The passenger numbers in this table have been rounded so that the total number of passengers affected in each aviation sector adds up to the number given in the table in paragraph 5.3.8.

5.3.10 This suggests that 78% of the affected passengers were affected in the week 15-21 April, so 78% of the economic effect is assumed to occur in this week. This gives an estimate of £356 million for the net loss to UK GDP of one week in April without aviation. This equates to a loss of £1,525 million for April.

5.3.11 Applying this monthly loss of £1,525 million for a period of 10 years gives a total loss of £155,064 million. (See Annex 3 for details of the calculation.)

5.3.12 The estimate in paragraph 5.3.11 assumes that the loss in April is representative of the loss in every other month. However, passenger numbers vary over the year, from about 13.5 million per month in winter up to about 23 million per month in July and August. If it is assumed that the losses are proportional to the number of passengers affected, then the effect each month can be estimated relative to April (see Annex 2 for details). Applying this adjusted monthly loss for a period of 10 years gives a total loss of £155,770 million. (See Annex 3 for details of the calculation.)

5.3.13 The estimates in paragraphs 5.3.11 and 5.3.12 assume that the impact of the loss will continue for the whole of the ten years at the same level. In reality it is likely that people will adjust to the unavailability of aviation, by using other means of transport for travelling and sending cargo. Depending on the whether the government decided to continue to monitor the safety of foreign operators, it is possible that some business would also be transferred from UK air operators to foreign air operators. However, the extent of this adjustment and how quickly it will occur is difficult to predict. Therefore estimates from a range of scenarios are calculated. Further details of the calculations are provided in Annex 3.

Scenario	Total Loss over 10 years (£ million)
1) Annual trends are not taken into account, and there is no adjustment to the situation.	155,064
2) Annual trends are taken into account, but there is no adjustment to the situation.	155,770
3) The effect decreases linearly to 0 over 10 years.	83,580
4) The effect decreases linearly to 0 over five years.	44,840
5) The effect decreases linearly to 50% over 10 years.	119,675

Scenario	Total Loss over 10 years (£ million)
6) The effect decreases in steps of 20% per year for five years.	51,903
7) The full effect is felt for three months, then decreases linearly to 40% over three years.	80,897
8) The effect decreases geometrically by 0.5% per month.	119,636
9) The effect decreases geometrically by 1% per month.	94,458

Note: In scenarios 3 to 9, annual trends are taken into account.

5.3.14 It is unrealistic to assume that there would be no adjustment to a lack of aviation. There is the possibility of substitutability to non-UK operators, but as described in paragraph 4.2 and noted in paragraph 5.3.13 this would be subject to the UK being willing to accept such operation when it had no legal competence to carry out safety checks. However, as there are other transport options that could be utilised scenarios 1 and 2 are ignored. The lowest estimate from the remaining scenarios is £44,840 million (Scenario 4) and the highest estimate is £119,675 million (Scenario 5). The mean of scenarios 3 to 9 is £84,998 million, which is also approximately half way between the lowest and highest estimates.

5.3.15 Therefore the best estimate for the benefits of Option 2 relative to the original baseline is £85,000 million over 10 years. The lower and upper estimates are £45,000 million and £120,000 million respectively. It should be emphasised that these estimates are imprecise due to the many uncertainties in this model, and many other plausible scenarios could be used to describe how the UK economy would adapt to a lack of aviation.

#### 5.4 Costs and Benefits of Option 2 compared to Option 1 (baseline where the EU Regulation does not exist)

5.4.1 Under this option there would be some costs to air operators needing to familiarise themselves with the European legislation and the revised ANO. However, if the EU regulations were not implemented there would continue to be ongoing costs for airlines to familiarise themselves as regulations evolved and developed. Therefore the net cost over the baseline is assumed to be negligible.

5.4.2 There may also be some costs to air operators to apply for certificates from the CAA. However currently, in accordance with the ANO, UK air operators already have to obtain certificates and approvals from the CAA to demonstrate that they can operate safely. It is assumed that the process to apply for certificates would be broadly similar to comply with the new European regulations and therefore that the net cost is zero.

5.4.3 The costs of making the CAA the competent authority and to issue the required certificates and approvals is thought to be negligible as the CAA is responsible for doing this for national regulations already. There may be some additional workload for the CAA to process forms from air operators when the regulations are initially implemented, but it is assumed this would be covered by the CAA's usual staffing costs.

5.4.4 There are also benefits associated with the regulations. Consistent regulations across the EU will be beneficial for airline operators, making it simpler to comply with the regulations right across their business. Passengers will also benefit from enhanced safety standards which will be consistent across EU airlines, meaning UK citizens will be as safe when they travel on other EU airlines as they are when they travel on UK airlines. These benefits have not been quantified.

5.4.5 Supporting airlines and providing confidence to passengers is important given the economic impact of aviation is substantial and the effect on the wider economy significant, as described above.

#### 5.5 Update of Estimates

5.5.1 The estimates have not been recalculated to reflect the delayed implementation of the EASA Air Operations Regulations (originally expected to be April 2012) since the uncertainties in the modelling would greatly outweigh any changes to the figures due to monthly variations. As an



illustration, changing the start date from April 2012 to October 2012 would give the following estimates in paragraphs 5.3.14 and 5.3.15:

Estimate	Scenario	£ million	£ million (rounded)
Lowest	4	43,390	43,000
Highest	8	118,749	119,000
Best	Mean of Scenarios 3 to 9	83,992	84,000

## 6 Level of Analysis Used in the Impact Assessment

- 6.1 Since there is no option regarding how the policy is implemented, in accordance with the principle of proportionality (see paragraph 17 of [Impact Assessment Guidance](#)) it has not been considered appropriate to estimate the costs and benefits with excessive accuracy. There is little solid evidence on which to base assumptions about how passengers and businesses would react to aviation being unavailable.

## 7 Risks and Assumptions

- 7.1 The biggest risk is that if the UK does not have appropriate legislation and regulatory oversight in place then foreign States will not have confidence in the safety of UK air operators. Thus air travel between the UK and foreign States could be severely curtailed.
- 7.2 It is assumed that EU legislation for aircraft operations will come into force with effect from the second half of 2012 as is specified on the EASA website.
- 7.3 It is assumed that if no sanctions were in place for breaches of the regulations, people would be more likely to break the law.
- 7.4 It is assumed that the figures taken from the Oxford Economics reports used in this IA have produced reasonably accurate estimations of the economic impact of aviation, or its loss, on the UK economy. The CAA believes that this assumption is justified because a margin for error has been allowed for in the range of projected outcomes and that these assumptions are unlikely to create any major effects other than those discussed.

## 8 Direct Costs and Benefits to Business Calculations (following OIOO methodology)

### 8.1 Illustrative EANCB with a Baseline of UK not implementing the EU Regulation

- 8.1.1 The overall costs and benefits of Option 2 compared to the original baseline were estimated based on data from a report into the economic loss to the UK of the airspace restrictions due to the volcanic ash cloud in April 2010 (see paragraph 5.3.7 for details). This report estimated the net impact on UK GDP for the period 15 April to 20 May 2010 as a loss of £456.5 million, which has been used as the basis for the benefit of Option 2 compared to the original baseline in this Impact Assessment.
- 8.1.2 The Oxford Economics report estimated the direct impact on the UK tourism economy to be a loss of £424.7 million (Section 5 of the report). This is approximately 90% of the figure of £456.5 million. Therefore it is reasonable to estimate the Business Net Present Value as 90% of the net present value for the UK economy. This gives the following estimates for the Business Net Present Value:

Estimate	UK Economy NPV (£ million)	Business NPV (£ million)
Low	45,000	40,500
High	120,000	108,000
Best	85,000	76,500

- 8.1.3 From the 'One-In, One-Out (OIOO) Methodology' document, the EANCB is given by:

$$EANCB = \frac{PVNCB}{a_{t,r}}$$

where:

PVNCB (Present Value of Net Cost to Business) is the negative of the Business NPV;

$a_{t,r}$  is the annuity rate.

For a time period of 10 years and a discount rate of 3.5% the annuity rate is:

$$a_{10, 0.035} = \frac{1.035}{0.035} \left[ 1 - \frac{1}{(1.035)^{10}} \right] = 8.607686509$$

8.1.4 Therefore the estimates for the illustrative EANCB are as follows:

Estimate	PVNCB (£ million)	EANCB (£ million)	EANCB (£ million) (to nearest £100 m)
Low	-40,500	-4,705	-4,700
High	-108,000	-12,547	-12,500
Best	-76,500	-8,887	-8,900

8.1.5 It is not considered proportionate to attempt to estimate the direct costs and benefits any more accurately than this, since it is clearly preferable for aviation to be allowed to continue (Option 2) so detailed discrimination between the two options is unnecessary.

## 8.2 EANCB of Option 2 (compared to baseline where the EU Regulation does not exist)

8.2.1 As mentioned above there are no direct costs or benefits which are monetised and therefore no direct costs or benefits to business. In other words the EANCB is zero.

## 9 Wider Impacts

### 9.1 Statutory Equality Duties

#### 9.1.1 Race

9.1.1.1 The proposals relate to all air operators, therefore we do not anticipate that these amendments will lead to:

- different consequences according to people's racial group;
- people being affected differently according to their racial group in terms of access to a service, or the ability to take advantage of proposed opportunities;
- discrimination unlawfully, directly or indirectly, against people from some racial groups;
- different expectations of the policy from some racial groups;
- harmed relations between certain racial groups, for example because they will be seen as favouring a particular group or denying opportunities to another; or
- damaged relations between any particular racial group (or groups) and the Department for Transport (DfT).

#### 9.1.2 Disability

9.1.2.1 The Disability Discrimination Act (DDA) 1995 now gives rights to disabled people in the area of access to goods, facilities and services. The proposals apply equally to all air operators, so we do not anticipate any disadvantages or discrimination for disabled people, in line with this Act.

#### 9.1.3 Gender

9.1.3.1 The proposals will apply to all air operators. Therefore we do not anticipate that these amendments will lead to:

- different consequences according to people's gender;
- people being affected differently according to their gender in terms of access to service, or the ability to take advantage of proposed opportunities;
- discrimination unlawfully, directly or indirectly, against genders; or
- different expectations of the policy from different genders.

## **9.2 Economic Impacts**

### *9.2.1 Competition*

- 9.2.1.1 If the ANO is not amended to nominate the CAA as the competent authority for the purposes of the EASA Air Operations Regulations, then no new companies would be able to obtain AOCs in the UK, which would limit competition in commercial air operations. Furthermore, UK aircraft operators would not have available to them the approvals, permissions and exemptions that they currently enjoy, which would put them at a commercial disadvantage to their foreign competitors.
- 9.2.1.2 If the ANO is amended to nominate the CAA as the competent authority for the purposes of the EASA Air Operations Regulations, then air operations would continue under similar requirements as is currently the case, so there would not be an impact on competition.

### *9.2.2 Small Firms*

- 9.2.2.1 The EASA Regulations will come into force in the second half of 2012, regardless of what action is taken by the UK government. The purpose of the proposed change to the ANO is to minimise the disruption caused by the EASA Regulations superseding certain UK regulations.
- 9.2.2.2 Any disproportionate impact on small firms due to the EASA Regulations cannot be mitigated by these policy options and so is outside the scope of this consultation.
- 9.2.2.3 Under the original baseline, small air operators would be in the same position as larger ones, in that there would be no way for them to comply with the regulations, so effectively they would be forced out of business.
- 9.2.2.4 Under Option 2, small air operators would be in the same position as larger ones, in that they would have to comply with the EASA Air Operations Regulations just as they currently have to comply with UK and European Air Operations Regulations.

## **9.3 Environmental Impacts**

### *9.3.1 Greenhouse Gas Assessment*

- 9.3.1.1 It is recognised that the environmental impact of the aviation industry is considerable. Under this policy (Option 2) greenhouse gasses would continue to be emitted as usual, by aviation, road, rail and sea travel.
- 9.3.1.2 Under the original baseline aviation to and from the UK would be restricted, so greenhouse gasses emitted by UK transport would primarily be due to road, rail and sea travel. Under the original baseline, it is likely that many people would wish to continue to enjoy the benefits of air travel and would travel overseas in order to fly with foreign operators. Therefore there would still be a large amount of greenhouse gasses emitted by foreign operators overflying UK airspace.
- 9.3.1.3 Under the original baseline a greater proportion of greenhouse gas emissions would be caused by means of transport other than aviation, and foreign operators overflying the UK; under Option 2 a greater proportion of greenhouse gas emissions would be caused by UK aviation. It is not proportionate to try to quantify the costs of the difference in emissions between the original baseline and Option 2, since these cannot be quantified from data held by the CAA and any difference in costs would be too small in relation to the benefits of air travel to be significant.

### *9.3.2 Wider Environmental Issues*

- 9.3.2.1 There are two wider environmental issues relevant to the aviation sector as a whole: noise pollution and air quality. Under Option 2 both noise pollution and air quality would remain as it is now subject to any changes in aircraft efficiency.

- 9.3.2.2 Under the original baseline there would be hardly any flights to or from the UK (although overflights by foreign operators would continue), so the noise pollution produced by aviation would be reduced.
- 9.3.2.3 Under the original baseline, it is likely that much of the transport of passengers and cargo would be transferred to other means of transport (or foreign operators, as described in paragraph 9.3.1.2), which would offset a significant proportion of the reduction in pollutants resulting from fewer flights. Therefore, similarly to paragraph 9.3.1.3, under the original baseline a greater proportion of pollutants would be attributable to means of transport other than aviation, and foreign operators overflying the UK; whereas under Option 2 a greater proportion of pollutants would be attributable to UK aviation. It is not proportionate to try to quantify the costs of the difference in pollutants between the original baseline and Option 2, since these cannot be quantified from data held by the CAA and any difference in costs would be too small in relation to the benefits of air travel to be significant.

## **9.4 Social Impacts**

### *9.4.1 Health and Well-being*

- 9.4.1.1 None of the proposals are expected to have a direct impact on health. There is no potential for any of the proposals directly to affect wider determinants of health such as income or the environment, nor is there any potential for the proposals to affect relevant lifestyle-related factors such as physical activity or diet. There is no anticipated impact on the demand for health and social care services.

### *9.4.2 Human Rights*

- 9.4.2.1 It is not anticipated that the proposals will have any human rights impacts.

### *9.4.3 Justice System*

- 9.4.3.1 It is not anticipated that the proposals will have any implications for the justice system.

### *9.4.4 Rural Proofing*

- 9.4.4.1 It is not believed that any of the proposals will have a different impact on people in rural areas because of their particular circumstances or needs.

## **9.5 Sustainable Development**

### *9.5.1 Sustainable Development Impact Test*

- 9.5.1.1 Sustainable development entails the current generation satisfying its basic needs and enjoying an improving quality of life without compromising the position of future generations. The proposals do not affect the resources available to future generations, and are therefore compatible with sustainable development.

## **10 Summary and Preferred Option with Description of Implementation Plan**

- 10.1 The coming into force of EASA Regulations in the second half of 2012 obliges the UK to amend its national legislation accordingly, in particular the ANO. Not doing this would subject UK businesses to requirements with which they were unable to comply, which would put them at a competitive disadvantage relative to their EU counterparts. Hence the CAA's preferred option is Option 2.
- 10.2 The CAA intends to provide the DfT with a description of the required amendments to the ANO by the beginning of June 2012. The DfT should then be able to make the necessary changes to the ANO as soon as the EASA Air Operations Regulations are published in the Official Journal of the European Union. Once the EASA Air Operations Regulations which come into force in the second half of 2012 are published in their final form, the CAA will review them and publish on its website a list of any further ANO articles which are disapplied in certain situations due to the EASA Regulations taking precedence.
- 10.3 Certain Commercial Air Transport aeroplane and helicopter A-to-A operations (i.e. flights where the take-off and landing are made at the same place) are currently excluded from the EASA Air

Operation Regulations. They will remain subject to the existing regulations (usually EU-OPS or JAR-OPS 3) until the EASA Air Operations Regulations are amended to include them.

- 10.4 Once the remaining EASA Air Operations Regulations which will come into force after 2012 are published, the CAA intends to provide to the DfT a description of the rest of the amendments to the ANO resulting from the EASA Air Operations Regulations. This description will be informed by the experience of implementing the EASA Regulations thus far. For those regulations in the ANO that still apply to non-EASA air operators (such as State aircraft), the CAA intends to align them as far as is practicable with the EASA Air Operations Regulations, in order that the overall UK civil aviation regulations are simpler. It is hoped that this later ANO amendment will coincide with the amendment to implement the EASA Regulations for air traffic and aerodromes.

## **11 Changes made to the IA following the RPC opinion**

- 11.1 Subsequent to the production of the original IA in 2012, it was decided to take up the available derogation allowing implementation to be deferred for two years. Since the RPC opinion was issued in 2012, the appropriate baseline to use for analysis of EU legislative changes has been amended. Therefore, this IA retains all the original analysis, but refers to this as being carried out against “the original baseline” (see para 4.3) and the figures for Costs, Benefits and EANCB of Option 2 have been amended to use a baseline where the EU Regulation does not exist. In particular, paragraphs 4.2 and 4.3 have been amended to define the baseline, section 5.3 has been retitled, section 5.4 has been added, section 8.1 has been retitled, section 8.2 added and amendments have been made to section 9.3 to reflect the updated baseline. Figures in the summary sheets have been updated to reflect these changes.

## Annex 1 – Estimation of Accident Rates

This Annex provides a more detailed explanation of the figures given in paragraph 1.2 of the Evidence Base.

CAP 800 *UK Safety Performance Volume I* gives the numbers of various types of accident and incident for various types of aircraft for the years 2000-2009.

The European regulations will initially apply to commercial air transport using aeroplanes and helicopters, and to operations requiring specific approval (e.g. low-visibility operations or the transport of dangerous goods) carried out by any aircraft. It is likely that the regulations governing operations requiring specific approval will affect a greater proportion of commercial operations than non-commercial operations, so overall the regulations will initially have the largest effect on commercial operations. The data in CAP 800 that most closely matches this category is UK public transport, so the data from Chapter 1 has been used, except for balloons which will not initially be subject to the European commercial air transport regulations.

Paragraphs 2.3-2.5, 3.4-3.6 and 4.6-4.8 of Chapter 1 to CAP 800 include the following data:

<b>Aircraft Type</b>	<b>No. of Reportable Accidents</b>	<b>No. of Fatal Accidents</b>	<b>No. of Flights (x 1000)</b>	<b>No. of FLYing Hours (x 1000)</b>
Large Aeroplanes	113	3	11523	26950
Small Aeroplanes	16	1	649	427
Helicopters	22	3	2646	1336

Summing this data gives the following:

<b>Aircraft Type</b>	<b>No. of Reportable Accidents</b>	<b>No. of Fatal Accidents</b>	<b>No. of Flights (x 1000)</b>	<b>No. of FLYing Hours (x 1000)</b>
All Public Transport Aeroplanes and Helicopters	151	7	14818	28713

Dividing the number of accidents by the number of flights (or number of flying hours) gives the accident rate:

<b>Aircraft Type</b>	<b>Reportable Accident Rate (per million flights)</b>	<b>Reportable Accident Rate (per million flying hours)</b>	<b>Fatal Accident Rate (per million flights)</b>	<b>Fatal Accident Rate (per million flying hours)</b>
Large Aeroplanes	9.806	4.193	0.260	0.111
Small Aeroplanes	24.653	37.471	1.541	2.342
Helicopters	8.314	16.467	1.134	2.246
Total	10.190	5.259	0.472	0.244

Except for the accident rates (per million flying hours) for small aeroplanes, the rates for the three aircraft types agree with the rates given in paragraphs 2.6, 3.7 and 4.9 of Chapter 1 to CAP 800, as given below:

<b>Aircraft Type</b>	<b>Reportable Accident Rate (per million flights)</b>	<b>Reportable Accident Rate (per million flying hours)</b>	<b>Fatal Accident Rate (per million flights)</b>	<b>Fatal Accident Rate (per million flying hours)</b>
Large Aeroplanes	9.8	4.2	0.3	0.1
Small Aeroplanes	24.7	37.6	1.5	2.4
Helicopters	8.3	16.5	1.1	2.2

The minor discrepancy for small aeroplanes is possibly due to a more accurate figure being used in the CAP 800 calculations for the number of flying hours in small aeroplanes.

The Total row in the third table above, rounded to one decimal place, is the source for the figures given in paragraph 1.2 of the Evidence Base.

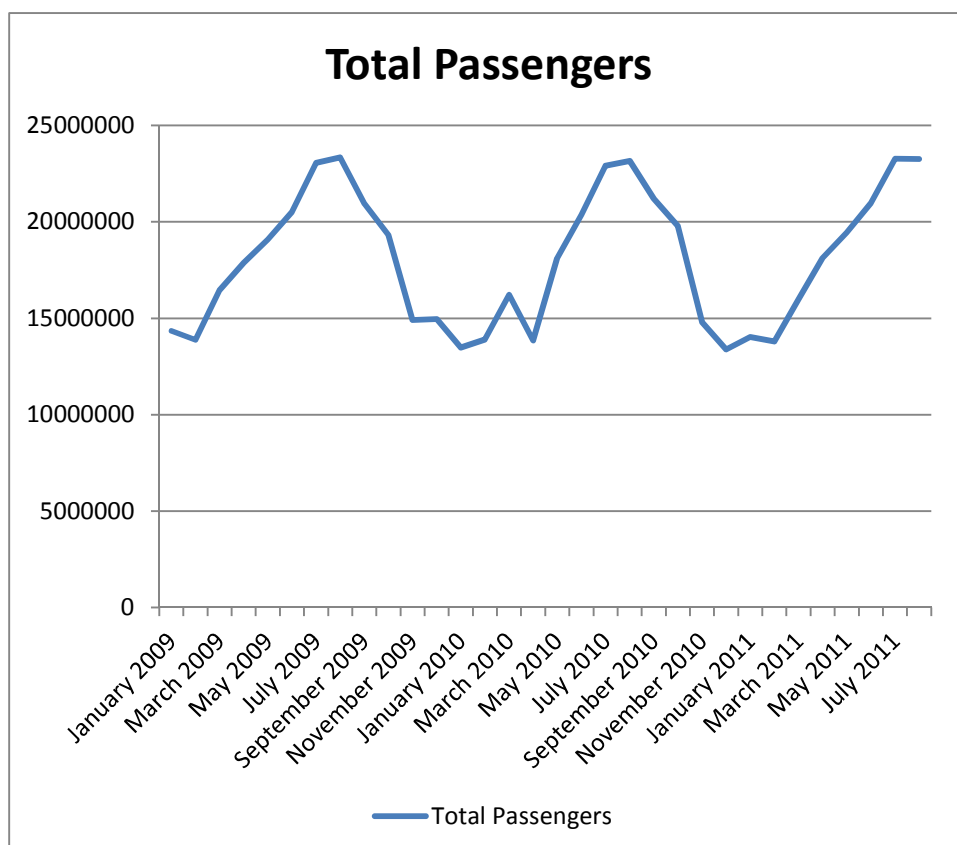
## Annex 2 – Annual Variation in Passenger Numbers

This Annex provides a more detailed explanation of the way that passenger numbers usually vary during the year, as used in paragraph 5.3.12 of the Evidence Base.

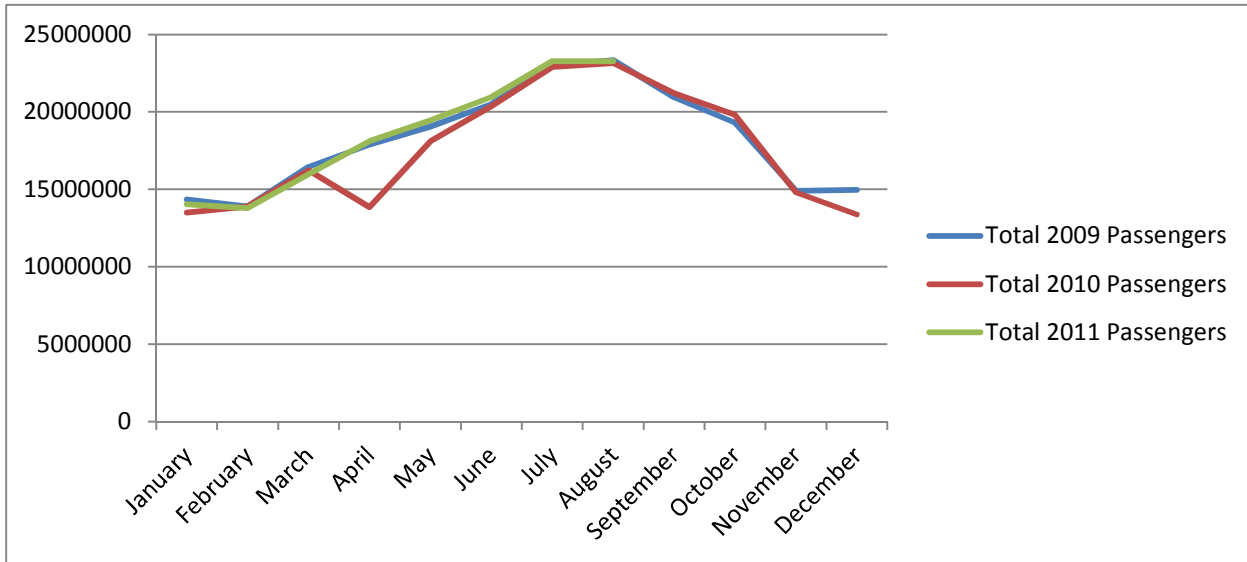
From CAA Statistics (Table 2.2 of each month at [www.caa.co.uk/airportstatistics](http://www.caa.co.uk/airportstatistics)), passenger numbers since January 2009 are as follows:

Month	Total Passengers		
	2009	2010	2011
January	14,342,557	13,490,338	14,028,059
February	13,889,099	13,898,450	13,794,349
March	16,457,928	16,227,531	15,979,115
April	17,888,213	13,845,761	18,109,673
May	19,068,199	18,105,049	19,440,882
June	20,503,021	20,366,845	20,966,580
July	23,053,669	22,912,871	23,273,137
August	23,333,093	23,159,597	23,265,813
September	20,935,965	21,198,035	
October	19,310,017	19,795,965	
November	14,910,067	14,789,307	
December	14,954,679	13,380,219	

Throughout the year, passenger numbers vary in a predictable manner, as shown by the following diagrams:







Using the passenger numbers from the most recent 12 months (i.e. September 2010 to August 2011), relative to April the monthly scale factors for passenger numbers are as follows:

Month	Monthly Scale Factor, $M_n$ (April = 1)
January	0.77
February	0.76
March	0.88
April	1.00
May	1.07
June	1.16
July	1.29
August	1.28
September	1.17
October	1.09
November	0.82
December	0.74

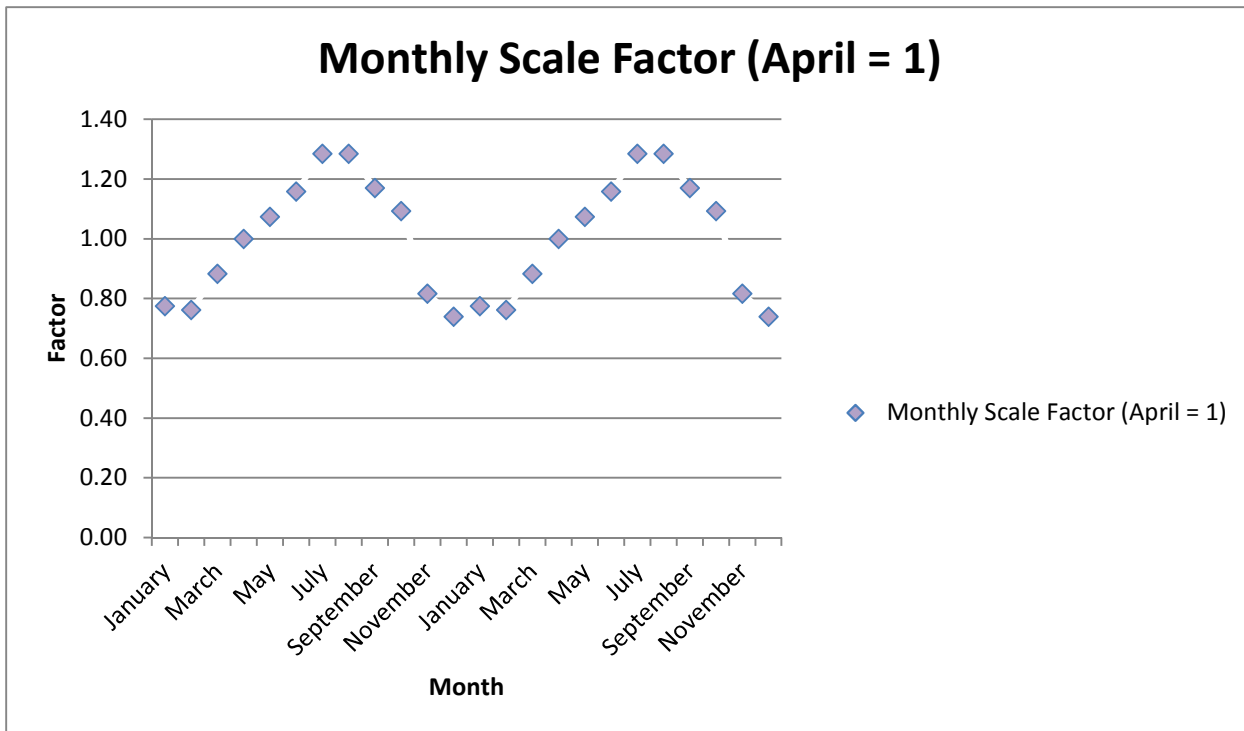
### Annex 3 – How the Monthly Impact Might Develop Over 10 Years

This Annex provides a more detailed explanation of the calculations of the total economic impact over the course of 10 years of UK aviation not being possible, as used in paragraphs 5.3.11 to 5.3.13 of the Evidence Base.

The standard monthly loss is taken to be £1,525 million, as calculated in paragraph 5.3.10 of the Evidence Base.

The economic impact is usually calculated using a discount rate of 3.5%, i.e. £100 one year from now has a present value of  $\pounds(100/1.035)$  because it is preferable to have money immediately. Due to the fact that the estimates have been made based on the assumed figure for one month, the calculations have been made on a month-by-month basis. Therefore the equivalent monthly discount rate of  $1/(1.035^{1/12})$  has been used. The discount factor for month n is  $1/(1.035^{1/12})^{n-1}$ .

In most cases, the monthly scale factors ( $M_n$ ) calculated in Annex 2 have been applied to account for variations in passenger numbers over the course of a normal year. Otherwise the monthly scale factor is 1 for every month. The effect of using the monthly scale factors is to introduce an oscillation into the monthly impact. This oscillation is shown in the diagram below:



Various scenario scale factors have been applied to account for how the UK might adjust to a lack of aviation.

The total impact for month n under scenario k is as follows:

$$\begin{aligned}
 & \text{Standard Monthly Loss} \times \text{Discount Scale Factor} \times \text{Monthly Scale Factor} \times \text{Scenario Scale Factor} \\
 = & \pounds 1,525 \text{ million} \times \frac{1}{(1.035^{1/12})^{n-1}} \times M_n \times S_{k,n}
 \end{aligned}$$

The total loss under each scenario is obtained by summing the monthly losses over the ten years, i.e. months 1 to 120.

Each scenario is described below, with the monthly and scenario factors given in sufficient detail to allow the results to be replicated.

Each scenario scale factor is also shown graphically in order to give an indication of its effect. (Line graphs are used for ease of interpretation, although strictly speaking they should be scatter graphs since they represent discrete data.)

The economic impact for a selection of months is shown, given in £ million to one decimal place.

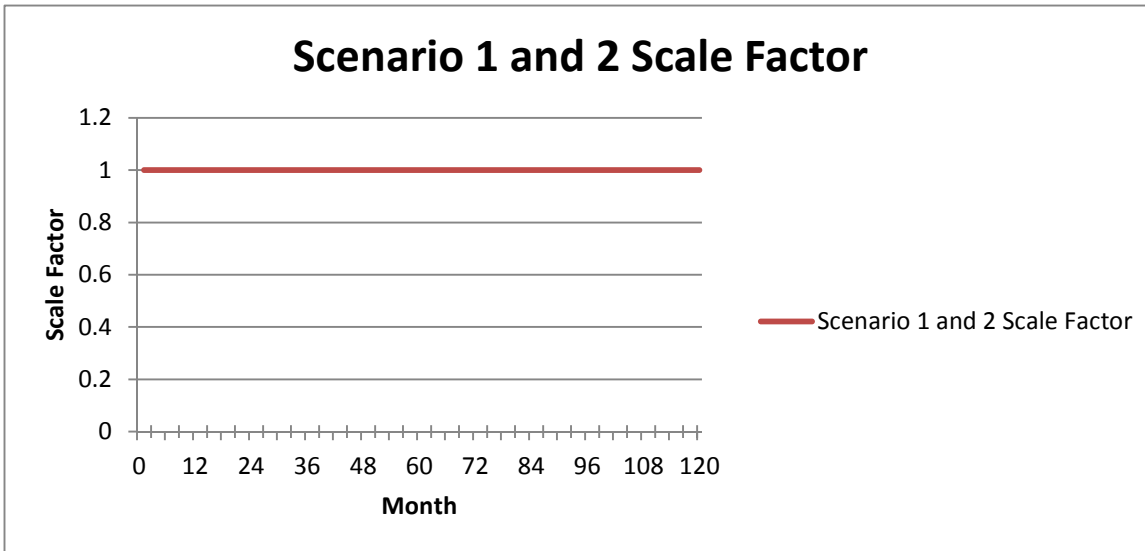
Finally, a graph of the monthly amounts is provided to give an indication of the whole scenario (combining the discount factor to show the decreasing present value of money with increasing time, the oscillating effect of the monthly scale factor, and the adjustment effect of the scenario factor). Again, line graphs are used instead of scatter graphs for ease of interpretation, since 120 data points would be cluttered.

**Scenario 1**

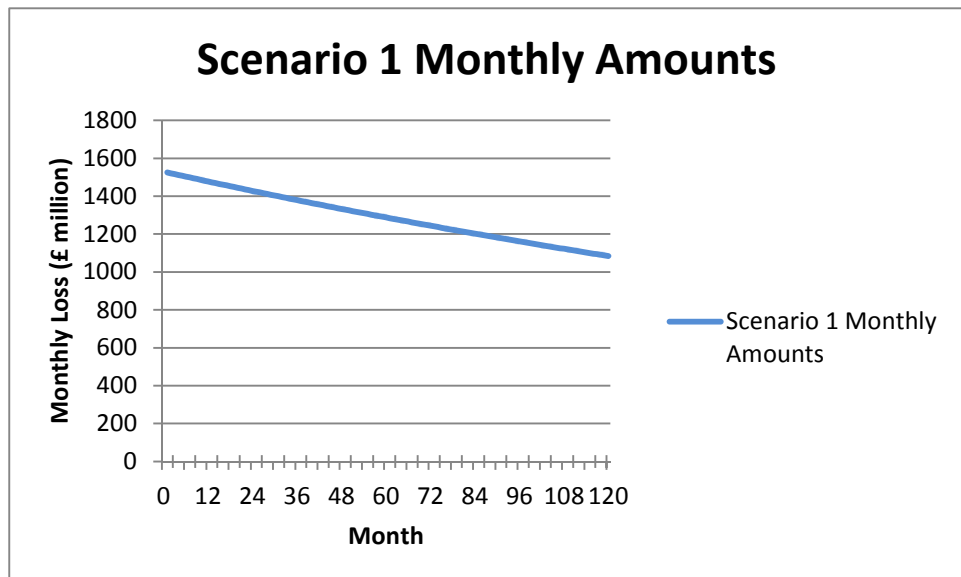
Description: No allowance is made for the fact that passenger numbers vary throughout the year, and the UK economy does not adjust to the new situation.

Monthly Scale Factor:  $M_n = 1$  for  $n = 1$  to 120.

Scenario Scale Factor:  $S_{1,n} = 1$  for  $n = 1$  to 120.



Month	Economic Impact (£ million)
1	1525.0
2	1520.6
3	1516.3
...	
37	1375.5
38	1371.5
...	
59	1291.4
60	1287.7
...	
120	1084.2

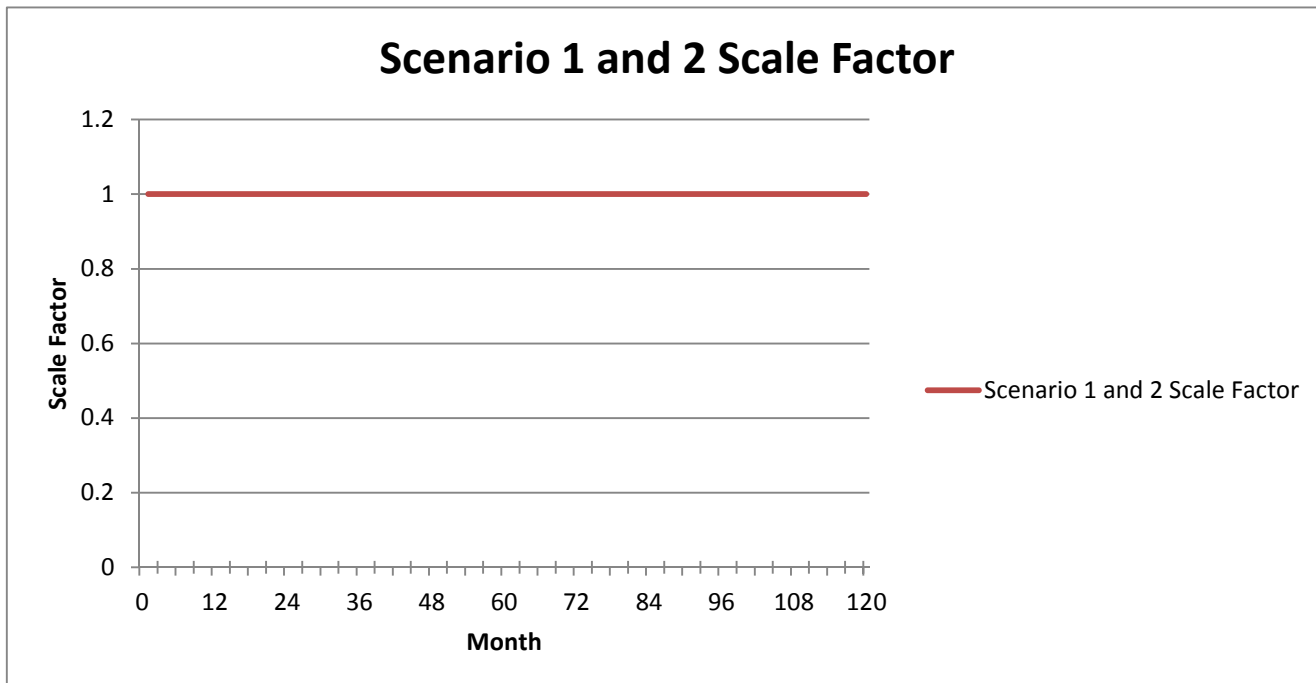


## Scenario 2

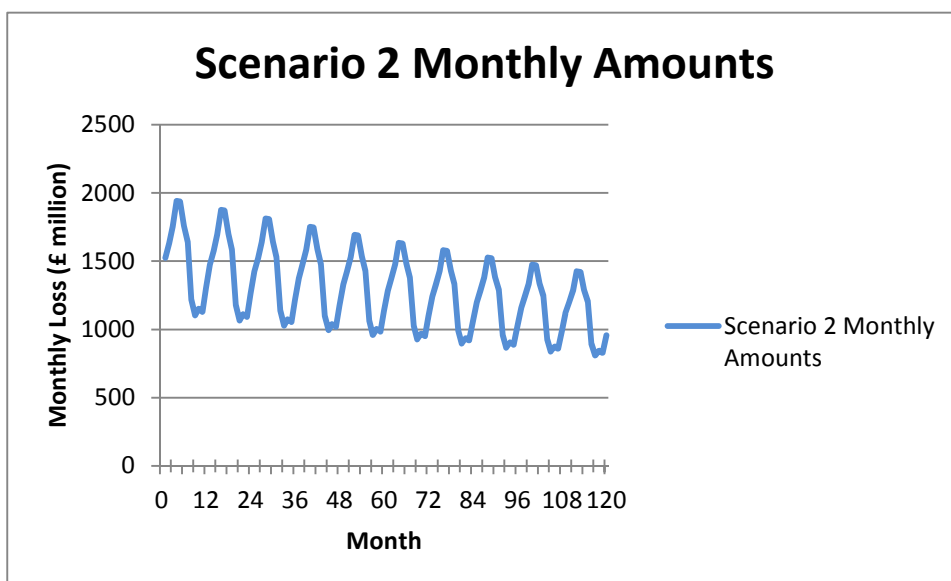
Description: Allowance is made for the fact that passenger numbers vary throughout the year, but the UK economy does adjust to the new situation.

Monthly Scale Factor:  $M_n$  as defined in Annex 2.

Scenario Scale Factor:  $S_{2,n} = 1$  for  $n = 1$  to 120.



Month	Economic Impact (£ million)
1	1525.0
2	1632.4
3	1755.5
...	
36	1217.1
37	1375.5
38	1472.3
39	1583.3
...	
59	983.7
60	1136.2
61	1284.0
...	
120	956.7

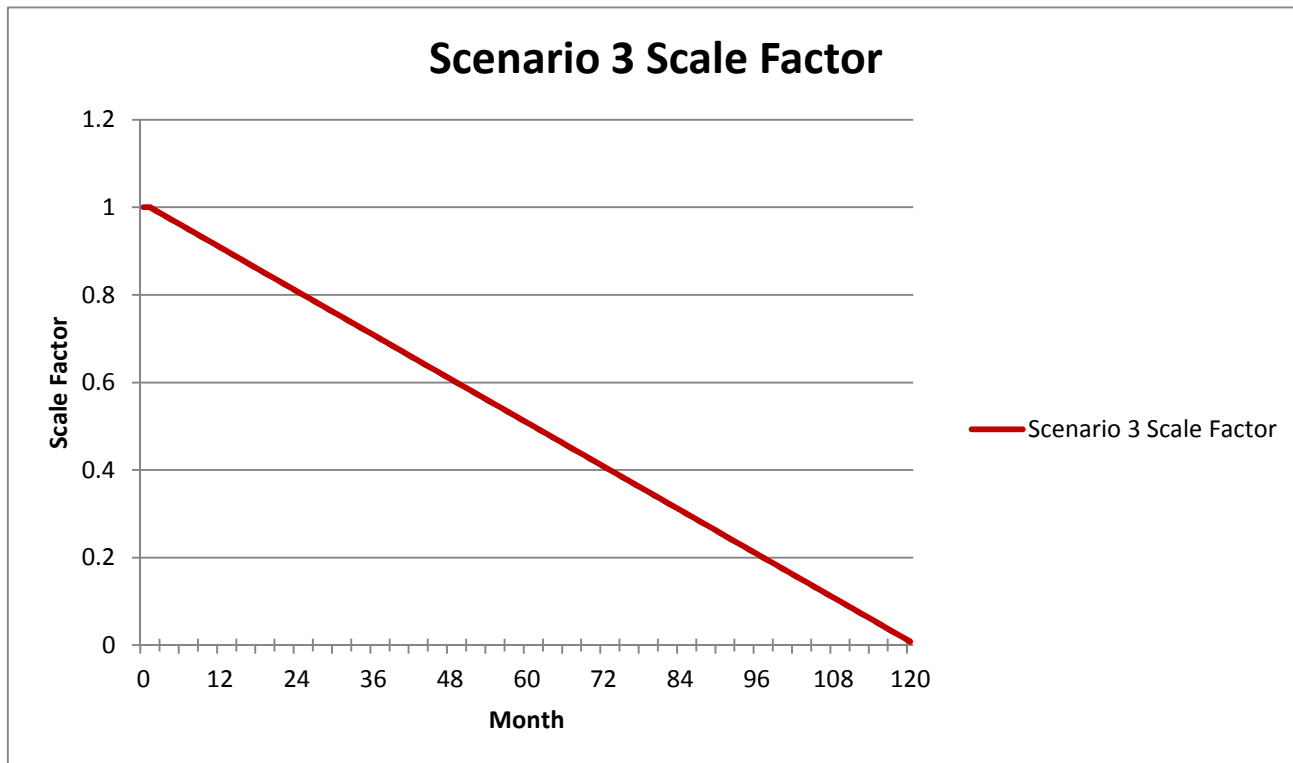


### Scenario 3

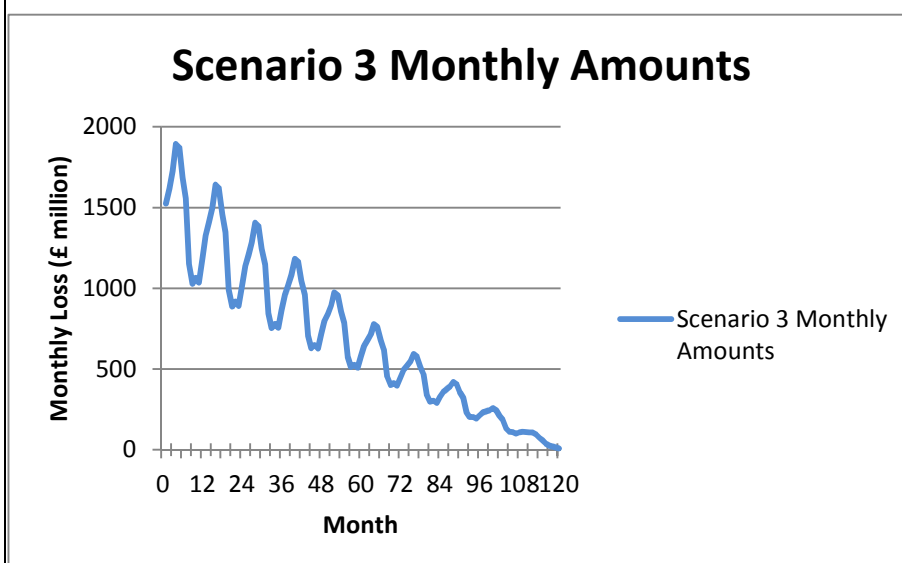
Description: Allowance is made for the fact that passenger numbers vary throughout the year. The UK economy adjusts uniformly until after 10 years there is no impact.

Monthly Scale Factor:  $M_n$  as defined in Annex 2.

Scenario Scale Factor:  $S_{3,n} = 1 - ((n-1)/120)$  for  $n = 1$  to 120.



Month	Economic Impact (£ million)
1	1525.0
2	1618.8
3	1726.2
...	
36	862.1
37	962.8
38	1018.4
39	1082.0
40	1182.9
41	1164.6
...	
59	508.2
60	577.6
61	642.0
...	
120	8.0

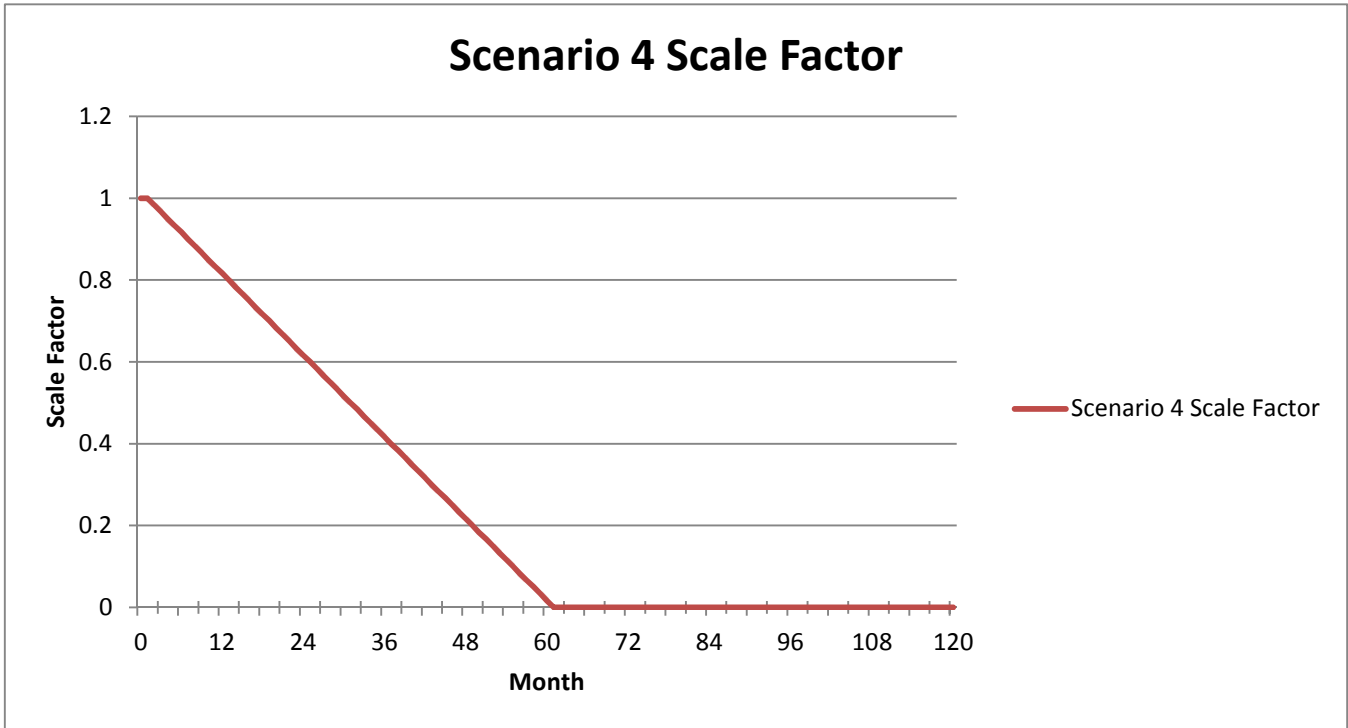


**Scenario 4**

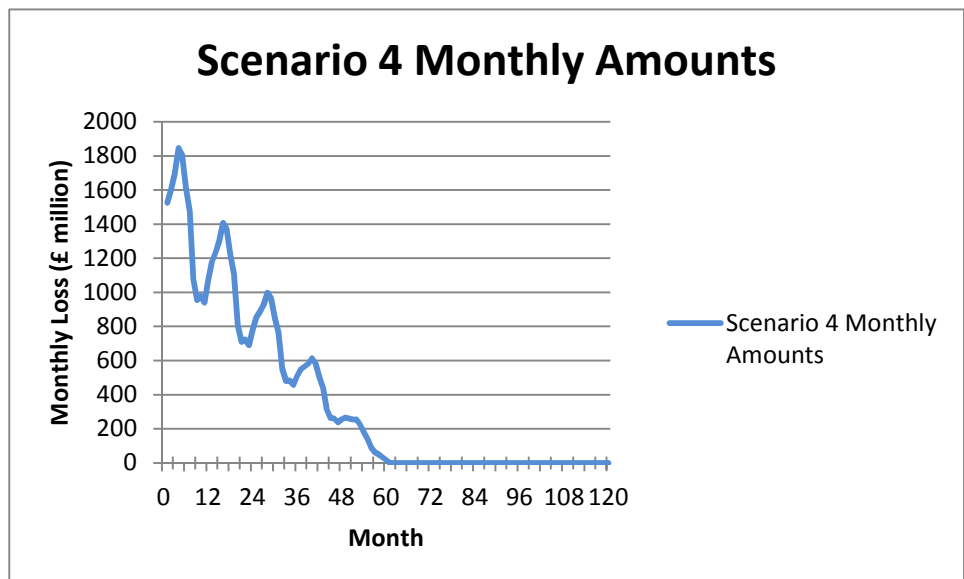
Description: Allowance is made for the fact that passenger numbers vary throughout the year. The UK economy adjusts uniformly until after five years there is no impact.

Monthly Scale Factor:  $M_n$  as defined in Annex 2.

Scenario Scale Factor:  $S_{4,n} = 1 - ((n-1)/60)$  for  $n = 1$  to  $60$ .  
 $S_{4,n} = 0$  for  $n = 61$  to  $120$ .



Month	Economic Impact (£ million)
1	1525.0
2	1605.2
3	1697.0
...	
36	507.1
37	550.2
38	564.4
39	580.6
40	613.4
41	582.3
...	
59	32.8
60	18.9
61	0.0
...	
120	0.0

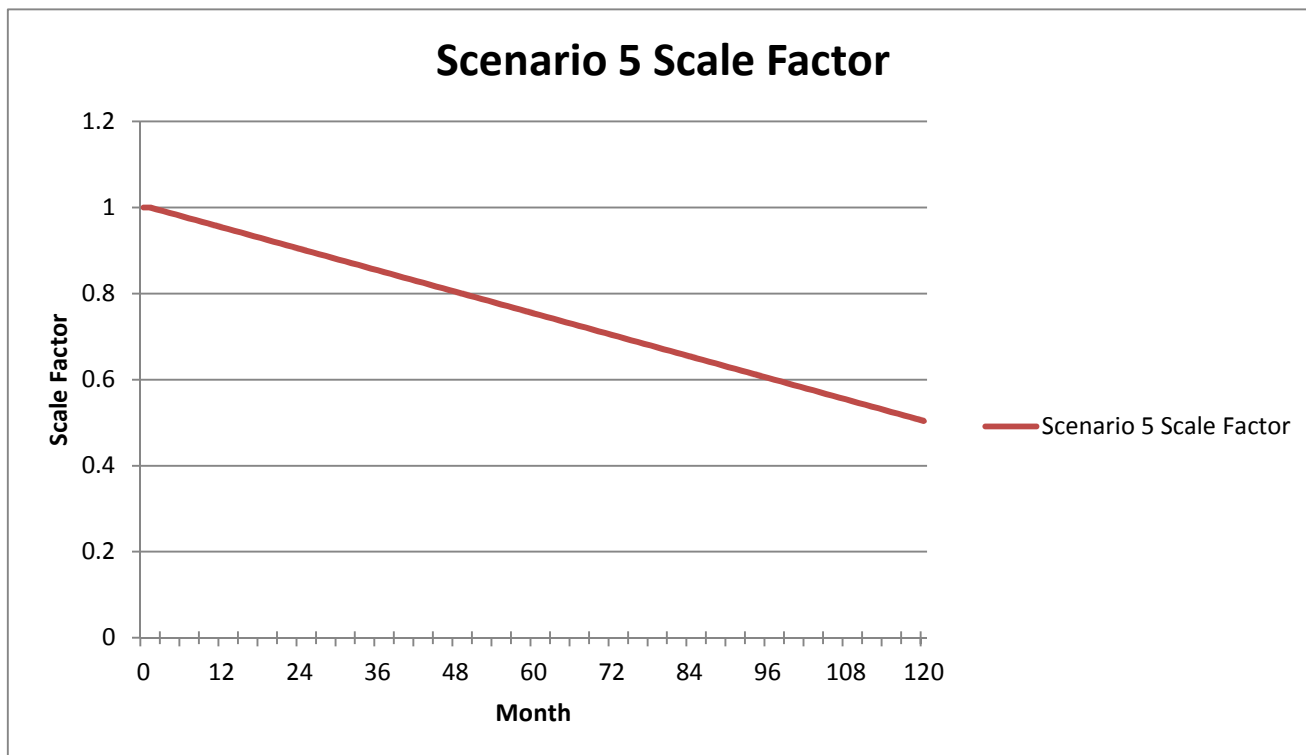


## Scenario 5

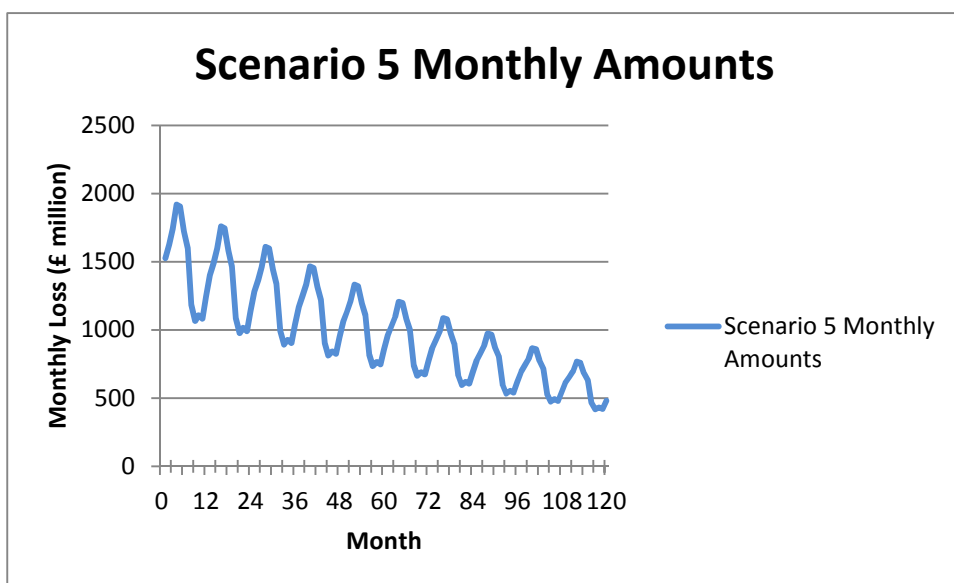
Description: Allowance is made for the fact that passenger numbers vary throughout the year. The UK economy adjusts uniformly until after 10 years there is 50% of the original impact.

Monthly Scale Factor:  $M_n$  as defined in Annex 2.

Scenario Scale Factor:  $S_{5,n} = 1 - ((n-1)/240)$  for  $n = 1$  to 120.



Month	Economic Impact (£ million)
1	1525.0
2	1625.6
3	1740.9
...	
36	1039.6
37	1169.1
38	1245.4
39	1332.6
40	1467.7
41	1455.8
...	
59	745.9
60	856.9
61	963.0
...	
120	482.3

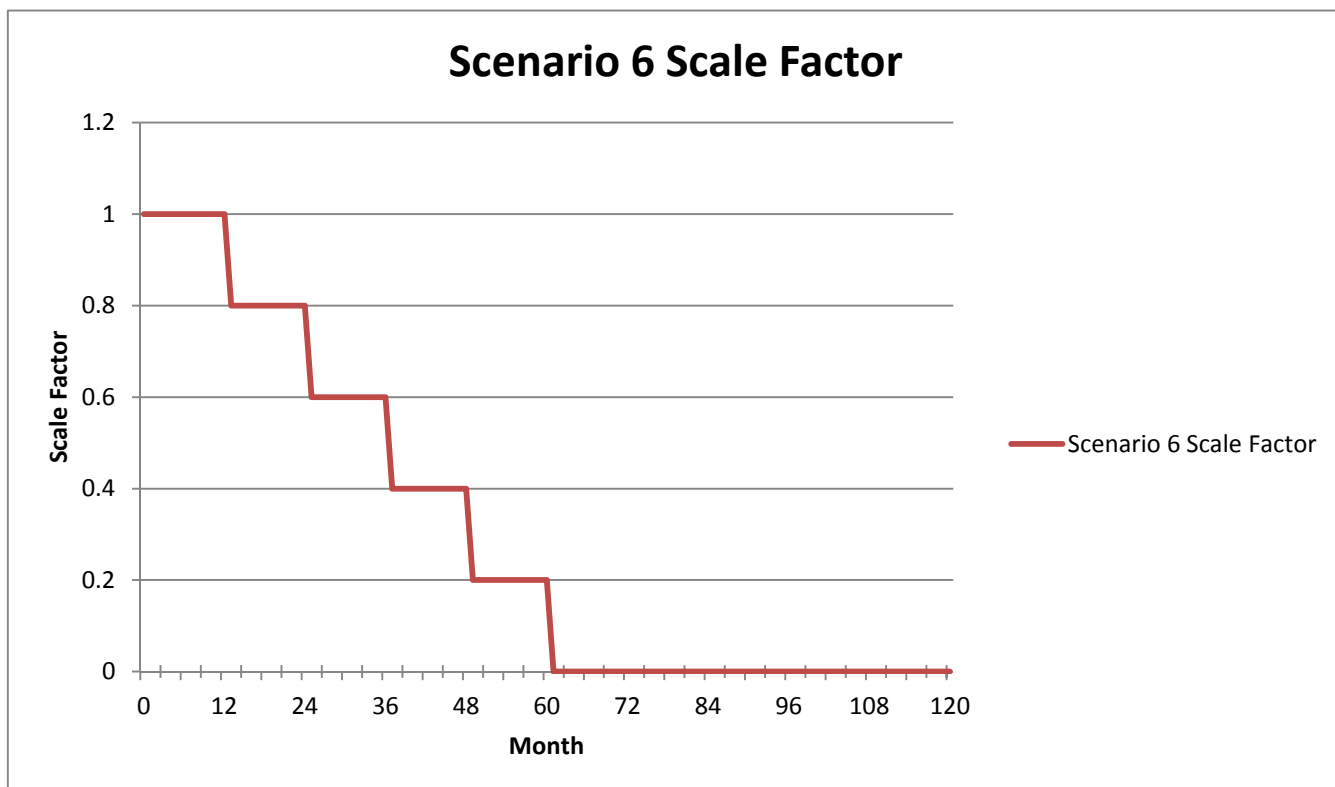


## Scenario 6

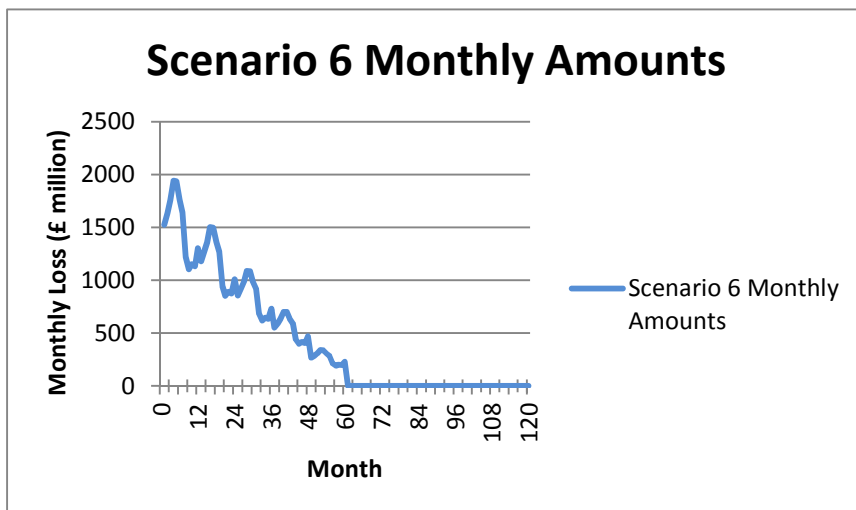
Description: Allowance is made for the fact that passenger numbers vary throughout the year. The UK economy adjusts in steps (the full impact is felt in the first year, 80% of the original impact is felt in the second year, and so on) until after five years there is no impact.

Monthly Scale Factor:  $M_n$  as defined in Annex 2.

Scenario Factor: Scale  $S_{6,n} = 1$  for  $n = 1$  to 12.  
 $S_{6,n} = 0.8$  for  $n = 13$  to 24.  
 $S_{6,n} = 0.6$  for  $n = 25$  to 36.  
 $S_{6,n} = 0.4$  for  $n = 37$  to 48.  
 $S_{6,n} = 0.2$  for  $n = 49$  to 60.  
 $S_{6,n} = 0$  for  $n = 61$  to 120.



Month	Economic Impact (£ million)
1	1525.0
...	
11	1128.8
...	
23	872.5
...	
35	632.2
...	
47	407.2
...	
59	196.7
...	
71	0.0
...	





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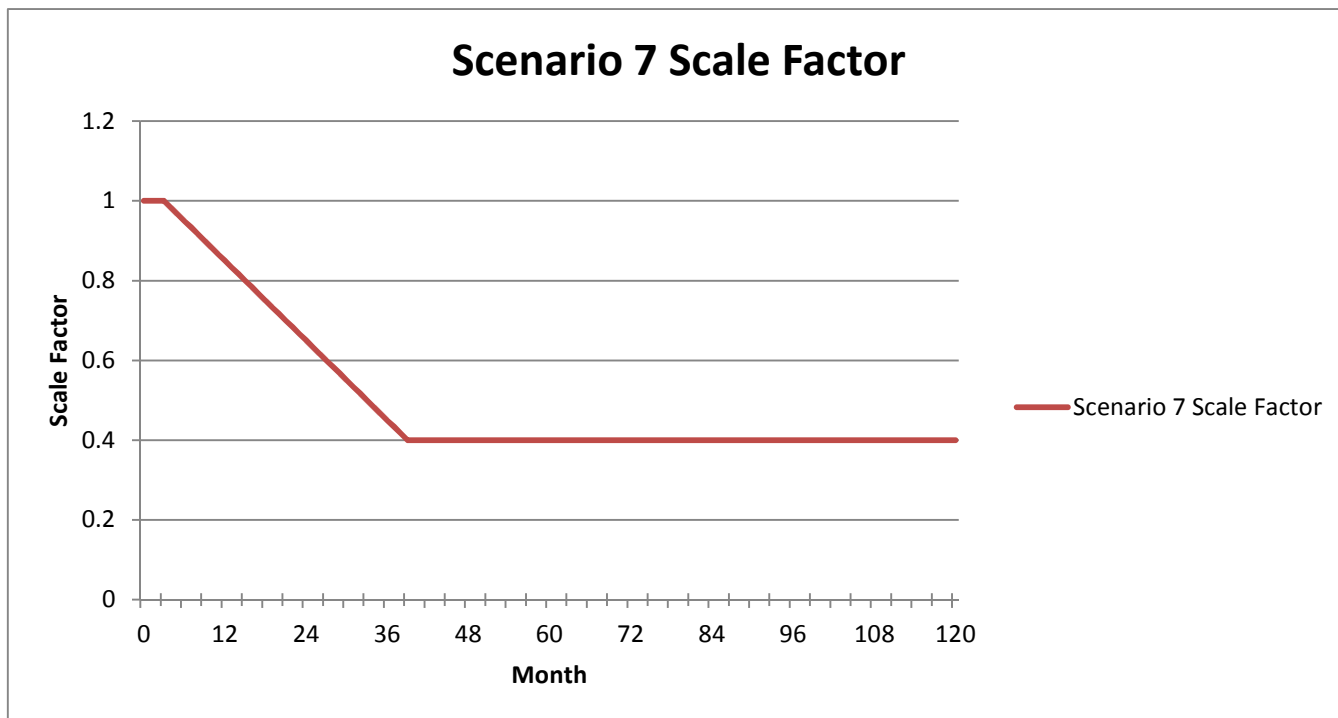
120	0.0
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## Scenario 7

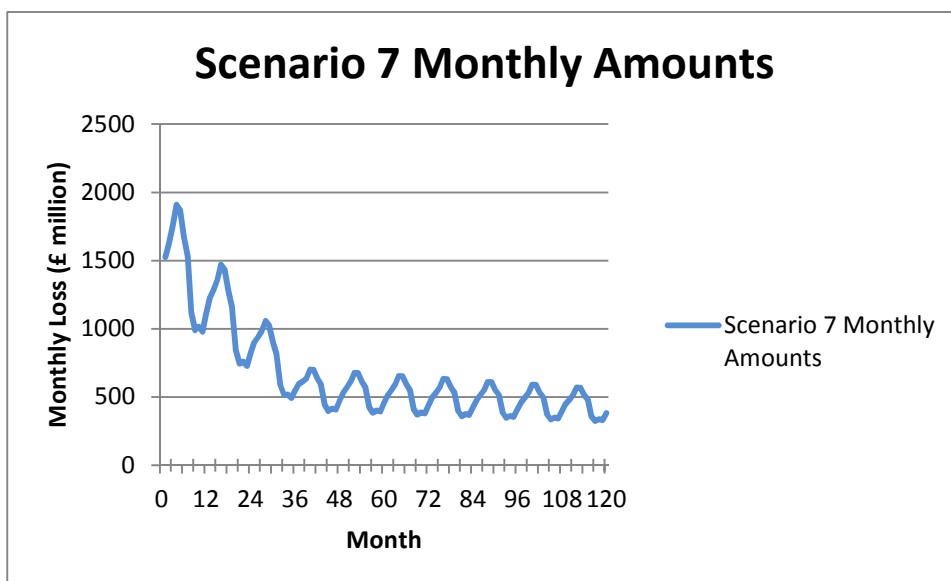
Description: Allowance is made for the fact that passenger numbers vary throughout the year. The full impact is felt for the first three months, then the UK economy adjusts uniformly until after a further three years there is 40% of the original impact.

Monthly Scale Factor:  $M_n$  as defined in Annex 2.

Scenario Scale Factor:  $S_{7,n} = 1$  for  $n = 1$  to 3.  
 $S_{7,n} = 1 - ((n-3)/60)$  for  $n = 4$  to 39.  
 $S_{7,n} = 0.4$  for  $n = 40$  to 120.



Month	Economic Impact (£ million)
1	1525.0
2	1632.4
3	1755.5
...	
36	547.7
37	596.0
38	613.5
39	633.3
40	701.0
41	698.8
...	
59	393.5
60	454.5
61	513.6
...	
120	382.7

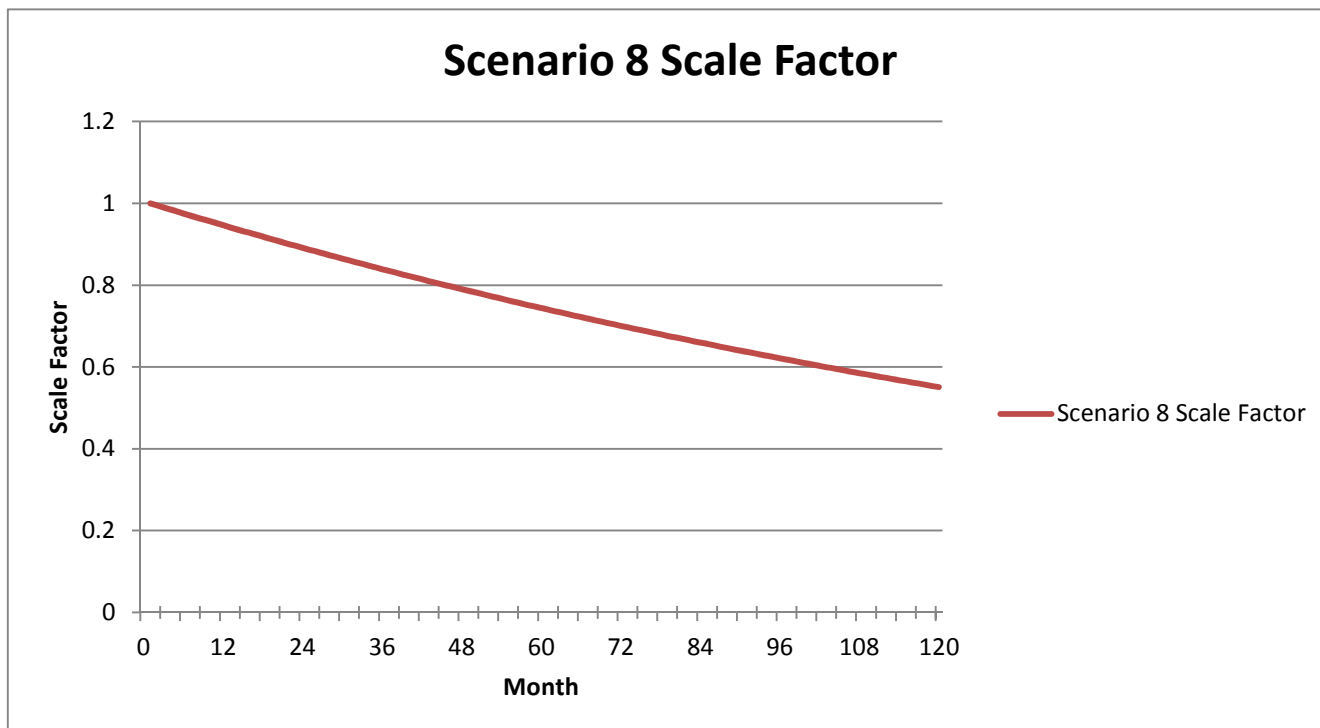


## Scenario 8

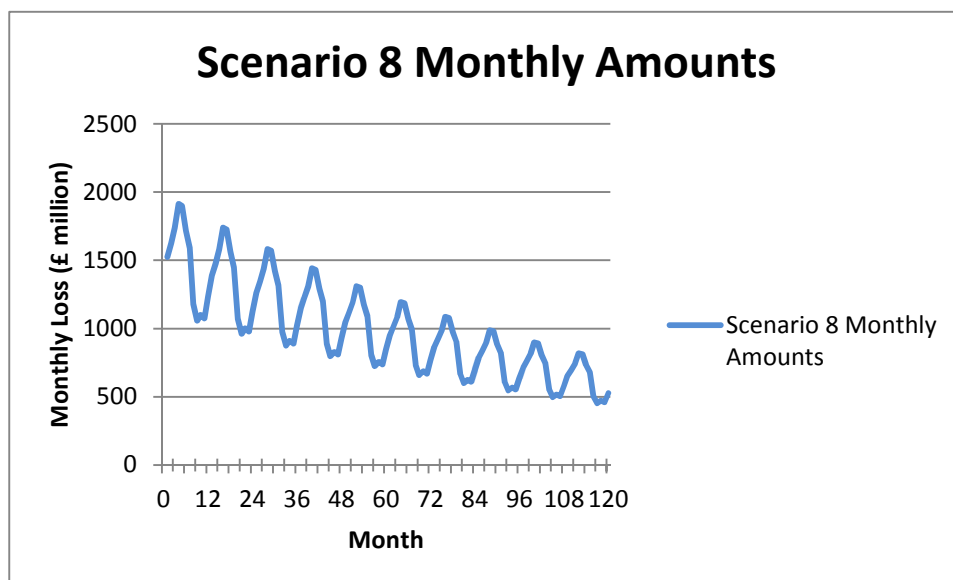
Description: Allowance is made for the fact that passenger numbers vary throughout the year. The UK economy adjusts by the impact reducing by a further 0.5% per month.

Monthly Scale Factor:  $M_n$  as defined in Annex 2.

Scenario Scale Factor:  $S_{8,n} = 0.995^{n-1}$  for  $n = 1$  to 120.



Month	Economic Impact (£ million)
1	1525.0
2	1624.3
3	1738.0
...	
36	1021.3
37	1148.4
38	1223.1
39	1308.7
40	1441.3
41	1429.6
...	
59	735.5
60	845.3
61	950.5
...	
120	526.9

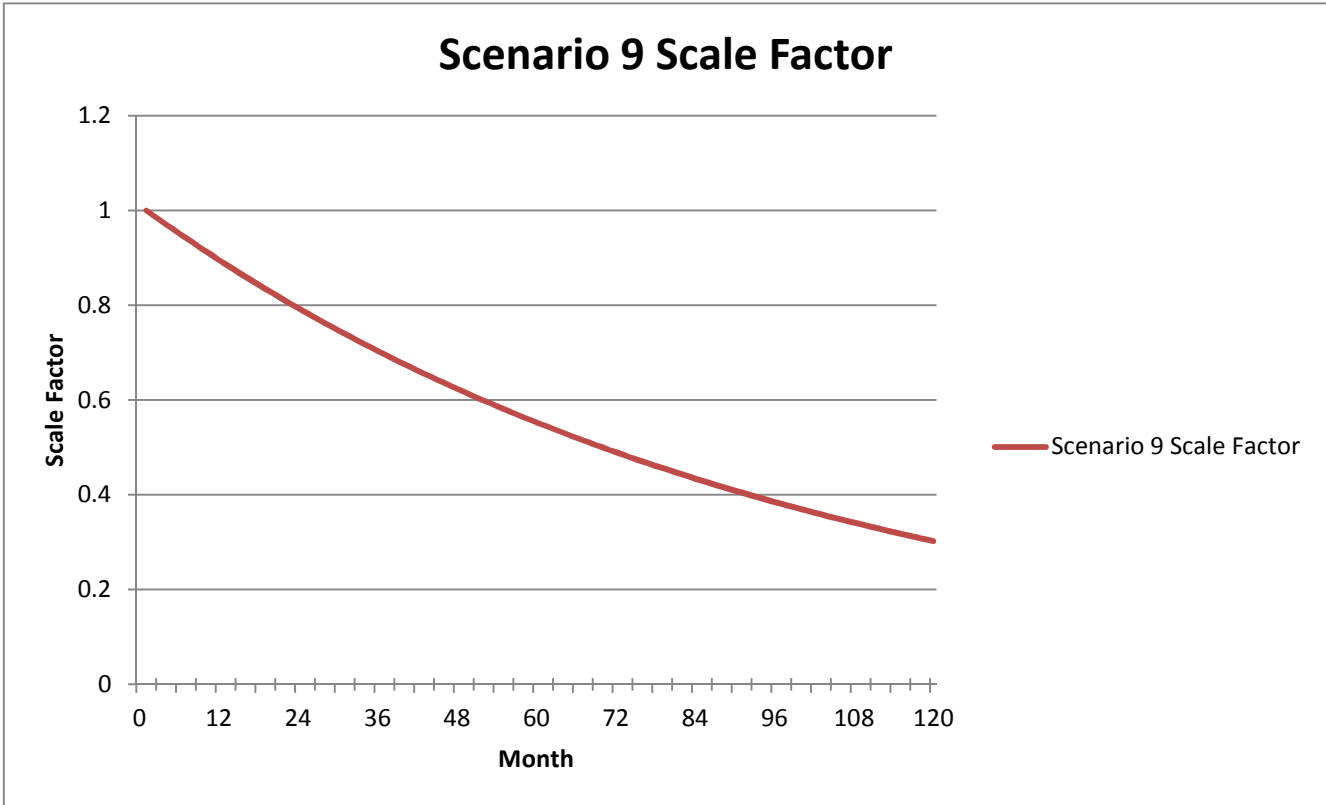


**Scenario 9**

Description: Allowance is made for the fact that passenger numbers vary throughout the year. The UK economy adjusts by the impact reducing by a further 1% per month.

Monthly Scale Factor:  $M_n$  as defined in Annex 2.

Scenario Scale Factor:  $S_{9,n} = 0.99^{n-1}$  for  $n = 1$  to 120.



Month	Economic Impact (£ million)
1	1525.0
2	1616.1
3	1720.5
...	
36	856.2
37	957.9
38	1015.1
39	1080.7
40	1184.2
41	1168.6
...	
59	549.1
60	628.0
61	702.6
...	
120	289.3

