



Ex post assessment of the impact of state aid on competition

Final report



Competition

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Ex post assessment of the impact of state aid on competition

Final report

November 2017

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Abstract

In this report, Oxera has developed an analytical framework for the ex post assessment of the effect of state aid on competition. This framework is consistent with merger and antitrust assessments but tailored to the specificities of state aid. Although it focuses on ex post impact assessments of state aid, most elements of it can also be used for ex ante evaluation.

We apply this framework to four cases where the Commission authorised the granting of aid to individual companies. The case studies were selected in order to cover a diversity of aid objectives, economic sectors and amounts of aid. The four cases selected are: regional aid to an airport in the UK; R&D&I aid to a French substrates manufacturer; SGEI aid to an Italian postal operator; environmental aid to a French starch producer.

Following the four case studies, we show that the impact of the aid could vary according to the relative amount of the aid, the breadth of the aid, and frequency of the aid. We also conclude that usual techniques in antitrust and merger assessments can be used in ex post assessments. However, there are some specific challenges regarding market definition, counterfactual analysis, and data availability.

Résumé

Dans ce rapport, Oxera a développé un cadre d'analyse pour évaluer l'impact ex post des aides d'État sur la concurrence. Ce cadre d'analyse suit les mêmes principes que les cadres utilisés dans l'évaluation des concentrations et des pratiques anticoncurrentielles. Cependant, il est adapté aux spécificités des aides d'Etat. Même s'il a été développé pour l'évaluation ex post des aides, la plupart des éléments qui le constituent sont valides pour l'évaluation ex ante de l'impact des aides.

Nous appliquons ce cadre d'analyse à quatre cas où la Commission a autorisé le versement d'aide à des entreprises. Ces études de cas ont été choisies dans le but de couvrir différents types d'aides, de secteurs, et de montants octroyés. Les cas ainsi sélectionnés sont : aide pour le développement régional à un aéroport au Royaume-Uni ; aide pour la recherche et le développement à un producteur français de substrats ; aide relative aux services d'intérêt économique généraux pour un opérateur postal italien ; aide environnementale à un producteur d'amidon français.

A l'issue de ces études de cas, nous montrons que l'impact d'une aide peut varier en fonction du montant relatif de l'aide en rapport à la taille du marché, l'ampleur de l'aide, et sa fréquence d'attribution. Nous concluons par ailleurs que les techniques communément utilisées dans l'évaluation des concentrations et des pratiques anticoncurrentielles sont applicables à l'évaluation ex post des aides d'Etat. Cependant, il existe des particularités qui concernent la définition de marché, l'analyse contrefactuelle et la disponibilité des données.

Executive summary

Context

The European Commission is going to place more weight on ex post assessment in state aid

The European Commission has initiated a series of measures relating to the EU state aid modernisation reform, which aims to improve state aid control. The reform is based on several pillars, including the evaluation of state aid measures. In this specific context, the Commission is considering introducing a greater role for standard competition analysis in ex post evaluations, especially in the assessment of the market distortions that aid schemes may introduce.

Objectives of the study

Oxera's report sets out an analytical framework for ex post assessments of state aid and tests it on four different case studies

The Commission asked Oxera to conduct a study assessing, on an ex post basis, the impact of state aid on competition and in particular any distortion of competition that might have occurred. The purpose of the study is to review and evaluate a selection of four individual cases of aid granted five to ten years ago.

In this context, we developed a framework that is consistent with merger and antitrust assessments but tailored to the specificities of state aid. The framework focuses on the ex post assessment of the impact of state aid on competition, although most elements can also be used for ex ante evaluation.

We have applied this analytical framework to four cases where the Commission authorised the granting of aid to individual companies.

Designing the analytical framework

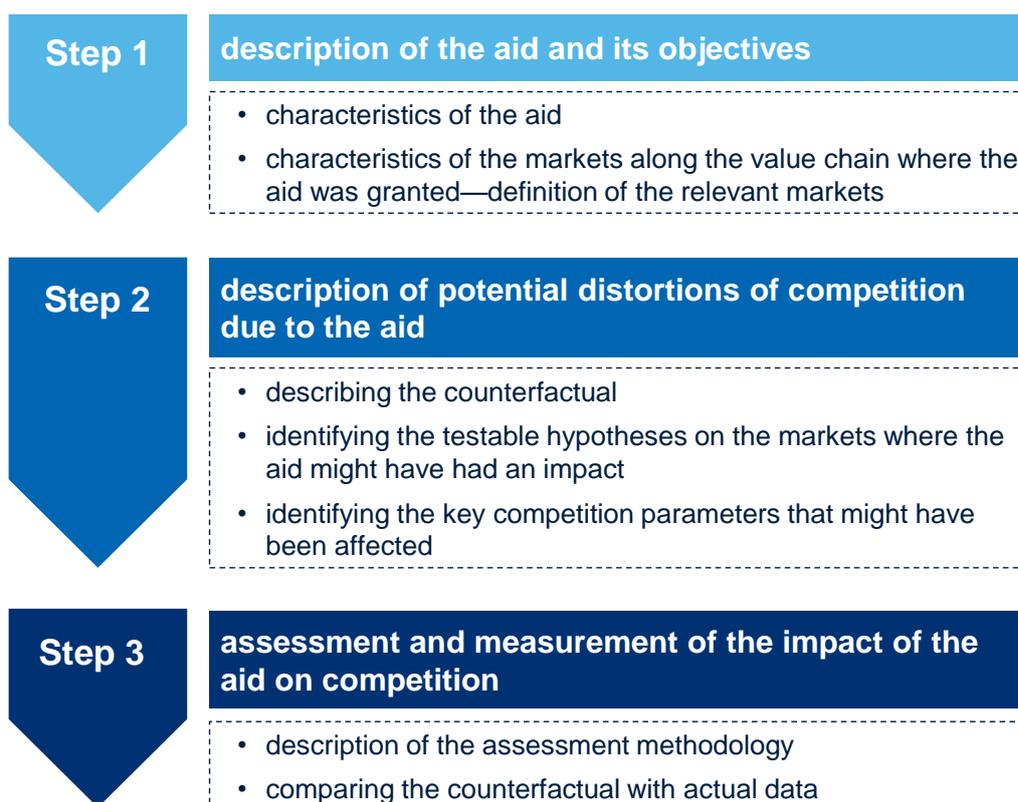
The analytical framework is consistent with usual impact assessments but tailored to the specificities of state aid

To assess the actual impact of state aid on past cases, we developed an analytical framework that consists of three steps.

1. Describing the aid and setting out its characteristics.
2. Explaining how the aid might have affected the market.
3. Assessing the magnitude of the impact of the aid on the market.

This structure is summarised in the figure below.

Analytical framework to assess the impact of state aid on competition



Source: Oxera.

As the impact of aid on competition is likely to vary according to the type of aid, the framework has been designed to be applicable to a range of aid measures, including, among others, environmental aid, regional development aid, research, development and innovation (R&D&I) aid, and aid under the services of general economic interest (SGEI) scheme. It is, however, sufficiently generic to also be applicable to other state aid measures including rescue and restructuring aid. The framework focuses on the development of testable hypotheses and the approach to identifying indicators of competition against which the impact of the aid can be examined. The impact on competition is determined by comparing a hypothetical scenario (the counterfactual) in which the aid was not granted, with actual data.

Choosing the four case studies

The case studies were chosen in order to cover different industries and types of aid

Together with the Commission, Oxera selected the four case studies (see the box below) in order to cover a diversity of aid objectives, economic sectors and amounts of aid. In line with the Commission's requirements for the study, we selected these case studies taking into account criteria such as:

- the decision date: we considered decisions published between 1 January 2006 and 31 December 2011;
- the economic sector: we filtered by using NACE codes for a number of economic sectors where we have relevant competition experience—energy, transport, water and waste, telecoms and post, and consumer electronics;

- the decision type: we focused our attention on the following decision types: decision not to raise objections; decision to initiate the formal investigation procedure; and positive decisions;
- the primary objectives: we focused on environmental protection; regional development; R&D&I; and SGEI;
- the case type: we only focused on aid that was not granted on the basis of an already approved scheme.

Description of the four case studies

Regional aid to an airport in the UK—this case study presents an example of aid given to Cornwall Airport Newquay, a regional airport previously used by the Royal Air Force (RAF) and for small-scale commercial purposes. Following the announcement that the RAF would cease its operations there, the airport received state aid for infrastructure development to transform it into a viable stand-alone airport on a yearly basis from 2006 to 2011.

R&D&I in France—this case study presents an example of aid given to the French substrates manufacturer, Soitec, for its NanoSmart nanotechnology R&D programme in 2007. The programme was aimed at developing substrates for micro- and optoelectronic applications.

Postal sector in Italy—this case study presents an example of SGEI aid given to Poste Italiane for maintaining the universal service obligation between 2000 and 2017. Poste Italiane received two main forms of compensation from the Italian government: monetary compensation in the form of direct state funding, and protection from competition in the form of a right to be the sole provider of a reserved area of the market for a certain period of time.

Energy market in France—this case study presents an example of environmental aid given to Roquette Frères S.A. (RF), a producer of starch and starch derivatives in Beinheim in the Alsace region of France, to construct a wood-fuelled biomass plant. The aid was granted from the 'Fonds Chaleur' scheme organised by the French Environment and Energy Management Agency (ADEME), which supported a number of biomass plants. The aim of the scheme was to promote the production of heat from renewable energies, to promote employment and investment in that sector, and to better mobilise renewable energies.

Source: Oxera.

*Main
conclusions
from the case
studies*

The relative size of the aid, breadth of the aid and frequency of the aid are key factors in explaining the effects of specific aid on competition

The table below provides an overview of both the characteristics of the aid instruments that we have considered in our study and our conclusions.

Summary of the aid characteristics and conclusions

Industry	Aid objective	Form of aid	Total amount of aid	Impact on competition
Air transport	Regional aid	Annual payments from 2006–11	£46.8m; ¹ of which £6.6m was used directly to enhance the airport's capacity ²	Possible distortive effects
High-tech	R&D&I	One-off payment in 2007	€80.0m	Unlikely to be significant
Post	SGEI	Annual payments from 2000–17	€6.5bn	Some effects identified, but insufficient data available
Energy	Environmental protection and energy saving	Annual payments from 2009–14	€11.2m	Unlikely to be significant

Note: ¹ This is calculated as the costs financed by EU sources (£22.m) and national sources (£24.3m). For further details, see European Commission (2009), 'State aid N 269/2009 – United Kingdom Newquay Cornwall Airport Development', 2 July, para. 55. ² This is calculated assuming that the proportion of the total costs relating to the capacity expansion, 14%, has not changed from the 2007 decision and that the aid intensity, 69%, is equal across the four categories of costs, namely, the airport transition infrastructure, the airport's interim development strategy (capacity expansion), post-transition CAA licence, and land purchase. For further details, see European Commission (2007), 'State aid No N 303/2007 – United Kingdom Newquay Cornwall Airport Development', 23 October, p. 6 and European Commission (2009), 'State aid N 269/2009 – United Kingdom Newquay Cornwall Airport Development', 2 July, para. 73.

Source: Oxera.

From the four case studies, we can draw conclusions about different dimensions that may be relevant in assessing the impact of aid on competition.

- **Relative amount of the aid:** in the R&D&I and energy case studies, the amount of aid was small relative to the market size (less than 1%), and we concluded that the aid was unlikely to have distorted competition (see the table below). In contrast, in the airport case study, the aid amounted to 51%¹ of the total revenues of regional airports in South West England, and we concluded that the aid might have caused distortions to competition. Therefore, our analysis suggests that the relative size of the aid could be informative as regards the magnitude of the distortions to competition.

¹ The market value used to calculate the relative size of the aid represents the average aeronautical and non-aeronautical revenues at Newquay, Plymouth, Exeter and Bristol airports over the 2007–11 period.

Relative size of the aid in the case studies

Case study	Amount of aid	Size of the market	Relative size of the aid
Regional aid to Cornwall Airport Newquay	£46.8m; ¹ of which £6.6m was used directly to enhance the airport's capacity ²	£91m (average from 2007 to 2011)	51% ³
R&D&I aid to Soitec	€80.0m (in 2007)	€16.5bn (in 2007)	<1%
SGEI aid to Poste Italiane	€6.5bn (from 2000 to 2017)	€73bn ⁴ (average from 2000 to 2017)	9%
Environmental aid to Roquette Frères	€11.2m	€5.8bn (in 2012)	<1%

Note: The relative size of the aid compares the total amount of the aid, and a yearly measure of the market size. ¹ This is calculated as the costs financed by EU sources (£22.m) and national sources (£24.3m). For further details, see European Commission (2009), 'State aid N 269/2009 – United Kingdom Newquay Cornwall Airport Development', 2 July, para. 55.

² This is calculated assuming that the proportion of the total costs relating to the capacity expansion, 14%, has not changed from the 2007 decision and that the aid intensity, 69%, is equal across the four categories of costs, namely, the airport transition infrastructure, the airport's interim development strategy (capacity expansion), post-transition CAA licence, and land purchase. For further details, see European Commission (2007), 'State aid No N 303/2007 – United Kingdom Newquay Cornwall Airport Development', 23 October, p. 6 and European Commission (2009), 'State aid N 269/2009 – United Kingdom Newquay Cornwall Airport Development', 2 July, para. 73. ³ The relative size of the aid is based on the total amount of the aid. If it is, instead, based on the aid that was used directly to enhance the airport's capacity, it would represent approximately 7% of the market size. For the SGEI case study, we used the average revenues of Poste Italiane, as no information about the market value was available. ⁴ The postal market size is based on revenues from Poste Italiane over the relevant period, since for much of the relevant period it was the sole provider of relevant services.

Source: European Commission, Oxera.

- **Breadth of the aid:** in the energy case study, we concluded that the existence of the 'Fonds Chaleur' scheme might have affected competition, while it is unlikely that aid granted to Roquette Frères alone would have created any distortions. This suggests that aid schemes that cover a number of companies in the same industry or market are more likely to affect competition than aid granted to only one company. Equally, granting aid to a company serving the majority of the market may have a greater impact on competition than granting aid to a company serving a smaller proportion of the market.
- **Frequency of the aid:** in the airport and post case studies, the aid was granted on a yearly basis in markets where entry represents a key driving force of competition.² Granting aid on a rolling basis in markets that are characterised by a degree of entry and exit is more likely to confer a competitive advantage to companies relative to potential entrants. In these cases, it is expected that the aid will have a greater impact on competition than in cases where the aid is provided only at one point in time. In the energy and R&D&I case studies, aid is provided only at one point in time in markets where demand and supply are likely to adjust to developments only

² In the airport case study, the aid that enabled Newquay Airport to continue its commercial operations led to the opening of new routes that competed with existing ones. In the post case study, market liberalisation led to the entry of new postal operators in the Italian market.

over the long term. Our analysis suggests that aid that is provided only over a short period of time is less likely to affect competition, particularly in those markets where supply and demand are not able to adjust quickly in response to developments.³

The conclusions set out above are based on the results of ex post evaluations of aid measures. It is plausible that similar conclusions would apply to ex ante assessments of the compatibility of aid, and it is very likely that additional conclusions could be drawn from a greater number of case studies.

On the basis of these conclusions, the impact of aid on competition is likely to differ depending on the circumstances of each case. It is important therefore that the state aid assessment reflects the specifics of each case.

It may not always be necessary, however, to undertake a detailed assessment of the impact of aid on competition in all of the relevant markets. This may be the case, for example, where the magnitude of the aid granted is small relative to the size of the affected market(s). In this case, the measure is unlikely to have an appreciable effect on competition.

*Main insights
in terms of
methodology*

The techniques usually used in antitrust and merger assessments can be used in ex post assessments of state aid, but there are some specific challenges

Tools commonly used in antitrust and merger analysis can be applied to assess the impact of aid on competition. This is because all of these assessments essentially explore the impact of a certain shock—a merger, a company's commercial behaviour or the receipt of state aid—on the level of competition in the affected market(s). The general framework for assessing these shocks is therefore largely similar. In each case, the underlying shock needs to be described and the affected market(s) delineated. This forms the basis for identifying the relevant counterfactual (i.e. what would have happened with/without the shock) and measuring the impact on competition by means of a factual/counterfactual comparison.

However, it is important that the application of such tools is tailored to reflect the differences between state aid assessments and merger control or antitrust investigations.

Market definition

In competition assessments, market definition provides an analytical framework in the sense that it separates markets that are affected by a certain shock from those that are not. At the heart of market definition lies the question of substitutability. Products and services that are substitutable—from either a demand perspective or a supply perspective—fall within the same market. These principles apply to mergers, antitrust investigations and state aid cases equally.

In merger control and antitrust, the typical aim of the assessment is to identify potential effects that distort competition arising from (increased) market power.⁴ The corresponding theories of harm often relate to higher prices, lower quality,

³ Our research did not allow us to gain insights on the relative magnitude of the impacts of aid aimed at reducing fixed costs, and aid aimed at reducing operating costs. However, if we presume that aid granted on a rolling basis is more likely to affect operating costs, and aid granted as a one-off is more likely to affect fixed costs, the insights we highlight in relation to the frequency of the aid might be applicable.

⁴ Such assessments usually focus on consumer welfare and the impact on prices or quality, while in the context of state aid, the focus is more on the forces driving competition than on consumer welfare.

etc. Consequently, the emphasis in market definition is often from the perspective of the consumer.

In contrast, state aid is often supposed to result in lower prices and higher quality. The aim of state aid control is therefore to identify possible competitive distortions arising from changes in firm behaviour triggered by the receipt of aid. As such, the market definition exercise in state aid assessments relies more on the supply side—i.e. the effect of aid on suppliers.

It is also important that the market definition exercise considers the competitive forces beyond the short/medium term, as highlighted in the R&D&I case study. Given that state aid often enables lower prices, improved quality and/or greater innovation, it is possible that the aid benefits consumers in the short term but has an adverse effect in the longer term. For instance, in the airport case study, we observe that total passenger traffic at Newquay Airport increased following the aid. We also show that it is possible that the aid might have represented one of the factors that contributed towards the demise of Plymouth Airport. It means that in the short term, the aid might have benefited passengers, while in the medium term, the available options, at least for some passengers, might have declined. Therefore, it is possible that the impact of the aid could have differing effects over the short term versus the long term.

The airport case study also shows that in state aid assessments it may be advisable to initially consider a relatively wide market definition in order to test whether certain hypotheses are supported by the data.

Describing the counterfactual

All competition assessments are based on a comparison of two states of the world: a factual state and a counterfactual state. In forward-looking assessments, the factual state is an unknown situation where we suppose that a future shock has already occurred—such as a merger or acquisition. Correspondingly, the counterfactual is a known state where that shock has not occurred. In backward-looking assessments—such as antitrust investigations or state aid cases—the factual and counterfactual are slightly different in the sense that in the known factual state, a shock really occurred, while the counterfactual is the unknown situation that would have prevailed in the absence of the shock.

Building on the Commission's 2014 guidance,⁵ this report describes different approaches that economists may follow to determine the appropriate counterfactual in ex post evaluations. These approaches rely on techniques that are similar to those used in the context of merger control and antitrust investigations.

However, differences may arise where the assessment is undertaken on an ex post rather than an ex ante basis. The factual and counterfactual scenarios in ex ante assessments resemble those in merger assessments—i.e. the factual is unknown (what happens with the aid) and the counterfactual is known (what happens if the aid is not granted) but uncertain. In addition, in ex ante assessments and especially in determining the incentive effects of the aid, the counterfactual describes the predicted performance of the company if it does not receive the aid (e.g. profitability, sales, investment levels), while in ex post

⁵ European Commission (2014), 'Common methodology for state aid evaluation', Commission Staff Working Document, 28 May, http://ec.europa.eu/competition/state_aid/modernisation/state_aid_evaluation_methodology_en.pdf.

assessments the counterfactual describes the performance of the market had the aid not been granted.

The factual and counterfactual scenarios in ex post assessments are similar to those in antitrust investigations—i.e. the factual is the situation that prevails taking for granted that the shock has occurred while the counterfactual is the situation that prevails in the absence of the shock.

Measuring the impact on competition

Common among all competition assessments is also the step of measuring the impact of a given shock on competition. Measuring the impact on competition requires a comparison of the counterfactual with actual data. There are several approaches to this, the simplest of which is qualitative. This approach examines the evolution of key variables of interest (such as firms' R&D&I expenditure) in the factual and in the counterfactual. It is only appropriate if there is one effect that can account for any breaks in the trend, or if any alternative effects are likely to be negligible.

If several effects occur at the same time, which can influence competition, the descriptive analysis will not be conclusive and more sophisticated techniques such as econometrics can then be used to compare the counterfactual with actual data. The airport case study illustrates how useful econometric analysis is in some circumstances. As the provision of aid to Newquay Airport coincided with the onset of the financial crisis, it was important to use econometric analysis to be able to separately delineate the impact of the aid on passenger traffic from wider market developments, such as the financial crisis.

Data availability

All competition assessments rely on the availability of robust and reliable data and information. In the case of mergers and antitrust investigations, competition authorities may exercise their legal powers to obtain data and information from the relevant parties. In state aid cases, such data-gathering powers can usually not be relied on, which shifts the emphasis onto data and information in the public domain or provided by parties on a voluntary basis.

This report has been prepared based on information that market participants volunteered and/or that was publicly available. As we highlight in the report, if further data had been available, we could have tested additional hypotheses and undertaken a more in-depth assessment of the actual impact of aid on competition for the R&D&I, energy and post case studies. For the airport case study, publicly available data enabled a much more detailed analysis than in the other cases.

The data we obtained for the R&D&I, energy and post case studies did not allow us to estimate a number of effects separately, due to the lack of granularity and consistency in the data. Furthermore, as we highlight in the R&D&I case study in particular, it is important to be able to consider a sufficiently long time period in order to ensure that the full effects of the aid are captured.

Our experience from the case studies therefore suggests that without the authority to formally require parties to provide the information, obtaining all of the necessary data to enable the full set of hypotheses to be tested may not always be feasible.

Nevertheless, as shown in this report, meaningful conclusions on the impact of specific aid on competition can often be drawn based on public information and the analytical framework developed in this study. Obtaining access to confidential information through formal means would allow for even more robust ex post assessments of state aid.

*Main insights
in terms of
policy*

The assessments do not always need detailed or complete analyses

Magnitude of the aid granted

When considering the likely effects of an aid measure on competition, it can be helpful to put the size of the measure (in monetary terms) into the context of the size of the affected markets. As highlighted by the case studies selected for this report, the smaller the relative size of an aid measure, the smaller likelihood of that measure distorting competition in the affected market(s).

In some cases, the measure may be so small in relative terms that a competitive effect can be ruled out, making a detailed competition analysis unnecessary. The energy case study highlights this point. Here, the aid granted reduced the beneficiary's demand for natural gas. However, the relatively small volume of gas that the aid recipient would have demanded without the aid relative to the scale of the natural gas market, makes it so unlikely that the aid distorted competition that a detailed analysis was unnecessary for this market.

However, while an individual measure of an aid scheme may have a negligible effect on the affected market, the scheme with all its measures combined may still distort competition. Again, this is illustrated by the energy case study. Here, the aid-fuelled demand of low-quality wood might not have had a competitive effect, while increased demand from all beneficiaries together might have had.

Effect on adjacent markets

The airport case study highlights that some aid measures have a direct effect on the markets that they apply to (here, the provision of airport services). In other cases, however, aid affects adjacent upstream or downstream markets. This is highlighted in the energy case study, where the aid granted did not affect the market for heat, but instead the upstream market for wood used to generate that heat.

Design of the aid measure

The energy case study also highlights the importance of the design of the aid scheme with regard to avoiding distortions in competition. While the scheme in question incentivised the beneficiary to switch from burning gas to burning wood, and therefore risked a distortion of competition in that market, it could have gone one step further and incentivised the beneficiary to burn by-products of its own production processes (as is done in the sugar industry). Whether this would have been viable from a technical perspective is not an economic question, however, and therefore falls outside of the scope of this report.

The importance of data

The postal case study highlights the importance of data availability when carrying out competition assessments. Unlike in merger cases and antitrust investigations, for this report we could not draw on data from outside the public domain or that companies did not provide voluntarily. The postal case study

identifies some plausible competitive effects of the aid granted but is unable to provide firm conclusions.

Quantitative versus qualitative analyses

Sophisticated quantitative analyses are not always required. The R&D&I case study illustrates the insights from relatively high-level analyses such as market share developments. In this study, the recipient of the aid was small and saw decreasing market share, making it unlikely that the aid granted had distortionary effects on competition.

The airport case study, in contrast, highlights what useful analyses can be completed when detailed data is available (and for this case study, even available in the public domain). Using data on passenger numbers, the case study was able to identify changes in usage patterns and relate these to a number of causal factors, including the provision of aid to a regional airport.

Résumé analytique

Contexte

La Commission Européenne donnera plus de poids à l'évaluation ex post des aides d'État

La Commission Européenne a initié une série de mesures relatives à la modernisation de sa politique en matière d'aides d'État, visant à améliorer le contrôle de ces aides. La réforme repose sur plusieurs piliers, dont l'évaluation ex post de l'impact des aides sur la concurrence. Dans un tel contexte, la Commission donnera plus de poids à l'évaluation ex post des aides d'État afin de déterminer les distorsions de marché que les mesures sont susceptibles d'introduire.

Objectifs de l'étude

Le rapport Oxera définit un cadre d'analyse pour l'évaluation ex post de l'impact des aides d'État sur la concurrence et l'applique à quatre études de cas différentes

La Commission Européenne a chargé Oxera de mener une étude évaluant l'impact réel d'aides d'État sur la concurrence, et en particulier les éventuelles distorsions de concurrence pouvant en découler. Le but de cette étude est de passer en revue et d'évaluer une sélection de quatre cas différents d'aides accordées au cours des cinq à dix dernières années.

Dans ce contexte, Oxera a développé un cadre d'analyse pour évaluer l'impact ex post des aides d'État sur la concurrence. Ce cadre d'analyse suit les mêmes principes que les cadres utilisés dans l'évaluation des concentrations, et des pratiques anticoncurrentielles. Cependant, il est adapté aux spécificités des aides d'État. Même s'il a été développé pour l'évaluation ex post des aides, la plupart des éléments qui le constituent sont valides pour une évaluation ex ante.

Nous appliquons ce cadre d'analyse à quatre cas pour lesquels la Commission a autorisé le versement d'aide à des entreprises isolées.

Conception du cadre d'analyse

Le cadre d'analyse suit la structure générique des études d'impact, mais il est adapté aux spécificités des aides d'État

Le cadre d'analyse que nous avons développé suit trois étapes :

1. La description de l'aide et ses caractéristiques
2. L'explication des effets de l'aide sur le marché
3. L'évaluation de la magnitude de l'impact de l'aide sur le marché

Cette structure est détaillée dans la figure ci-dessous.

Cadre d'analyse pour l'évaluation de l'impact des aides d'État sur la concurrence



Source : Oxera.

Puisque l'impact de l'aide sur la concurrence est susceptible de varier en fonction du type d'aide, le cadre a été conçu pour tenir compte des différents types d'aide, notamment : les aides environnementales, les aides pour le développement régional, les aides pour la recherche, le développement et l'innovation (R&D&I), et les aides relatives aux services d'intérêt économique général (SIEG). Cependant, le cadre d'analyse est assez générique pour évaluer l'impact des aides au sauvetage et à la restructuration d'entreprises en difficulté, et des aides à la promotion de l'exportation. Le cadre a pour objectif premier de déterminer les hypothèses à tester et d'identifier les indicateurs de concurrence qui permettent d'examiner l'impact de l'aide. L'impact sur la concurrence est déterminé par comparaison d'un scénario hypothétique (le contrefactuel) où l'aide n'aurait pas été octroyée, au scénario factuel pour lesquels nous avons des données réelles.

Choix des quatre études de cas

Les études de cas ont été sélectionnées de sorte qu'elles couvrent diverses industries et différents types d'aides

En collaboration avec la Commission, Oxera a sélectionné quatre études de cas (voir encadré ci-dessous) couvrant divers objectifs, secteurs économiques et montants. Conformément aux exigences de la Commission pour l'analyse, nous avons choisi ces cas en tenant compte de critères tels que :

- la date de la décision : nous considérons les décisions publiées entre le 1er janvier 2006 et le 31 décembre 2011 ;

- le secteur économique : nous délimitons, au moyen de codes NACE, un certain nombre de secteurs économiques dans lesquels Oxera bénéficie d'une expérience pertinente en matière de concurrence – énergie, transports, eau et propreté, télécoms et poste, et appareils électroniques de consommation ;
- le type de décision : nous portons notre attention sur les types de décision suivants : décision de ne pas soulever d'objections, décision d'ouverture de la procédure formelle d'examen, et décision positive ;
- les objectifs principaux : nous nous concentrons sur la protection environnementale, le développement régional, la recherche, le développement et l'innovation (R&D&I), et les services d'intérêt économique général (SIEG) ;
- le type de cas : nous nous concentrons uniquement sur les aides qui n'ont pas été octroyées sur base d'un plan déjà approuvé.

Description des quatre études de cas

Aide régionale à un aéroport en Grande-Bretagne – cette étude de cas traite de l'aide octroyée au Cornwall Airport Newquay (NQY). Cet aéroport régional était auparavant utilisé par les Forces Royales Aériennes britanniques (RAF) et par les avions commerciaux de petites tailles. Après l'annonce de la cessation des activités de la RAF dans cet aéroport, ce dernier a perçu une aide d'État annuelle de 2006 à 2011 afin de le transformer en aéroport viable à part entière.

R&D&I en France—cette étude traite d'une aide octroyée en 2007 à Soitec, un producteur français de substrats, pour NanoSmart, un programme français de recherche et développement en nanotechnologie. Le programme visait à développer des supports pour applications micro- et optoélectroniques.

Secteur de la poste en Italie—cette étude traite d'une aide SIEG octroyée à Poste Italiane pour le maintien de l'obligation de service public entre 2000 et 2017. Poste Italiane a reçu du gouvernement italien, une compensation financière sous forme de financement direct de l'État et la protection de la concurrence sous la forme du droit à être le seul fournisseur pour une zone particulière pendant une durée déterminée.

Marché de l'énergie en France—cette étude traite d'une aide octroyée par le "Fonds Chaleur" de l'ADEME à Roquette Frères (RF) pour la construction d'une chaufferie biomasse au bois à Beinheim, en Alsace. Auparavant, Roquette, fournisseur d'amidon et de ses dérivés, utilisait une chaufferie au gaz. Le "Fonds Chaleur" a pour ambition de développer la filière biomasse en France afin de réduire les émissions de dioxydes de carbone provenant de la production de chaleur, ainsi que de promouvoir l'emploi, l'investissement et la meilleure utilisation des ressources dans le secteur.

Principales conclusions des études de cas

La taille relative de l'aide, son ampleur ainsi que sa fréquence sont des facteurs clés expliquant les effets d'une aide spécifique sur la concurrence

Le tableau ci-dessous fournit un aperçu des caractéristiques des d'aide que nous avons prises en compte dans notre étude et nos conclusions.

Résumé des caractéristiques de l'aide et conclusions

Secteur	Objectif de l'aide	Forme de l'aide	Montant total de l'aide	Impact sur la concurrence
Transport aérien	Aide régionale	Paiements annuels de 2006 à 2011	46,8 M£, dont 6,6 M£ dédiés à l'expansion de la capacité de l'aéroport	Éventuels effets de distorsion
High-tech	R&D&I	Paiement unique en 2007	80 M€	Probablement négligeable
Poste	SIEG	Paiements annuels de 2000 à 2017	6,5 Md€	Certains effets identifiés mais données disponibles insuffisantes
Énergie	Protection de l'environnement et économie d'énergie	Paiements annuels de 2009 à 2014	11,2 M€	Probablement négligeable

Remarque : le détail des calculs est présenté dans la version anglaise du résumé.

Source : Commission Européenne, calculs d'Oxera.

Suite aux quatre études de cas, nous pouvons tirer des conclusions sur différentes dimensions pouvant s'avérer pertinentes dans l'évaluation de l'impact de l'aide sur la concurrence.

- Montant relatif de l'aide** : dans les études de cas « R&D&I » et « énergie », le montant de l'aide était peu élevé par rapport à la taille du marché (moins d'un pourcent). Nous avons conclu que l'aide n'avait probablement pas créé de distorsion de la concurrence (voir le tableau ci-dessous). En revanche, dans l'étude de cas « aéroport », l'aide représentait environ 51% des revenus aéronautiques et non aéronautiques des aéroports de la région du Sud-Ouest de l'Angleterre⁶, nous avons conclu que l'aide a pu créer des distorsions de la concurrence. Par conséquent, notre analyse suggère que la taille relative de l'aide puisse apporter des informations sur l'ampleur des distorsions de la concurrence.

Taille relative de l'aide dans les études de cas

Étude de cas	Montant de l'aide	de Taille du marché	Taille relative de l'aide
Aide régionale à Newquay	46,8 M£, dont 6,6 M£ dédiés à l'expansion de la capacité de l'aéroport	91 M£ (moyenne de 2007 à 2011)	51%
Aide de R&D&I à Soitec	80 M€	16,5 Md€ (en 2007)	<1%
Aide de SIEG à la Poste Italiana	6,5 Md€	73 Md€	9%
Aide environnementale à Roquette Frères (RF)	11,2 M€	5,8 Md€ (en 2012)	<1%

Remarque : le détail des calculs est présenté dans la version anglaise du résumé.

⁶ Revenus des aéroports de Newquay, Exeter et Bristol sur la période 2007-2011.

Source: Commission Européenne, calculs d'Oxera.

- **Ampleur de l'aide** : dans l'étude de cas « énergie », nous avons conclu que l'existence du Fonds Chaleur pouvait avoir affecté la concurrence, tandis qu'il est peu probable que l'aide accordée à Roquette Frères ait pu à elle seule créer la moindre distorsion. Cela suppose que les programmes d'aide couvrant un certain nombre d'entreprises dans le même secteur ou le même marché sont davantage susceptibles d'affecter la concurrence que les aides accordées à une seule entreprise. De la même manière, le fait d'accorder une aide à une entreprise desservant la majorité du marché peut avoir un impact plus important sur la concurrence que celui d'accorder une aide à une entreprise desservant une plus petite proportion du marché.
- **Fréquence de l'aide** : dans les études de cas « aéroport » et « poste », l'aide a été accordée sur une base annuelle à des marchés dans lesquels les entrées représentent le principal moteur de la concurrence⁷. L'octroi d'aides sur une base continue à des marchés caractérisés par un certain degré d'entrée et de sortie est davantage susceptible de conférer un avantage concurrentiel aux entreprises sur le marché par rapport aux potentiels entrants. Dans ces cas, l'aide semble avoir davantage d'impact sur la concurrence que dans les cas où elle est octroyée en une seule fois. Dans les études de cas de « énergie » et « R&D&I », l'aide est fournie à un moment donné aux marchés dont l'offre et la demande sont susceptibles de s'adapter aux développements seulement sur le long terme. Notre analyse suggère que l'aide qui est fournie sur une courte période de temps est moins susceptible d'avoir un impact sur la concurrence.

Nous avons tiré les conclusions ci-dessus des évaluations ex post des mesures d'aide. Il est possible que des conclusions similaires puissent s'appliquer aux évaluations ex ante, et il est fortement probable que des conclusions supplémentaires puissent être tirées d'un plus grand nombre d'études de cas.

Sur base de ces conclusions, l'impact de l'aide sur la concurrence est susceptible de varier selon les circonstances de chaque cas. Il est donc important que l'évaluation de l'aide d'État reflète les spécificités du marché où l'aide a été octroyée. Il n'est toutefois pas toujours nécessaire d'entreprendre une évaluation détaillée de l'impact de l'aide sur la concurrence dans tous les marchés pertinents.

*Conclusions
méthodologiques
de l'étude*

Les techniques habituellement utilisées pour des évaluations d'antitrust et de fusion peuvent être adaptées à des évaluations ex post en matière d'aides d'État, en dépit des défis inhérents à ce domaine

Les outils communément utilisés dans les analyses antitrust et de fusions peuvent être appliqués pour évaluer l'impact de l'aide sur la concurrence. En effet, ces analyses cherchent essentiellement à évaluer l'impact d'un choc – une fusion, le comportement d'une entreprise, une aide – sur le niveau de concurrence des marché(s) affecté(s). Le cadre d'analyse de ces chocs est de ce fait identique. Dans chacun des cas, l'analyse doit décrire les chocs, et identifier les marchés qu'ils perturbent. Ces étapes permettent de définir le contrefactuel pertinent (c'est-à-dire ce qui serait advenu en l'absence du choc)

⁷ Dans l'étude de cas « aéroport », la création d'un nouvel aéroport a entraîné l'ouverture de nouveaux itinéraires alors en concurrence avec ceux préexistants. Dans l'étude de cas « poste », la libéralisation du marché a provoqué l'entrée de nouveaux opérateurs postaux sur le marché italien.

et d'évaluer l'impact du choc en recourant à une comparaison factuel / contrefactuel.

Néanmoins, il est important que l'application de tels outils soit adaptée afin qu'elle puisse refléter les différences entre l'évaluation d'aides d'État, et l'évaluation de concentrations ou de pratiques anticoncurrentielles.

Définition du marché

Dans l'évaluation des effets d'un choc sur la concurrence, l'étape de définition des marchés permet de différencier les marchés qui sont affectés par le choc des marchés qui ne le sont pas. Au cœur de cette évaluation, se trouve le principe de substituabilité. En effet, des produits et services considérés comme substituables – du point de vue de la demande ou de l'offre—font partie d'un même marché. Ce principe concerne de la même manière les fusions, les enquêtes antitrust, et les cas d'aides d'État.

Dans le cadre de l'évaluation des concentrations et des pratiques anticoncurrentielles, le but des analyses est en général d'identifier de potentielles distorsions de la concurrence découlant d'un pouvoir de marché (accru).⁸ Les théories du préjudice associées dénoncent souvent une augmentation des prix, une diminution de la qualité des biens et services affectés, etc. En conséquence, le point de vue qui est considéré en premier lieu est celui des consommateurs.

En revanche, les aides d'État ont en général pour résultat de diminuer les prix et d'augmenter la qualité des biens et des services. Ainsi, l'objectif du contrôle des aides d'État est d'identifier de potentielles distorsions de la concurrence découlant de changements de comportement de l'entreprise, déclenchés par l'octroi de l'aide. De ce fait, l'exercice de la définition de marché dans le cadre d'évaluations d'aides d'État met davantage l'accent sur l'offre que dans le cadre de contrôle de fusions et d'antitrust.

Il importe également que l'exercice de définition de marché prenne en considération les forces concurrentielles au-delà du court / moyen terme, tel que souligné dans l'étude de cas « R&D&I ». Puisque l'aide favorise souvent des prix plus bas, une meilleure qualité et / ou une plus grande innovation, il est possible que l'aide puisse bénéficier au consommateur sur le court terme, et lui causer préjudice sur le long terme. Par exemple, dans l'étude de cas sur les aéroports, nous observons une augmentation substantielle du nombre de passagers à l'aéroport de Newquay suite à l'octroi de l'aide. Par la suite, nous montrons que l'aide a pu être l'un des facteurs contribuant au déclin de l'aéroport de Plymouth. Ceci signifie que, sur le court terme, l'aide aurait été bénéfique pour les passagers, alors que sur le moyen terme, les options disponibles aux consommateurs ont décliné. Il est dès lors possible que l'aide puisse avoir des effets différents sur le court et sur le moyen terme.

L'étude de cas relative à l'aéroport de Newquay montre qu'il est parfois préférable d'adopter une définition de marché élargie afin de tester certaines hypothèses, et voir si elles sont compatibles avec les données collectées.

⁸ Ce genre d'évaluation se concentre généralement sur le bien-être du consommateur et sur l'impact des prix sur la qualité, tandis que dans le contexte de l'aide d'État, l'attention est plus portée sur les éléments moteurs de la concurrence, plutôt que sur le bien-être du consommateur.

Description du contrefactuel

L'évaluation des effets d'un choc repose habituellement sur la comparaison de deux scénarios : le factuel et le contrefactuel. Dans des évaluations prospectives, comme dans le cadre d'une fusion, le factuel est un scénario inconnu où l'on suppose que le choc est déjà advenu, et le contrefactuel, un scénario connu où il n'y a pas eu de choc. Dans des évaluations rétrospectives, comme des enquêtes antitrust, le factuel est une situation connue où le choc a déjà eu lieu, et le contrefactuel, la situation inconnue qui aurait prévalu en l'absence du choc.

Ce rapport décrit différentes approches que pourraient suivre les économistes afin de définir un scénario contrefactuel adéquat dans le cadre d'évaluations ex post en s'appuyant sur les recommandations de la Commission de 2014.⁹ Ces approches reposent sur des techniques similaires à celles utilisées dans le cadre d'enquêtes sur des fusions ou sur des affaires d'antitrust.

Cependant, des différences peuvent apparaître lorsque l'évaluation est menée à titre ex post plutôt qu'ex ante. Le contrefactuel dans les évaluations ex ante est similaire au contrefactuel dans le cadre de fusions : le factuel est inconnu (ce qui se passe avec l'aide) et le contrefactuel (ce qui serait passé si l'aide n'avait pas été octroyée) est connu mais incertain. De plus, dans les évaluations ex ante et dans la détermination des effets incitatifs de l'aide en particulier, le contrefactuel décrit la performance de l'entreprise en l'absence de l'aide (rentabilité, vente, niveaux d'investissements, etc.). En revanche, dans les évaluations ex post, le contrefactuel décrit la performance du marché si l'aide n'avait pas été octroyée.

Les scénarios factuel et contrefactuel dans des évaluations ex post sont semblables au contrefactuel en antitrust : le factuel est la situation qui prévaut en supposant que le choc est survenu, alors que le contrefactuel est la situation qui aurait prévalu en l'absence de choc.

Mesure de l'impact sur la concurrence

Mesurer l'impact de l'aide nécessite de comparer le contrefactuel aux données réelles. Plusieurs approches de comparaison existent. La plus simple est qualitative ; elle repose sur l'examen de l'évolution de variables d'intérêt (telles que les dépenses en R&D&I d'une entreprise) dans les scénarios factuel et contrefactuel. Cette approche n'est pertinente que si un seul facteur peut expliquer les variations de la tendance observée, ou si l'effet des autres facteurs sur la tendance sont probablement négligeables.

Si plusieurs facteurs semblent expliquer la tendance, l'analyse descriptive ne sera pas concluante ; des techniques plus sophistiquées, telles que l'économétrie pourront alors être utilisées pour comparer le contrefactuel aux données réelles. L'étude de cas relative à l'aéroport de Newquay illustre ce point et son importance. En effet, le versement de l'aide a coïncidé avec la crise financière. Recourir à des techniques économétriques a permis de déterminer séparément l'impact de l'aide sur le nombre de passagers, et celui d'autres développements de marché, comme la crise financière.

⁹ European Commission (2014), 'Common methodology for state aid evaluation', Commission Staff Working Document, 28 May, http://ec.europa.eu/competition/state_aid/modernisation/state_aid_evaluation_methodology_en.pdf.

Disponibilité des données

L'évaluation de l'impact d'un choc nécessite l'obtention de données robustes et fiables. Dans le cadre de fusion, ou d'enquêtes plus généralement, les autorités de concurrence peuvent utiliser les pouvoirs qui leur sont conférés pour obtenir des données de la part des parties concernées. Dans des cas d'aides d'États, les autorités de concurrence n'ont en général pas ces pouvoirs. En conséquence, les analyses doivent s'appuyer sur des sources publiques et des données que les parties transmettent d'elles-mêmes.

Notre rapport a été préparé sur la base des informations mises à disposition par les acteurs du marché et / ou disponibles au public. Si plus de données étaient disponibles, nous pourrions tester des hypothèses supplémentaires et mener une évaluation approfondie de l'impact réel de l'aide d'État sur la concurrence, pour les études de cas « R&D&I », « énergie » et « poste ». Pour l'étude de cas « aéroport », nous avons pu utiliser des données publiques détaillées qui nous ont permis d'affiner l'analyse.

Faute de données suffisamment granulaires, pour ces trois affaires, nous n'avons pas pu distinguer l'effet sur la concurrence des différents facteurs qui pourraient l'influencer. En outre, comme souligné dans le cas de l'étude portant sur la R&D&I en particulier, il est important de pouvoir prendre en considération une période suffisamment longue afin de s'assurer que l'ensemble des effets de l'aide soit saisi.

Un des enseignements de cette étude suggère dès lors que, faute d'une autorité permettant de pouvoir formellement exiger des parties de fournir l'information, obtenir l'ensemble des données nécessaires au test de la totalité des hypothèses n'est pas toujours possible.

Néanmoins, comme nous le montrons dans ce rapport, il est déjà possible de parvenir à des conclusions significatives sur la base d'informations publiques et du cadre d'analyse développé dans cette étude. Obtenir l'accès à des informations confidentielles par des biais formels permettrait des évaluations ex post d'aides d'État encore plus robustes.

*Enseignements
de l'étude*

Les évaluations ne doivent pas nécessairement être approfondies ou complètes

La magnitude de l'aide

Lors de l'évaluation de l'effet potentiel d'une aide sur la concurrence, il peut être utile de comparer la taille de l'aide (en termes monétaires) à la taille du marché ou des marchés concerné(s). Comme nous l'avons souligné dans les études de cas du rapport, plus l'aide est petite de manière relative, moins elle a de risque de distordre la concurrence dans les marchés concernés.

Dans certains cas, où l'aide serait particulièrement petite par rapport à la taille totale du marché, l'absence d'effet sur la concurrence peut être supposée sans avoir à mener une analyse détaillée. L'étude de cas relative au secteur de l'énergie souligne ce point. En effet, l'aide octroyée permettait à son bénéficiaire de réduire sa consommation de gaz naturel. Cependant, le volume que le bénéficiaire aurait consommé en l'absence de l'aide est si infime comparé aux volumes échangés sur le marché du gaz naturel, qu'il est hautement improbable que l'aide ait distordu la concurrence. Une analyse détaillée de l'impact de l'aide n'était donc pas nécessaire.

Par ailleurs, il n'est pas impossible qu'un programme comprenant de nombreuses aides puisse avoir un effet sur la concurrence, alors qu'une mesure isolée n'en aurait pas. Ce point est à nouveau un enseignement de l'étude de cas relative aux marchés de l'énergie. En effet, l'aide octroyée à l'entreprise n'a pas augmenté la demande de bois de faible qualité de manière à distordre la concurrence sur les marchés. En revanche, les différentes aides versées au travers du Fonds Chaleur ont pu conduire à une augmentation de la demande menant à des distorsions conséquentes.

Effets sur les marchés connexes

L'étude de cas relative à l'aéroport de Newquay montre que certaines aides peuvent avoir un effet sur le marché où elles sont octroyées (ici, le marché du transport aérien), tandis que d'autres aides peuvent avoir un effet sur des marchés connexes. Dans l'étude de cas relative au secteur de l'énergie, le marché affecté n'est pas le marché de la production de chaleur mais celui du marché du bois de faible qualité.

La conception des programmes d'aide

L'étude de cas relative au secteur de l'énergie montre que parfois le programme d'aides d'État en lui-même, tel que celui du Fonds chaleur, détermine la nature et la magnitude des effets distorsifs des aides octroyées. Ainsi la conception des programmes d'aides peut être essentielle dans l'analyse concurrentielle. Le Fonds Chaleur avait pour objectif d'inciter les bénéficiaires des aides à reporter leur consommation de gaz vers une consommation de bois. Le programme aurait pu aller plus loin et obliger les bénéficiaires à ne brûler que les reliquats du processus de production (comme c'est le cas pour l'industrie sucrière). La possibilité technique d'une telle solution ne relève pas de notre expertise, et de ce fait n'est pas étudiée dans ce rapport.

L'importance des données

L'étude de cas relative au secteur postal a montré que la disponibilité des données était cruciale pour évaluer l'impact d'une aide sur la concurrence. Contrairement aux enquêtes liées à des fusions ou à des comportements anticoncurrentiels, notre étude n'a pu utiliser que des données disponibles publiquement. Dans cette étude de cas, nous avons identifié des effets

anticoncurrentiels possibles, mais nous n'avons pu conclure, faute de données. L'étude de cas relative à l'aéroport de Newquay montre en revanche que le recours à des données détaillées permet d'entreprendre des analyses fines sur les effets d'une aide sur la concurrence.

Analyses qualitatives vs. quantitatives

Des analyses quantitatives sophistiquées ne sont pas toujours nécessaires. L'étude de cas relative aux recherches R&D illustre ce point. En effet, dans cette étude de cas, le bénéficiaire de l'aide était petit, et sa part du marché a décliné sur la période d'analyse. Ainsi, l'aide n'a vraisemblablement pas eu d'effet distorsif sur la concurrence.

L'étude de cas relative à l'aéroport de Newquay en revanche montre quelles sont les analyses qui peuvent être mises en œuvre lorsque les données sont disponibles (dans le cas présent, publiquement). En utilisant des données sur le nombre de passagers, nous avons pu identifier un changement de comportement des usagers et de dégager un nombre de causes, comme l'octroi d'une aide à un aéroport régional.

1 Introduction

1.1 Context of the study

The European Commission (the Commission) has asked Oxera to conduct a study on ex post assessments of the impact of state aid on competition.

This study should be considered in the context of the EU state aid modernisation (SAM) reform, which aims to improve state aid control. The reform is based on several pillars, including the evaluation of state aid measures.¹⁰ In this specific context, the Commission is introducing a greater role for standard competition analysis, especially in the assessment of the market distortions that aid schemes may introduce.¹¹

To provide guidance on state aid evaluation, the Commission published the ‘Common methodology for State aid evaluation’ in 2014 (‘the 2014 guidelines’).¹² These guidelines provide a high-level overview of the main requirements of ex post evaluations, although they do not focus exclusively on the assessment of the impact of state aid on competition.

Building on the 2014 guidelines, for this study we have developed an analytical framework that can be used to assess the actual impact of state aid on competition. This framework is consistent with techniques used in merger and antitrust assessments but tailored to the specificities of state aid. Although it focuses on ex post assessment of the impact of state aid on competition, most elements of the framework can also be used for ex ante evaluation.

We have applied this analytical framework to four cases where the Commission authorised the granting of aid to individual companies. In line with the Commission’s requirements for the study, we selected these case studies taking into account criteria such as:

- the decision date: we considered decisions published between 1 January 2006 and 31 December 2011, such that sufficient time had passed to carry out an ex post assessment;
- the economic sector: we filtered through the use of NACE codes for a number of economic sectors where we have relevant competition experience—energy, transport, water and waste, telecoms and post, and consumer electronics;
- the decision type: we focused our attention on the following decision types: decision not to raise objections; decision to initiate the formal investigation procedure; positive decision;

¹⁰ The pillars are: (i) identifying common principles for assessing the compatibility of aid with the internal market, across various guidelines and frameworks; (ii) revising, streamlining and possibly consolidating state aid guidelines to make them consistent with those common principles; (iii) modernising the procedural Regulation and its implementation; (iv) requiring Member States to evaluate their main aid schemes. See European Commission, ‘State Aid Modernisation (SAM) and its implementation’, http://ec.europa.eu/competition/state_aid/modernisation/index_en.html.

¹¹ Koopman, J. (2015), ‘Economics in the SAM and future challenges’, Conference on Economics of State Aid Control, 23 September, slide 15.

¹² European Commission (2014), ‘Common methodology for state aid evaluation’, Commission Staff Working Document, 28 May, http://ec.europa.eu/competition/state_aid/modernisation/state_aid_evaluation_methodology_en.pdf.

- the primary objectives of the aid: we focused on environmental protection; regional development; research, development and innovation (R&D&I); and services of general economic interest (SGEI);
- the case type: we focused on aid that was not granted on the basis of an already approved scheme.

The four cases selected are listed below and described in more detail in Box 1.1.¹³

1. Regional aid given to Cornwall Airport Newquay in the UK.
2. R&D&I aid given to the NanoSmart programme in France.
3. SGEI aid given to Poste Italiane in Italy.
4. Environmental aid for the construction of a wood-fuelled biomass boiler in Beinheim, France.

Box 1.1 Description of the four case studies

Regional aid to an airport in the UK—this case study presents an example of aid given to Cornwall Airport Newquay, a regional airport previously used by the Royal Air Force (RAF) and for small-scale commercial purposes. Following the announcement that the RAF would cease its operations there, the airport received state aid for infrastructure development to transform it into a viable stand-alone airport on a yearly basis from 2006 to 2011.

R&D&I in France—this case study presents an example of aid given to the French NanoSmart nanotechnology R&D programme in 2007. The programme was aimed at developing substrates for micro- and optoelectronic applications.

Postal sector in Italy—this case study presents an example of SGEI aid given to Poste Italiane for maintaining the universal service obligation between 2000 and 2017. Poste Italiane received from the government monetary compensation in the form of direct state funding, and protection from competition in the form of a right to be the sole provider of a reserved area of the market for a certain period of time.

Energy market in France—This case study presents an example of environmental aid given to Roquette Frères S.A. (RF), a producer of starch and starch derivatives in Beinheim in the Alsace region of France, to construct a wood-fuelled biomass plant. The aid was granted from the 'Fonds Chaleur' scheme organised by the French Environment and Energy Management Agency (ADEME), which supported a number of biomass plants. The aim of the scheme was to reduce carbon dioxide emissions associated with the production of heat.

Source: Oxera.

1.2 Structure of the report

This report is structured as follows:

- section 2 describes the analytical framework that Oxera developed to assess the actual impact of state aid on competition;
- sections 3 to 6 apply the analytical framework to the four case studies and set out our findings;
- section 7 provides Oxera's overall conclusions;
- Appendix A1 describes our approach to case selection.

¹³ We detail our approach to case selection in Appendix A1.

2 Analytical framework for ex post evaluations of the impact of aid on competition

2.1 Objectives

The Commission instructed Oxera to carry out a study on ex post assessments of the impact of authorised aid on competition.

In the 2014 guidelines,¹⁴ the Commission provided a high-level overview of the main requirements for ex post evaluations, introducing the role of the evaluation plan, which defines the scope of the evaluation.¹⁵ The guidelines mention the types of questions that should be answered in order to assess the direct impact of the aid on the beneficiaries as well as the indirect effects on third parties. The guidelines do not focus specifically on the assessment of the impact of aid on competition, but instead provide types of questions to examine the main common assessment principles.¹⁶

In addition, the Commission's more general state aid guidelines, such as the sector-specific guidelines, provide an overview of some of the key factors to be considered when assessing the potential competitive effects of the aid.¹⁷

Building on the 2014 guidelines and the Commission's more general state aid guidelines, this section sets out a framework that can be used to assess the actual impact of the aid on competition. In line with the Commission's requirements, the framework reflects the substantive criteria for competition assessments adopted in merger control and antitrust cases.¹⁸

The framework takes into account the specificities of state aid as compared with competition assessments in mergers and antitrust. For example, in the assessment of mergers or cartels, the typical concern is that prices could increase and harm consumers; on the contrary, state aid may result in lower prices and/or improved product specifications. In turn, this could benefit consumers, at least in the short term.

Our framework has been designed for ex post evaluations, but in principle large parts of it can also be applied to the ex ante evaluation of state aid. The main difference is that the ex ante assessment of the compatibility of aid, which is undertaken before the aid is approved by the Commission, relies on projections of the likely impact of the aid on the company receiving the aid (i.e. ex ante data). This contrasts with ex post assessments, which can use actual data and focus on the impact of granting the aid on competition. Therefore, there is likely

¹⁴ European Commission (2014), 'Common methodology for state aid evaluation', Commission Staff Working Document, 28 May.

¹⁵ European Commission (2014), 'Common methodology for state aid evaluation', Commission Staff Working Document, 28 May. The guidelines recommend that evaluations are carried out by an independent body from the authority granting the aid.

¹⁶ For example, the guidelines include questions to assess the actual incentive effects of the aid, the proportionality and the appropriateness of the aid, in addition to the actual impact of the aid on competition and trade.

¹⁷ For further details, see European Commission website, 'Legislation', http://ec.europa.eu/competition/state_aid/legislation/legislation.html, accessed 6 May 2017. Although the sector-specific state aid guidelines set out the framework for the assessment of the compatibility of aid on an ex ante basis (including the assessment of the potential for the aid to create undue distortions to competition), the guidelines can be used as a starting point to inform the ex post assessment of the competitive effects of the aid.

¹⁸ For instance, DG Competition (2004), 'Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings'; DG Competition (2004) 'Guidelines on the application of Article 81(3) of the Treaty'; and DG Competition (2004), 'Guidance on its enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings'.

to be more data available for ex post assessments than for ex ante assessments.

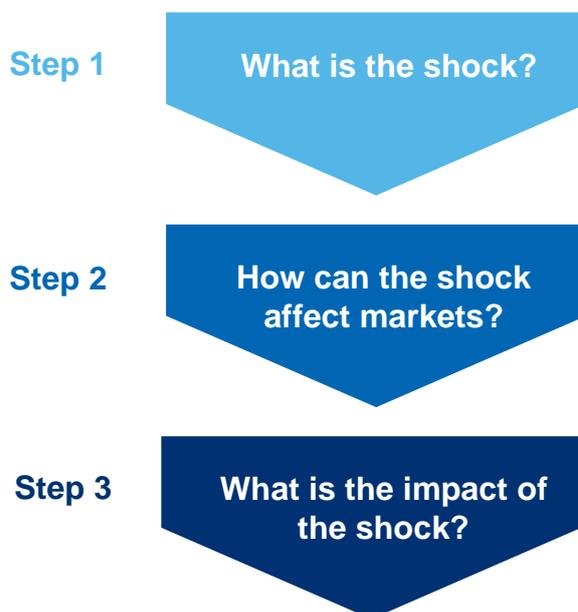
2.2 Overview of the framework

We have designed the overall structure of the framework to be consistent with any impact assessment. It consists of three steps.

1. Describing the relevant event or shock that occurred in the market—e.g. a merger, an agreement between firms, or the granting of state aid—and setting out its characteristics.
2. Explaining how the shock might have affected the market—e.g. the disappearance of a competitor, potentially leading to a weakening of competition and resulting in an increase in prices; or the implementation of an information exchange, allowing competitors to coordinate on focal prices, monitor the market and retaliate in the case of deviations from the common understanding, leading to a restriction of total output in the market.
3. Assessing the magnitude of the impact on the market—e.g. assessing the likelihood of horizontal and vertical effects, assessing whether the conditions for a cartel to be set up are met, estimating the overcharge, or estimating the deadweight loss.

This structure is summarised in Figure 2.1.

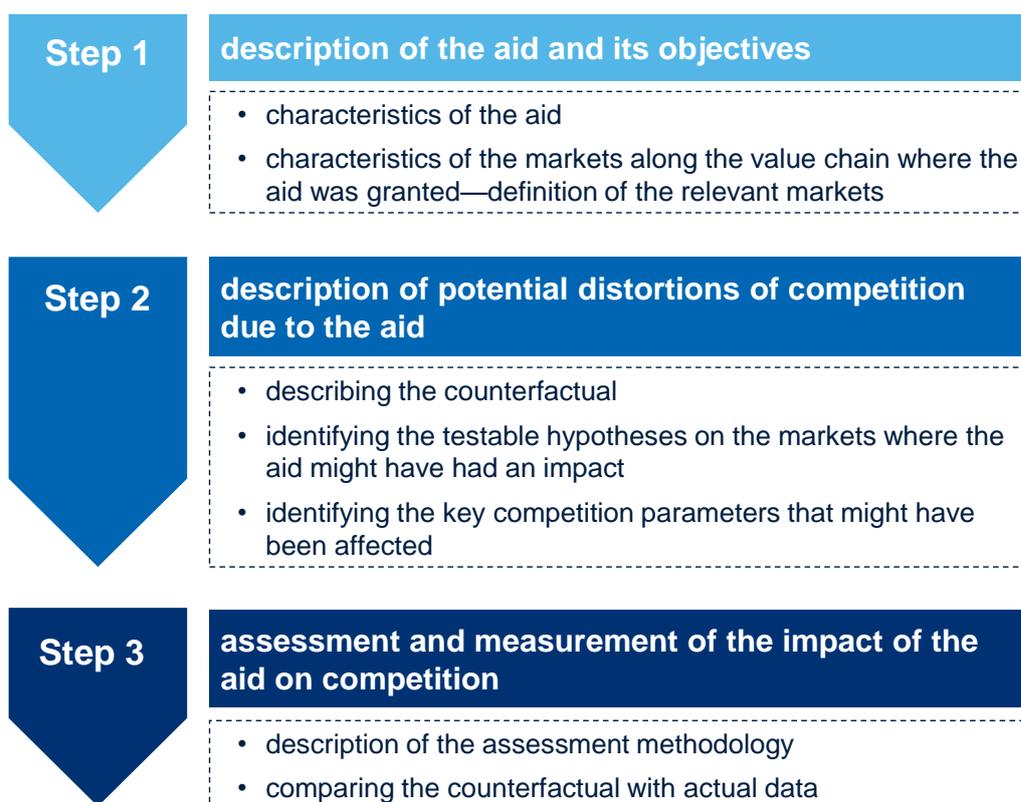
Figure 2.1 Structure of an impact assessment



Source: Oxera.

In the case of state aid, the relevant shock will be the granting of the aid. Therefore, by following the common structure of an impact assessment, the evaluation of the aid impact consists of: step 1, describing the aid; step 2, describing the potential distortions to competition due to the aid; and step 3, assessing whether they materialised. Figure 2.2 presents in more detail the analytical framework to assess the impact of the aid. Each of the steps is discussed further in the subsections below.

Figure 2.2 Analytical framework to assess the impact of state aid on competition



Source: Oxera.

As the impact of aid on competition is likely to vary according to the type of aid, the framework has been designed to be applicable to a range of aid measures, including, among others, environmental aid, regional development aid, R&D&I aid, aid under the SGEI scheme, rescue and restructuring aid, and aid to promote exports.

2.3 Step 1: description of the aid and its objectives

State aid is intended to change market outcomes in order to correct market failures identified by a public authority. It is likely to affect the outcomes of normal competition, as otherwise the aid would not be having the intended effect.

As the impact of the aid on competition is likely to vary according to its characteristics, the first step is to identify the characteristics of the aid, including its objectives and the aid instrument (as detailed in section 2.3.1). The magnitude of the impact of the aid on competition is also likely to depend on the characteristics of the market in which the aid is granted (see section 2.3.2).

2.3.1 Characteristics of the aid

The granting of aid can commonly be viewed as an event that creates a shock in the market. The magnitude of the shock largely depends on the nature of the event—i.e. the characteristics of the aid.

To characterise the possible shock, we first describe the form, the type and amount of aid granted, including the aid instrument, the number of firms

receiving the aid (i.e. the degree of selectivity), the amount (in absolute value and relative to the market size) and the objectives of the aid.

The form of the aid matters, as aid that reduces the marginal costs of production may be more likely to lead to distortions to competition than aid that affects fixed costs. In theory, lump-sum government funding (e.g. an airport receiving a grant of €1m per year for a three-year period) is not expected to distort the recipient's incentives to operate in a commercial manner, as the grant will not have a significant impact on its marginal costs and therefore prices (in theory, companies set prices with reference to marginal or variable costs, not fixed costs). Variable subsidies, such as the direct covering of any losses made by a company or subsidies that depend on the volume of output produced by the recipient, can have a greater effect on market outcomes, and may be more likely to distort competition.

The type and amount of aid are important, as certain aid characteristics may have greater potential to distort certain aspects of competition. For example, a direct grant is typically considered to be more likely to be distortive than other aid instruments such as a repayable advance or a soft loan.¹⁹

The extent of selectivity refers to whether the aid was granted to all of the companies in the industry, or to a subset. In other words, selectivity enables the assessment of the extent to which incentives have been modified and whether some companies are likely to have enjoyed an advantage over others.²⁰

2.3.2 Identification of the affected markets—including demand and supply

The description of the recipient(s) of the aid provides an indication of both the likely magnitude of the impact of the aid, and the potential markets where the aid might have had an impact.

Furthermore, the characteristics of the aid beneficiary will influence the markets that need to be considered for the competitive assessment. For example, if the aid beneficiary is a multi-product firm that can cross-subsidise its activities, it may be necessary to take into account a number of different markets in which the firm operates, irrespective of whether the aid is targeted at a specific activity. If the firm receiving aid has strong upstream or downstream linkages, it may be necessary to include these markets in the competitive assessment, as they could be affected by any changes in the market induced by the aid.

To identify the boundaries of the markets where the impact of the aid is likely to be greater, the relevant geographic and product markets need to be defined, as explained in Box 2.1.

¹⁹ A direct grant is an unconditional and unrepayable grant. In contrast, a repayable advance (including interest) would need to be paid back to the national authority only if the project is successful. In the case of partial success, the repayment is pro-rated. A soft loan has a subsidised rate of interest (or potentially no interest). This general presumption may be valid *only* to the extent that aid amounts and specific conditions of those instruments are comparable.

²⁰ If a measure is company-specific, such as restructuring aid to an airline, selectivity is obvious. If a measure is industry-specific, the aid may only be available to existing companies (as compared with new entrants), or to companies whose domicile is located in a specific area.

Box 2.1 Overview of the approach to defining the relevant geographic and product markets

Geographic market—i.e. the area where conditions of competition between firms are sufficiently homogeneous and can be distinguished from neighbouring areas.

It is important that the impact of the aid is not considered on too narrow a geographic market. In particular, supply-side geographic market factors, such as the extent of imports/exports from/to other regions, should be taken into account when assessing whether a geographic market is sufficiently large to reflect the potential adverse effects of the aid on competition. In particular, it needs to be considered whether there are significant exports from one region to another, and whether the level of exports would change significantly as a result of changes to the relative prices between the two regions.

Product market—i.e. the relevant product market, which comprises those products and/or services that are interchangeable or substitutable by the consumer, on the basis of the products' characteristics, price and intended use.

The relevant product market can be identified by considering the response of consumers to an increase in the price of one product (i.e. demand-side substitutability). This assessment will be informed by information about the product's characteristics, prices and sales over time as well as customers' response to price changes.

In state aid cases it is also often important that the product market definition reflects the response of suppliers to changes in price (i.e. supply-side substitution). For example, it may need to be considered whether, as a result of the aid, suppliers in otherwise unrelated markets switched their means of production to serve the market in question. To assess the degree of supply-side substitution, information on adjustment costs, production processes and distribution systems should be taken into account.

Source: Oxera.

Market definition provides a frame of reference for assessing the impact of the aid; hence, it is a means to an end in the overall analysis. It can involve the use of standard economic tools, drawing on merger control and the assessment of anti-competitive practices.²¹ However, it is important that the application of such tools is tailored to reflect the differences between state aid assessments and merger control and antitrust. In merger control and antitrust, the aim of the assessment is typically to identify potential effects that distort competition arising from (increased) market power (as a result of abuse of dominant positions or collusion, for example). In contrast, the aim of state aid control is to identify possible competitive distortions arising from changes in firm behaviour triggered by the receipt of state aid. Therefore, it is plausible that state aid will affect competition between firms more immediately than consumer welfare.

As such, the market definition exercise in state aid assessments should focus more on the supply-side than in merger control and antitrust. For example, if firms' supported production facilities could supply several downstream markets, it may be necessary to define the relevant market more widely than is typically the case in competition analysis in mergers and antitrust.

It may not always be possible to assess the impact of the aid on competition in all of the relevant markets, and it may not always be necessary to undertake a detailed assessment of the relevant geographic and product markets. For practical reasons, it may be appropriate to define a threshold for the amount of aid on an absolute and relative basis (i.e. the amount of aid relative to total revenues in the industry) below which a detailed market definition exercise is not required. As discussed in section 2.4, identifying the ways in which the aid might

²¹ For further details, see European Commission (1997), 'Commission Notice on the definition of the relevant market for the purposes of Community competition law', *Official Journal of the European Communities*, 9 December.

have distorted competition helps understand the markets that should be assessed.

2.4 Step 2: identification of the potential distortions to competition

To examine if the aid changes incentives to a point where it may affect competition negatively, it is important to identify appropriate comparators against which to assess the current situation. The comparators must describe a hypothetical scenario in which the aid in question was not granted—i.e. the ‘counterfactual scenario’ (discussed in more detail in section 2.4.1).

Once the counterfactual is defined, the current situation can be compared with what would have happened in the absence of the aid. This enables the possible competitive distortions that might have been created by the aid to be identified, and, consequently, the hypotheses to be tested in order to assess the impact of the aid on competition (see section 2.4.2). The testable hypotheses inform the key competition parameters underpinning the assessment of the impact of aid on competition, as explained in section 2.4.3.

2.4.1 Describing the counterfactual

The main objective in assessing the impact of state aid on competition is to identify the causal link between the aid measure and the observed market outcomes. A commonly applied methodology in this context is a factual–counterfactual comparison or counterfactual analysis. The factual describes the observed scenario in the presence of the aid; the counterfactual describes the hypothetical scenario that would have been observed without the aid.

Factual–counterfactual comparisons are commonly used in other areas of antitrust analyses, such as merger control and Articles 101 and 102. However, the nature of the counterfactual depends on the type of assessment. For instance, in merger control, counterfactuals are established on an ex ante basis, often taking the status quo (i.e. the market as it is before the transaction) as the reference.²² In investigations under Articles 101 and 102, the counterfactuals defined are usually established on an ex post basis.

The counterfactual in state aid assessments is considered on an ex ante basis as part of the evaluation of the incentive effects of the aid. In this setting, the counterfactual analysis aims to identify the economic activity that would not have occurred, had the aid not been granted. It means that the hypothetical scenario usually focuses on the company receiving the aid.

The ex ante counterfactual may be equally relevant for an ex post assessment of the potential distortive effects of the aid on competition; indeed, the same counterfactual scenarios as in the ex ante analysis can be used as a starting point. However, it is important to determine whether the counterfactual scenarios identified on an ex ante basis still represent the most appropriate scenarios for the purposes of the ex post assessment.

The 2014 guidelines specify the factors that need to be considered in order to identify the appropriate counterfactual.²³ The counterfactual can be identified based on a group of the most comparable firms that have not received aid (‘the

²² In merger control, the Commission has gradually adopted a more forward-looking approach to counterfactuals by also taking into consideration the dynamics of innovation and investment.

²³ European Commission (2014), ‘Common methodology for state aid evaluation’, Commission Staff Working Document, 28 May.

control group’).²⁴ However, the following factors need to be considered when identifying the appropriate control group:

- the potential for firms that receive aid to be in a different situation from those that do not receive aid, including potential selection biases between firms applying and not applying for aid;
- the common factors that explain companies’ performance, such as general trends in the industry;
- the potential for firms to receive aid from multiple sources.²⁵

The overall approaches that can be used to estimate the counterfactual are discussed further in section 2.5, including the approaches that are more suitable for certain types of aid measures.

2.4.2 Identifying the testable hypotheses

To evaluate state aid schemes ex ante, the Commission requests an evaluation plan at the notification stage.²⁶ This plan is required to specify, among other aspects, the key mechanisms through which the aid could distort competition, together with the testable hypotheses to examine the impact of the aid on competition.

The evaluation plan can form a useful starting point for the ex post assessment as well. However, the ex post evaluation should not solely be limited to what appears in the evaluation plan, as it is possible that both the hypotheses to be tested and the appropriate counterfactual might have changed, reflecting subsequent market developments.

As an example, in the airport case study presented in section 3, we examine the competitive effects of investment aid to expand capacity at Cornwall Airport Newquay. At the time of the original notification of the aid in February 2007, it is likely that neither the notifying parties nor the Commission would have expected one of the airports in the neighbouring region, Plymouth Airport, to close in 2011, and nor would they have expected the onset of the economic and financial crisis.²⁷ On an ex post basis, however, it is possible to investigate whether the closure of Plymouth Airport was due to the aid or to the financial crisis, or to a combination of events.

The testable hypotheses that are developed should be closely linked to the assessment of the other common assessment principles required for the ex post evaluation, as outlined below.

- **The assessments of market failures:** if aid is granted in the absence of a clearly established market failure, it will be more likely to have the effect of distorting competition, as the subsidised output is more likely to displace the output of non-aided firms.

²⁴ European Commission (2014), ‘Common methodology for state aid evaluation’, Commission Staff Working Document, 28 May, section 3.4.

²⁵ For further details, see European Commission (2014), ‘Common methodology for state aid evaluation’, Commission Staff Working Document, 28 May, pp. 8–10.

²⁶ European Commission (2014), ‘Common methodology for state aid evaluation’, Commission Staff Working Document, 28 May, p. 6.

²⁷ For example, in April 2007, the Bank of England predicted that ‘the UK financial system remains highly resilient, with banks well capitalised and highly profitable’. For further details, see Bank of England (2007), ‘Financial Stability Report’, April, p. 38.

- **The proportionality of aid:** if the amount of aid received by the recipient has exceeded the net costs of providing the aided service (plus a 'reasonable' profit), competition is more likely to be distorted, as the aid beneficiary could use the additional funds to support its other activities.
- **The incentive effects of the aid:** the testable hypotheses developed for the assessment of the competitive effects of the aid should be informed by the counterfactual scenario that is developed to assess the incentive effects of the aid.

It is important that the testable hypotheses also take into account the potential differing effects of the aid on supply and demand over time. State aid often does not harm consumers in the industry receiving the aid, at least not in the short term: it tends to have a more direct effect on production in the short to medium term. However, negative effects of the aid may arise in the medium to long term, for example, as a result of reduced incentives for innovation.

The R&D&I case study presented in section 4 illustrates this point. Indeed, the aid assisted the recipient, Soitec, to develop new applications in the medium term, although the demand for such products has probably not materialised as of 2017. However, in the future, the demand for these applications is likely to rise and the recipient may then benefit from a competitive advantage compared with its rivals which did not receive aid.

It is important that the testable hypotheses also take into account the different types of aid, as potential competitive distortions could differ significantly across different categories of aid. For example, one of the main concerns typically highlighted in relation to regional aid is the potential for aid to lead to subsidy races between different regions, thereby risking distorting production and location decisions. In contrast, a standard concern regarding rescue and restructuring aid is that it might preserve inefficient industry structures.

An illustration of the types of testable hypotheses that could be developed to examine the ex post competitive impact of the aid is provided in Box 2.2 for three of the more important aid instruments in 2015.

Box 2.2 Illustration of testable hypotheses to examine the ex post impact of aid on competition for three of the most important aid instruments in 2015

Environmental protection including energy saving

- has the aid distorted product markets by discouraging the emergence of even cleaner technology?
- has the aid strengthened or maintained the market power of the beneficiary?
- has the aid altered the decision of the beneficiary in terms of where to locate the aided plant, without improving the level of environmental protection?
- has the aid led to distortions in the raw materials market, as a result of the fuel requirements of the aided plant?

Regional development

- has the aid increased the market power of the beneficiary?
- does the aid create capacity in a market that is in structural decline?
- has the aid affected the location of economic activities by influencing investors' choices about where to locate investment projects?
- has the beneficiary closed down the activity elsewhere in the EU in order to relocate to the target area in order to receive the aid?

Research and development and innovation

- has the aid distorted the competitive entry and exit process by supporting inefficient undertakings?
- has the aid distorted dynamic incentives to invest by crowding out private investment?
- has the aid increased or maintained market power in certain markets?
- has the aid distorted locational decisions by displacing economic activities from one area in the EU into another region?

Source: Oxera.

2.4.3 Identifying the key competition parameters

In order to measure the impact of aid on competition, a number of indicators can be used. These include 'structural' indicators of competition such as the number of firms in the industry, the market shares and the degree of concentration.

For instance, the market share of the aid recipient(s) matters, as it affects whether the recipient is likely to influence market outcomes. A small, capacity-constrained company that expands output as a consequence of aid, may remain below the threshold at which it has power to behave independently of competitive pressures. On the other hand, if the affected market is concentrated and the aid recipient is a major player, then it is more likely that competitors will alter their strategies in response to the aid. This may reduce the efficiency of the market. It could also result in the exit of competitors, thereby further increasing the market share of the recipient and enhancing the scope for anti-competitive behaviour.

However, there are drawbacks in using solely market structure indicators to assess the impact of aid on competition. First, the market structure on its own does not always provide the full picture for analysing competition. For instance, Airbus and Boeing are often described as competing fiercely, despite operating in a duopolistic market environment. Second, these structural parameters may depend on the outcome of the market definition exercise (e.g. market shares

may change if only one competitor is included or excluded when defining the relevant geographic and product markets).

Therefore, it is important to consider a number of indicators that capture market outcomes (e.g. prices, volumes and quality) and market dynamics (e.g. innovation, market entry and exit, and barriers to switching). These indicators capture the interaction between competitors, firms' profitability and the evolution of market dynamics.

Box 2.3 Overview of key indicators of competition to be considered

Market structure

- **Market concentration.** Aid has greater potential to distort competition in industries that are more concentrated, as firms with higher market shares are more likely to influence the market price.
- **Market share of the aid recipient, its competitors and size of the sector.** The size of the aid recipient and the sector provide an indication of whether the recipient is likely to be able to influence market outcomes.

Market outcomes and dynamics

- **Prices, volumes and quality.** The potential distortive effects of aid may be reflected in changes to the evolution of prices, volumes and quality.
- **Profitability.** The aid may increase firms' profitability.
- **Degree of product differentiation.** If one company has an advantage in a market with differentiated products, the competitive impact is less than if that same company faced closer, non-differentiated competitors, since consumer switching to the aided company will be affected by the degree of product differentiation.
- **Innovation and R&D&I.** In industries characterised by a high degree of R&D&I, it is important to take this into account in the competitive assessment, as it can represent a **key** driver of entry and exit in the industry. If this is a particular characteristic of the industry, it would be important to consider the time horizon over which the evaluation is undertaken, in order to enable the long-term impact of the aid to be examined.
- **Entry and exit.** Aid may have a greater potential for distortions if it leads to exit or entry in the market, or affects barriers to entry, exit and expansion (such as branding and marketing, intellectual property rights and patents).

Source: Oxera.

2.5 Step 3: assessment of the effects of the aid on competition

The last step in the assessment is to compare the counterfactual with actual data to evaluate the impact of state aid on competition. In this section, we first discuss data collection (section 2.5.1), followed by an overview of the main comparative techniques that can be used for the analysis (section 2.5.2).

2.5.1 Data collection

The 2014 guidelines highlight the importance of the data collection process, emphasising that data must be consistent between beneficiaries and non-beneficiaries and that it should be obtained at the most granular level possible.²⁸

Building on the 2014 guidelines, the data required for ex post evaluation should ideally be quantitative, obtained from a combination of publicly available sources and data requests to market participants. The most useful public domain data sources are likely to include databases from national statistics offices and from

²⁸ European Commission (2014), 'Common methodology for state aid evaluation', Commission Staff Working Document, 28 May, p. 31.

regulators, market studies, analysts' reports, as well as financial database packages such as Bloomberg, Datastream and Orbis. Insights may also be obtained from qualitative sources, such as interviews with key market participants.

Information should be collected over a sufficiently long timescale, both before and after the aid was granted, in order to enable identification of the medium- to long-term impacts of the aid. A longer time period may be necessary in some cases—e.g. for the ex post evaluation of aid measures in industries characterised by a high level of R&D&I or for assessments of aid to operators for providing SGEI and public service obligations (PSOs).

However, data may sometimes be difficult to obtain, particularly if the ex post assessment is conducted by independent third parties that have no official powers to request data. If there are difficulties obtaining sufficient quantitative data, depending on the hypotheses to be tested, it is possible that a significant part of the assessment could be based on qualitative insights and descriptive analysis. The assessment may not necessarily require sophisticated techniques such as econometric analysis, but if the data is available, econometric analysis can add further insight.

2.5.2 Comparing the counterfactual with actual data

The simplest approach to assessing the competitive impact is qualitative. It is based on examining the evolution of key variables of interest (such as firms' R&D&I expenditure). It consists of plotting time series on a graph and looking for abrupt changes in trends when the aid was introduced. Identifying breaks that are contemporary to the granting of the aid may, in some cases, be sufficient to identify the impact on competition.

This approach is only appropriate if there is one effect that can account for any breaks in the trend, or if any alternative effects are likely to be negligible. If several effects occur at the same time, which can influence competition, the descriptive analysis will not be conclusive.

If sufficient data is available, the following techniques can be used to assess the competitive impact of the aid and disentangle the impact of several effects.

A) Comparator-based approaches

These approaches use data from sources that are external to the infringement to estimate the counterfactual. Broadly, this can be undertaken in three different ways:

- cross-sectional comparisons (comparing different geographic or product markets);
- time-series comparisons (analysing prices before, during and after the granting of aid);
- combining the techniques in difference-in-differences models (e.g. analysing the change in price or volumes over the period of the aid, and comparing this analysis against the change in price or volumes over the same time period, but in the absence of the aid, i.e. against a market not affected by the aid).

Cross-sectional comparisons

A cross-sectional analysis uses data on a comparator market that was not affected by the aid, and compares the outcomes between the market affected by the aid and the market not affected. This could be the same product market in another country (provided these are separate geographic markets) or another product market in the same country. This approach relies on the availability of an appropriate comparator market—i.e. a market that is otherwise the same in terms of competition but for the aid—and the availability of data for that market.

A market is an appropriate comparator if it is subject to the same dynamics as the market affected by the aid. In addition, it should be comparable to avoid capturing effects that are due to differences between the market affected by the aid and the comparator.

Time-series comparisons

An alternative approach to cross-sectional comparisons is to estimate the impact of the aid by comparing the parameters of competition before and after the aid was granted. This method requires time-series data on the parameters of interest in the affected relevant market covering the period before, during and after the granting of the aid.

The underlying assumption in this approach is that the competitive condition in the market before the aid was granted can be used to approximate the counterfactual. This assumption is common in ex ante merger assessments where pre-merger conditions are typically taken as the baseline. However, in ex post evaluations of aid, such an assumption may not always be appropriate, as other factors, such as the stage of the economic cycle and policy changes, could lead to a difference between the before–after comparison and the factual–counterfactual.

If such factors are likely to be present, these should be taken into account in the estimation approach. This can be done by formulating a model that includes all relevant factors leading to changes in competition and using econometric techniques to estimate the relationship between the aid and competition. For example, econometric analysis could be undertaken to explain the evolution of firms' market shares, with independent variables including the sector, the form and type of aid, together with control variables such as the firm's profitability and the stage of the economic cycle. This type of before-and-after econometric analysis is common in cartel damages cases where the amount of overcharge is estimated by comparing the pre- or post-cartel price with the price during the cartel, controlling for other factors.²⁹

However, defining the counterfactual as the status quo—i.e. considering that the situation before the aid can act as a proxy for what would have happened without the aid—may not be appropriate for assessing the competitive effects of aid for providers of SGEI or PSOs. In such instances, where aid is typically granted on an annual basis over a long period of time (e.g. ten years or more), a different approach to assessing the competitive effects of the aid may be necessary, as outlined in Box 2.4.

²⁹ Oxera and a multi-jurisdictional team of lawyers led by Dr Assimakis Komninos (2009), 'Quantifying Antitrust Damages: Towards Non-binding Guidance for Courts', study prepared for the European Commission, Directorate General for Competition, December.

Box 2.4 Approach for assessing distortions to competition for providers of SGEI and PSOs

Time-series comparisons for assessing the competitive effects of the aid are unlikely to be appropriate for companies that receive compensation for providing SGEI or PSOs, such as incumbent postal operators, broadband providers and transport operators. This is because it may not be possible to obtain data on the period prior to the granting of aid, as the providers have typically always had an SGEI obligation or PSO. As discussed in Box 2.1, in such circumstances, it may be more appropriate to consider the competitive effects of the aid by assessing whether the aid threatens to spill over into markets outside the scope of the SGEI or the PSO (such as financial and other commercial services in the case of postal operators). In order to assess this, an ‘event study’ approach may be appropriate.

Source: Oxera.

Difference-in-differences models

To the extent that both cross-sectional data and time-series data is available, it may be possible to conduct a difference-in-differences analysis. The difference-in-differences technique aims to overcome some of the shortcomings of cross-sectional and time-series techniques—i.e. the assumption that any unexplained difference is solely due to the impact of the aid.

Difference-in-differences estimators control for what would have happened in the absence of the aid by examining what changed over time in the aided and non-aided markets, followed by a comparison of those differences. However, this approach still requires that controls are introduced for factors that affect competition parameters differently in the markets being compared.

B) Market-structure-based approaches

The market-structure-based approach represents an alternative to the comparator-based approach. It consists of using models developed in economics to simulate what the market would have been like in the absence of the aid, based on actual data.³⁰

Following these approaches, the estimated impact of the aid on competition will be influenced, to a large extent, by the choice of the counterfactual model. Therefore, it is important to undertake a number of sensitivity checks on the assumptions underlying the counterfactual model.

There are two main ways in which Industrial Organisation (IO) models can be used.

- **The ‘one-model’ approach (estimation of a structural model of competition).** This approach uses an IO model to estimate the counterfactual, using the factual outcomes as inputs. The counterfactual model is calibrated using an estimate of the demand and supply features of the market. The information to calibrate the model either comes from the factual or is based on assumptions about what the counterfactual is expected to look like given the nature of the case. The counterfactual model estimates are then compared against the factual.
- **The ‘two-model’ approach.** IO models are adopted for both the factual and counterfactual scenarios. By specifying the model for the factual,

³⁰ The market-structure-based approach uses findings in Industrial Organisation (IO), which is a separate discipline in economics. IO theory has developed a range of generally recognised models of competitive interaction and firm behaviour that can be used to predict a variety of outcomes.

characteristics of demand can be inferred from observable data in the factual, such as prices, quantities and costs. The counterfactual outcomes can then be expressed as a ratio to the factual (e.g. counterfactual prices might be estimated as being one-third above prices in the factual). Less estimation is required when using two IO models rather than one; however, this is replaced by a greater reliance on assumptions.

2.6 Conclusions

Building on the 2014 guidelines for ex post evaluation and the sector-specific state aid guidance, this section has provided a framework that can be used to conduct ex post evaluations of the impact of aid on competition.

The framework consists of three main steps.

1. Description of the aid and its objectives
 - a. Characteristics of the aid
 - b. Identification of the affected market
2. Identification of the potential distortions to competition
 - a. Describing the counterfactual
 - b. Formulating the testable hypotheses
 - c. Identifying the key competition parameters
3. Assessment of the effects of the aid on competition
 - a. Collecting data
 - b. Comparing the counterfactual with actual data

As explained above, the framework focuses on the development of the testable hypotheses and the approach to estimating indicators of competition on which the impact of the aid can be examined.

Although the framework has been designed for ex post evaluations, similar techniques can readily be used to estimate the expected impact of the aid on competition for ex ante compatibility of aid assessments.

3 Regional aid to an airport in the UK

Executive summary

Between 2006 and 2011, Cornwall Airport Newquay (NQY) in the UK received approximately £46.8m of aid to convert the airport from part-military use to fully commercial use. Approximately £6.6m of the aid was used to expand the capacity of the airport from 400,000 passengers in 2007 to 700,000 passengers in 2011.

In 2007 and 2009, the Commission concluded that aid to NQY constituted compatible aid, based on the 2005 aviation state aid guidelines.¹ In line with the evidence submitted by the UK government, the Commission concluded that aid to NQY was unlikely to significantly distort competition. According to the UK government, NQY was not in significant competition with the three commercial airports located closest to NQY—Plymouth (PLH), Exeter International (EXT) and Bristol (BRS).

We have assessed whether aid to NQY has created any competitive distortions. As a first step, building on the approach set out in the Commission's aviation state aid guidelines, we have defined the relevant market by considering both the product and geographic dimensions.

- Product dimension.** NQY mostly serves domestic short-haul point-to-point traffic in the summer season. Mainly low-cost carriers (LCCs) and regional carriers operate at NQY. The main routes operated by NQY over the 2006–08 period were to Bristol, London Gatwick, Leeds Bradford, Manchester, Plymouth and Stansted airports.² Regional airports are typically considered by airlines and passengers to provide similar offerings, and therefore are often considered to fall within the same product market. However, there is some product differentiation between NQY and other regional airports in South West England. For example, the runway at NQY is longer than at either PLH or EXT, which allows larger commercial aircraft, such as the Boeing 737-800, used by airlines such as Ryanair, to operate from the airport.
- Geographic dimension.** From discussions with airports and airlines, a significant proportion of NQY's passengers are tourists visiting Cornwall, and are unlikely to consider alternative destinations within or outside the UK to be substitutable. Typically, competition authorities assume that passengers are not willing to travel for over two hours to and from the airport. Our analysis of the potential for competitive effects of aid to NQY therefore focused on airports within NQY's surrounding area—namely, EXT and PLH (before its closure in 2011). PLH was 1.1 hours' drive time and 75km away from NQY, while EXT is 1.5 hours' drive time and 130km away from NQY. As BRS is 2.5 hours' drive time and 230km away from NQY, it is unlikely that aid to NQY will have had an adverse impact on BRS.

NQY's share of the airports' market in South West England has remained relatively stable over the 2004–12 period, accounting for around 2–6% of total passenger traffic at airports within South West England. Given NQY's limited market share, at most, the aid is only likely to have affected the closest substitutes to NQY. Therefore, our analysis focuses on those segments where NQY has a high share of the market, namely, specific routes to and from NQY that are also served by airports in the surrounding area. After being loss-making for five years, PLH closed in December 2011, as routes from the airport were no longer profitable.³ Our analysis investigates whether aid to NQY might have represented one of the factors that led towards PLH's closure, together with the airport's short runway and the exit of its main airline, Air Southwest, due to financial difficulties.

To study the impact of aid to NQY on competition, the current competitive landscape needs to be compared with what would have been likely to have happened if aid had not been granted (i.e. the 'counterfactual'). In the absence of aid, it is likely that NQY would have ceased operations. According to NQY, if the airport had not been able to undertake the necessary investments to secure a licence from the UK Civil Aviation Authority, the airport would have closed. As the airport was loss-making at the time, the airport would not have been able to raise sufficient funding without government support.⁴

The hypotheses we have tested to examine the potential competitive effects of the aid are outlined below, together with the results from the analysis.

Did aid to NQY lead to a decline in traffic on routes that were also served by neighbouring airports (i.e. 'overlapping routes')?

We have undertaken econometric analysis to assess the impact of aid to NQY on traffic on

overlapping routes (as well as overall levels of traffic at the other airports). The econometric analysis enables the impact of the aid to be isolated from the impact of the economic and financial crisis in addition to factors that may have affected demand on particular routes. The results therefore provide an indication of the impact of the aid alone, separated from other possible market influences.

It should be noted that, although it is likely that in the absence of aid NQY would have closed, this counterfactual scenario cannot be modelled using the econometric analysis given the available data. Instead, the econometric analysis implicitly assumes that, in the absence of the aid (i.e. in the counterfactual scenario), NQY would have maintained commercial operations at a low level similar to the period before the aid. Therefore, the results from the econometric analysis could be considered to be conservative, i.e. the results may underestimate the competitive distortions due to the aid.

The results indicate that the aid led to a significant decline in passenger traffic across all overlapping routes at PLH and EXT compared with levels prior to the aid to NQY.

- **Overlapping routes served by both NQY and PLH.** Over the 2004–06 period, both NQY and PLH operated a route to and from London Gatwick (LGW). Growth in passenger traffic on the route from NQY to/from LGW significantly exceeded growth in traffic at other airports in South West England as well as overall growth at NQY. In contrast, passenger traffic declined on the PLH and LGW route over the same period. The results from our econometric analysis indicate that aid to NQY led to passenger traffic on the route declining by approximately 26% compared with levels prior to the aid (i.e. in the 2004–06 period).
- **Overlapping routes served by both NQY and EXT.** Analysis of overlapping routes between NQY and EXT suggests that passenger traffic declined significantly on the EXT and Edinburgh (EDI) route. The results of our econometric analysis suggest that the aid to NQY led to a decline in passenger traffic on the EXT route to/from EDI by approximately 42% compared with levels prior to the aid (i.e. in the 2004–06 period).

Did aid to NQY have a significant impact on overall passenger traffic at neighbouring airports?

NQY is the only airport in South West England that experienced above average growth in passenger traffic over the 2006–12 period. In contrast, passenger traffic at PLH stagnated after the capacity expansion at NQY, which might have been due to the economic and financial crisis, the decline of the largest airline operating from PLH, Air Southwest, in addition to passengers potentially switching from PLH to NQY. In particular, the results from the econometric analysis suggest that the aid might have contributed towards the decline in passenger traffic at PLH. However, even in the absence of aid to NQY, it is unclear whether the airport would have been able to achieve financial stability after the exit of Air Southwest.

The results from the econometric analysis suggest that aid to NQY had a more pronounced impact on EXT than PLH. In the long run, the aid led to around 1,000 fewer passengers, on average, per route each month at EXT, which represents approximately 9% of passenger traffic per route at EXT in the 2004–06 period.

Did aid to NQY lead to a change in the airline base, the number of routes, and airline capacity at neighbouring airports?

Based on our discussions with airports and airlines, there is no clear evidence that airlines switched to NQY following the capacity expansion as a result of the aid.

- Only a limited number of airlines (Air Southwest being the largest) operated from PLH before the aid. An analysis of capacity on routes at NQY and PLH indicates that the route most likely to have been affected is the LGW route.
- Flybe was present at EXT and operated or started operating at NQY around the time of NQY's expansion, which could have led to Flybe reallocating some capacity from EXT to NQY. Of the routes potentially affected by the aid, EDI appears most likely to have been affected by reallocation of some capacity from EXT to NQY.

Did aid to NQY lead to competing airports charging lower fees to airlines due to greater competition?

As airlines typically negotiate charges at airports, it has not been possible to obtain data on charges paid by all airlines operating at NQY and the neighbouring airports, as this is commercially sensitive. However, one airline voluntarily provided Oxera with data on net charges paid by the airline at NQY and BRS.

Analysis of this data does not show that airport charges at NQY and BRS decreased following the aid. This result is consistent with insights from the interviews with BRS and NQY. BRS considered that aid to NQY did not have a significant impact on BRS's airport charges. NQY also stated that airport charges were unlikely to have been affected by the aid, as they represent the outcome of airport–airline negotiations. Therefore, there is no evidence that aid to NQY had a significant impact on charges paid by the airline.

Overall, the econometric analysis helped disentangle the impact of aid from contemporary market developments like the financial crisis. The analysis used information on market trends gained from traffic at comparable airports in the wider region to measure the effect of the aid in isolation. The results show that aid to Newquay Airport negatively affected passenger traffic at the neighbouring airports Plymouth and Exeter Airport and may even have contributed towards the closure of Plymouth Airport in 2011.

Sources: ¹ European Commission (2007), 'State aid No N 303/2007 – United Kingdom Newquay Cornwall Airport Development', 23 October, and European Commission (2009), 'State aid N269/2009—United Kingdom, Newquay Cornwall Airport Development', 2 July. ² Only those routes from NQY that had an annual seat capacity of over 50,000 are reported. ³ For details, see BBC (2011), 'Final day protest against Plymouth Airport's closure', news report, 23 December, <http://www.bbc.co.uk/news/uk-england-devon-16310805>, accessed 8 December 2016. ⁴ Based on our discussions with NQY.

3.1 Description of the aid and its objectives

3.1.1 Overview of the aid

Between 2006 and 2011, NQY received £46.8m of aid from public funds to convert the airport from part-military use to fully civilian use.³¹

- The aid was primarily used to enable the continuation of airfield services at NQY, which were previously provided by the Royal Air Force (RAF), after the RAF's departure in 2008. The aid funded expenditure on runway and taxiway maintenance, airfield security and safety, UK Civil Aviation Authority (CAA) licence compliance requirements (including a new control tower, fire station, taxiway upgrades and upgrades of utility services), as well as the purchase of land from the RAF.³² It is possible that at least some of the aid could have affected the competitive dynamics compared with the counterfactual scenario where NQY would have ceased its commercial operations in the absence of the aid (as discussed in section 3.2.1).
- NQY also received at least £6.6m of aid in 2007 and 2008, which was used to fund a significant proportion of the airport's interim development strategy in order to enhance the airport's capacity from 400,000 passengers in 2007 to 700,000 passengers in 2011.³³ According to NQY, the main pillars of the interim strategy were the development of airport infrastructure (such as hold baggage screening and flight information display systems); the opening of a new arrivals hall, which increased passenger capacity to 700,000 per year; and the reconstruction of existing aircraft stands in 2009–10 to accommodate larger aircraft such as Boeing 737-800. As the aid enhanced NQY's capacity, it is more likely that this portion of the aid had an observable effect on

³¹ This is calculated as the costs financed by EU sources (£22.m) and national sources (£24.3m). For further details, see European Commission (2009), 'State aid N 269/2009 – United Kingdom Newquay Cornwall Airport Development', 2 July, para. 55.

³² European Commission (2007), 'State aid No N 303/2007 – United Kingdom Newquay Cornwall Airport Development', 23 October, para. 30.

³³ The amount of £6.6m of aid is calculated assuming that the proportion of the total costs relating to the capacity expansion, 14%, has not changed from the 2007 decision and that the aid intensity, 69%, is equal across the four categories of costs, namely, the airport transition infrastructure, the airport's interim development strategy (capacity expansion), post-transition CAA licence, and land purchase. For further details, see European Commission (2007), 'State aid No N 303/2007 – United Kingdom Newquay Cornwall Airport Development', 23 October, p. 6 and European Commission (2009), 'State aid N 269/2009 – United Kingdom Newquay Cornwall Airport Development', 2 July, para. 73.

competition. Our analysis therefore considers 2007 to be the first year in which possible distortive effects of the aid might have been observed.

3.1.2 The Commission's assessment at the time

The Commission concluded that aid to NQY was compatible, based on the 2005 Aviation Guidelines.³⁴

The Commission concluded that aid to NQY was unlikely to significantly distort competition, based on the evidence submitted by the UK government. In particular, according to the UK government, NQY's catchment area would be almost exclusively within the county of Cornwall, with a small number of passengers (5%) from South Devon.³⁵ According to the UK government, NQY did not compete with its three closest commercial airports (Plymouth, Exeter International and Bristol airports). This finding was consistent with how the Commission defined the relevant market in previous merger decisions including OTTP/Macquarie/BRS.³⁶

- The closest airport to NQY was Plymouth Airport ('PLH').³⁷ According to the UK government, at the time of granting the aid, PLH's main route was to London Gatwick ('LGW'), which operated as a joint service with NQY. The airline serving the route, Air Southwest, flew from LGW to PLH and then to NQY before returning to LGW. As a result, the UK government concluded that NQY did not compete with PLH.
- Exeter International Airport ('EXT'), which is the second closest airport to NQY, is approximately 1.5 hours by road from NQY. According to the UK government, its traffic is predominantly outbound traffic originating from Devon and Somerset. Therefore, there is a degree of overlap in the catchment areas of NQY and EXT.
- The UK government argued that Bristol Airport ('BRS') could not be considered as competing with NQY, since it is more than three hours by road.

According to the UK government, unlike PLH, EXT and BRS, which had strong outbound traffic, NQY would be used predominantly for inbound flights. Only 40% of NQY passengers lived in Cornwall and had their departing outbound journey from Cornwall. However, the UK government did acknowledge that there was some scope for competition between NQY and the neighbouring airports in relation to outbound traffic.³⁸

Although First Great Western operates a train service from London Paddington to Newquay, since the journey takes approximately five hours, the Commission concluded that it would be unlikely to constitute a competitive alternative to air transport. Based on this evidence, the Commission's Decision concluded that

³⁴ European Commission (2005), 'Communication from the Commission, Community Guidelines on financing of airports and start-up aid to airlines departing from regional airports', *Official Journal of the European Union*, 9 December.

³⁵ European Commission (2007), 'State aid No N 303/2007 – United Kingdom Newquay Cornwall Airport Development', para. 65.

³⁶ European Commission (2009), 'Case No COMP/M.5648 - OTTP/ MACQUARIE/BRISTOL AIRPORT', para. 11.

³⁷ Plymouth Airport closed in 2011. For details, see BBC (2011), 'Final day protest against Plymouth Airport's closure', news report, 23 December.

³⁸ European Commission (2007), 'State aid No N 303/2007 – United Kingdom Newquay Cornwall Airport Development', para. 68.

'there are no comparable competing transport systems to the region which Newquay services.'³⁹

3.1.3 Market definition

NQY is a small regional airport, operating mostly domestic flights. It currently serves around 250,000 passengers a year, of which the majority of traffic is to/from LGW. NQY is mostly used as a leisure destination by passengers from the Cornwall region, and most routes are only operated in the summer.

To define the market(s) in which NQY operates, we have considered both the product dimension and the geographic dimension.

In economic terms, an airport acts as a platform, serving different customer groups on two sides of the market: passengers and airlines. Both customer groups affect the revenues generated by an airport, either directly through substitution by airlines, or indirectly through substitution by passengers. For example, an increase in charges could affect airline demand, but also indirectly that of passengers, assuming that at least some of the increase in charges is passed through to airfares. It is therefore necessary to consider both types of customers to define the relevant market.

Product dimension

The relevant market may differ for various customer segments, as they may respond differently to changes in price. Passenger segments are usually defined based on purpose of the journey (leisure or business; often also captured as non-time-sensitive and time-sensitive passengers), long-haul or short-haul flights, charter or scheduled flights, and whether passengers are transit passengers or flying point to point.⁴⁰

Given the location of NQY, the majority of NQY's passengers are domestic leisure passengers visiting NQY. In 2015, 95% of NQY's 255,000 passengers flew to/from airports within the UK. The remaining 5% of passengers were from elsewhere in Europe.⁴¹ All of NQY's passengers were short-haul. As most traffic is focused on the summer season, based on our discussions with various airports and airlines, the majority of passengers using NQY are likely to be visiting Cornwall.⁴² NQY does not serve as a hub for any airline, and therefore passengers typically fly point to point.

The airlines operating at NQY—Flybe, Aer Lingus (services operated by Stobart Air), Ryanair, Eurowings (services operated by Germanwings) and Isles of Scilly Skybus—are all considered low-cost carriers ('LCCs'). These airlines mainly operate short-haul and point-to-point flights within Europe.

According to Ryanair, the airline could not operate from either PLH or EXT because the runway was too short for Boeing 737-800 aircraft. Therefore, for large commercial carriers, PLH and EXT may not be within the same product market as NQY. However, a representative of an airline whose fleet comprises

³⁹ European Commission (2007), 'State aid No N 303/2007 – United Kingdom Newquay Cornwall Airport Development', para. 67.

⁴⁰ See, for example, UK competition Commission (2009) 'BAA airports market investigation', 19 March, para. 2.20, http://webarchive.nationalarchives.gov.uk/20140402141250/http://www.competition-commission.org.uk/assets/competitioncommission/docs/pdf/non-inquiry/rep_pub/reports/2009/fulltext/545.pdf.

⁴¹ Oxera analysis, based on CAA statistics, tables 12_1 and 12_2, <https://www.caa.co.uk/Data-and-analysis/UK-aviation-market/Airports/Datasets/UK-Airport-data/Airport-data-2015/>.

⁴² According to the CAA, only a negligible number of passengers use charter flights (less than 2%).

smaller-sized aircraft stated that there is otherwise no key difference in terms of product offerings at NQY and the other airports. This suggests that, at least for those LCCs and regional airlines that operate smaller aircraft, a number of regional airports may be substitutable from a product market perspective.

Geographic dimension

To assess the geographic market, we have considered passengers' and airlines' ability and willingness to substitute NQY for other airports.

To identify the geographic scope, it needs to be assessed whether passengers would substitute NQY for another airport, should there be a small but significant price increase. It is likely that most passengers will only consider a limited number of destinations to be substitutable.⁴³

As noted above, we understand that NQY's passengers are typically UK tourists visiting Cornwall. It is unlikely that these visitors would consider a number of other destinations to be substitutable either within or outside the UK. Similarly, passengers flying from NQY are unlikely to consider more than a few close airports to represent viable alternatives. This suggests that it is appropriate to limit the analysis of the geographic market to airports within NQY's neighbouring region. This approach is consistent with the Commission's merger assessments, where the relevant market for scheduled flights is defined typically on the basis of origin/point of destination city-pairs. According to the Commission, passengers do not consider different city-pairs to be substitutable.⁴⁴

To analyse which airports fall within the same geographic market, catchment area and isochrone analyses are typically used, taking into account the size, density and wealth of the local population, as well as the type and size of business in the area.⁴⁵

The Commission defines the catchment area on a case-by-case basis; however, it has often used a radius of 100km around regional airports (300km for international airports),⁴⁶ or a 60-minute drive time.⁴⁷ Indeed, this definition is assumed in the Commission's 2014 aviation state aid guidelines.⁴⁸ The UK Civil Aviation Authority (CAA) used a radius of 60-, 90- and 120-minute travel times in its assessments for Stansted, LGW and Heathrow airports.⁴⁹

The size of the airport's catchment area is also likely to depend on the type of passengers at the airport. For example, in comparison to holidaymakers, business passengers are likely to be less price-sensitive and more time-sensitive, implying that the catchment area for such passengers would be smaller. Similarly, passengers taking a long-haul flight may be willing to travel further than passengers flying to a nearby destination, as travelling 30 minutes or

⁴³ According to the Commission, most passengers have a clear preference for one destination over another, and therefore the destination is generally not substitutable. See, for example, European Commission (2013), 'Case No COMP/M.6663 – Ryanair/Aer Lingus III', 27 February, para. 50.

⁴⁴ European Commission (2013), 'Case No COMP/M.6663 – RYANAIR/ AER LINGUS III, Regulation (EC) No 139/2004 Merger Procedure', 27 February, para. 50.

⁴⁵ European Commission (2009), 'Case No COMP/M.5648 – OTPP/ Macquarie/Bristol Airport', December, para. 12.

⁴⁶ European Commission (2005), 'Case No COMP/M.3823 – MAG/ Ferrovial Aeropuertos/Exeter Airport', August, para. 18.

⁴⁷ European Commission (2013), 'Case No COMP/M.6663 – RYANAIR/ AER LINGUS III, Regulation (EC) No 139/2004 Merger Procedure', 27 February, para. 80.

⁴⁸ European Commission (2014), 'Guidelines on state aid to airports and airlines', para. 25(12).

⁴⁹ For further details, see the ACI's commissioned study that assesses the nature of competition between European airports; Copenhagen Economics (2012) 'Airport Competition in Europe', June.

an hour further to the airport represents a relatively smaller increase in overall travel time for long-haul passengers than for short-haul passengers.

Table 3.1 outlines the distance from NQY to the airports in the neighbouring region. Currently, the nearest airport to NQY is EXT, which is within 1.5 hours drive time and 130km. Based on the Commission’s definition of the catchment area of one hour, strictly-speaking, NQY and EXT do not fall within the same catchment area; however, at least part of the catchment areas of both airports overlap.⁵⁰ PLH, which closed in 2011, was approximately one hour’s drive time and 75km from NQY; therefore, the catchment areas of NQY and EXT, as well as NQY and PLH, overlap to an extent.

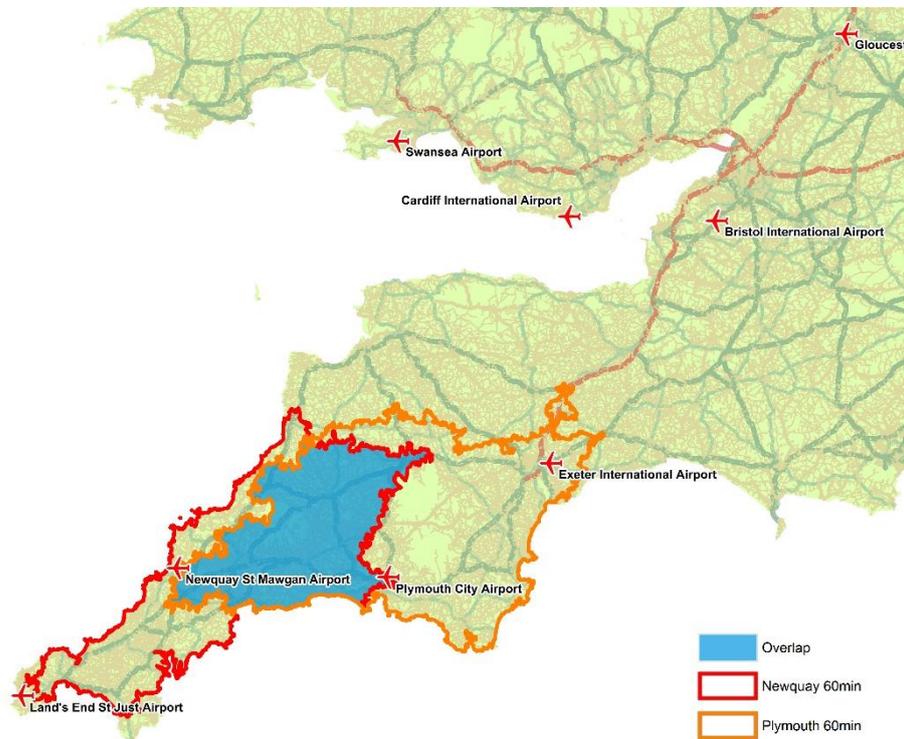
Table 3.1 Distance from NQY to airports in the neighbouring regions

Airport	Distance (km)	Drive time (hours)
PLH	75	1.1
EXT	130	1.5
BRS	230	2.5
BOH	268	3.3
SOU	307	4.0

Source: Oxera, based on Google Maps.

Figure 3.1 and Figure 3.2 illustrate 60 minutes’ drive time around NQY and PLH, as well as NQY and EXT, which highlights the overlap in the catchment areas.

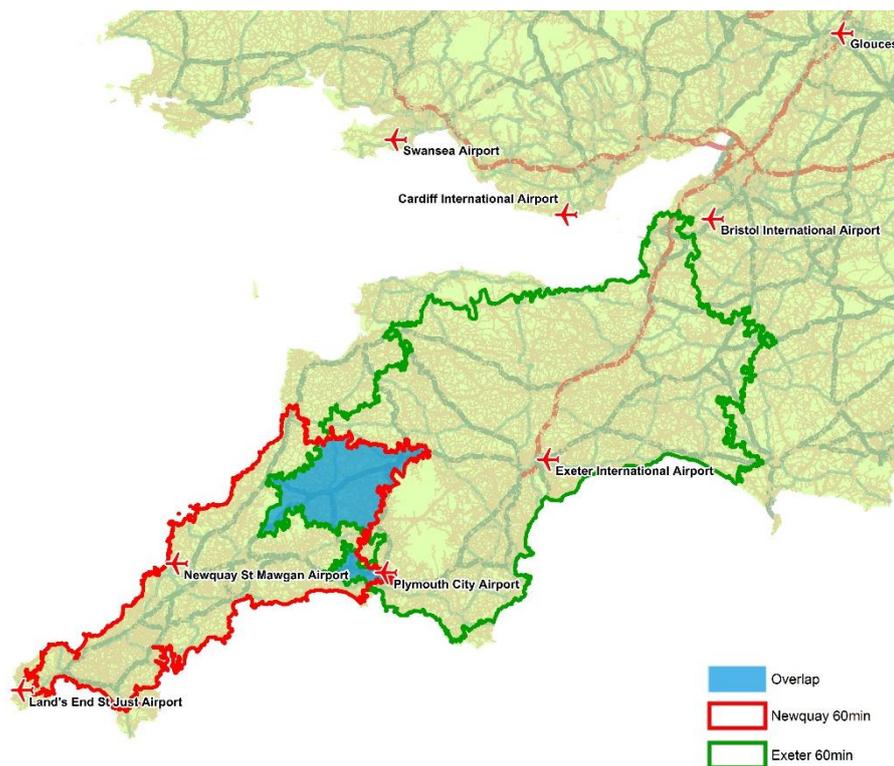
Figure 3.1 60 minutes’ drive time around NQY and PLH



Source: Oxera analysis, based on MapInfo.

⁵⁰ Although some parts of the overlapping area are sparsely populated as a result of a national park, there is still a significant population for whom both airports are likely to represent viable options for passengers.

Figure 3.2 60 minutes' drive time around NQY and EXT



Source: Oxera analysis, based on MapInfo.

As noted above, there may be some differences in the characteristics of NQY—which is primarily an airport that attracts inbound tourist traffic from the UK—and PLH and EXT, as well as BRS, implying that the airports may not be regarded as close substitutes.

However, in an (ex post) state aid assessment, not only should the current situation be considered, but also the counterfactual scenario. In the event that NQY did not receive aid, and therefore had ceased commercial operations, passengers visiting or travelling from Cornwall would have been likely to have mainly used PLH or EXT. Therefore, even though parts of the overlapping area between NQY and EXT may be sparsely populated, and there may be differences between these airports and NQY, in the absence of aid to NQY, it is likely that passengers would have considered EXT and PLH to represent viable options. This is acknowledged in the Commission’s decision, which states that 15% of EXT’s traffic originates from or has a destination in Cornwall.⁵¹ Given that NQY did receive aid, it is possible that NQY was able to exercise some competitive constraint on both EXT and PLH in particular.

Although NQY’s catchment area does not necessarily overlap with that of BRS (as shown in Figure 3.1 and Figure 3.2 above), we have tested whether aid to NQY affected BRS, in order to ensure that the analysis is as comprehensive as possible. According to NQY, BRS represented the airport’s strongest competitor, while BRS considered NQY to be within the airport’s catchment (albeit at its

⁵¹ European Commission (2007), ‘State aid No N 303/2007 – United Kingdom Newquay Cornwall Airport Development’, para. 66.

periphery). In contrast, NQY considers that EXT, and formerly PLH, exert weaker competitive constraints, if any.⁵²

Similar to passengers, airlines can substitute one airport for another if prices increase. As airlines are not necessarily bound by certain geographic locations, they might regard a wider set of airports as substitutes.⁵³ The Commission has assessed whether, from an airline perspective, the geographic market could be wider than 'origin and destination' pairs. Indeed, arguments have been put forward that LCCs can reallocate some capacity between airports relatively easily.⁵⁴

In previous cases that have considered airports in South West England, the Commission and the UK Office of Fair Trading (OFT, now merged into the Competition and Markets Authority), left the definition of the geographic market open. For example, in its decision about the MAG/Ferrovial Aeropuertos/EXT merger, the Commission concluded that:

(...) it cannot be excluded that the geographic scope of the market is as narrow as the South West of the UK (i.e. airports of Bristol, Exeter, Bournemouth, Newquay and Southampton).⁵⁵

The OFT, assessing the same merger, concluded that:

(...) the possibility of a regional frame of reference cannot be excluded, in particular for airlines already established in a region.⁵⁶

In a 2009 merger decision involving BRS and the Canadian pension fund, OTPP, the Commission noted that most airlines identified Cardiff, London Heathrow, EXT, Southampton, PLH and LGW as alternatives to BRS.⁵⁷

In a 2010 investigation into alleged predatory pricing by Flybe against Air Southwest on the NQY to LGW route, the OFT considered it unlikely that flights from PLH to LGW placed a significant competitive constraint on flights from NQY to LGW.⁵⁸ The OFT therefore considered NQY separately so as to be conservative in the abuse of dominance assessment (i.e. err on the side of finding a dominant position before assessing the abuse; eventually the OFT found that there was no abuse in this case). For the purpose of the ex post assessment of the effects of the aid, it is prudent to define the market more widely initially, in order to be able to test whether there are any effects of the aid.

Finally, although airlines could have potentially moved capacity from airports across Europe to NQY, it is unlikely that airports outside South West England would have been significantly affected by aid to NQY.

⁵² Based on our interviews with BRS and NQY.

⁵³ From discussions with airports, some consider that they compete with a number of other airports located anywhere in Europe in terms of airfares and capacity to attract airlines.

⁵⁴ European Commission (2013), *Ryanair/DAA-Aer Lingus*, Commission Decision dated 17 October 2013, para. 73; UK Office of Fair Trading (2005), 'Anticipated acquisition by Macquarie Airports Ltd and Ferrovial Aeropuertos SA of Exeter and Devon Airport Ltd', para. 18; and European Commission (2005), 'Case No COMP/M.3823 – MAG/ Ferrovial Aeropuertos/Exeter Airport', August, para. 17.

⁵⁵ European Commission (2005), *COMP/M.3823 – MAG/Ferrovial Aeropuertos/Exeter Airport*, Commission Decision dated 8 August 2005, para. 16.

⁵⁶ European Commission (2005), *COMP/M.3823 – MAG/Ferrovial Aeropuertos/Exeter Airport*, Commission Decision dated 8 August 2005, para. 16.

⁵⁷ European Commission (2009), 'Case No COMP/M.5648 – OTPP/ MACQUARIE/ BRISTOL AIRPORT Notification of 6/11/2009 pursuant to Article 4 of Council Regulation No 139/2004', 11 December, para. 28.

⁵⁸ Office of Fair Trading (2010), 'No Grounds for Action Decision: Alleged Abuse of a Dominant Position by Flybe Limited', Case No. MPINF-PSWA001-04, December.

Conclusion on market definition

NQY competes to some extent with other regional airports for both airlines (directly) and passengers (indirectly). NQY competes for LCCs and regional carriers, servicing mostly short-haul, scheduled leisure passengers flying point to point.

In terms of geographic scope, NQY, EXT and PLH (before its closure) are considered to represent the relevant market for the reasons outlined above. Although the market could potentially be wider from the airlines' perspective, any impact of aid to NQY on other airports is unlikely to be significant. However, we have also examined whether aid to NQY adversely affected BRS in order to ensure the comprehensiveness of the analysis.

3.1.4 Description of demand and supply in the affected market

To examine the impact of aid on competition, we have assessed the general market dynamics over the 2004–12 period, such as supply, demand, capacity and market shares, before focusing on individual airports and specific routes. Our analysis focuses on the aviation market, as road and rail transport are unlikely to represent substitutes to NQY, for the reasons set out in Box 3.1.

Box 3.1 Potential impact of aid on alternative modes of transport

It is unlikely that aid to NQY affected other modes of transport. As shown in the table below, only a limited number of routes to/from NQY face competition from other modes of transport, namely the routes to Plymouth and Land's End. The majority of journeys using alternative modes of transport to/from NQY are significantly over four hours in duration. Therefore, these alternative forms of transport are unlikely to be affected by aid to NQY. The European Commission previously concluded that aid to NQY is unlikely to affect other modes of transport.¹

Table 3.2 Potential competition between NQY and other modes of transport: an overview

Routes to/from NQY	Alternative mode of transport	Journey time by alternative mode of transport
Bristol	Rail	4 hours
Bristol	Coach	4.5 hours
Cardiff	Rail	5.5 hours
Durham	Rail	12 hours
Edinburgh	Rail	10 hours
Gatwick	Rail	6.5 hours
Isles of Scilly	Ferry	4 hours
Land's End	Rail	2 hours to Penzance
Leeds Bradford	Rail	8 hours
Luton	Rail	7 hours
Manchester	Rail	8 hours
Plymouth	Rail	2 hours
Plymouth	Coach	1.5–2 hours
Stansted	Rail	7 hours

Sources: Rail times taken from National Rail website, <http://ojp.nationalrail.co.uk/>; Google Maps, <https://google.co.uk/maps>; coach times taken from National Express website, <http://www.nationalexpress.com/>, and National Rail website, <http://ojp.nationalrail.co.uk/>; ferry times taken from Isles of Scilly Travel website, <https://www.islesofscilly-travel.co.uk/scillonian->

iii/; all accessed 13 July 2017.

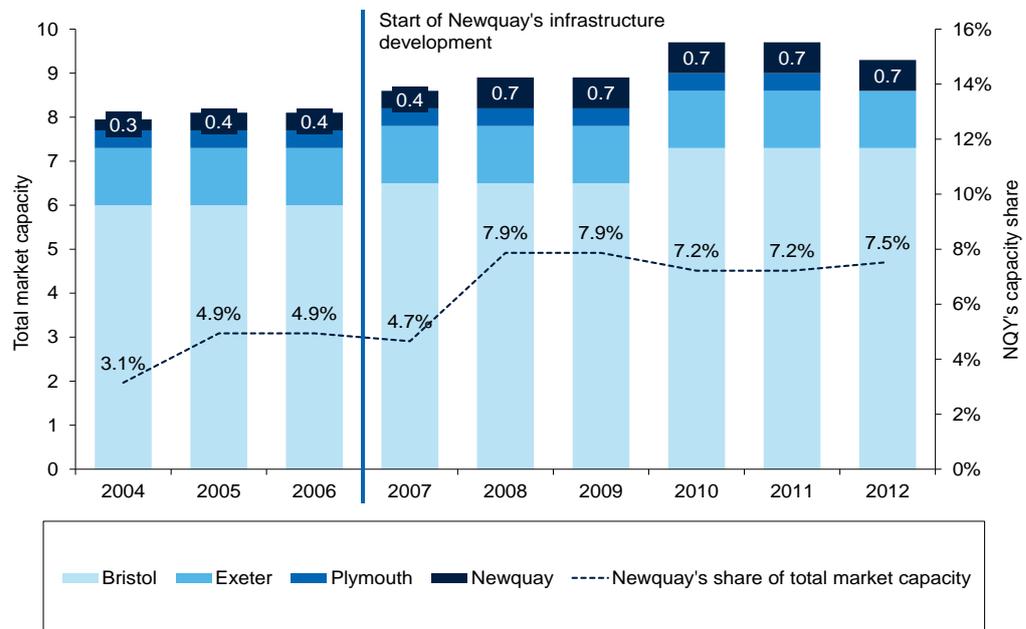
Other markets that potentially might have been affected by aid to NQY are not assessed in detail. In theory, aid to NQY could have potentially affected competition in the local housing market (e.g. as a result of an increase in the price of land); however, any such distortive effects are likely to be minor.

Note: ¹ European Commission (2007), 'State aid No N 303/2007 – United Kingdom Newquay Cornwall Airport Development', para. 67.

Source: Oxera.

Figure 3.3 shows the evolution of total passenger capacity from regional airports in South West England, as well as NQY's share of capacity in the same market. In 2004, NQY could accommodate up to 0.25m passengers per annum (mppa), representing approximately 3% of total capacity. From 2007 to 2008, the terminal expansion and related developments (such as hold baggage screening facilities) at NQY increased the airport's capacity to 0.7mppa, increasing NQY's share to 8% of total capacity.

Figure 3.3 Total capacity of airports in South West England per year (mppa)

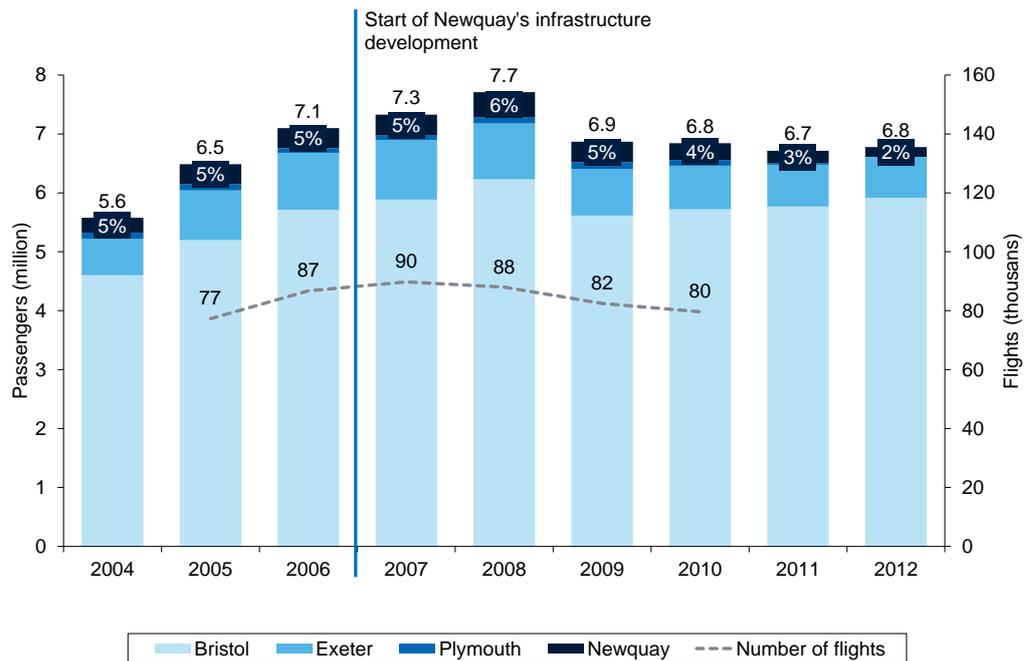


Note: Annual airport capacity is defined as the maximum number of passengers that can be accommodated by each airport. Data is not available after 2012.

Source: Oxera, based on information provided by the airports and various public sources, including airports' websites, press releases and master plans, as well as WWF (2011), 'Available UK airport capacity under a 2050 CO2 target for the aviation sector, An AEF report for WWF-UK', July, http://assets.wwf.org.uk/downloads/airport_capacity_report_july_2011.pdf, accessed 8 March 2017.

With the rise of LCCs across Europe in the early 2000s, passenger numbers at airports in South West England grew from 5.5mppa in 2004 to 7.5mppa in 2008, prior to declining to 6.9mppa in 2009, which is likely to be, at least partly, due to the onset of the economic and financial crisis. Figure 3.4 shows that NQY's market share remained relatively stable, at around 2–6% of total passengers at regional airports in South West England.

Figure 3.4 Passengers and flights per year across all airports in South West England

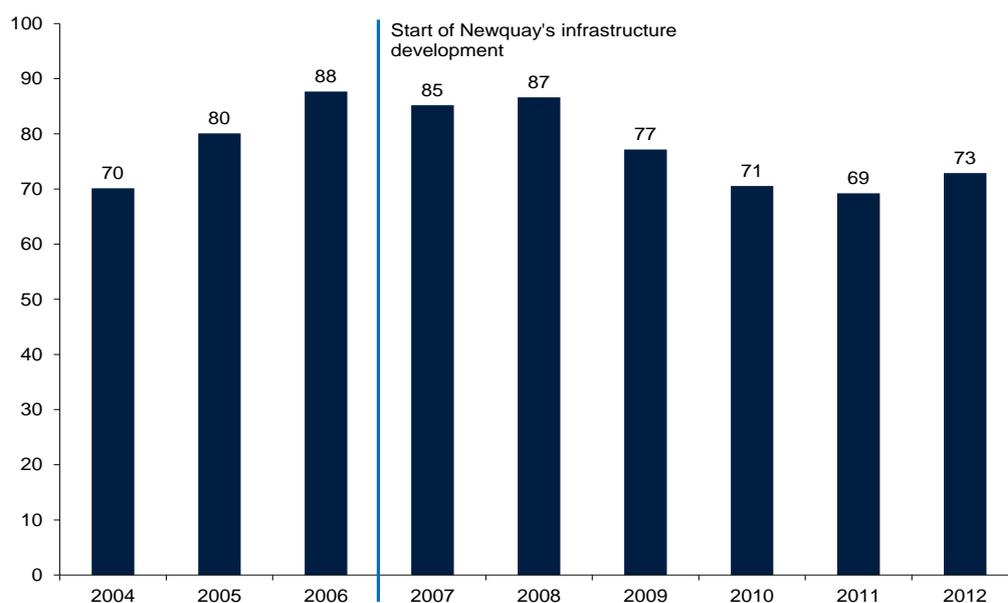


Note: Total inbound and outbound passengers for domestic and international travel at NQY, PLH, EXT and BRS. Flight data is not available after 2010.

Source: Oxera analysis, based on CAA and OAG data.

From 2004 to 2008, the rising demand for air traffic led to a steady increase in passenger traffic relative to total capacity (i.e. market utilisation) from 70% to 90%. However, as shown in Figure 3.5, increased capacity and declining passenger traffic due to the financial crisis led to market utilisation falling to 70–75% after 2008. This development is consistent with the fact that GDP in the UK decreased to its lowest level in 2009, with GDP declining by 4.3% in that year.⁵⁹ GDP levels in the UK only slowly recovered afterwards, and it was not until 2014 when GDP in the UK reached a similar level to that prior to the crisis in 2007. It is important therefore that the subsequent analysis of the impact of aid on competition controls for the effects of the financial crisis.

⁵⁹ World Bank (2017), 'United Kingdom, GDP (current US \$) and Annual GDP Growth (%)', United Kingdom, <https://data.worldbank.org/country/united-kingdom>, last accessed on 13 October 2017.

Figure 3.5 Evolution of market utilisation (%)

Note: Market utilisation is calculated as the total number of passengers at NQY, PLH, EXT and BRS divided by the total annual capacity. Data is not available after 2012.

Source: Oxera analysis, based on CAA data, information provided by the airports and various public sources, including airports' websites, press releases and master plans.

Given NQY's small share of market capacity and passenger traffic, any impact of aid on competition is likely to be limited to the closest substitutes to NQY. This is also consistent with our discussions with various airports. For example, SOU, which is four hours away from NQY, did not consider the impact of aid to NQY to be significant because of NQY's relatively low passenger traffic and the distance between the airports. Therefore, our analysis focuses on those segments where NQY has a high share of the market, in particular, specific routes from NQY that are also served by airports in the region.

Table 3.3 Annual seat capacity of the ten largest airlines at NQY

Airline	Average annual seat capacity, 2005–10
Air Southwest	335,469
Ryanair	146,766
Flybe	71,281
Bmibaby	62,125
Isles of Scilly Skybus	23,216
British Airways	23,045
Monarch Airlines	5,700
Jet2	5,081
Aer Arann	2,666
Lufthansa ¹	841

Notes: Aer Arann only flew from NQY to Cork and Luton in 2006 with 15,994 seats, which represents an average of 2,666 seats over the six years. ¹ Lufthansa only operated approximately 30 flights during the summer seasons in the 2008–10 period.

Source: Oxera analysis, based on OAG data.

Air Southwest used to carry the highest number of passengers at NQY (until the airline ceased operations in 2011), with a capacity of over 335,000 seats on

average between 2005 and 2010. Air Southwest flew to UK destinations such as Cardiff, LGW and Glasgow, and to destinations in Ireland. Ryanair mostly flew to Stansted Airport, as well as Alicante and Girona (Spain). Other large airlines at NQY included Flybe (UK destinations) and bmibaby, which mostly flew to Manchester and Birmingham in the UK, but stopped operations in 2012 following a takeover by IAG.

Market entry and exit

Following at least five years of losses, PLH closed in December 2011 after its owner, the Sutton Harbour Group, acknowledged that routes from the airport were no longer profitable.⁶⁰

In 2010 and 2011, one of the largest airlines operating from PLH, Air Southwest, gradually withdrew its services from PLH and stopped operations altogether, as a result of low demand, high costs of landing slots at the destination airports, and the impact of the volcanic ash crisis.⁶¹ The last commercial flight by Air Southwest departed in July 2011.

A study by the UK Department for Transport identified the relatively short runway at PLH as a primary constraint at the airport.⁶² As a result, PLH was restricted to operating only 50-seat turboprop aircraft, with the runway being too short to accommodate commercial aircraft used by airlines such as Ryanair.

No other airports opened or closed in the Southwest of England over the 2004–12 period.

3.2 Identification of potential distortions to competition

3.2.1 Counterfactual scenario

To study the impact of aid to NQY on competition, the current competitive landscape needs to be compared with what would have happened if the aid had not been granted to NQY (i.e. the ‘counterfactual’).

Before the aid was granted to expand NQY’s commercial passenger services, airfield services at NQY were provided by the RAF. According to our discussions with NQY, following the departure of the RAF, the airport needed to undertake significant investments to secure a licence from the CAA to continue to operate airfield services. A significant portion of the aid was therefore required for CAA licence compliance purposes.⁶³ In particular, the Commission’s decision states that:

the investment is required in order to perform works necessary for obtaining the civil operating licence from the CAA. Currently the airport operates under the

⁶⁰ For details, see BBC (2011), ‘Final day protest against Plymouth Airport’s closure’, news report, 23 December.

⁶¹ Before the airline was sold to Eastern Airways in 2010, both Air Southwest and PLH were owned by Sutton Harbour Holdings. For further details, see: BBC (2010), ‘Plymouth-based airline Air Southwest sold’, 20 September, <http://www.bbc.co.uk/news/uk-england-devon-11368697>, last accessed 11 May 2017; Gatwick Airport Guide (2011), ‘Air Southwest pulls plug on Plymouth route’, 27 January, <https://www.gatwick-airport-guide.co.uk/blog/2011/01/27/air-southwest-pulls-plug-on-plymouth-route/>, last accessed 11 May 2017; and Jamieson, A. (2010), ‘Airline scraps London City flights to Newquay, Plymouth’, *Telegraph*, 5 May, <http://www.telegraph.co.uk/travel/travelnews/7680849/Airline-scraps-London-City-flights-to-Newquay-Plymouth.html>, last accessed 11 May 2017.

⁶² UK Department for Transport (2016), ‘A study of consultancy reports’ conclusions on reopening Plymouth City Airport for commercial passenger services’, 16 December.

⁶³ This includes a new control tower, a new fire station and the widening and re-surfacing of an additional taxiway for a new terminal. For further details, see European Commission (2007), ‘State aid No N 303/2007 – United Kingdom Newquay Cornwall Airport Development’, para. 67, para. 22.

RAF's military licence. **Obtaining the civilian licence is critical to the continued operation of the airport. Without such licence the airport will be forced to close to commercial traffic.**⁶⁴ [emphasis added]

According to NQY, if the airport had not been able to undertake the investments, it would have needed to close.⁶⁵ Given that the airport was loss-making, it is unlikely that the airport would have been able to raise sufficient funding without government support.⁶⁶ Furthermore, the Commission decision notes that:

Although it is the intention of the public owners of the airport that the airport be capable of reaching break-even by 2013–14 and ensure long-term commercial viability thereafter the public authorities do not have any expectation of a financial return on the investment in question.⁶⁷

Therefore, in the absence of aid, the airport would not have been able to raise sufficient private financing, implying that commercial operations at NQY would have ceased without the aid. Therefore, the appropriate counterfactual to consider is that NQY would not have been able to operate as a commercial airport and therefore would have closed in the absence of the aid.

3.2.2 Testable hypotheses on the impact of competition

The aid to NQY will adversely affect competing airports if there is a high degree of substitutability between airports in terms of airlines and passenger groups, and if the airports are in the same geographic vicinity, serving a similar economic catchment.

- **Competition for airlines.** The expansion of NQY's capacity may weaken the bargaining position of competing airports when negotiating with airlines, particularly for those airports that are most substitutable for NQY and for LCCs that are likely to face relatively low switching costs.⁶⁸
- **Competition for passengers.** If NQY's product offering is closely substitutable with competing airports, it is possible that aid could have diverted both airlines and passengers from competing airports (i.e. the cannibalisation effect). However, if NQY's service is differentiated from competing airports, the airport is likely to serve customers that otherwise might have not travelled or travelled to a different destination (i.e. the market expansion effect).

In general, it is plausible that increased competition as a result of airport entry or expansion will harm competing airports, but benefit airlines and passengers, at least in the short term.

We have examined the following hypotheses to assess the impact of aid to NQY on competition.

- **Hypothesis 1:** did aid to NQY lead to a decline in traffic on those routes that were also served by neighbouring airports (i.e. 'overlapping routes')?
- **Hypothesis 2:** did aid to NQY have a significant impact on overall passenger traffic at neighbouring airports?

⁶⁴ European Commission (2007), 'State aid No N 303/2007 – United Kingdom Newquay Cornwall Airport Development', para. 76.

⁶⁵ From our discussions with NQY.

⁶⁶ From our discussions with NQY.

⁶⁷ European Commission (2007), 'State aid No N 303/2007 – United Kingdom Newquay Cornwall Airport Development', paras 63 and 67.

⁶⁸ Based on insights from our interviews with both airports and airlines.

- **Hypothesis 3:** did aid to NQY lead to a change in the airline base, the number of routes, and airline capacity at neighbouring airports, with airlines switching away from neighbouring airports to operate at NQY?
- **Hypothesis 4:** did aid to NQY lead to competing airports charging lower net fees to airlines due to greater competition?

In order to test these hypotheses, we have explored a number of avenues to obtain the necessary data, as summarised in Box 3.2.

Box 3.2 Overview of data availability

We have undertaken interviews with market participants and other relevant stakeholders in order to understand their views on whether aid to NQY impacted competition, and to obtain the relevant data to test hypotheses 1 to 4. A total of seven interviews were conducted between February and March 2017. Among the interviewees were representatives of NQY, neighbouring airports, and airlines operating from the airports in the relevant geographic market.

Following the interviews, we obtained the following information.

- Data on net charges paid by an airline at NQY and the same airline at one of the neighbouring airports (specifically, BRS).
- Publicly available data from the CAA. The data consists of the total number of passengers (i.e. both outbound and inbound) per month by route at UK airports, including NQY and its neighbouring airports, over the 2001–16 period. The data set covers both scheduled and charter flights, as well as both domestic and international routes.

We also explored a number of avenues to try and obtain the following data.

- Seat capacity data and passenger numbers by airline and route. Data on seat capacity and the number of passengers by airline and route over the 2001–16 period is not available in the public domain; although, a data set that includes this information was provided by one of the interviewees. However, following a detailed review of the data, the data set was found to be incomplete and therefore proved to be unreliable for detailed assessments; therefore, it was not possible to use the data set to test the stated hypotheses. Instead, the data set was used for high-level qualitative insights.
- Data on the type of passengers at NQY and the neighbouring airports. We reviewed publicly available Passenger Survey reports from the CAA that provide some information about passenger groups at different UK airports. However, this information was not available for NQY or PLH, while only limited information in non-successive years was available for EXT. This information was therefore insufficient to analyse how the passenger mix might have changed at the neighbouring airports due to the aid to NQY.
- Net charges paid by each airline at NQY and the neighbouring airports. We investigated the availability of databases such as airportcharges.com. However, this database only contains airports' published charges. As airlines typically negotiate charges with airports, particularly marketing payments received by airlines from airports and other forms of incentive payments, the use of published charges is unlikely to yield informative results.
- Route-level data on the profitability of airlines at NQY and the neighbouring airports. This information was considered by airlines as too commercially sensitive to share outside their organisations.
- Marketing expenditure and investments at NQY and the neighbouring airports. The financial accounts for each airport that are in the public domain do not contain this level of data. During interviews with airports, we requested data on marketing expenditure from the airports as well as details of the airports' marketing campaigns, in addition to data on airports' planned investments. However, the airports were not able to provide us with this information.
- Financial accounts for NQY and the neighbouring airports to assess the profitability of each airport. From the public domain, some financial information is available for parent companies. However, the airports in question typically are only a subsidiary of a larger corporate group. For example, Sutton Harbour Holdings, the previous owners of PLH, also owns Plymouth and Millbay harbours, as well as a number of car parks and real

estate. Therefore, financials at the level of the holding company do not contain sufficient detail for the purposes of the analysis. The airports were not able to provide more granular data on the level of the airports.

If the data on seat capacity and the number of passengers by airline and by route, which was provided by one of the interviewees, had been available in a complete form, this would have enabled us to draw further insights from the analysis undertaken to test hypotheses one to three.

If the data described above had been available, the following additional hypotheses could also have been tested:

- Did aid to NQY lead to a change in airlines' load factors on routes at the neighbouring airports?
- Did aid to NQY lead to greater marketing campaigns by neighbouring airports?
- Did aid to NQY lead to reduced capacity-related investments by neighbouring airports?
- Did aid to NQY lead to a change in the characteristics of passengers using neighbouring airports?

Source: Oxera.

3.3 Competitive assessment

The methodology that we have followed to examine each of the hypotheses that can be tested with the available data is set out below, together with the results.

3.3.1 Hypothesis 1: did aid to NQY lead to a decline in traffic on those routes that were also served by neighbouring airports (i.e. overlapping routes)?

It is possible that any switching to NQY from neighbouring airports, as a result of NQY's expansion, is most likely to be observed on overlapping routes (i.e. routes to and from NQY that are also served by neighbouring airports).

To assess the impact of aid to NQY on the overlapping routes, we have followed two approaches described below.

First, we have examined the evolution of passenger traffic on overlapping routes at NQY and the neighbouring airports (discussed further in Box 3.3) over the 2001–16 period. This descriptive analysis examines the trends 'before' the aid was granted in 2006 and 'after' the aid was granted. It can be inferred that the aid has an impact on competition if a sharp break in traffic is observed that cannot be explained by any obvious factors.

Box 3.3 Identifying overlapping routes from/to NQY

As NQY accounts for only 3–8% of the total capacity of airports in South West England, in order to assess whether aid to NQY had a competitive effect on neighbouring airports (namely, PLH and EXT), we first undertook the analysis on a route-by-route basis, focusing on those overlapping routes at PLH and EXT.

The number of overlapping routes from/to each airport is shown below for the 2006–10 period.

Table 3.4 Overlapping routes from/to NQY

	Number of overlapping routes
PLH	9
EXT	18

Note: Overlapping routes refer to destinations from neighbouring airports that can also be reached from NQY. A route captures both inbound and outbound traffic.

Source: Oxera analysis, based on publicly available CAA data.

Source: Oxera.

Secondly, as the period ‘after’ the aid coincides with the onset of the economic and financial crisis, in order to separately identify the impact of the aid, we also undertook econometric modelling—namely, dynamic panel models—to assess whether aid to NQY affected traffic on overlapping routes as well as total passenger traffic at the neighbouring airports. The modelling is described in detail in Box 3.4.

Analysis of the evolution of passenger traffic on overlapping routes

Overlapping routes between NQY and PLH

Over the 2004–06 period, both NQY and PLH operated routes to and from LGW. None of the other routes at NQY prior to the expansion of the airport were also served by PLH.⁶⁹

Figure 3.6 shows annual passenger traffic on the LGW route from NQY and PLH. Steady growth in passenger traffic at NQY can be observed following the capacity expansion in 2007, with the number of passengers doubling from 43,000 in 2006 to 106,000 in 2010. In contrast, passenger traffic at PLH declined by around 19% over the same period. It is plausible that NQY might have captured some of the traffic from PLH following the increase in the airport’s terminal capacity.

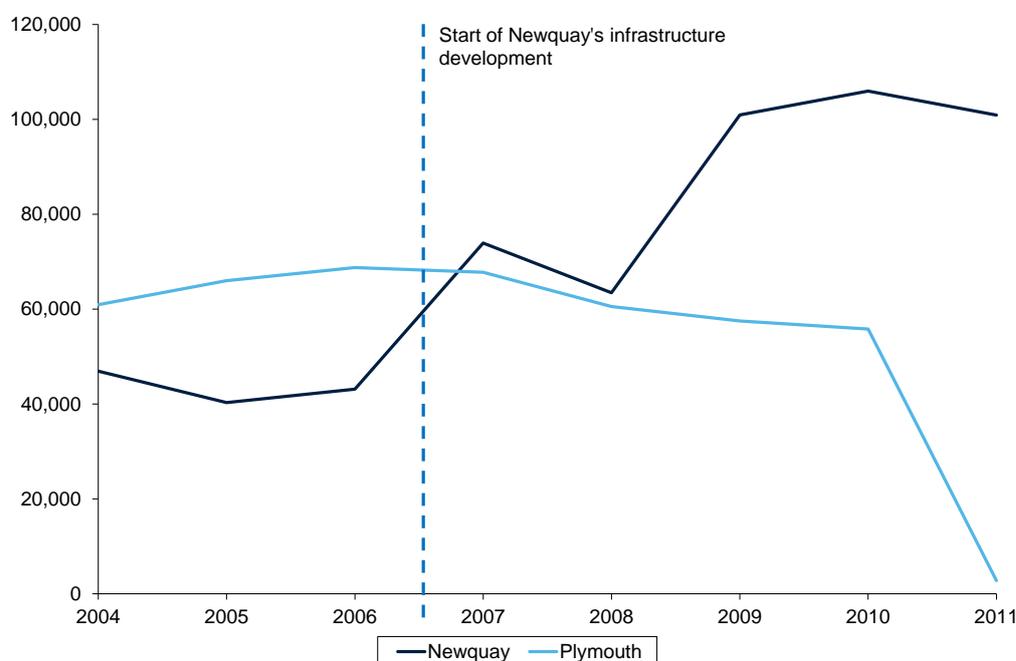
However, there is no increase in passenger traffic at NQY in 2011 when PLH ceased its operations, suggesting that PLH’s passengers might have switched to airports other than NQY. A possible explanation is that a significant proportion of PLH’s passengers switched from PLH to NQY following the increase in the capacity of NQY’s terminal. These passengers might therefore have already been using NQY instead of PLH by the time that PLH closed, which would explain why there was no significant increase in passenger traffic at NQY following PLH’s closure.

This explanation would be consistent with the hypothesis that NQY captured some of the traffic from PLH following the increase in the airport’s terminal

⁶⁹ Both NQY and PLH also operated flights to BRS before and after the aid. However, BRS was solely a stopover for other destinations.

capacity. However, it is also possible that the decline in passenger traffic at PLH was, at least partly, due to the onset of the financial crisis. Therefore, graphical analysis of passenger traffic alone does not enable clear conclusions to be drawn about whether aid to NQY affected PLH.

Figure 3.6 Total passenger traffic on the NQY and PLH routes to/from LGW



Note: Total passenger numbers include departing and arriving passengers. The figure covers the period until 2011, in light of PLH stopping commercial operations.

Source: Oxera analysis, based on publicly available CAA data.

Overlapping routes between NQY and EXT

Table 3.5 shows how passenger traffic on overlapping routes between NQY and EXT developed after the capacity expansion.

Table 3.5 Growth in passenger traffic on overlapping routes at NQY and EXT in 2007–09 compared with 2004–06

	Growth of passengers at NQY		Growth of passengers at EXT	
	in number of passengers	as percentage of the 2004–06 period	in number of passengers	as percentage of the 2004–06 period
Dublin	-1,222	-6%	-6,248	-18%
Edinburgh	11,388	209%	2,395	4%
Isles of Scilly	-2,235	-13%	291	-7%
Leeds Bradford	2,036	11%	1,567	8%
Manchester	16,197	47%	26,438	105%

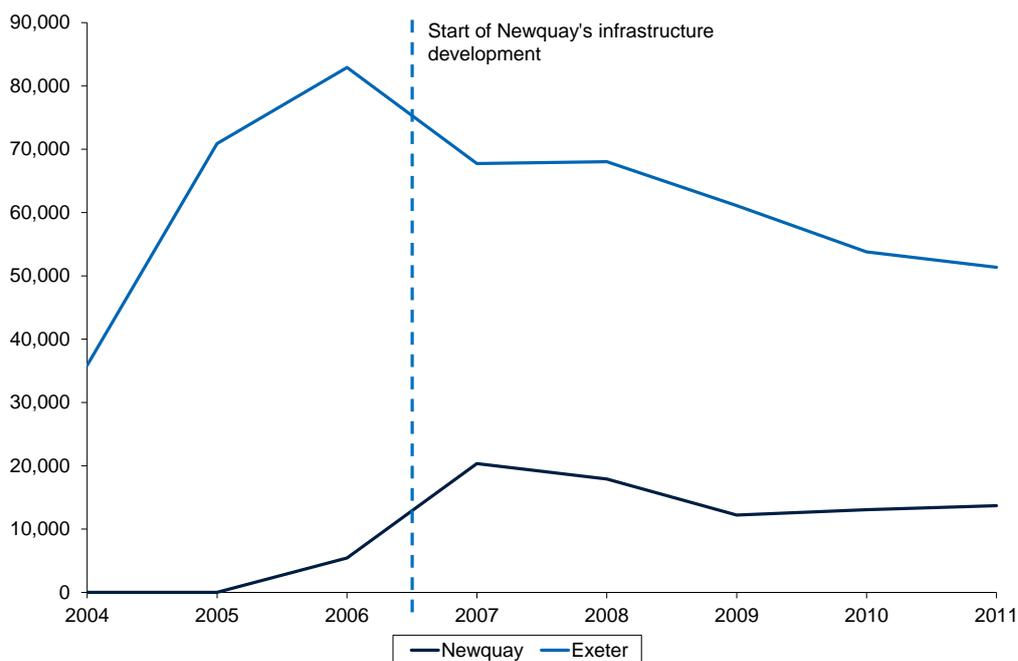
Note: The estimates show growth in average annual passengers for the 2007–09 period compared with 2004–06.

Source: Oxera analysis, based on publicly available CAA data.

The evidence presented in Table 3.5 is not conclusive. While the number of passengers to and from some destinations increased more quickly at NQY than at EXT (such as the NQY–EDI route), for many destinations (such as Dublin, the Isles of Scilly and Leeds), growth in passenger traffic was similar at both NQY and EXT. In contrast, in the case of Manchester, growth at EXT was stronger than at NQY. Therefore, based on analysis of the descriptive statistics alone, a persistent effect of the capacity expansion at NQY on overlapping routes at EXT cannot be observed.

The evolution of traffic on the EDI route is consistent with aid to NQY adversely affecting passenger traffic on that route (see Figure 3.7). Indeed, the figure shows that the start of the NQY route is associated with a significant decline in passenger traffic on the EXT route. However, the decline may also be partly due to the onset of the financial crisis. Based on the descriptive statistics alone, it is not possible to robustly separate the effect of the aid from other market influences. However, the dynamic panel data models enable the impact of the aid to be robustly quantified, separately from wider market trends, such as the financial crisis. As discussed below, the results from the econometric analysis suggest that aid to NQY had a significant adverse impact on EXT.

Figure 3.7 Total passenger traffic on the NQY and EXT routes to/from EDI



Note: Total annual passengers (including departing and arriving passengers) to EDI from NQY and EXT. To be consistent with Figure 3.6, the figure only covers the period up until 2011.

Source: Oxera analysis, based on publicly available CAA data.

Dynamic panel data models

To extend the descriptive analysis, we have undertaken econometric analysis of the impact of the aid on the overlapping routes in the form of dynamic panel data models. There are a number of advantages of the dynamic panel models over the descriptive analysis.

- First, the dynamic panel models enable the level of traffic that would have been likely in the absence of aid to NQY (i.e. the counterfactual level of passenger traffic) to be estimated.
- Second, the dynamic panel models enable the impact of the aid to NQY to be robustly quantified separately from the impact of wider market developments, such as the financial crisis. In order to control for the impact of the financial crisis, we compare the evolution of traffic at PLH, EXT and BRS to the evolution of traffic at other airports in the wider region not affected by the aid (i.e. the control group). Although the control group of airports are unlikely to have been affected by the aid to NQY, they are likely to have been affected by market developments in a similar way to NQY's neighbouring airports (see Box 3.4 for further details). In the absence of aid to NQY, we would expect passenger traffic at PLH, EXT and BRS to have experienced similar trends to the control group of airports. This enables the impact of the aid to be estimated separately from the impact of the financial crisis or other market developments.
- Third, the dynamic panel data models enable the impact of the aid to NQY across a number of routes to be estimated together, with controls for route-specific factors as well as wider market developments that might have affected passenger traffic on these routes.

It should be noted that, although for the reasons set out in section 3.2.1, it is likely that NQY would have closed in the absence of aid, this counterfactual scenario cannot be modelled using the econometric analysis given the available data. Instead, the dynamic panel data models implicitly assume that, in the absence of the aid (i.e. in the counterfactual scenario), NQY would have maintained commercial operations at a low level similar to the period before the aid. Therefore, the results from the panel data models of the impact of the aid to NQY are likely to be conservative, as we would expect the impact of the aid compared with the counterfactual where NQY would have closed to be larger.

As described in Box 3.4, the dynamic panel data models have been estimated to quantify the impact of the aid on overlapping routes at PLH and EXT (i.e. hypothesis 1), as well as the impact of the aid on overall traffic at each airport (i.e. hypothesis 2).

Box 3.4 Overview of the specification of the dynamic panel model

The dynamic panel model is a widely used forecasting model, which uses the pattern of past values of the variable under investigation (e.g. the number of passengers) to forecast future values.

As discussed above, the dynamic panel data models enable the impact of the aid to be isolated from other market developments. The effect of the aid is measured as the difference in passenger traffic between routes that may have potentially been affected by the aid to NQY (i.e. the treatment group) and routes at those airports that are unlikely to have been affected by the aid (i.e. the control group). The difference between the treatment and the control group is compared before and after the aid was given. This approach is called a difference-in-differences estimator.

The control group should ideally reflect the same trends and shocks over time that are also faced by the treatment group. The control group consists of 194 routes from Bournemouth Airport (BOH) and Southampton Airport (SOU). These routes serve as a benchmark for the evolution of passenger traffic at airports that are unlikely to have been affected by the aid, given that both airports are located more than three hours away from NQY. However, as regional airports in South England, it is likely that SOU and BOH are affected by similar trends and seasonal fluctuations in passenger traffic as NQY. For example, it is plausible that SOU and BOH would have been affected by the financial crisis

to the same extent as NQY and the airports in the treatment group. Therefore, the comparison with the development of traffic at the control group of airports enables the effects of the aid to be robustly estimated separately from the impact of market-wide factors, such as the financial crisis.

It should be noted that if the characteristics of the treatment group differ significantly from those of the control group (such as differences in journey purpose), the estimate of the impact of the aid may be biased. It is not possible, however, to state the direction and size of any possible bias, as this cannot be identified from the data.

Figure 3.8 compares the evolution of passenger traffic prior to the aid to NQY across PLH, EXT and BRS (i.e. the treatment group) and the control group. This shows that fluctuations in passenger traffic for the treatment and control groups were broadly similar before the aid. This highlights the appropriateness of the control group, as it suggests that, in the absence of the aid, trends in traffic across the airports in the control and treatment groups are likely to have been similar. It should be noted that BRS has been included in the treatment group in order to check that aid to NQY has not affected BRS, given the significant distance between BRS and NQY.

Figure 3.8 Development of monthly average passenger numbers per route across the treatment and control groups before the aid



Note: Parallel trends in passenger numbers in the 2001–06 period before the aid indicate that routes from BOH and SOU represent an appropriate control group.

Source: Oxera analysis, based on publicly available CAA data.

Depending on the exact model specification, the composition of the routes in the treatment group varies. For example, in order to examine the impact of the aid on the route between PLH and LGW, the treatment group consists only of observations on this particular route. All PLH routes are included in order to assess the general effect of the aid on the airport.

We have estimated the following regression model over the 2001-16 period in order to capture trends both before and after the aid to NQY. As shown below, passenger traffic is modelled over time for each route assuming that past passenger numbers represent a good predictor of future levels. Seasonal fluctuations and wider industry trends, such as the impact of the economic and financial crisis, are captured by fixed time effects that are calibrated based on the routes in the control group.

$$Y_{it} = \alpha_i + \delta_t + \beta Y_{it-1} + \gamma \text{Aid}_{it} + \epsilon_{it}$$

where

- Y_{it} is the estimated number of passengers in month t for each route (i.e. route i);
- α_i is a fixed route effect that captures systematic differences in passenger traffic for

route i from traffic on other routes;

- δ_t is a fixed time effect for month t that captures seasonality and general trends in the aviation industry across time;
- Y_{it-1} is the actual number of passengers on the route in the previous month, such that β represents the lagged effect of passenger traffic in the previous month on traffic in month t ;
- Aid_{it} is a dummy variable that takes the value 1 if route i was potentially affected by the aid in time t . The dummy variable takes on the value 0 for all routes in the control group and all observations before January 2007 i.e. before the aid to NQY;
- γ represents the short-run impact of the aid in the first month after the aid, i.e. January 2007;
- $\frac{\gamma}{1-\beta}$ represents the long-run monthly impact of the aid (for an explanation of the short-run and the long-run impact, see Box 3.5 below);
- ϵ_{it} is a route- and time-specific residual term.

The counterfactual scenario that implicitly underlies the dynamic panel data models is that, in the absence of aid, NQY would have operated at a low level of traffic similar to the period before the aid, and that passenger traffic on routes to/from NQY would have developed in line with wider industry trends. The more appropriate assumption that NQY would have ceased its commercial operations in the absence of the aid cannot be modelled, given the fact that no such comparable situation exists (i.e. a situation with no commercial operations at NQY before the aid).

Notes: The data set underlying the dynamic panel model consists of monthly route-level passenger data for the 2001-16 period. On average, the data set contains 55 observations per route. The relatively long time dimension of the panel mitigates the so called Nickell bias that occurs in data sets with a limited number of time periods (i.e. a *small T*) and a large number of panels (i.e. a *large N*). A standard approach that is used to correct for the Nickell bias is with an Arellano-Bond estimator that uses Generalised Method of Moments to instrument the lagged variable. We have examined such estimators; however, the results demonstrate that the standard original least squares estimator generally represents a better fit for the data.

Source: Oxera.

In order to investigate the impact of the aid on overlapping routes separately from other factors such as route-specific factors that affect passenger traffic as well as industry-wide influences such as the financial crisis, we have estimated the following three models.⁷⁰

- **Model 1: impact of the aid on routes operated by PLH to and from LGW.** Here, the treatment group is comprised of only the PLH route to/from LGW. The same control group as outlined in Box 3.4 has been used. The impact of the aid, separated from other effects, is modelled as a dummy variable that takes the value 1 from January 2007 onwards.
- **Model 2: impact of the aid on routes operated by EXT to and from EDI.** The treatment group is comprised of the EXT route to/from EDI. Apart from the definition of the treatment group, the model specification is the same as model 1.
- **Model 3: impact of the aid on all overlapping routes at PLH, EXT and BRS.** This model expands the treatment group to include all overlapping routes at PLH and EXT, as well as BRS. The model estimates the effect of the aid on overlapping routes for each of these airports separately. As BRS is 230km and 2.5 hours' drive time from NQY, it is less likely that overlapping

⁷⁰ As described above, due to the comparison of the treatment group to the control group, the models enable the impact of the aid compared with other market influences, such as the financial crisis, to be robustly quantified. This represents a key advantage of the dynamic panel data models compared with the descriptive analysis presented in Figure 3.6 and Figure 3.7 above. Models 1 and 2 therefore represent a more appropriate approach than the descriptive analysis shown in Figure 3.6 and Figure 3.7 to robustly identify whether the aid affected the PLH and LGW route as well as the EXT and EDI route.

routes at BRS would have been significantly affected by aid to NQY. However, BRS has been included within the analysis in order to ensure the comprehensiveness of the analysis. The treatment group therefore contains all routes from PLH, EXT and BRS that were also operated by NQY for at least one month from 2007 onwards.⁷¹

The results from the above models are summarised in Table 3.6 below, which shows the short-run and the long-run effects of the aid to NQY.

Table 3.6 Results of the dynamic panel data models for overlapping routes

	Model (1)	Model (2)	Model (3)		
Treatment group	LGW–PLH and PLH–LGW	EDI–EXT and EXT–EDI	All overlapping routes at PLH, EXT and BRS		
Control group	All routes at SOU and BOH				
Treatment period	Jan 2007–Oct 2011	Jan 2007–Jun 2016	Jan 2007–Jun 2016		
Lagged effect of passenger traffic on the route in the previous month (β) (robust standard errors clustered by route in parentheses)	0.849*** (0.0207)	0.849*** (0.0206)	0.853*** (0.0149)		
Short-run impact of the aid on passenger traffic per route each month (γ) (robust standard errors clustered by route in parentheses)	-216.0*** (61.71)	-356.4*** (63.37)	-156.9*** (58.91)	-216.3*** (74.32)	-131.8 (191.1)
Implied long-run impact of the aid on passenger traffic per route each month ($\frac{\gamma}{1-\beta}$)	-1,430	-2,360	-1,067	-1,471	-897
Number of routes in the treatment group ¹	1	1	8	24	35
Number of routes in the control group ¹	194	194	194		
Number of observations	8,575	8,615	12,290		
Within-R ²	0.794	0.795	0.788		

Notes: Asterisks indicate the p-value, a measure of statistical significance, where ***, ** and * represent statistical significance at the 99%, 95% and 90% levels respectively. The short-run impact measures the marginal effect of the aid in each month. The short-run impact accumulates over time, as the impact of the aid to NQY reduces over time. The long-run impact describes the monthly difference between the average factual and counterfactual passenger traffic after a few years. The long-run impact is calculated as is the sum of short-run effects expressed as an infinite geometric series as described below in Box 3.5.

¹ One route refers to both the outbound and inbound journey.

Source: Oxera analysis, based on CAA data.

Table 3.6 shows the estimate of the impact of the aid to NQY on passenger traffic on the overlapping routes in both the short and the long run. The short-run impact measures the marginal effect of the aid over the subsequent month, while the long-run refers to the maximum monthly effect of the aid. Intuitively, the

⁷¹ In order to ensure that the model appropriately captures the impact of overlapping routes at NQY, the routes in the treatment group are only taken into account in those months in which they overlap with NQY from January 2007 onwards.

effect of the aid may accumulate over time as passengers become more aware of the additional route options from/to NQY when choosing flights, and more airlines might start operating new routes from/to NQY. Box 3.5 outlines how the long-run effect has been implied from the results of the dynamic panel data models.

Box 3.5 Explanation of the short-run and long-run effects of the aid to NQY

Due to the dynamic structure of the models, the coefficient of the aid dummy γ represents the effect of the aid in the first month after the aid (i.e. the short-run effect)—i.e. January 2007. The effect in $t \geq 1$, where $t = 1$ is the first month after the start of the aid, can be represented by the following equation:

$$\text{aid effect}_t = \sum_{t=1}^t \gamma \beta^{t-1}$$

As set out in Box 3.4, the coefficient β represents the effect of the previous month's passenger traffic on the route on passenger traffic in period t . After a sufficient period of time following the start of the aid to NQY, mathematically, when t reaches infinity, the long-run effect becomes:

$$\text{long-run aid effect}_{t|t \rightarrow \infty} = \frac{\gamma}{1 - \beta}$$

The results from the models suggest that the long-run effect of the aid to NQY is reached after three to five years. This can be interpreted as the duration of the transitional period until NQY is able to make maximum use of its new capacity from the aid, given the level of competition.

Source: Oxera.

The results in Table 3.6 indicate that aid to NQY led to a reduction in traffic on overlapping routes from PLH to/from LGW and from EXT to/from EDI, as outlined below.

- **Impact of the aid on PLH's route to/from LGW.** Compared with the development of passenger traffic on the control routes at SOU and BOH, passenger traffic on the route between PLH and LGW declined significantly over the 2007–11 period. The results suggest that, in the short run, aid to NQY led to approximately 216 fewer passengers on the route between PLH and LGW each month. In addition, this effect accumulates over time, such that passenger traffic on the route is lower by around 1,430 passengers per month as a result of aid to NQY. This represents approximately 26% of passenger traffic on the route between PLH and LGW in the period before the aid (i.e. in the 2004–06 period).
- **Impact of the aid on EXT's route to/from EDI.** The results indicate that the aid led to 365 fewer passengers per month in the short-run, amounting to approximately 2,360 fewer passengers per route each month in the long-run. This represents approximately 42% of passenger traffic per route, on average, in the 2004–06 period.
- **Impact of the aid on all overlapping routes at PLH, EXT and BRS.** The results suggest that the aid led to a reduction in passenger traffic across all overlapping routes at PLH and EXT, but not at BRS. The overall effect on the overlapping routes at PLH and EXT is smaller than that observed on the individual routes between PLH and LGW and between EXT and EDI, respectively.

3.3.2 Hypothesis 2: did aid to NQY have a significant impact on overall passenger traffic at neighbouring airports?

In addition to directly affecting overlapping routes, it is possible that the aid to NQY could have also adversely affected overall passenger traffic at neighbouring airports for the following reasons. First, it might have affected airlines' capacity decisions, such as where to open a new route, or it might have led airlines to reallocate some capacity from nearby airports to NQY. Second, the aid might have affected passengers' decisions in terms of destinations to fly to. For example, it is possible that outbound holidaymakers seeking a sun-and-sea destination or a city trip might have considered new destinations from NQY as substitutes for existing destinations from neighbouring airports.

In Table 3.7, we compare the evolution of total passenger traffic at the airports in South West England during the 2004–06 period (i.e. before the aid) with that during the 2007–09 period (i.e. the period after the capacity expansion at NQY).

Table 3.7 Comparison of average annual passenger traffic at NQY and other airports in South West England (mppa)

	2004–06	2007–09	Growth rate
NQY	0.31	0.38	21%
PLH	0.10	0.10	0%
EXT	0.81	0.92	13%

Source: Oxera analysis, based on publicly available CAA data.

It is noticeable that NQY experienced significant growth in passenger traffic compared with either PLH or EXT in the three years after the aid. In contrast, passenger traffic at PLH stagnated after the capacity expansion at NQY.⁷²

The differences in growth rates between the airports suggests that it is possible that the aid might have affected neighbouring airports more generally, rather than only affecting specific overlapping routes. This would be consistent with the views put forward by one airport in discussions with us, who considered it likely that aid to NQY adversely affected PLH.

In our discussions, a representative from an airport in South West England considered that aid to NQY is likely to have significantly affected PLH. However, other interviewees commented that PLH and NQY did not compete with each other due to differences in infrastructure (e.g. the limited length of the runway at PLH) and therefore considered it unlikely that NQY's operations would have contributed towards PLH's closure.

Dynamic panel data models

We have assessed the impact of aid to NQY on passenger traffic at PLH, EXT and BRS. The model captures the impact of the aid on overall traffic separately for each airport ('model 4'). The results are summarised in Table 3.8 below, which shows the short-run and long-run effects of the aid to NQY.

⁷² This is in line with the conclusions from a study by the Department of Transport. For further details, see Department for Transport (2016), 'A study of consultancy reports' conclusions on reopening Plymouth City Airport for commercial passenger services', 16 December.

Table 3.8 Results of the dynamic panel data models for individual airports

Model (4)			
Treatment group	All routes at PLH, EXT and BRS		
Control group	All routes at SOU and BOH		
Treatment period	Jan 2007 - June 2016		
Lagged effect of passenger traffic on the route in the previous month (β) (robust standard errors clustered by route in parentheses)	0.815*** (0.0110)		
	PLH	EXT	BRS
Short-run impact of the aid on passenger traffic per route each month (γ) (robust standard errors clustered by route in parentheses)	-130.4** (61.28)	-186.5*** (63.32)	23.95 (80.12)
Implied long-run impact of the aid on passenger traffic per route each month $(\frac{\gamma}{1-\beta})$	-705	-1,008	129
Number of routes in the treatment group ¹	11	82	186
Number of routes in the control group ¹		194	
Number of observations		26,229	
Within-R ²		0.718	

Notes: Asterisks indicate the p-value, a measure of statistical significance, where ***, ** and * represents statistical significance at the 99%, 95% and 90% levels respectively. The short-run impact measures the marginal effect of the aid in each month. The short-run impact accumulates over time, as the impact of the aid to NQY reduces over time. The long-run impact describes the monthly difference between the average factual and counterfactual passenger traffic after a few years. The long-run impact is calculated as is the sum of short-run effects expressed as an infinite geometric series as described below in Box 3.5 above.

¹ One route refers to both the outbound and inbound journey.

Source: Oxera analysis, based on publicly available CAA data.

The results indicate that aid to NQY is likely to have had a significant impact on passenger traffic at PLH and EXT, but not at BRS, as explained further below.

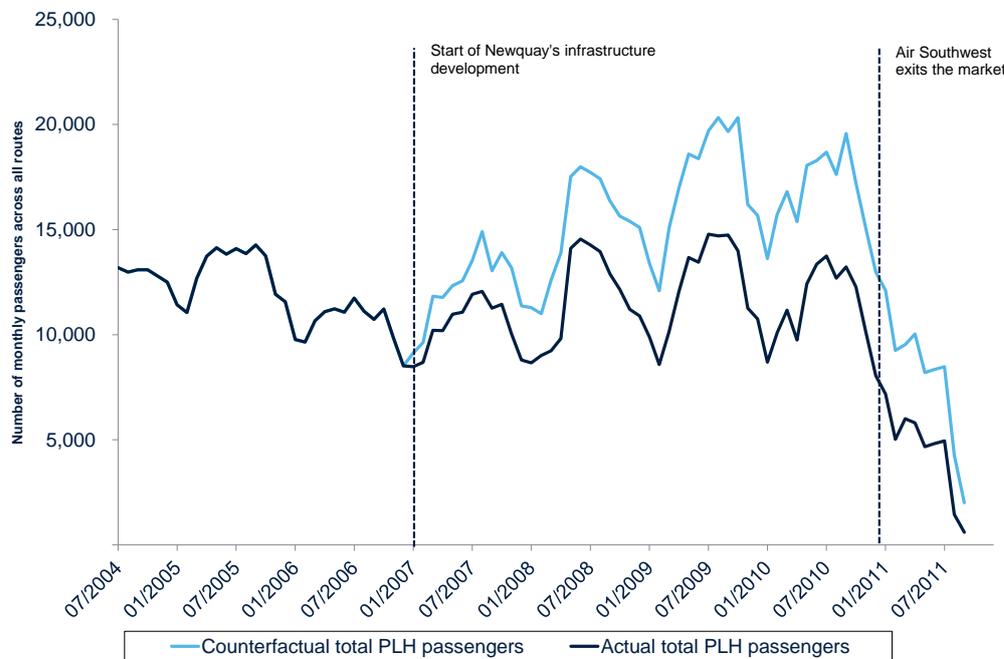
- **Impact of aid on EXT.** The results suggest that the impact of the aid was more pronounced on EXT than PLH. The results indicate that traffic at EXT declined by 187 passengers per route each month, on average, as a result of aid to NQY, amounting to a long-run effect of 1,008 passengers per route each month.⁷³ This represents approximately 9% of passenger traffic per route at EXT prior to the aid in 2004–06.
- **Impact of aid on BRS.** The results indicate, as expected, that the aid did not have a statistically significant impact on BRS. This is likely to be due to BRS being located 230km, approximately 2.5 hours' drive time, from NQY, and is evidence that NQY and BRS indeed operate in different markets.
- **Impact of aid on PLH.** The results suggest that aid to NQY led to an average short-term reduction of 130 passengers per route each month, amounting to 705 fewer passengers at PLH per route each month over the long-term. This

⁷³ See Box 3.5 above for an explanation of the difference between the short-run and the long-run impact of aid to NQY.

represents approximately 6% of total passenger traffic per route in the period before the aid (i.e. 2004–06).

Figure 3.9 shows the evolution of actual passenger traffic (i.e. the factual level of traffic) at PLH compared with estimated traffic at PLH in the absence of any aid to NQY (i.e. the counterfactual traffic, estimated from model 4 above).

Figure 3.9 Actual and counterfactual total passenger traffic at PLH



Note: Monthly passengers across all routes on PLH over time.

Source: Oxera analysis, based on publicly available CAA data.

As shown in Figure 3.9, in both the factual and the counterfactual scenarios, traffic at PLH declined significantly from summer 2010 onwards, which is likely to be due to the financial problems experienced by Air Southwest and might also still be an effect of the financial crisis.

However, the results from the dynamic panel model indicate that, even after controlling for market-wide factors such as the financial crisis, it is likely that PLH would have had 8,460 more passengers per year in the absence of aid to NQY. It remains unclear whether such higher levels of passenger traffic would have enabled PLH to continue operations after Air Southwest exited the market, especially as PLH’s short runway might have limited the ability of the airport to attract new commercial airlines.

3.3.3 Hypothesis 3: did aid to NQY lead to a decrease in airline capacity or a change in the composition of airlines at the neighbouring airports, with airlines switching away from neighbouring airports to operate at NQY?

In the interviews undertaken by Oxera, the airlines commented on the potential impact of aid to NQY on switching between airports. Airlines acknowledged that the costs of opening new routes are typically low, and are mainly limited to the marketing of new services. This implies that, in general, LCCs do not typically face high costs of switching from one airport to another.

Therefore, we considered whether any airlines could have potentially reallocated some capacity from PLH or EXT to NQY. The analysis presented in this section is based on information from the interviews and a combination of the publicly available CAA passenger data and insights from the more detailed, but incomplete, data on seat capacity and the number of passengers by airline and route, which we received from one of the interviewees.

PLH

A limited number of airlines operated from PLH, with Air Southwest accounting for the majority of passenger traffic.⁷⁴

In 2006, Air Southwest served ten destinations from/to PLH and ten destinations from/to NQY, of which five routes overlapped; however, there was limited passenger traffic on these routes, apart from LGW and BRS.⁷⁵

Although Air Southwest did not open any new routes from NQY in 2007 or 2008 that were previously operated from PLH, in light of the results from the dynamic panel data model, it is likely that the aid affected Air Southwest's traffic on the route between PLH and LGW. It is therefore plausible that the aid might have led Air Southwest to reallocate some capacity from PLH to NQY on this route, as well as some capacity from PLH to non-overlapping routes from NQY.

EXT

Of the airlines that operated at NQY, Flybe and Jet2 had significant operations at EXT around the time of the aid.⁷⁶

In 2007, Flybe operated flights from NQY to Belfast, EDI, Leeds Bradford and Geneva. After the aid, in 2008, Flybe added five routes at NQY, of which only LGW was still in operation in 2010. As none of the new routes were in operation for several years or overlapped with EXT, there is no evidence that Flybe switched routes from EXT to NQY. However, it is possible that the airline might have reallocated some of its capacity on this route, rather than switching an entire route. For example, Flybe operated a route to EDI from both EXT and NQY before and after the aid. As Flybe was the only airline operating this route from NQY, and accounted for most of the traffic on the EXT route, the results from the dynamic panel data model suggest that it is possible that the aid affected total passenger traffic on this route. It is therefore plausible that the aid might have led Flybe to reallocate some capacity from EXT to NQY.

In addition, in the interviews, we explored whether airlines considered opening new routes at the neighbouring airports instead of operating at NQY. We also explored, how, in general, airlines select new destinations, in order to help understand which airports the airlines would have considered if NQY had ceased its commercial operations. Due to changes in personnel, airlines were not able to comment on their commercial decisions at the time when the aid was first provided to NQY. However, airlines shared the principles they follow when selecting new destinations.

According to most airlines, new destinations are usually selected based on the level of expected demand, given that strong demand is a key driver of the

⁷⁴ We do not have access to detailed passenger or capacity data by airline, but do have data on total traffic by route and airline.

⁷⁵ The overlapping routes were Bristol, Cardiff, Gatwick, Leeds Bradford and Manchester.

⁷⁶ Insufficient information is available to be able to assess whether Jet2 may have altered their allocation of capacity in light of aid to NQY.

profitability of the route. Moreover, the airlines outlined a number of factors that restricted whether they were able to operate at PLH or EXT instead of NQY, particularly the short runways at both PLH and EXT. For example, Ryanair highlighted that it would not be able to operate from PLH or EXT due to the airports' short runways. Another airline also noted that PLH would not be able to handle large commercial aircraft. Therefore, based on our discussions with airlines, there is no clear evidence of airlines considering operating from neighbouring airports instead of NQY. It is therefore not possible to draw any firm conclusions about where the airlines would have reallocated their capacity if NQY had ceased its commercial operations.

Overall, there is no clear evidence of airlines switching entire routes to NQY following the aid nor is there evidence of airlines opening new routes from NQY instead of at the neighbouring airports. However, it cannot be ruled out that the aid might have led some airlines to reallocate at least some capacity from neighbouring airports to NQY.

3.3.4 Hypothesis 4: did aid to NQY lead to competing airports charging lower net fees to airlines due to greater competition?

As airlines typically negotiate the charges paid at airports, it has not been possible to obtain data on charges paid by all airlines operating at NQY and the neighbouring airports, as this information is commercially sensitive. However, one airline provided data on net charges paid by the airline at NQY and BRS.

We have assessed whether net airport charges per passenger paid by the airline at BRS have declined as a result of the capacity expansion at NQY. The evidence shows that average net airport charges per departing passenger paid by the airline at NQY remained relatively constant over the 2004–10 period, while net airport charges paid by the airline at BRS increased in the 2008–10 period.⁷⁷ This implies that aid to NQY did not have a significant impact on airline charges at neighbouring airports. Therefore, the possible avenue of competitive harm outlined in the 2014 aviation state aid guidelines—that public funding granted to an airport may lead to airport charges at artificially low levels in order to attract airlines—does not seem to be met in the case of the aid to NQY.⁷⁸

The results from the analysis of charges paid by the airline is consistent with insights from BRS and NQY. In particular, BRS considered that aid to NQY did not have a significant impact on BRS's airport charges. NQY also stated that airport charges were unlikely to have been affected by the aid, as they represent the outcome of negotiations between the airport and the airline. An airline also suggested that charges at NQY are lower than at other airports, such as BRS or EXT, as a result of the airport's relatively small size.

3.3.5 Additional hypotheses to be tested

If more data had been available, in addition to testing a larger number of hypotheses, more sophisticated techniques could have been used to enable the competitive effects of aid at NQY to be more precisely estimated, as explained in Box 3.6.

⁷⁷ Based on our analysis of net airport fees per passenger paid by the airline over the 2004–10 period at both BRS and NQY.

⁷⁸ European Commission (2014), 'Communication from the Commission, Guidelines on state aid to airports and airlines', *Official Journal of the European Union*, 4 April, para. 43.

Box 3.6 Further methods for assessing the impact of aid on competition

As explained below, if more detailed data had been available, more sophisticated quantitative techniques could have been used to enable the impact of the aid at NQY on airports and airlines to be more precisely estimated.

Analysis of route-level airline profits

If data had been available on airlines' route-level profits, it could have been tested whether the aid to NQY intensified competition between neighbouring airports and thus increased airlines' profits. A simple event study analysis of profits on routes from NQY, PLH and EXT before and after 2007 might reveal the impact of the aid. The analysis could be extended to include control variables for other influences and to adjust for potential endogenous effects.

Analysis of airline capacity and load factors

If data had been available on seat capacity and the number of passengers by route for each airline, this would have enabled us to examine the impact of aid to NQY on the number of available seats and load factors by route. The results from this analysis would have provided further insights about how airlines responded to the aid at NQY, and the extent to which airlines reallocated some capacity as a result of the aid to NQY.

Switching analysis

Survey data for individual passengers (such as from the CAA Passenger Survey report) with information on the journey (e.g. destination, purpose) and on the passenger (e.g. home address) would have enabled us to undertake more sophisticated switching analysis, enabling us to determine the impact of the aid specifically for passenger segments. For example, the availability of survey data would have enabled testing of whether passengers living between Plymouth and Newquay were likely to switch airports following the aid.

Analysis of PLH's cost structure

If data had been available on PLH's cost structure, research could have been undertaken to more firmly assess whether aid to NQY contributed towards the closure of PLH. In particular, detailed analysis could have been undertaken to assess whether the counterfactual level of traffic would have enabled PLH to achieve a financially sustainable position in order to continue operations.

Source: Oxera.

3.4 Conclusions on the impact of the aid on competition

Building on the approach set out in the Commission's 2014 aviation state aid guidelines, we have examined the impact of aid to NQY on competition.⁷⁹ The results from the four hypotheses that we have tested are outlined below.

As discussed in this section, in order to test hypotheses 1 and 2, we have undertaken econometric analysis. This analysis enables us to quantify the impact of aid to NQY on traffic on overlapping routes as well as neighbouring airports separately from market-wide developments, such as the financial crisis, as well as factors that might have influenced passenger traffic on each route.

The econometric analysis implicitly assumes that, in the absence of aid, NQY would have continued its commercial operations at a low level comparable to the pre-aid period and that its traffic would have developed in line with wider market trends. The results from the econometric analysis for hypotheses 1 and 2 can therefore be considered to be conservative, as they are likely to underestimate the impact of the aid, given that NQY would likely have ceased its operations in the absence of the aid, as discussed in section 3.2.1.

⁷⁹ European Commission (2014), 'Communication from the Commission, Guidelines on state aid to airports and airlines', *Official Journal of the European Union*, 4 April.

3.4.1 Hypothesis 1: did aid to NQY lead to a decline in total traffic on routes that were also served by neighbouring airports (i.e. overlapping routes)?

The results from the econometric analysis suggest that aid to NQY led to a noticeable decrease in passenger traffic on routes from PLH to LGW and EXT to EDI, in particular.

- PLH to LGW route: over the 2004–11 period, both NQY and PLH operated a route to/from LGW. Passenger traffic on the route between PLH and LGW route decreased steadily, while passenger traffic on the route between NQY and LGW increased, suggesting that some passengers may have switched from PLH to NQY. The finding is supported by the results of our econometric analysis, which indicates that, due to the aid to NQY, passenger traffic on the route from PLH to/from LGW declined by approximately 26% compared with levels prior to the aid (i.e. in the 2004–06 period).
- EXT to EDI route: our results indicate that certain routes from EXT, such as the route to/from EDI, were affected by the aid. In particular, the results from the econometric analysis suggest that passenger traffic on the EXT route to/from EDI declined by approximately 42% in the long-run as a result of the aid compared with levels prior to the aid in 2004–06.

3.4.2 Hypothesis 2: did aid to NQY have a significant impact on overall passenger traffic at neighbouring airports?

It is plausible that aid to NQY contributed towards the decline in total traffic at the closest airport, PLH. Total passenger traffic at PLH stagnated after the capacity expansion at NQY, which is likely to be driven by the exit of the airport's largest airline, Air Southwest, as well as the onset of the financial crisis. However, in light of the above-average growth in total passenger traffic at NQY, it is plausible that some passengers at PLH may have switched to NQY.

The results from the econometric analysis indicate that aid to NQY had a substantial effect on passenger traffic at PLH. In the long-run, the results suggest that the aid to NQY led to a 36% reduction in PLH's traffic compared with levels prior to the aid in 2004–06. It is unclear whether PLH could have continued to operate if the aid had not been granted to NQY. However, the possibility that the aid to NQY contributed towards the closure of PLH cannot be excluded.

The results from the econometric analysis suggest that the aid had a more pronounced impact on EXT than PLH. In the long run, the results indicate that the aid led to a 9% reduction in passenger traffic at EXT compared with the 2004–06 period.

The results suggest that airports are, to some extent, substitutable for at least some of the passenger traffic. However, we cannot identify whether certain passenger groups were more likely to switch to NQY after the aid than others.

These findings are consistent with the Commission's 2014 aviation state aid guidelines that aid to an airport that is in the catchment area of another airport that is operating below capacity (e.g. PLH) can have distortive effects.

3.4.3 Hypothesis 3: did aid to NQY lead to a decrease in airline capacity or a change in the composition of airlines at the neighbouring airports, with airlines switching away from neighbouring airports to operate at NQY?

Based on our discussions with airports and airlines, there is no evidence that airlines switched entire routes to NQY following the capacity expansion as a result of the aid. However, it cannot be ruled out that some airlines might have reallocated at least some capacity to NQY.

Only a limited number of airlines were present at PLH before the aid, of which Air Southwest accounted for the most traffic. An analysis of capacity on the routes at NQY and PLH indicates that the route most likely to be affected is the LGW route, and that it is possible that Air Southwest reallocated some capacity from PLH to NQY on this route. This would be in line with findings from the dynamic panel data model that the aid had a negative impact on passenger traffic on the route from PLH to/from LGW.

Flybe (as well as Jet2) were present at EXT and operated or started operating at NQY around the time of NQY's expansion. Of the possible routes that could have been affected by the aid, EDI appears to have been affected by the potential reallocation of capacity from EXT to NQY.

3.4.4 Hypothesis 4: did aid to NQY lead to competing airports charging lower net fees to airlines due to greater competition?

As airlines typically negotiate charges with airports on a confidential basis, it has not been possible to obtain data on charges paid by all airlines operating at NQY and the neighbouring airports. However, one airline has provided us with data on net charges paid NQY and BRS.

There is no evidence that aid to NQY had a significant impact on charges paid by the airline. This result is consistent with insights from BRS and NQY from the interviews.

Overall, the results from this case study suggest that, in addition to the factors outlined in the aviation state aid guidelines, the assessment of the competitive effects of the aid needs to take into account the specific circumstances of each of the airports within the neighbouring region, including the characteristics of both the airlines and the routes operated at each airport.

4 R&D&I aid to a substrates manufacturer in France

Executive summary

This case study investigates the competitive effects of state aid received in 2007 by Soitec, a French manufacturer of substrates. Substrates are thin slices of silicon or other semiconductor material used to build devices for opto- and microelectronic applications (e.g. transistors, integrated circuits, microprocessors, LEDs). Substrates are purchased by large semiconductor producers, including Intel, Samsung and Toshiba.

The aid consisted of a direct subsidy and a reimbursable grant and was used to partially finance Soitec's NanoSmart research and development ('R&D') programme, aimed at producing new, improved silicon-on-insulator ('SOI') substrates, which are higher-cost and higher-performance compared with the more standard 'bulk' silicon substrates.

Potential competitive effects of the aid

The programme was targeted at expanding the range of applications for Soitec's substrate manufacturing technology, SmartCut, which it licenses to other SOI manufacturers. For the purpose of the ex post assessment, we consider the most likely counterfactual scenario to be one where Soitec continues to engage in R&D but at a slower rate than with the aid.

As a result of allowing Soitec to increase its R&D spending, competitive effects could arise in two ways. First, as the aid could increase Soitec's portfolio of intellectual property rights, it could affect the licensing of Soitec's manufacturing technology to rivals. Second, to the extent that the increased R&D spending allows Soitec to improve its substrates, the aid could provide Soitec with a competitive advantage at the substrates manufacturing level.

As regards the substrates manufacturing level, Soitec has not brought any optoelectronic products to market as part of NanoSmart, and has instead re-focused its business on microelectronics. We have therefore focused our ex post analysis on substrates for microelectronic applications.

Market definition

In the short run, substrates customers cannot easily switch between SOI and bulk substrates, as this would require significant changes in downstream manufacturing processes. However, in the longer run, customers can and do switch between the two. In general, this decision will vary by application and by type of customer.

To capture competitive effects both in the short run and in the long run, we have therefore conducted our analysis on the basis of both a narrow SOI-only market and a wider silicon substrates market that also includes bulk substrates. Given the long-run focus of NanoSmart, we consider the wider market to be of particular relevance. We also consider that both markets are global.¹

The impact of the aid on competition

We have considered a number of potential competitive effects of the aid. First, we assessed whether the aid might have given Soitec a competitive advantage, increasing its market share and profits at the expense of its rivals. In addition, we reviewed whether the aid might induce rivals to respond, either by increasing their own spending on R&D or by repositioning their existing product portfolios. Failing that, we considered whether some rivals might have been forced to exit the market due to the increased competitive pressure from Soitec.

On this basis, we have identified a number of specific parameters relating to competition that might have been affected by the aid. In order to conduct our analysis we gathered data and information from public sources and conducted telephone interviews with Soitec, the public body providing the aid, a competitor and three customers. Overall, we found that the data and information we collected has allowed us to conduct a number of meaningful descriptive analyses of the competitive impact of the aid.

Overall conclusions

Our main finding is that the aid does not seem to have had any material impact on competition. In particular:

- **the aid did not have any material impact on market shares.** Soitec's market share in the wider substrate market did not grow following the aid and continues to be small, at less than 5%. The share of SOI within the wider substrates market seems to have increased slightly, but continues to be low, at less than 10% of the market. Soitec's share

within the SOI market has decreased significantly, from above 80% to 50–60%, following market entry by competitors;

- **the aid did not have any material impact on Soitec's profits.** Although some manufacturers' profits decreased in the years following the Commission's approval of the aid, this occurred before 2011, when Soitec aimed to bring to market the new substrates. Indeed, we consider the financial crisis to be a more plausible explanation for the decreased profits;
- **the aid did not have any material impact on competitors' R&D spending.** Although one competitor's R&D spending peaked in 2009, so did its revenues. In principle, we consider it possible that the aid had an indirect effect on R&D spending at the customer level (specifically by Intel), but this is difficult to verify on the basis of the available information;²
- **the aid did not have an impact on market entry and exit.** Although a major supplier of SOI substrates went bankrupt in 2016, this can be attributed to acquisitions in unrelated business segments, not the aid to Soitec;
- **customers are likely to have countervailing buyer power.** Customers are large, sophisticated players, with a small number of firms making up the bulk of Soitec's revenues. Customers can readily switch to other SOI suppliers in the short run and other substrates manufacturers in the long run;
- **the aid did not have any competitive effects at the licensing level.** Rather than refusing to license its SmartCut technology, we found that Soitec entered into licensing agreements early on, which might have been a result of the importance of multi-sourcing for customers. The fact that royalties account for only 2% of Soitec's revenues suggests that Soitec has not been charging excessive rates.

The absence of any material competitive effects in this particular case may largely be because: i) the recipient of the aid was an emerging player, and ii) the amount of the aid was low relative to the size of the market.³ Finally, we note that, although Soitec's fully depleted (FD) SOI seems to have been successful from a technical perspective, this has yet to materialise commercially.⁴ When this happens, it could be that competitive effects will arise, but we believe that competitive effects are unlikely at this stage.

Note: ¹ We note that although some suppliers manufacture in just one country, they have significant sales in other countries and continents—for example, Soitec, which manufactures in France but has over 70% of its sales outside Europe. ² The idea is that Intel has significantly invested (including through R&D) in technology that is based on bulk substrates and competes with other downstream technologies based on SOI, so that advances in SOI may induce Intel to increase its R&D spending to protect its investments. ³ Soitec received a total of €62m over a five-year period, of which €28m was reimbursable, whereas the substrates market exceeded USD12bn in 2007 alone. ⁴ Other products (in particular radio-frequency 'RF' SOI) are commercially more significant for Soitec than FD SOI. However, significant attention has been given in the trade press to the question of whether FD SOI is on the cusp of break-through in the significant integrated circuits ('ICs') and microprocessor segment.

4.1 Description of the aid and its objectives

This case study investigates the effect on competition of aid granted by the French Industrial Innovation Agency ('the Agency') in support of the NanoSmart programme, launched in 2007. The Commission approved the aid in 2007 on the basis of the 2006 framework for R&D&I aid.⁸⁰

4.1.1 Characteristics of the aid

In 2007, the Agency funded two parties developing new electronic components:

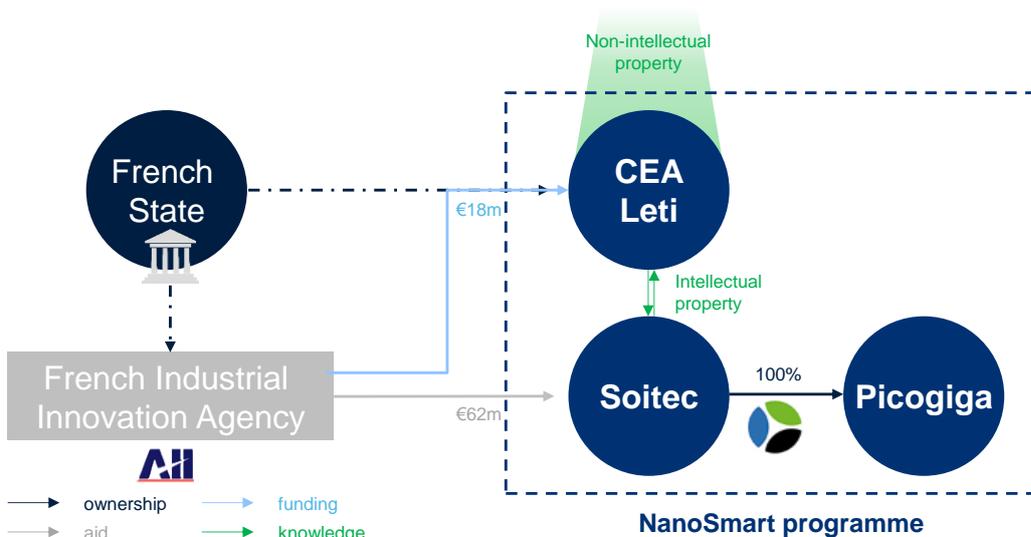
- Soitec (and its subsidiary, Picogiga), a listed company with expertise in electronic components; and

⁸⁰ European Parliament (2006), 'Community framework for state aid for research and development and innovation', *Official Journal of the European Union*, C 323, 30 December, pp. 1–26.

- CEA-Leti, a publicly funded applied-research lab focusing on micro- and nano-electronics that cooperates with industrial players and undertakes commercial and non-commercial activities.

The costs of the programme amounted to around €200m over five years, including €80m of public aid. The aid granted to Soitec consisted of a direct grant of €34m and an advance of €28m, reimbursable only if the project was successful. CEA-Leti received €18m in support of its non-private activities.⁸¹ Therefore, the aid was a lump sum, representing 20% of the total programme cost.⁸² Figure 4.1 summarises the aid structure.

Figure 4.1 Aid structure in the R&D&I case study



Source: European Commission, Oxera.

The NanoSmart programme’s stated aim was to improve the performance and electricity consumption of micro- and optoelectronic components such as image processors, high-frequency components for telecommunications, power components for automobiles, consumer audio-visual devices and light-emitting diodes (‘LEDs’).⁸³

The programme was intended to develop higher-added-value components called substrates (‘advanced substrates’) and to market these new components in 2011. Substrates are ultra-thin disks (200–300mm in diameter and less than 1mm thick) over or within which micro-fabricated devices such as chips are built.⁸⁴

The Commission noted in its decision to approve the aid that the programme is subject to significant technical and commercial risk because it requires the modification of production techniques and there is a risk of technological failure.

⁸¹ European Commission (2007), ‘Soutien de l’Agence de l’innovation industrielle en faveur du programme NanoSmart’, State aid N 185, 12 September.

⁸² Soitec received a total of €62m over a five-year period, whereas the substrates market exceeded USD12bn in 2007 alone.

⁸³ European Commission (2007), ‘Soutien de l’Agence de l’innovation industrielle en faveur du programme NanoSmart’, State aid N 185, 12 September, p. 1: ‘le but est de développer de nouveaux supports à forte valeur ajoutée, appelés substrats avancés, pour des composants microélectroniques et optoélectroniques’.

⁸⁴ European Commission (2007), ‘Soutien de l’Agence de l’innovation industrielle en faveur du programme NanoSmart’, State aid N 185, 12 September.

Moreover, micro- and optoelectronic markets are evolving quickly and competitive solutions might arise during the development of the substrates.⁸⁵

According to Soitec, the aid granted to the NanoSmart programme allowed it to develop new disruptive substrates that are said to be found in 99% of smartphones.⁸⁶ In addition, Soitec claims to be one of the world leaders in the production of substrates and now invests 10% of its turnover in R&D&I.⁸⁷ Nevertheless, Soitec appears to have fallen short of reaching its goal of achieving a 16% share of supply in microelectronics by 2015.⁸⁸

4.1.2 Identification of the relevant markets

The focus of the aid granted to Soitec's NanoSmart R&D programme was on the development of applications for its substrates manufacturing technology (i.e. substrates produced using SmartCut), especially in micro-electronics and optoelectronics.⁸⁹ However, the aid might have had an indirect impact on other markets in the substrates supply chain. Indeed, there exists a substrate ecosystem involving different technologies at the development, substrate manufacturing, processing and device manufacturing stages, as described in Box 4.1 below.

⁸⁵ European Commission (2007), 'Soutien de l'Agence de l'innovation industrielle en faveur du programme NanoSmart', State aid N 185, 12 September, para. 23.

⁸⁶ According to Soitec, 99% of smartphones are based on Soitec RF SOI technology. See p. 34 of Soitec (2015), 'Reference document 2014-2015', https://www.soitec.com/media/documents/36/file/soitec_ddr_2015_va_finale.pdf.

⁸⁷ See Soitec website, 'Innovation',

<https://www.soitec.com/en/company/innovation>. <https://www.soitec.com/fr/entreprise/innovati>

[on](#)

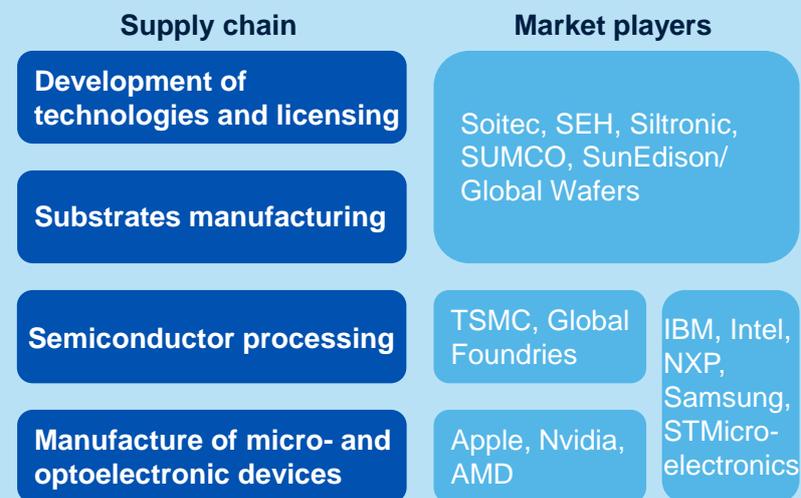
⁸⁸ The goal of reaching 16% was cited in the decision. Soitec's actual share of supply was 3%.

⁸⁹ [3<]

Box 4.1 The substrates supply chain

Substrates are part of the supply chain of micro- and optoelectronic devices. The supply chain consists of four levels, as depicted in the figure below.

Figure 4.2 Substrates supply chain



Source: Oxera.

- Development of technologies and licensing.** Soitec’s NanoSmart R&D programme focuses on the development of new and improved substrates, thus expanding the applications for its SmartCut manufacturing technology. Soitec licenses SmartCut to other manufacturers of SOI substrates. From an ex ante perspective, we consider that competitive effects around licensing are particularly likely given that the increased R&D spending led to an expansion of Soitec’s portfolio of intellectual property rights. However, in this particular case, given that SmartCut was developed several years before NanoSmart and that only 2% of Soitec’s revenue in 2014–16 came from royalties,¹ we consider it unlikely that there were any material competitive effects in relation to licensing.
- Substrates manufacturing.** The focus of this case study is the ‘substrates manufacturing’ level of the supply chain. As a result of substrate-specific production processes, customers face significant switching costs in the short run. In the long run, customers’ choice of substrates is driven largely by quality (e.g. performance and power consumption), price and cost savings via a reduction in processing steps. The weight placed by customers on these different factors typically depends on the particular application.² Long-run competition is thus marked by customers choosing between different types of substrates and investing in corresponding production processes, and by substrates manufacturers making continuous R&D efforts to improve their quality/cost offering, as discussed further below.
- Semiconductor processing and device manufacturing.** There are a number of processing stages before substrates can be incorporated into micro- or optoelectronic devices.³ Device manufacturers either have their own fabrication plants for processing or purchase processed wafers from foundries.⁴ At the processing level, technologies based on bulk substrates compete with technologies based on SOI.

Notes: ¹ See p. 7 of Soitec (2015), ‘Second update of the reference document 2014-2015’.

² For example, we understand that microprocessors tend to use high-price, high-performance technologies, whereas radio-frequency applications tend to use low-power technologies that are relatively less expensive. ³ This includes in particular ‘front-end’ processing, which involves building transistors in the substrate, and ‘back-end’ processing, which involves connecting the transistors to form circuits. ⁴ Device manufacturers that focus on design and purchase wafers from foundries are referred to as ‘fabless’ manufacturers.

Source: Soitec, European Commission, Oxera.

Overview of substrates and their applications

Substrates differ in terms of their properties, performance (reliability, speed, power consumption) and costs, and hence in terms of the applications for which they are used. Substrates can be broadly categorised into ‘bulk’ and ‘SOI’ (silicon-on-insulator) substrates.

- **‘Bulk’ substrates** consist of a single homogeneous monocrystalline material—we have focused on silicon—and are used primarily for micro-electromechanical systems (‘MEMS’). Bulk substrates are the traditional lower-performance, lower-cost substrates.⁹⁰
- **‘SOI’ (silicon-on-insulator) substrates** are higher-value substrates with improved material properties, enabling lower energy consumption and higher reliability.⁹¹

The large substrates manufacturers—GlobalWafers (including the recently acquired SunEdison), SEH, Siltronic and SUMCO—all offer a range of products including various types of bulk substrates. At the time the aid was granted, Soitec had only one competitor, SEH, in the supply of SOI substrates. SOI substrates are produced by SEH, SunEdison⁹² and Soitec.⁹³ SEH and SunEdison also supply a range of bulk substrates.⁹⁴

Substrates customers include a variety of large semiconductor manufacturers, including household names such as Intel, Samsung and Toshiba. They are active in various areas, such as the production of memory components or logic semiconductors. Table 4.1 shows the top ten substrates customers in terms of 2010 semiconductor revenue.⁹⁵

Table 4.1 Top ten substrates customers in 2010

Rank	Company	Semiconductor revenue (USDm)	Share of semiconductor revenue (%)
1	Intel Corporation	40,394	13%
2	Samsung Electronics	27,834	9%
3	Toshiba Semiconductor	13,010	4%
4	Texas Instruments	12,944	4%
5	Renesas Electronics	11,840	4%
6	Hynix	10,577	3%
7	STMicroelectronics	10,290	3%
8	Micron Technology	8,853	3%
9	Qualcomm	7,200	2%
10	Broadcom	6,506	2%

Note: Semiconductors (e.g. integrated circuits) are downstream products that use substrates as an input into production. Foundries are excluded from this accounting—their revenue is

⁹⁰ For our purposes, bulk substrates are defined as including lower-performance ‘polished’ wafers as well as ‘annealed’ wafers and higher-performance ‘epitaxial’ wafers.

⁹¹ SOI substrates are considered suitable for high-integration, low-power consumption, high-speed and high-reliability applications.

⁹² SunEdison started manufacturing SOI at commercial volumes in 2010. In 2016 it was acquired by rival substrates manufacturer, GlobalWafers.

⁹³ For our purposes, SOI will refer to high-value ‘thin’ SOI, as produced by Soitec.

⁹⁴ The Commission decision notes that SEH had a substrates market share of 32% and SunEdison (which used to be called MEMC) had a market share of 14%.

⁹⁵ We note that these are shares of semiconductors (i.e. downstream) and not shares of substrates purchases, but we would expect them to be highly indicative of such. In particular, semiconductors (e.g. integrated circuits) use substrates as an input into production.

attributed to the companies placing the orders. Thus, this is a semiconductor product-based top ten list, not a semiconductor maker-based top ten list.

Source: Lithoguru website, 'The Semiconductor Top 20', <http://www.lithoguru.com/scientist/essays/SemiTop20.html>.

Market definition: product dimension

As explained above, there are two types of substrates: bulk and SOI. The aim of product market definition is therefore to identify those types of substrates that constitute a significant competitive constraint for SOI substrates. To assess this, it is useful to consider the extent to which other substrates are substitutable with SOI on the demand and supply sides.⁹⁶

To inform our assessment, we considered the Commission's decisions to approve aid to Soitec's NanoSmart⁹⁷ and Bernin 2010⁹⁸ research programmes. We also collected relevant information on the product dimension in the interviews we conducted with market participants, and as part of the market research.

Unlike the Commission, we have not considered whether substrates for microelectronics are in the same market as substrates for optoelectronics, as this does not affect the conclusions of our competitive assessment.⁹⁹ The reason for this is that Soitec stated that it never entered the LED market as a result of strong competitive pressure from China. Therefore, the aid is unlikely to have affected optoelectronic applications, even if this were defined as a separate market.

Our approach also differs slightly from that of the Commission in that we consider the most relevant distinction to lie between SOI substrates and other substrates, and not between 'advanced' substrates (which the Commission defines as including not only SOI but also other added-value wafers, such as epitaxial wafers) and other substrates. This is because the greatest differences in terms of price and quality are between SOI and other substrates, as noted by respondents and shown in Table 4.2.

Table 4.2 Comparison of substrate prices per wafer in 2007 (USD)

	Polished	Annealed	Epitaxial	SOI
200mm	48.73	65.13	66.37	209.35
300mm	240.31	286.40	299.50	748.50

Note: Bulk substrates include lower-performance 'polished' wafers as well as 'annealed' wafers and higher-performance 'epitaxial' wafers.

Source: OPC Lasers website, 'Report I: Silicon industry 2008 summary', http://opclasers.com/index_htm_files/Report1%20-%20Silicon%20Industry%202008%20Summay.pdf.

In the NanoSmart decision, the Commission considered bulk substrates to be in the same market as what it referred to as 'advanced' substrates.¹⁰⁰ The

⁹⁶ The focal product for the purpose of market definition is the product supplied by Soitec, i.e. SOI substrates (used in microelectronic applications).

⁹⁷ European Commission (2007), 'Soutien de l'Agence de l'innovation industrielle en faveur du programme NanoSmart', State aid N 185, 12 September.

⁹⁸ European Commission (2007), 'Aide en faveur du projet «Bernin 2010»', State aid N 887, 10 July.

⁹⁹ In its decision to grant aid to Soitec's NanoSmart programme, the Commission concluded that substrates for opto- and microelectronic applications are in separate product markets.

¹⁰⁰ The Commission defined advanced substrates as including not only SOI but also other higher-value substrates, in particular epitaxial wafers. Similarly, the Commission defined bulk substrates more narrowly than we have done (e.g. excluding epitaxial wafers).

Commission noted that there is supply-side substitutability as soon as substrates manufacturers have the facilities to produce various types of substrates. As large manufacturers supply both bulk and advanced substrates, this suggests a certain degree of supply-side substitutability.¹⁰¹

This argument is also valid for SOI substrates as there is significant overlap between suppliers of SOI and suppliers of bulk substrates. Indeed, except for Soitec, all the manufacturers producing SOI substrates also produce bulk substrates.

However, Soitec stated that SOI manufacturing uses bulk silicon as an input but involves additional processing. The company also noted that the capacity required for this additional processing differs from the capacity used to manufacture bulk substrates¹⁰² and more closely resembles capacities at the processing level than at the substrates level (for bulk substrates).¹⁰³ We therefore consider that supply-side substitution between SOI and bulk substrates is likely to be limited, at least in the short term.

Indeed, the choice between bulk and SOI substrates largely seems to depend on the productivity gains that SOI substrates enable, according to interview respondents.¹⁰⁴ Soitec and GlobalFoundries noted that customers' production processes are fixed in the short run, and that Soitec therefore competes primarily with other manufacturers of SOI. However, in the long run, customers can choose which types of substrates to use, and Soitec therefore competes more widely, also with manufacturers of bulk substrates.¹⁰⁵

In relation to the demand side, the Commission noted that both bulk and SOI substrates served as 'support material' and were used in the production of the same components, with customers of bulk substrates competing with customers of SOI substrates (e.g. AMD and Intel¹⁰⁶—however, Soitec noted that AMD has switched away from SOI).

In its decision to grant aid to Bernin 2010, the Commission took a similar view, noting that the majority of SOI substrates customers—including IBM, Freescale, STMicroelectronics and Philips—also use bulk substrates to produce the same components.

To capture both short-run and long-run aspects of competition we therefore consider it useful to define both a narrow SOI substrates market and a wider market for silicon substrates that also includes bulk substrates. Given the long-

¹⁰¹ A similar consideration applies to the substrate diameter and other specifications, with all of the major manufacturers supplying ranges of different specifications. This approach is broadly consistent with the Commission's market definition guidelines. See European Commission (1997), 'Commission notice on the definition of relevant market for the purposes of Community competition law', *Official Journal of the European Communities*, 97/C 372/03, para. 21.

¹⁰² Indeed, Soitec noted that it purchases bulk substrates from SEH as an input for its SOI production.

¹⁰³ That is, SOI and bulk substrates are processed using the same plants and toolsets at the foundry level.

¹⁰⁴ In the case of FD SOI and bulk FinFETs, Soitec informed us that the latter have higher performance and higher cost, whereas FD SOI has lower power consumption. For this reason, bulk FinFETs are used for high-price devices such as processors for smartphones and tablets. The potential for this to change in the future depends on whether FinFETs continue to improve or whether they face constraints in this regard.

¹⁰⁵ Other respondents informed us that SOI substrates can allow customers to reduce the number of processing steps, thus reducing their costs. In general, the production process depends on the substrate chosen, and companies need to decide upfront whether they will use SOI or bulk silicon. Once they opt for a particular type of substrate and have invested in a corresponding production process, switching is costly, as the production architecture relies on the type of substrate used.

¹⁰⁶ [3<]

term focus of the NanoSmart programme, we consider that the wider silicon substrates market is of particular importance in the context of this case.¹⁰⁷

We have not investigated whether these markets should be defined to include non-silicon materials (e.g. III-V materials), as this would not alter our conclusions. We therefore leave open the precise definition of the substrates markets, and we reserve the term ‘market shares’ for our two candidate markets.

Market definition: geographic dimension

Both the NanoSmart and the Bernin 2010 decisions refer to a global geographic market.¹⁰⁸ This is supported by other decisions relating to semiconductors, which assume a global market, on the basis that customers have global purchasing strategies and competition between suppliers is worldwide; quality standards and technical characteristics are similar; and transport costs are low as a proportion of manufacturing costs.¹⁰⁹ These arguments are relevant for the geographic dimension of the market we consider.

As shown in Figure 4.3, substrates are manufactured in the USA, Europe and Asia Pacific.

Figure 4.3 Substrates manufacturing locations



Note: The numbers of fabrication plants are given in parentheses.

Source: Oxera based on online research.

¹⁰⁷ Alternatively, short-term competition could be considered to represent competition *in* the market and long-term competition to represent competition *for* the market. Therefore, in the long run, a narrow market definition would be likely to overestimate Soitec’s market share. For a discussion of market definition in dynamic markets, see pp. 44 and 57–8 of OECD (2012), ‘Market definition’, Policy Roundtables, DAF/COMP(2012)19.

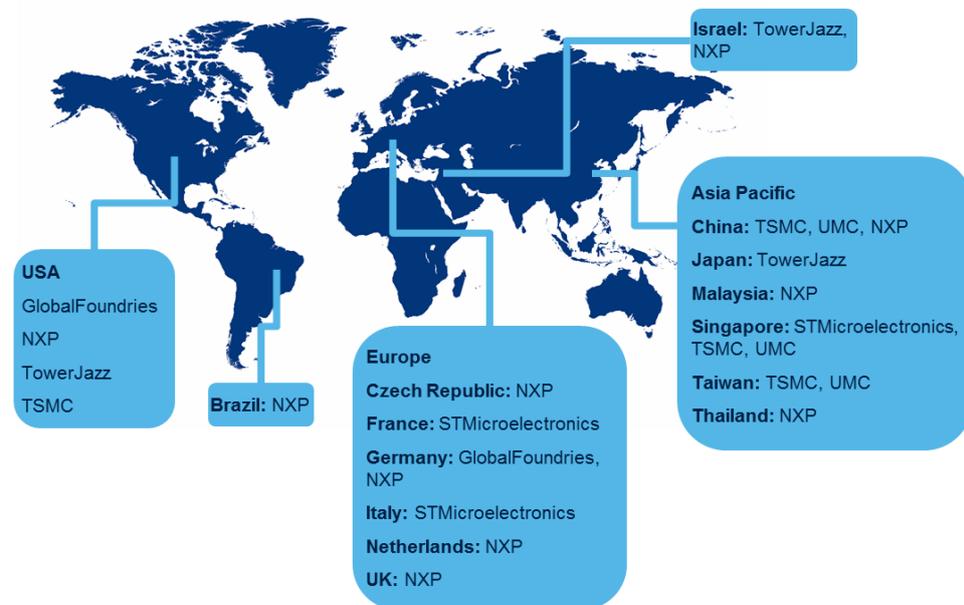
¹⁰⁸ European Commission (2007), ‘Soutien de l’Agence de l’innovation industrielle en faveur du programme NanoSmart’, State aid N 185, 12 September, para. 24; and European Commission (2007), ‘Aide en faveur du projet «Bernin 2010»’, State aid N 887, 10 July, para. 97.

¹⁰⁹ European Commission (2016), ‘Aid to STMicroelectronics’, Case No SA.44547, para. 103; European Commission (2015), Intel/Altera, Case No COMP/M.7688, paras 24, 56 and 65–68; European Commission (2015), NXP/Freescale, Case No COMP/M.7585, paras 55–8; European Commission (2010), Samsung Electronics/Samsung Digital Imaging, Case No COMP/M.5804, para. 25; European Commission (2009), ‘Amendments to state aid N 810/2006 – Deutschland AMD Dresden (MSF 2002) and N 522/2003 Deutschland AMD Fab 36 (MSF 1998)’, State aid N 575/2008, para. 34; and European Commission (2008), TDK/EPCOS, Case No COMP/M.5255, paras 17–20.

Soitec noted that its plant in Singapore requires further investment and is not yet active. In addition to its French fabrication plant, R&D facilities and offices, Soitec also has offices in the USA, Singapore, Taiwan, South Korea and Japan.¹¹⁰

Furthermore, with a couple of exceptions, Soitec's large customers are also located in the USA, Europe and Asia Pacific, as shown in Figure 4.4.

Figure 4.4 Locations of Soitec's large customers



Note: The numbers of fabrication plants are given in parentheses.

Source: Oxera.

Although we do not have trade-flow data for the substrates level, the analysis set out below suggests that trade flows are significant. First, SUMCO is the second largest supplier of substrates and all of its fabrication plants are in Japan, yet 74% of its 2014 revenues came from outside Japan and 22% came from outside Asia.¹¹¹ Second, Soitec is the largest supplier of SOI and all of its active fabrication plants are in France, yet it has sales offices in the USA and in Asia, and 72% of its 2014–15 revenues came from outside Europe.¹¹²

Market definition: summary

To carry out our competitive assessment in the following section, we consider the following market definitions:

- first, a global market for SOI substrates in the short term. The global market for SOI substrates is characterised by short-term competition between Soitec, SEH and SunEdison over customers that have sunk investments in SOI-specific production processes;
- second, a global market for silicon substrates (i.e. bulk and SOI) used in microelectronic applications. This market is characterised by long-term

¹¹⁰ See Soitec website, <https://www.soitec.com/en/company/soitec-in-brief/locations>.

¹¹¹ See Sumco's 2014 annual report.

¹¹² See Soitec (2014), 'Second update of the 2014-2015 reference document'.

dynamic competition involving customers' choice between different processing technologies using specific silicon substrates.

4.2 Identification of the potential distortions to competition

4.2.1 Describing the counterfactual

At the time of its decision, the Commission assessed the likely impact of the aid against a hypothetical situation ('the counterfactual') in which, without the aid, Soitec would not launch the NanoSmart programme. It also considered that, in the counterfactual, no alternative programme would be launched, although Soitec would continue with its 'routine' R&D.

On the basis of the evidence we collected, we did not consider that it was necessary to use a different counterfactual in our assessment.

4.2.2 Identifying the testable hypotheses on the market(s) where the aid might have had an impact

Given the objective of the aid, and following the definition of the counterfactual for this assessment, we consider that the aid is likely to have resulted in improvements for Soitec's substrates.

As such, the aid may have resulted in an increase in quality differentiation in the market for substrates, as well as in an expansion of the market for SOI substrates.¹¹³

Against this backdrop, our assessment aims at understanding whether the aid increased the competitive pressure faced by rival producers of substrates and whether the aid granted Soitec a comparative advantage that competing substrates manufacturers could not match.

First and foremost, the aid might have had the effect of bestowing market power on Soitec and causing it to gain market share.

In addition, Soitec's rivals might have responded to this increase in competitive pressure in a number of ways. For example:

- **seeking to develop better substrates than those of NanoSmart.** This might occur if the aid enabled Soitec to catch up with its rivals. To avoid neck-to-neck competition, rivals may be willing to develop better-quality substrates to regain competitive advantage.¹¹⁴ Given that Soitec's rivals are for the most part very large suppliers of substrates, it seems plausible that the aid would put Soitec on a more equal footing with its competitors;¹¹⁵
- **repositioning their existing substrates portfolios.** To the extent that the aid leads to the production of new substrates, rival producers of substrates may choose to shift focus to the production of other types of substrates (e.g. with applications not covered by NanoSmart) in order to shield themselves from neck-and-neck competition through the introduction of new applications.

¹¹³ As noted above, in principle competitive effects around the licensing level also seem plausible. However, in practice such effects are unlikely in this case given the low proportion of Soitec's revenues that come from royalties.

¹¹⁴ See Aghion, P., Bloom, N., Blundell, R., Griffith, R., and Howitt, P. (2005), 'Competition and Innovation: An Inverted-U Relationship', *Quarterly Journal of Economics*, **120**:2, pp. 701–28.

¹¹⁵ In principle, the aid may also reduce rivals' incentives to develop better substrates ('crowding out'). This is the case if the aid allows Soitec to leapfrog its rivals, and if rivals do not want to catch up with Soitec because they want to avoid neck-and-neck competition.

This seems plausible, especially given that Soitec's rivals are already active in the production of a range of substrates,¹¹⁶

- **exiting the substrates markets or choosing not to enter.** Given increased competitive pressure as a result of the aid, some rivals might not be able to profitably differentiate themselves horizontally or vertically from Soitec and might instead choose to exit the market. Alternatively, firms seeking to enter the market may no longer consider this profitable.¹¹⁷

In the end, as featured in Box 4.2, the aid may could have had a number of impacts. In the remaining section, we focus our attention on five testable hypotheses that we believe are the most insightful:

- **Hypothesis 1:** did aid to Soitec allow the company to expand its share of the market at the expense of its competitors?
- **Hypothesis 2:** did aid to Soitec allow the company to increase its profits?
- **Hypothesis 3:** did aid to Soitec trigger competition in R&D&I spending?
- **Hypothesis 4:** did aid to Soitec trigger entry and exit in the market?
- **Hypothesis 5:** did aid to Soitec modify the company's countervailing buyer power?

¹¹⁶ We have not analysed this effect in detail, as we did not have sufficiently disaggregated data. We note however that our market definition gives a benchmark for what constitutes significant horizontal differentiation. To the extent that rivals differentiate to non-silicon substrates, this would be captured in a reduction in market share.

¹¹⁷ Given that Soitec was already active as a manufacturer of SOI substrates, we do not consider that the aid allowed Soitec to enter new markets.

Box 4.2 Potential impact of the R&D&I aid on competition parameters

The aid might have:

- allowed Soitec to increase its market share at the expense of rivals, in particular those producing similar substrates ('Bestowing market power on Soitec and causing it to gain market share');
- resulted in major customers switching from rivals to Soitec, especially in segments affected by NanoSmart (as a direct consequence of the above);
- increased Soitec's profitability (as a direct consequence of the above);
- increased rivals' spending on R&D&I associated with substrates *similar* to those covered by NanoSmart ('Seeking to develop better substrates than those of NanoSmart');
- increased rivals' spending on R&D&I associated with substrates *different* from those covered by NanoSmart ('Repositioning their existing substrates portfolios');
- reduced rivals' profitability (as a direct consequence of the above);
- given rise to improvements in quality and/or product diversity in the substrates markets (as a result of increased R&D&I leading to product improvements/repositioning);
- resulted in cost reductions in the substrates markets (as a result of increased R&D&I leading to improvements in manufacturing processes);
- led to price reductions in the substrates markets (as a result of cost reductions and/or increased competitive pressure);
- resulted in significant benefits to customers in downstream markets, with a consequent significant increase in the market-wide quantity of substrates sold (as a result of increased quality/product diversity and lower prices);
- led to the market exit of one or more rivals ('Exiting the substrates markets or choosing not to enter').

Source: Oxera.

4.3 Competitive assessment

In this subsection, we analyse the competitive impact of the aid on the basis of the available data and information.

To this end, we conducted desk research and gathered publicly available data on market shares, market size, market volume, manufacturer profits, R&D expenditures, substrates customer volumes and the locations of manufacturers and customers.

In addition, we conducted interviews with stakeholders in order to get a balanced view of the market and market dynamics. We spoke with:

- Soitec (the recipient of the funding);
- BPIFrance (the public investment bank that took over the role of the Agency, which provided the funding);
- a substrates manufacturer that asked to remain anonymous;
- STMicroelectronics (a customer of Soitec);
- NXP (a customer of Soitec);
- GlobalWafers (a customer of Soitec).

Overall, we found that the data and information we collected allowed us to conduct a number of meaningful descriptive analyses of the competitive impact of the aid. In particular, analysis of:

- market structure;¹¹⁸
- manufacturer profitability;¹¹⁹
- R&D spending;¹²⁰
- entry and exit;¹²¹
- countervailing buyer power.

At the end of the subsection, we discuss licensing and set out additional analyses that could have been conducted had more data been available.

4.3.1 Hypothesis 1: did the aid have an impact on market shares?

In this section we look at the evolution of market shares, both in the market for SOI substrates and in the wider substrates market, as direct competitive effects of the aid can manifest themselves in increased market shares for Soitec and/or SOI.¹²²

Given that the aim of NanoSmart was long-term growth, we consider the wider substrates market to be of particular relevance for assessing the competitive effects of the aid. Nevertheless, we also considered potential short-term effects of the aid in the narrower market for SOI substrates.

Our assessment in this subsection relies on the following data:

- silicon substrates market shares for 2006 and 2015 (for Soitec also for the years in between);
- Soitec's SOI market shares for 2007 and 2015;
- the volume of the silicon substrates market for 2003–15;
- the revenue of the silicon substrates market for 2003–15.¹²³

The market for silicon substrates

The Commission's main concern was that the R&D&I aid would strengthen the market power of the aid recipient.¹²⁴ We have further considered whether the aid had a negative effect on competitors, in particular by causing them to lose market share to Soitec. In the context of market structure, the Commission also

¹¹⁸ On the basis of data from SEMI, EE Times, Orbis, the European Commission's NanoSmart decision and GlobalWafers.

¹¹⁹ On the basis of data from Orbis.

¹²⁰ On the basis of data from Orbis, Statista and IC Insights.

¹²¹ On the basis of data on market structure, press reports and information from Soitec's website.

¹²² As noted in the discussion on market definition, we consider that there are two candidate markets of relevance to the analysis of competition at the substrates level: a market for SOI substrates and a wider market that also includes bulk silicon substrates. We have not investigated whether these markets should be defined to include non-silicon materials (i.e. 'silicon-on-anything' and III-V materials, respectively) as this would not alter our conclusions. We have therefore left open the precise definition of the substrates markets, and reserved the term 'market shares' for our two candidate markets.

¹²³ We calculated implied prices taking annual data on volumes and revenues.

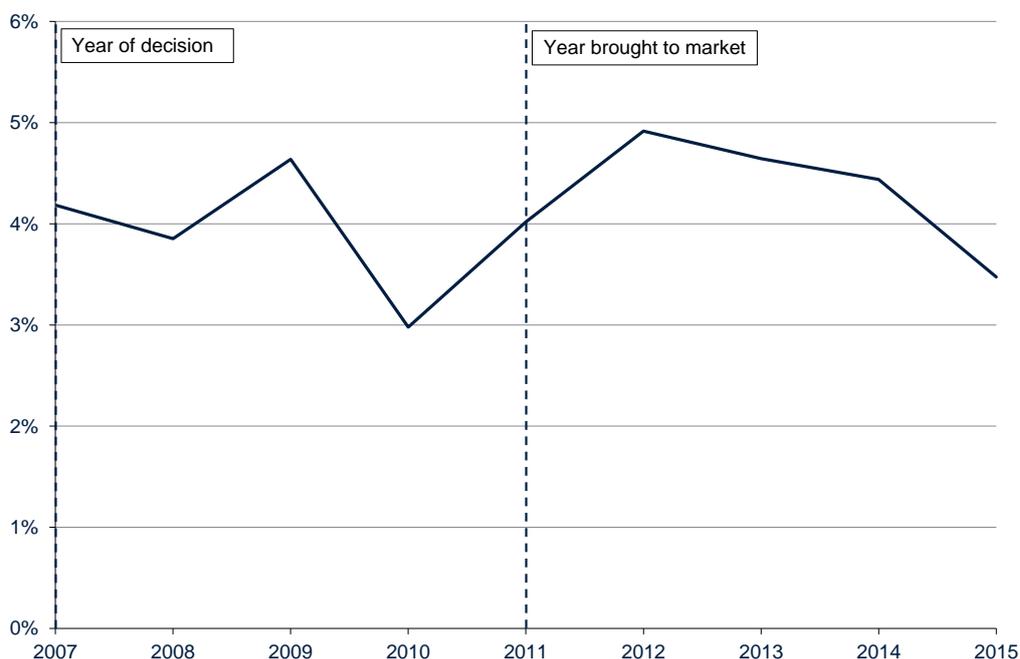
¹²⁴ European Commission (2014), 'Framework for state aid for research and development and innovation', Communication from the Commission, *Official Journal of the European Union*, C 198/01, para. 113.

made the more general point that competition and efficiency concerns are more likely to arise in declining industries.¹²⁵

We find that the aid gave rise to no material effects on the evolution of market shares. In particular, the aid had no material impact on market concentration, and it did not significantly divert market share to Soitec at the expense of its rivals.

First, with regard to the potential of the aid strengthening Soitec’s market power we note that Soitec’s market share was and continues to be far below the 25% threshold, below which the Commission is ‘unlikely to identify competition concerns related to market power’.¹²⁶ This is illustrated in Figure 4.5, which shows the development of Soitec’s market share for 2007–15.

Figure 4.5 Soitec’s silicon substrates market share based on revenue



Note: The Commission decided to grant the aid in 2007, and NanoSmart brought improved substrates to market by 2011.

Source: Oxera, using data from SEMI, EE Times and Orbis.

Second, we note that the aid appears to have had no significant effect on market shares, including those of Soitec’s competitors.

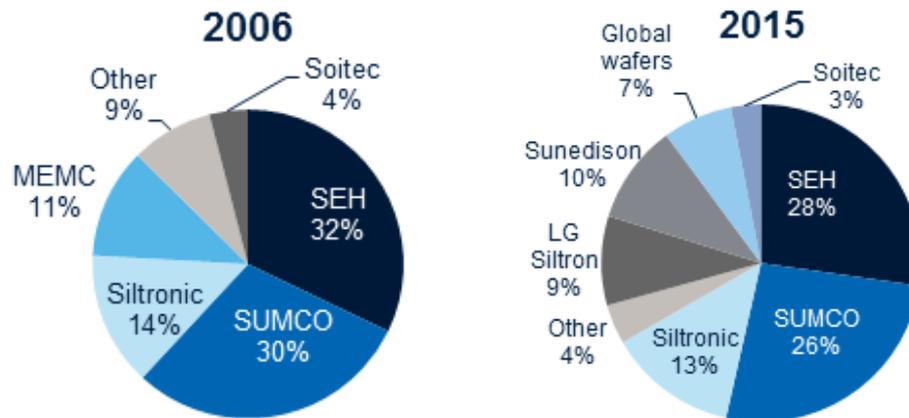
As shown in Figure 4.6, Soitec’s market share, if anything, slightly decreased, from 4% in 2007 to 3% in 2015.¹²⁷

¹²⁵ This relates to concerns about distortions to dynamic incentives as well as concerns about maintaining inefficient market structures. See paras 112 and 115 of European Commission (2014), ‘Framework for state aid for research and development and innovation’, Communication from the Commission, *Official Journal of the European Union*, C 198/01.

¹²⁶ European Commission (2014), ‘Framework for State aid for research and development and innovation’, Communication from the Commission, *Official Journal of the European Union*, C 198/01, para. 113.

¹²⁷ At the same time, the share of SOI in the wider market slightly increased, from 5% in 2007 to 6–7% in 2015. These figures are based on market share data for Soitec as well as information on Soitec’s share of SOI production. See Soitec (2007), ‘Soitec and the French Agency for Industrial Innovation (All) announce the European Commission approval for the funding of the strategic R&D program, NanoSmart’, 13 September, <https://web.archive.org/web/20071017132132/http://www.soitec.com/en/news/press-releases-126.php>; and Business Wire (2015), ‘Research and Markets: Silicon Wafers for Semiconductor Device Processing 2015, A Critical Materials Report’, 24 June.

Figure 4.6 Silicon substrates revenue market shares



Note: In 2013, MEMC changed its name to SunEdison, which was acquired by GlobalWafers in 2016.

Source: European Commission NanoSmart decision; and GlobalWafers (2016), 'GlobalWafers Agreement to Acquire SunEdison Semiconductor', August, http://www.sas-globalwafers.com/GW/uploads/E33DA95731C44886AAC88FDFB412BE6B1017/2016-08%20Project%20Sunna_IR_Presentation_vf_EN.PDF.

Figure 4.6 also shows that, whereas the two largest incumbents (SEH and SUMCO) lost a combined share of 8% of the market, this was largely picked up by the Asian manufacturers LG Siltron and GlobalWafers, which experienced significant growth.¹²⁸ Market concentration has decreased as a result.¹²⁹ Therefore, we consider that any effect that the aid might have had on competitors' market shares was insignificant, both in absolute terms and relative to other market dynamics.

Finally, we note that revenues in the substrates market, which experienced significant growth at the time of the aid, have since decreased as a result of falling prices (and despite significant volume growth).

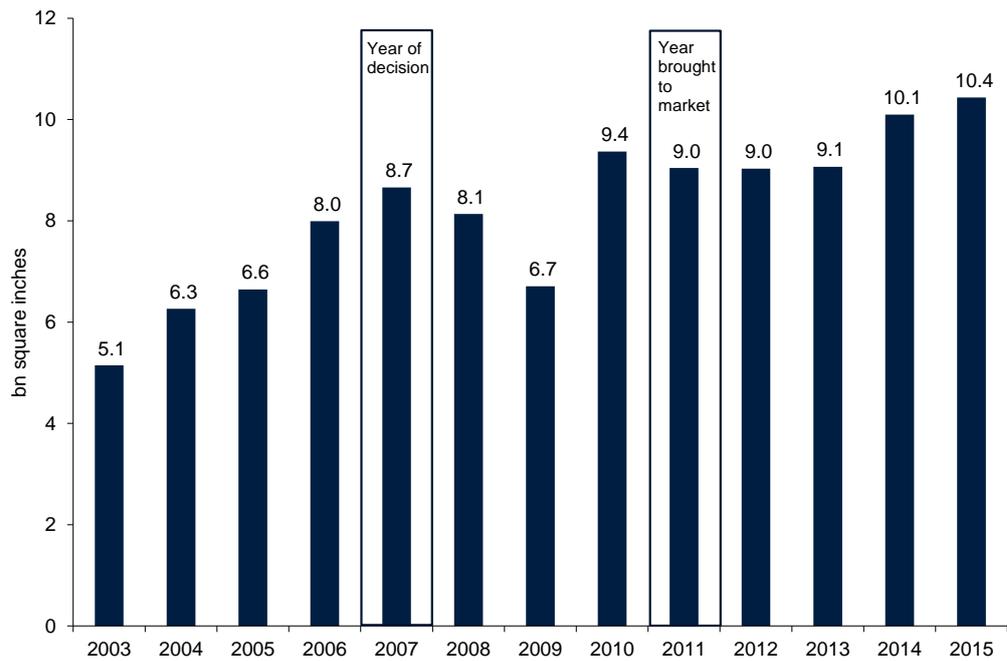
Figure 4.7 shows that market volumes (measured in wafer area) have more than doubled between 2003 and 2015, with the only two years of significant decline being 2008 and 2009 (i.e. the time of the financial crisis).

<http://www.businesswire.com/news/home/20150624005546/en/Research-Markets-Silicon-Wafers-Semiconductor-Device-Processing>.

¹²⁸ The latter has since acquired SunEdison, thus displacing Siltronic as the third manufacturer in the market.

¹²⁹ In particular, if we treat the 'Other' category as a single player, the Herfindahl–Hirschman Index (HHI) decreased from 2,338 in 2006 to 2,024 in 2015. Here, we have treated SunEdison/GlobalWafers as a single entity to reflect their merger in 2016.

Figure 4.7 Size of the silicon substrates market (in bn square inches)

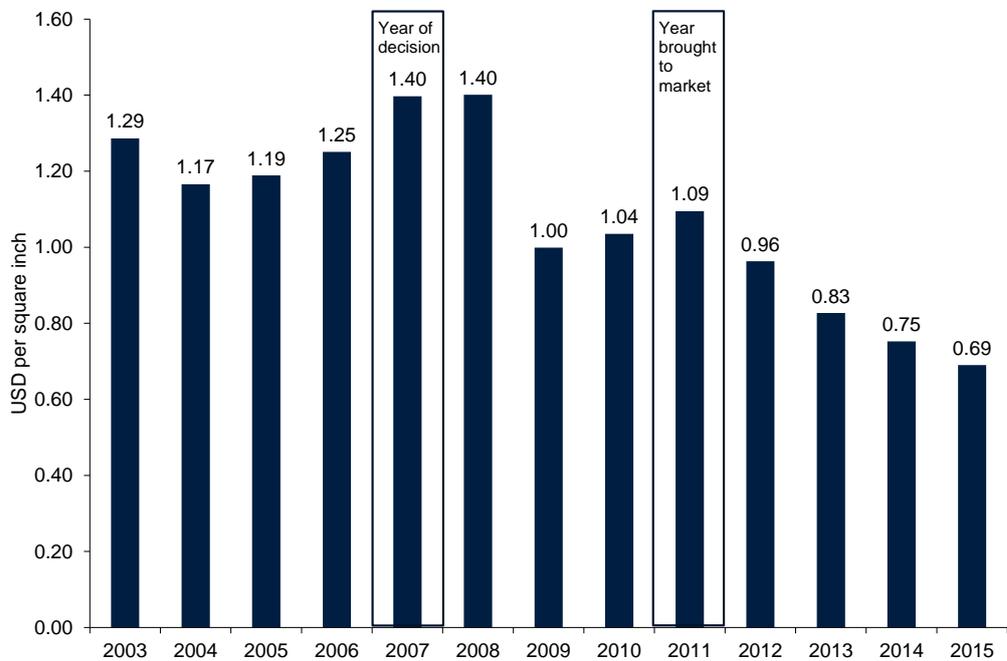


Note: The Commission decided to grant the aid in 2007, and the aim of NanoSmart was to bring improved substrates to market by 2011.

Source: Oxera, using data from SEMI.

Figure 4.8 shows that prices tend to fluctuate somewhat, but have declined overall, and in particular since 2011.

Figure 4.8 Average silicon substrates price (in USD per square inch)



Note: The Commission decided to grant the aid in 2007, and the aim of NanoSmart was to bring improved substrates to market by 2011.

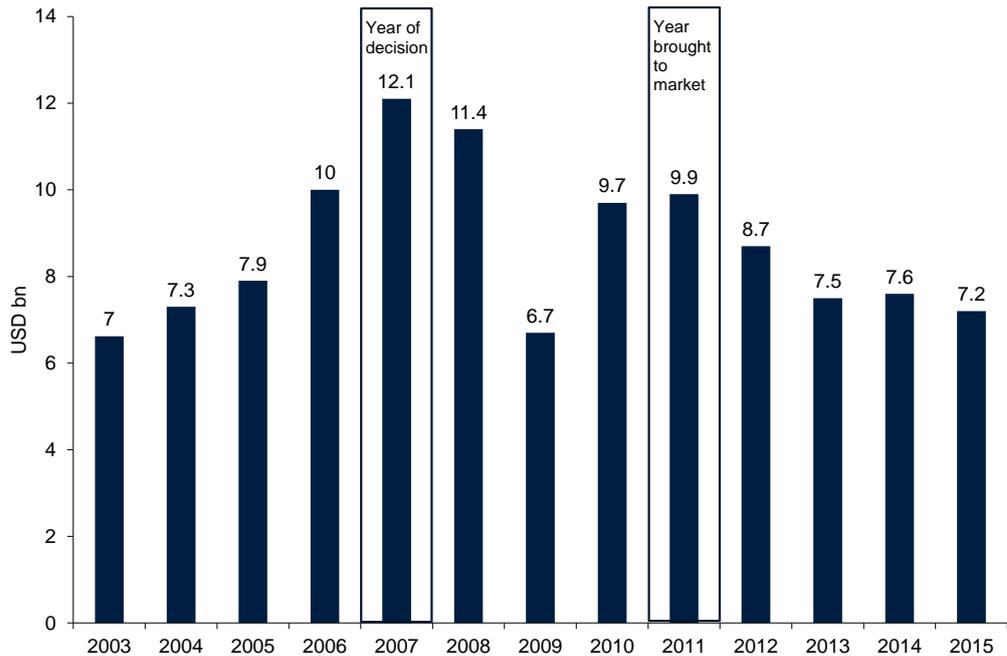
Source: Oxera, using data from SEMI and EE Times.

We note that this is a common feature of dynamic markets, where firms compete by, among other things, investing in cost-reducing technologies.

We also note that BPIFrance stated that there has been excess capacity following the 2009 crisis, and that this has created pressure to reduce prices. [X]

Figure 4.9 shows that total revenues in the market were on the rise up to 2007, but have since declined, with revenues in 2015 having returned to 2003/04 levels.

Figure 4.9 Size of the silicon substrates market (USDbn)



Note: The Commission decided to grant the aid in 2007, and the aim of NanoSmart was to bring improved substrates to market by 2011.

Source: Oxera, using data from SEMI and EE Times.

The market for SOI substrates

In the SOI market, we also consider it unlikely that the aid increased Soitec’s market power, or that it allowed Soitec to gain market share at the expense of its rivals. If anything, we consider that it is possible that the aid might have benefited rivals by expanding the SOI market, as explained below.¹³⁰

Business Wire estimates Soitec’s market share in SOI at 50–60% in 2015,¹³¹ SEH’s at 30%, with SunEdison supplying the remainder. Unlike the wider silicon market, Soitec thus has a significant market share in SOI.

We note, however, that in 2007 Soitec estimated its share of the SOI market at above 80%.¹³² This suggests that in the 2007–15 period, Soitec’s market share

¹³⁰ We noted this possibility in section 4.2.2.

¹³¹ In particular, Business Wire estimates for the ‘SOI wafer market’ that Soitec has a supply share of 60% for 300mm wafers and a supply share of 50% for 200mm wafers. See Business Wire (2015), ‘Research and Markets: Silicon Wafers for Semiconductor Device Processing 2015, A Critical Materials Report’, 24 June, <http://www.businesswire.com/news/home/20150624005546/en/Research-Markets-Silicon-Wafers-Semiconductor-Device-Processing>.

decreased significantly, whereas the combined market share of Soitec's rivals more than doubled.

Combining these figures with Soitec's market shares in the wider market for silicon substrates, and the size of the market for silicon substrates¹³³ we estimate that the share of SOI increased from 5% of the wider silicon market in 2007 to 6–7% in 2015.¹³⁴

The fact that the share of SOI within the wider silicon market increased (between 2007 and 2015) and Soitec's share of SOI has fallen is consistent with the aid potentially having benefited Soitec's rivals.

In line with this, GlobalFoundries, STMicroelectronics and Soitec stated that other SOI manufacturers benefited from Soitec developing and expanding the SOI market. GlobalFoundries and Soitec further noted that Soitec first competes to establish SOI within the wider market in the long run, and then competes with other SOI manufacturers in the short run. As a result, Soitec's SOI market share tends to be high when it introduces a new product to the market, before other SOI manufacturers catch up and Soitec's market share falls again.¹³⁵

This is in line with our understanding that the success of SOI depends significantly on the ability of suppliers and customers to collaborate in building an SOI ecosystem by adapting production processes at various levels of the supply chain. Thus, to the extent that the aid helped expand the SOI market by increasing development incentives, this is consistent with the aid benefiting Soitec's rivals, in particular given customers' desire to multi-source, which may explain Soitec's inability to hold on to its share within the SOI market.

Conclusion on the impact on market shares

Overall, we consider that the aid was not likely to have had a material impact on market shares of Soitec vis-à-vis its competitors in either the wider market for silicon substrates or the narrower market for SOI substrates. To the extent that it expanded the latter, this was likely to have benefited competing SOI manufacturers.

4.3.2 Hypothesis 2: did the aid have an impact on profits of Soitec and its competitors?

In this subsection, we consider whether there is any evidence that the aid had an impact on the profits of Soitec and its competitors.

Our assessment in this subsection relies on data on substrates manufacturers' operating profits. We have data for 2007–15 for Siltronic, Soitec and SUMCO, and have also have found data for 2012–15 for GlobalWafers.

¹³² See Soitec (2007), 'Soitec and the French Agency for Industrial Innovation (All) announce the European Commission approval for the funding of the strategic R&D program, NanoSmart', 13 September, <https://web.archive.org/web/20071017132132/http://www.soitec.com/en/news/press-releases-126.php>.

¹³³ In particular, if Soitec's share of SOI was 80% in 2007 and its share in the silicon substrates market was 4%, then the share of SOI in the silicon substrates market was $4\%/80\%=5\%$. On the other hand, if its share was 50–60% in 2015 and its share in the silicon substrates market was 3%, then the share of SOI in the silicon substrates market was between $3\%/60\%=5\%$ and $3\%/50\%=6\%$.

¹³⁴ Although it is difficult to determine accurately what this share would have been in the counterfactual, we note that even small changes can be significant from the perspective of the SOI market, which is itself not very large.

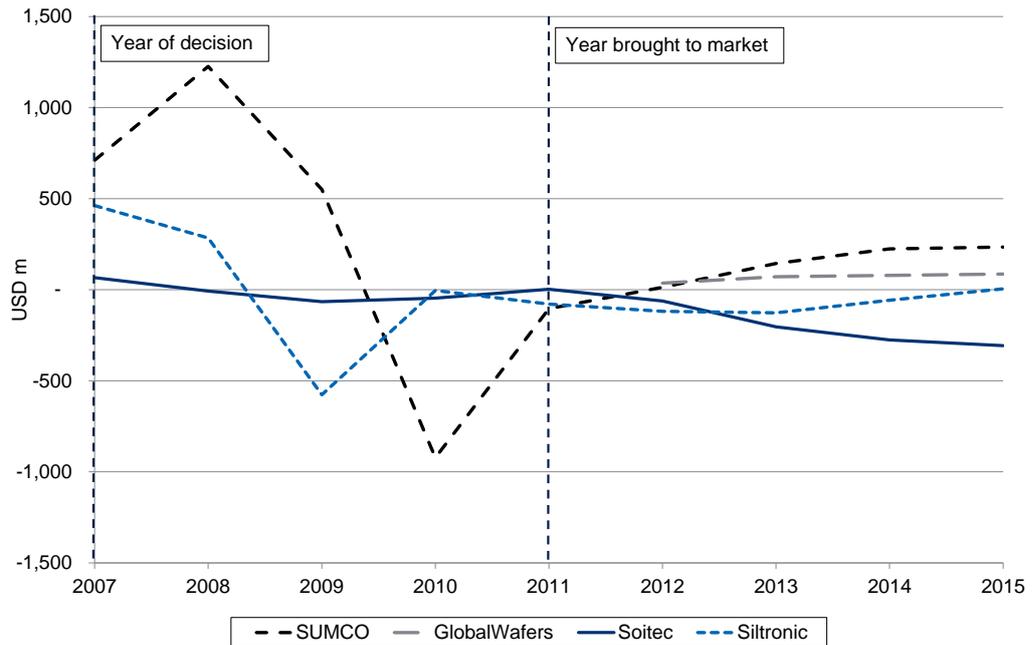
¹³⁵ GlobalFoundries noted that there is no quality difference between competitors and that Soitec's high market share is a result of timing.

Based on this data, we find no evidence to support the hypothesis that the aid had any material effect on competition. In particular, it seems that the aid has neither bestowed any market power on Soitec nor adversely affected the profits of rival substrates manufacturers.

However, the data does not permit us to carry out a more disaggregated analysis that targets specific market segments.

As shown in Figure 4.10, Soitec's profits have decreased over time and have been negative for most of the 2007–15 period.

Figure 4.10 Substrates manufacturer operating profits (USDm)



Note: The Commission decided to grant the aid in 2007, and the aim of NanoSmart was to bring improved substrates to market by 2011.

Source: Oxera, using data from Orbis.

For rivals' profits, the only clear downward trend is seen in the years following 2008 for Siltronic and SUMCO.

In principle, the aid could have decreased rivals' profits by diverting market share to Soitec, but given that Soitec's market share did not grow in the years following 2008 (see Figure 4.5), we consider this unlikely. We further note that NanoSmart did not aim to bring any new substrates to market prior to 2011. We would therefore not expect to see such effects before that time.

Alternatively, the aid could have decreased rivals' profits by inducing them to increase their spending on R&D. We include further analysis of R&D spending by rivals below (see in particular Figure 4.11), but note here that Siltronic's R&D spending was roughly constant, whereas SUMCO's R&D spending peaked in 2009 (not in 2010, as might be expected on the basis of Figure 4.10).

We consider that the decreases in the profits of Siltronic and SUMCO after 2008 are more plausibly attributed to the financial crisis. This is in line with the trends that can be seen for these years in Figure 4.7 to Figure 4.9.

Overall, we consider it unlikely that the aid had any material impact on firms' profits.

4.3.3 Hypothesis 3: did the aid have an impact on R&D spending by other companies?

In this subsection, we consider whether there is any evidence that the aid had an impact on the R&D spending of other companies.

R&D spending by other substrates manufacturers

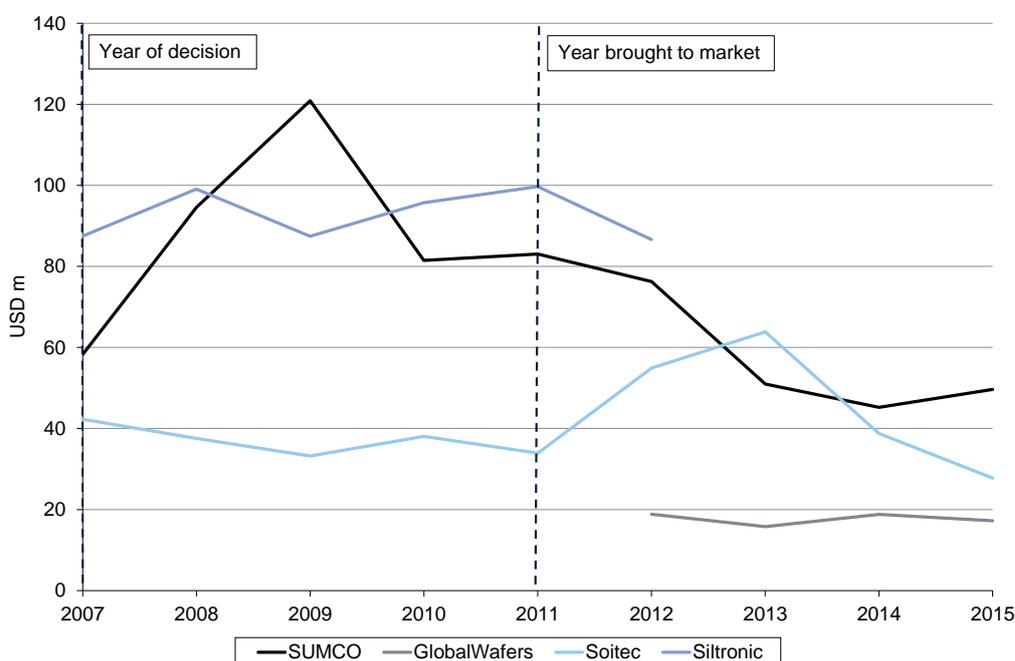
To the extent that rival substrates manufacturers increased their R&D spending, this might be evidence of rivals responding to increased competitive pressure as a result of the aid. Alternatively, rivals might decrease their R&D spending as a result of being 'crowded out'.¹³⁶

Our assessment in this subsection relies on data on substrates manufacturers' R&D spending.¹³⁷ We have data for 2007–15 for Soitec and SUMCO, as well as for 2007–12 for Siltronic and for 2012–15 for GlobalWafers.

Based on this data, we find no evidence to support the hypothesis that the aid had any material effects on competition. However, the data does not permit us to carry out a more disaggregated analysis that targets specific segments.

Figure 4.11 depicts the R&D spending of Soitec and the three other manufacturers over the 2007–15 period.

Figure 4.11 Substrates manufacturer R&D spending (USDm)



Note: The Commission decided to grant the aid in 2007, and the aim of NanoSmart was to bring improved substrates to market by 2011.

Source: Oxera, using data from Orbis.

¹³⁶ See European Commission (2014), 'Framework for state aid for research and development and innovation', Communication from the Commission, *Official Journal of the European Union*, C 198/01, para. 99.

¹³⁷ We also considered R&D spending by substrates customers.

The only spike in R&D spending¹³⁸ by Soitec's rivals after 2007 was for SUMCO in 2009. We note, however, that this was largely driven by a spike in SUMCO's revenues, which increased from USD1.3bn in 2007 to USD3.1bn in 2009.¹³⁹ R&D spending as a percentage of revenue stayed roughly constant, at 2.2% and 2.5% in 2007 and 2009, respectively. Overall, we consider it unlikely that the aid had a material impact on the R&D spending of Soitec's rivals.

In addition to R&D spending by rivals we have looked at R&D spending by customers, in particular manufacturers of integrated circuits ('ICs'). This is because we understand that Intel has invested heavily in a product based on bulk substrates. For this reason, we consider that Intel might have had an incentive to protect its investments by engaging in R&D spending. We briefly consider this case, which relates to indirect competitive effects at the downstream level in the following section.¹⁴⁰

The case of Intel's R&D spending

We understand from STMicroelectronics and one of the substrates manufacturers that SOI is a more expensive material than bulk substrates, but there can be savings at the (downstream) processing levels.

An important example that is frequently discussed in the trade press is that of ICs, which are used to manufacture microprocessors.¹⁴¹ For ICs, most of the industry has adopted Intel's 'FinFETs', a technology based on bulk substrates, which first came to market in 2011. Alternative technologies are based on Soitec's fully depleted ('FD') SOI substrates.

We understand that Intel has invested heavily in FinFETs and, in particular, has significantly increased its spending on R&D (see Figure 4.12) in recent years. Below, we consider whether it did so as a result of competitive pressure from rival technologies based on SOI.

Soitec stated that FD SOI is less expensive than FinFETs but also has lower performance. It further stated that FinFETs would be likely to continue to be used for high-price products such as smartphones and tablets. However, Soitec also noted that FinFETs might be facing limits in terms of further cost and quality improvements.

Soitec and GlobalFoundries both mentioned the goal of making FD SOI (and technologies based on it) more of a threat to FinFETs. Soitec noted that PD SOI, the predecessor to FD SOI, lost out to Intel's FinFETs (e.g. AMD switched from PD SOI to FinFETs) and that developing FD SOI was risky because FinFETs were an established product. In this context, Soitec pointed out Intel's significant R&D spending, which is illustrated below.

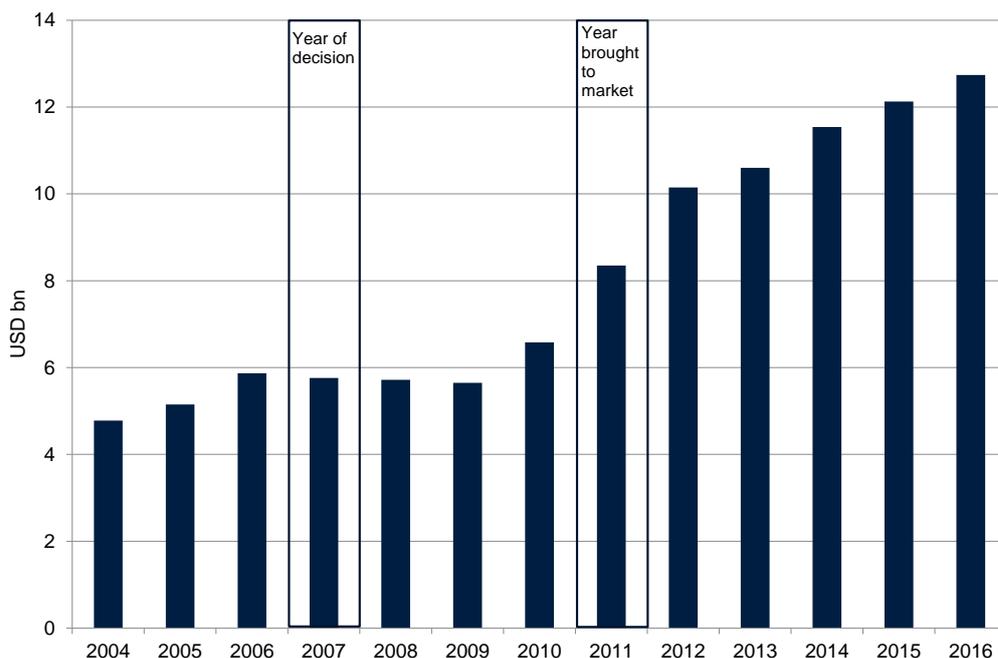
¹³⁸ We also considered R&D spending as a percentage of revenue, and this did not affect the conclusions.

¹³⁹ This data was obtained from Orbis.

¹⁴⁰ In addition to being at the downstream level, these effects are indirect to the extent that they relate to fully depleted (FD) SOI, which, we understand from GlobalFoundries, benefited indirectly from the aid as a result of revenues from RF SOI (which developed as part of NanoSmart) being made available to develop FD SOI.

¹⁴¹ See, for example, Lapedus, M. (2016), 'Bulk CMOS Vs. FD-SOI', *Semiconductor Engineering*, <http://semiengineering.com/bulk-cmos-versus-fd-soi/>.

Figure 4.12 Intel’s spending on R&D (USDbn)



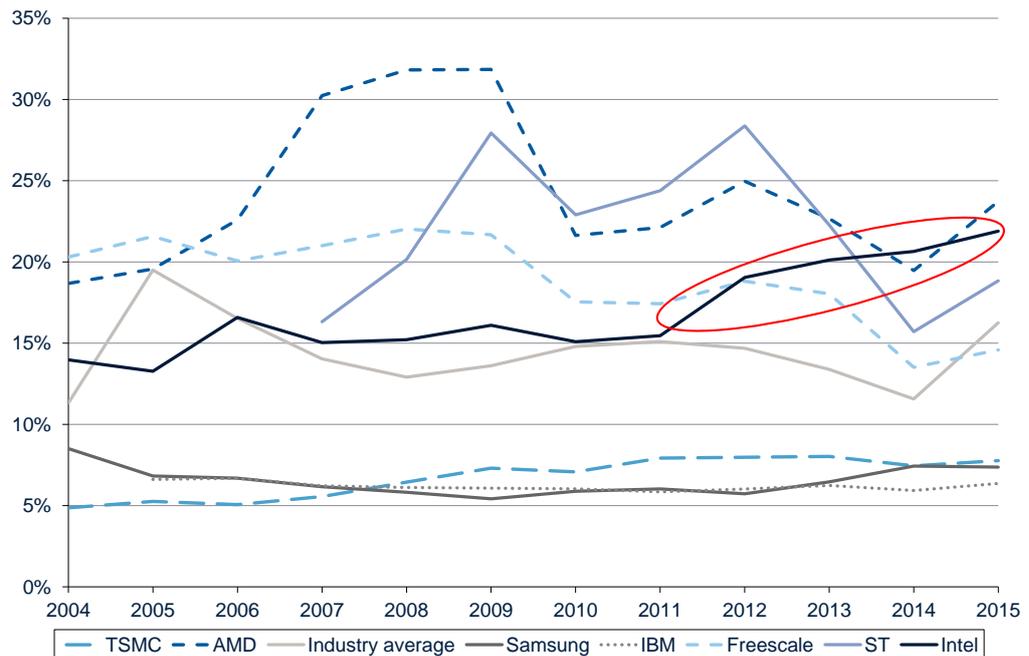
Note: The Commission decided to grant the aid in 2007, and NanoSmart brought improved substrates to market by 2011.

Source: Oxera, using data from Statista.

We note that in its annual reports, Intel has mentioned making the transition to new process technologies¹⁴² every year since 2012 as a reason for increasing its R&D spending. As such, we consider that FinFETs appear to be a significant driver of Intel’s R&D.

We now consider the hypothesis that Intel, as the leading developer of FinFETs, increased its R&D spending in order to prevent other chip manufacturers from adopting technologies based on FD SOI (if true, this may establish a link to the aid, which helped the development of FD SOI). In turn, this might suggest that other chip manufacturers did not match Intel’s R&D strategy. On the other hand, if Intel’s increase in R&D spending was driven by downstream competition, one might expect all chip manufacturers to have engaged in a similar strategy.

¹⁴² This essentially involves shrinking the size of its ICs in order to reduce manufacturing costs and updating manufacturing processes accordingly.

Figure 4.13 Semiconductor R&D spending as a percentage of revenue

Note: The Commission decided to grant the aid in 2007, and the aim of NanoSmart was to bring improved substrates to market by 2011.

Source: Oxera, using data from IC Insights and other public sources.

Figure 4.13 shows that, whereas Intel's R&D spending used to be more or less in line with that of other chip manufacturers (including the semiconductor total), in 2011 it began to raise R&D spending at a level reflected neither by its revenues nor by the rest of the semiconductor industry.

This is consistent with the hypothesis that FD SOI was one of the drivers behind the increase in Intel's R&D spending. It is therefore conceivable that the aid had an effect on Intel's R&D spending by helping Soitec bring FD SOI to market.

We note, however, that the analysis above is at a very high level, and that in its annual reports Intel mentions a number of reasons for increasing its R&D but does not explicitly refer to competition from FD SOI. In order to reliably isolate the effect of FD SOI, it would be useful to check first whether and to what extent Intel's internal documents link its R&D strategy to FD SOI. Second, if we had data on FD SOI volumes and prices (among other factors that may explain Intel's spending on R&D&I) as well as disaggregated data on Intel's R&D spending, we could test whether data relating to FD SOI can explain any variations of Intel's R&D&I spending in the relevant segments.

Overall, we consider that the increase in Intel's R&D spending in principle might have been a result of the aid, but that this cannot be determined with any certainty on the basis of the data and information available.

4.3.4 Hypothesis 4: did the aid have an impact on market entry and exit?

In this subsection, we consider a number of hypotheses relating to entry and exit, in particular.¹⁴³

¹⁴³ Given our market definitions and the fact that Soitec was already active in both markets prior to receiving the aid, it is not necessary to consider whether the aid allowed Soitec to enter any new markets.

- whether the aid caused any of Soitec's rivals to exit either of the substrates markets;
- whether the aid prevented the entry of an efficient competitor;
- whether the aid allowed an inefficient firm to remain in the market (and, linked to this, whether Soitec is an inefficient firm).

We find that the aid had no material impact on entry and exit.

The aid did not lead to any significant market exit

The only significant bankruptcy of a substrates manufacturer that we are aware of is that of SunEdison in 2016, when it was acquired by GlobalWafers. We note that SunEdison's bankruptcy has been attributed to an unsustainable acquisition strategy in the solar sector¹⁴⁴ and not to increased competitive pressure in the microelectronics substrates markets as a result of the aid to Soitec.¹⁴⁵

The aid is unlikely to have prevented market entry by an efficient competitor

In our review of industry press articles, we did not come across any mention of unsuccessful entry to the substrates markets.¹⁴⁶

One reason for this seems to be that market revenues have decreased since 2007 (see Figure 4.9), despite significant volume growth. Although consistent with a dynamic market and strong competition, this also makes entry less likely. In line with this, Figure 4.10 suggests that, although firm profitability has risen again immediately after the financial crisis, it continues to be limited, leaving little room for entry. This is also consistent with the view of BPIFrance, that there was excess capacity following the financial crisis, and the view of STMicroelectronics, that there continues to be no need for entry or more capacity on the substrates market.

This is likely to be strengthened by the fact that there are entry barriers as a result of the significant investments related to the development of technology and manufacturing processes—see discussion in our review of the relevant market.

In order for the aid to have prevented market entry, the market would have to be significantly less competitive (and more profitable) in the counterfactual. Given the limited observed impact of the aid on all metrics we have considered so far (in particular market share), we consider this unlikely.

The aid did not allow an inefficient firm to remain on the market

Throughout our assessment, we have followed the Commission's view that the relevant counterfactual is one where Soitec would have remained in the market, albeit only with its regular R&D efforts. We understand that this view was based on a thorough review of Soitec's NanoSmart programme.¹⁴⁷ This suggests that Soitec would have remained in the market regardless of the aid. In this regard, it is worth noting that the aid consisted of a non-reimbursable grant of €34m for a

¹⁴⁴ See Hals, T. and Groom, N. (2016), 'Solar developer SunEdison in bankruptcy as aggressive growth plan unravels', Reuters, 22 April, <http://www.reuters.com/article/us-sunedison-inc-bankruptcy-idUSKCN0XI1TC>.

¹⁴⁵ Moreover, for SOI we understand that the transaction did not change the market concentration, as GlobalWafers was not previously active in this market.

¹⁴⁶ Of course, it need not be the case that unsuccessful entry is picked up by the press.

¹⁴⁷ We note, however, that we have not had access to the relevant documents.

five-year period. This amount is unlikely to determine Soitec's fate (unless it is the basis for significant innovations, leading to significant increases in sales).

Rather, by covering a portion of the investment costs of NanoSmart, the aid is likely to have affected Soitec's decision to engage in this R&D programme in the first place. This does not mean, however, that Soitec is automatically active in a segment (let alone a market) in which it would not have been active in the counterfactual. Whether this is the case depends on the success of NanoSmart. That is, Soitec only enters new segments to the extent that this is commercially efficient.

For example, we understand that SOI is a premium product with significant advantages over other substrates in applications that require low power consumption. We understand that this is one of the reasons why SOI has been successful in radio-frequency applications and is used in virtually all smartphones.¹⁴⁸ In line with this, both Soitec and BPIFrance have noted that Soitec has begun to pay back the reimbursable part of the aid it received, which was contingent on performance.

For other applications, SOI is still trying to challenge the established technologies.¹⁴⁹ For example, for ICs we understand that SOI is less costly (taking into account the cost savings at the downstream processing level) than bulk substrates, but that technology based on FD SOI does not have the same performance as technology based on bulk substrates (i.e. Intel's FinFETs).

The commercial success of FD SOI may yet come. A number of customers have begun to invest in FD SOI in recent years, including: STMicroelectronics and GlobalFoundries, which began collaborating on FD SOI in 2012;¹⁵⁰ Samsung, which signed an agreement for FD SOI with STMicroelectronics in 2014; and IBM, which announced improved radio-frequency SOI chips in 2014.¹⁵¹

Whether FD SOI will ultimately be successful remains to be seen and will depend on whether manufacturers of rival technologies continue to improve their products,¹⁵² or whether they will be outpaced by Soitec in the future.

Therefore, it is unlikely that the aid allowed an inefficient firm to remain in the market. Indeed, to the extent that Soitec is inefficient with respect to a product developed as part of NanoSmart, it is unlikely to be able to market this successfully.

¹⁴⁸ See Soitec website, 'SOI for RF front-end modules', <https://www.soitec.com/en/products/rf-soi-for-front-end-modules>.

¹⁴⁹ Soitec stated that FD SOI is a technical success but not yet a commercial success. This may explain the fact that Soitec continues to have negative operating profits, as illustrated in Figure 4.10.

¹⁵⁰ See Windeck, C. (2012), 'STMicroelectronics und Globalfoundries kooperieren bei 20-nm-FD-SOI-Technik', Heise Online, 12 June, <https://www.heise.de/newsticker/meldung/STMicroelectronics-und-Globalfoundries-kooperieren-bei-20-nm-FD-SOI-Technik-1616142.html>. Moreover, GlobalFoundries announced production of FD SOI chips in 2015.

¹⁵¹ See Manners, D. (2014), 'IBM's new RF SOI and SiGe foundry processes', *Electronics Weekly*, 12 June, <http://www.electronicweekly.com/news/business/finance/ibms-new-rf-soi-sige-foundry-processes-2014-06/>.

¹⁵² The significant levels of R&D spending by other firms, in particular Intel, suggests that FD SOI's path to success is a challenging one. Nevertheless, some commentators are beginning to question whether Intel's R&D expenditures will pay off, noting that 'Intel's execution with respect to chip manufacturing technology seems to have deteriorated over the past five years – 14 nanometers was problematic, and 10 nanometers is very late'. See Eassa, A. (2017), 'Intel Corporation Struggles to Rein In Spending As R&D Approaches \$13 Billion', *The Motley Fool*, 5 February, <https://www.fool.com/investing/2017/02/05/intel-corporation-struggles-to-rein-in-spending-as.aspx>. We note that in its 2015 annual report, Intel moved away from its 'tick-tock' process of alternating between developing new architectures and developing associated process technology to a process incorporating a third component, 'optimization'. This might be indicative of Intel's ability to improve its products slowing down.

4.3.5 Hypothesis 5: did the aid have an impact on countervailing buyer power¹⁵³?

In this subsection, we examine whether Soitec's customers have countervailing buyer power. We do so for completeness only, as we have already shown that Soitec is unlikely to have market power for customers to counteract.

In its Guidance on Article 102, the Commission notes that the ability of even large companies to act independently of customers may be limited on account of customers' bargaining strength, including as a result of the following factors:¹⁵⁴

- customers' size or commercial significance for the dominant undertaking;
- customers' ability to switch quickly to competing suppliers.

Our assessment in this subsection relies on data on:

- the size of substrates customers (see Table 4.1);
- the shares of Soitec's business made up by its top five and top ten customers over the 2009–16 period.

We find that customers are likely to have countervailing buyer power as they are large, sophisticated companies that are of high commercial significance to Soitec. In addition, customers can easily switch to alternative suppliers, including in the narrower market for SOI substrates.

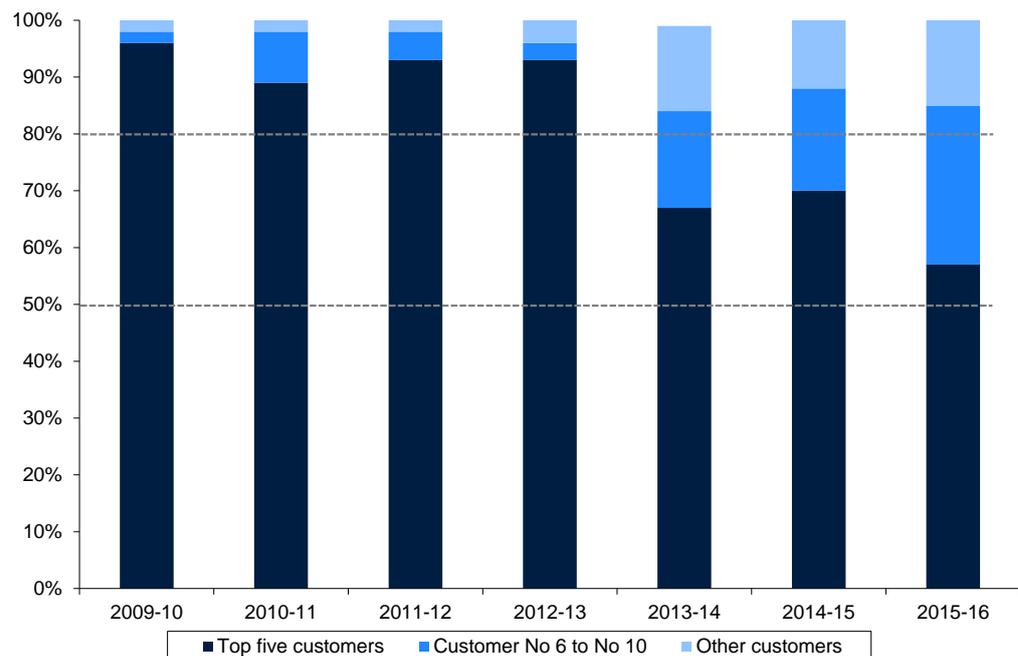
Customers' size or commercial significance for the dominant undertaking

Table 4.1 provides a list of the largest semiconductor companies in 2010. Some of Soitec's customers are on this list, including Samsung and STMicroelectronics. Other important customers that are not on this list include GlobalFoundries, TowerJazz, NXP, TSMC and UMC, all of which have several billion dollars of revenue per annum.

As shown in Figure 4.14, Soitec's customer base continues to be highly concentrated, although less than it used to be.

¹⁵³ The issue of countervailing buyer power is only relevant to effects on competition and not to effects on competitors.

¹⁵⁴ See European Commission (2009), 'Guidance on the Commission's enforcement priorities in applying Article 82 of the EC Treaty to abusive exclusionary conduct by dominant undertakings', *Official Journal of the European Union*, C 45/02, 24 February, para. 18.

Figure 4.14 Concentration of Soitec's customer base

Source: Oxera, using data from Soitec's financial documents.

In particular, Soitec's top five customers made up in excess of 80% (and, in most years, 90%) of Soitec's business until the year 2013–14 (see the upper dashed line). Furthermore, even now, Soitec's top five customers make up more than 50% and its top ten customers more than 80% of its business (see the lower dashed line).

On this basis, we consider that customers of substrates tend to be large, sophisticated companies. Moreover, Soitec has a small number of customers with significant commercial significance to its business.

Customers' ability to switch quickly to competing suppliers

We note that there are a number of alternative suppliers that customers can switch to. This is particularly the case for the wider silicon substrates market, where there are a larger number of suppliers than in the SOI market.¹⁵⁵ Given the long-term nature of NanoSmart, we consider the silicon substrates market to be of particular relevance to our analysis.

In the SOI market, the number of suppliers is smaller, with Soitec facing competition from SEH and SunEdison/GlobalWafers. We note, however, that a number of companies that we contacted (including BPIFrance) stated the importance to customers of being able to multi-source to minimise supply disruptions. We consider that this might have been one of the reasons why Soitec licensed its technology to SEH in 1997.¹⁵⁶ This implies that customers always have alternative sources of supply. One company we spoke to stated that switching between SOI manufacturers is very easy for customers.

¹⁵⁵ As noted previously, the wider substrates market is of particular relevance given the long-term nature of the NanoSmart programme and the ability of customers to switch to other substrates in the long run.

¹⁵⁶ In addition, it entered into a cross-licence with SunEdison in 2013.

4.4 Conclusions on the impact of aid on competition

4.4.1 Main insights

Our general conclusion in this case study is that there was no material impact on competition over the time frame of our assessment. This conclusion is based on our assessment of market shares, profits, R&D spending, entry, buyer power.

However, the effects of the aid might not have materialised yet given the nature and the objective of the aid (i.e. aid under the R&D&I framework) as well as the typical cost structure in the substrates industry (i.e. very high fixed costs). Furthermore, new applications are being developed (such as microprocessors with low energy consumption levels) as part of a general move toward smart cities, smart cars, connected devices, etc. These new applications may require higher-quality substrates, such as Soitec's SOI substrates, in the coming years.

Therefore, for aid granted under the R&D&I scheme, the competitive assessment must pay particular attention to all future developments. In addition, it may be useful to study the impact of the aid at several points in time (for instance, five years after the aid was granted, five years after the main technological advancement was introduced, etc.) to ensure that the assessment accounts for effects that have materialised.

Considering a wider temporal dimension may have consequences for market definition. It may be useful to consider the competitive forces in the short run and in the long run, considering several development scenarios if not enough time has elapsed between the time when the aid was granted and the time of the competitive assessment.

Finally, we consider that some factors are particularly relevant in determining the magnitude of the competitive effects: i) the recipient of the aid was an emerging player; ii), the aid is small in relation to the size of the market. However, if Soitec's FD SOI makes a commercial break-through, competitive effects could still arise in the future.

4.4.2 Competitive effects at the licensing level

In principle, there might be scope for Soitec to exercise market power as a result of its intellectual property rights related to its SmartCut technology, which it licenses to both SEH and SunEdison/GlobalWafers. For example, Soitec might be charging excessive royalty rates or foreclosing access to the SOI market by refusing to license SmartCut.

There are a number of reasons why competitive effects at the licensing level are unlikely.

- First, Soitec has had a licensing agreement with SEH since it began industrial-scale production of SOI in 1997—i.e. ten years before the Commission's decision to grant aid to Soitec.¹⁵⁷ As such, this licensing agreement is likely to have reflected the significant uncertainties that Soitec faced at the time, rather than a position of market power. Indeed, any attempt to charge excessive royalties would have been likely to result in customers not taking up SOI in the first place.

¹⁵⁷ As noted above, customers require multi-sourcing for reasons of security of supply and therefore would not have adopted SOI if Soitec had been the only supplier.

- Second, SunEdison entered the SOI market in 2010—i.e. three years after the Commission’s decision to grant aid to Soitec. We note that SunEdison has its own technology and entered into a cross-licensing agreement with Soitec in 2013, after five years of litigation.¹⁵⁸ Thus, competitive conditions at the licensing level were sufficiently attractive to stimulate entry into the SOI market. Alternatively, SunEdison might have been sufficiently self-reliant on the basis of its own manufacturing technology.
- Third, far from being indicative of excessive royalty rates, only 2% of Soitec’s revenues came from licensing in the years 2014–16.¹⁵⁹

The fact that there has been entry into the SOI market and that Soitec’s rivals doubled their SOI market share since the aid was granted in 2007 (as discussed previously) shows that Soitec did not foreclose competitors from the SOI market. The fact that Soitec’s licensing revenues are small suggests that royalties were not excessive. We therefore consider it unlikely that the aid gave rise to any material competitive effects at the licensing level in this particular case.

4.4.3 Additional analyses that could have been conducted on the basis of additional data

After identifying the testable hypotheses, we started gathering data from multiple sources. We collected information about volumes, market shares, and profitability from public sources, and also arranged telephone interviews with stakeholders from which we collected very good qualitative insights on the market.

The various stakeholders that we interviewed gave us useful insight into the market and competitive dynamics, but were not willing to share confidential data with us, and we had no data-gathering power when undertaking this study.

Yet, overall, we consider that the data and information that we have collected has allowed us to conduct a number of meaningful descriptive analyses of the competitive impact of the aid.

In general, a factor that can limit the extent of competition analysis in R&D-intensive industries is the lack of quantitative data on how R&D efforts actually translate (or are expected to translate) into technological and, more importantly, commercial (i.e. cost and sales) improvements.

This did not create any issues in this case, as Soitec’s growth in the market was not sufficient to merit competition concerns. However, the example above shows that additional analyses may be useful in other cases. In general, an appropriate balance needs to be struck between the costs and benefits of gathering additional evidence and carrying out additional analyses.

Table 4.3 sets out what additional analyses could have been conducted if additional data had been available.

¹⁵⁸ See SunEdison (2013), ‘Soitec And SunEdison Enter Into Patent License Agreement, November, http://investors.sunedison.com/phoenix.zhtml?c=106680&p=irol-newsArticle_print&ID=1880342.

¹⁵⁹ See p. 7 of Soitec (2016), ‘Second update of the reference document 2014 - 2015’, May, https://www.soitec.com/media/documents/32/file/second_update_of_the_2014-2015_reference_document_1.pdf.

Table 4.3 Additional data and analyses

Data	Additional analyses that could potentially be carried out using this data
Prices of different manufacturers by application and substrate type	Test correlation to assess substitutability Test whether the aid had a direct effect on prices (the ability to distinguish between substrate types might allow one to isolate effects due to the aid from general market trends)
Revenues of different manufacturers by application and substrate type	Test whether competitors repositioned their product offering
Customer switching between applications, substrate types and manufacturers	Test substitutability Test intensity of competition Test whether the aid had a direct effect on customers' choice of supplier
Customer business cases relating to the decision to use bulk versus SOI substrates	Analyse the investments, timescales and benefits of switching between SOI and bulk substrates
Variable margins/profits of different manufacturers by application and substrate type	Test correlation to assess substitutability Test whether the aid had a direct effect on margins/profits (the ability to distinguish between substrate types might allow one to isolate effects due to the aid from general market trends)
The relationship between R&D expenditures and costs/quality/sales (e.g. details on how Soitec's sales forecasts with and without aid were calculated)	Assess how and to what extent an increase in R&D spending (as a result of the aid) translates into: i) technological improvements (quality); ii) cost improvements and, as a result, improvements in sales
The precise product improvements associated with NanoSmart, including what products and when they were brought to market	Test whether the aid had a direct effect on sales (including sales of competing products)
Data on prices and quality for different manufacturers over time and across products	Assess the direct effect of aid in terms of cost and quality improvements Assess whether competitors responded by changing their quality
R&D data of different manufacturers, split by SOI and bulk substrates	Assess whether competitors responded by changing their R&D strategies
Internal documents from Intel regarding its R&D strategy	Assess whether Intel's increase in R&D spending is likely to be an indirect effect of competition from technologies based on FD SOI

Source: Oxera.

5 SGEI aid and measures applied to a postal operator in Italy

Executive summary

Poste Italiane is the universal service provider (USP) in the postal market in Italy. As such, it has a state mandate that entails a series of obligations related to the clearance, transport, sorting and distribution of post. The scope of its obligations has changed gradually over recent decades.

Poste Italiane has been the beneficiary of aid in the form of direct monetary compensation, in addition to further measures in the form of tax exemptions and the exclusive right to supply certain segments of the market (reserved areas).¹ The Italian government has granted the aid and further measures as a way to assist Poste Italiane in funding its network and ultimately fulfilling its requirement to deliver the universal service obligation (USO).

The aid to Poste Italiane has been in place for over 20 years. This poses a challenge for any ex post assessment of the effects of the aid on competition, both in terms of gathering consistent data across all relevant years, and conceptually, because there is no clear-cut before/after counterfactual scenario. Also, there has been much change over the relevant period which will affect the outcomes we observe. One such changing factor is in relation to the different types of aid and measures granted to Poste Italiane.

Potential competitive effects of the aid

Securing the sustainability of the USO is a fundamental objective for regulators, as this service is deemed as a right for the population. As such, the sustainability takes precedent over other objectives that regulators might have, including that of promoting competition.

While competition can bring benefits to consumers in the form of lower prices and higher-quality services, it also threatens the financeability of the provider of the USO, which may then require intervention to ensure its sustainability.²

Nevertheless, state aid should try to minimise the impact it has over competition. The aid granted to Poste Italiane potentially affected entry decisions and other market outcomes. The benefit has not only taken the form of monetary transfers, but also of tax exemptions and reserved areas. Therefore, whereas these measures might have jointly deterred entry, it is possible that they had the potential to individually affect competition as well. For example, the reserved area de jure handed a monopoly to Poste Italiane over certain market segments.

The impact of aid on competition

The data necessary to conduct a comprehensive counterfactual analysis has not been available to Oxera (largely due to the lack of formal information-gathering powers).³ Furthermore, aside from the desire to gather data across all the industry, and to cover all years in the relevant period, it is clear from this case study that data also needs to be obtained at a sufficient level of granularity to facilitate a robust analysis. For example, having detailed breakdowns of mail items by weight, across each year would be important to test certain hypotheses.

Based on the information available to us, we undertook a competition assessment that evaluated the impact on competition from changes to the reserved area. In particular, we evaluated the removal of the 'up to 50 grams' reserved area in 2011 to understand whether the liberalisation of the letter market affected prices and quality of service for these items. Importantly, this particular regulatory change has taken place in parallel with many others affecting the postal market. Therefore, causality has not been established.

Indeed, the last decade has been a period of significant change in the Italian postal market, as the market and technological developments in communications have induced consumers to leave behind the traditional post and use digital means instead. This trend has been common to all European markets, albeit having affected the Italian market in particular because of a low demand base and a higher dependency on economies of scale.

Hypothesis: Did the elimination of the reserved area provisions have an impact on entry, prices and quality of the services that it affected?

The evidence suggests that Poste Italiane followed a mixed pricing strategy, owing to the different competitive pressures experienced in each segment. While it seems to have raised its prices on the segments in which competition was limited, it appears to have maintained

lower prices for services in which consumers had wider substitution possibilities.

The quality of service also seems to have responded to the state aid. We can infer this from the comparison between registered mail and priority mail. The former experienced significant entry and the quality level remained very high. On the other hand, priority mail had limited entry and the quality for this service dropped significantly.⁴ Poste Italiane had the mandate to operate this high-cost service, and it did so without significant competition even after the liberalisation.

Finally, the liberalisation gradually allowed private operators to offer an increasing number of services. Market trends show that Poste Italiane still holds a majority of the share of supply, although it has ceded terrain in several segments. The reserved area prevented potential new entrants to make full use of the economies of scope, since some market segments were off-limits. The opening of the market eliminated this issue, potentially increasing the incentives and opportunities to enter and the possibilities to grow.

Overall conclusions

It seems likely that the monetary aid and other measures granted to Poste Italiane had an impact on competition. While unable to identify causality, the analysis that we have carried out shows that important changes to the market took place after the elimination of the reserved areas in 2011. Namely, the share supply of alternative competitors has increased, prices for newly competitive segments have gone down, and quality for these segments has remained stable.

Note: ¹ The reserved area is a regulatory measure that does not entail the transfer of State resources, and the VAT exemption is considered not to be imputable to the State. ² For example, introducing competition introduces the risk of cherry picking, whereby entrants pick the most profitable areas to compete, and thereby undermine the financeability of a national (i.e. USO) network, which must serve all areas of the country, including the less profitable areas. ³ To inform our analysis we engaged relevant stakeholders (including Poste Italiane) to enable us to gather as much information as possible. ⁴ However, it did still stay above the regulatory target for priority letters (of 89%).

This case study considers the Italian postal market, and the aid and measures received by the universal service provider (USP), Poste Italiane, for the period 2000 to 2017 (today).

Over this relevant period, Poste Italiane has been the recipient of direct aid in the form of monetary compensation, as well as measures of tax exemption and protection from competition in certain mail segments (i.e. a reserved area).

Our analysis is based on data gathered from industry stakeholders (including Poste Italiane) and publicly available sources. As we did not have data-gathering powers, we were not able to collect certain information that would have been helpful in conducting a comprehensive and robust assessment of competition effects.

Notwithstanding these data limitations, we have been able to derive key insights for this case study, specifically in relation to the impacts on competition as a result of the measure to protect Poste Italiane from competition (i.e. the reserved area).

5.1 Description of the aid and its objectives

In this section, we set out our analysis in relation to the market context, which will be important for scoping out the competition assessment presented in section 5.4.

We set out here the operations of the aid recipient (Poste Italiane), and its position as the designated universal service obligation (USO) provider in Italy, before presenting pricing analysis on the economics of USO provision and how market interventions can be used to support the financing of the USO.

We then analyse the specific USO funding challenges faced by Poste Italiane before considering the aid and other benefiting measures it has received in respect of its USO.

5.1.1 Poste Italiane as the USO provider

The Postal Services Directive (97/67/EC) of 1997 (hereafter ‘the Postal Directive’), established a regulatory framework for postal services in Europe and provided for the gradual liberalisation of the market.¹⁶⁰ In particular, the Commission prescribed that national markets in member states should be opened to competition without prejudice to the pre-existing USO and the associated quality requirements.

In order to enable the USP to fulfil its obligation from a financial point of view and guarantee a certain level of quality, it has been deemed necessary by the Italian government to provide monetary aid, as well as two complementary provisions, namely a VAT exemption on USO products and a segment of mail services in which these products would be protected from competition.

In 1999, the provision of the USO (in accordance with national decree No. 261/99) was entrusted to Poste Italiane until 2026. In the context of this obligation, Poste Italiane is committed to guaranteeing collection and distribution services to all Italian households for at least five days a week.¹⁶¹

The scope of the USO changed significantly in 2012 with the exclusion of direct mail (addressed advertising mail). The European Regulators Group for Postal Services (ERGP) noted that, in Italy, ‘liberalisation was the trigger for changing the USO scope.’¹⁶² The current scope of the USO in the Italian postal sector is described in Box 5.1.

Box 5.1 Scope of the USO in the Italian postal sector, 2017

The following services currently fall within the scope of the USO in the Italian postal sector:

- the clearance, transport, sorting and distribution of postal items up to 2 kg;
- the clearance, transport, sorting and distribution of postal packages up to 20 kg;
- services related to registered and insured items;
- bulk mail services (‘posta massiva’).

Source: AGCOM website, ‘Servizio universale’, <https://www.agcom.it/servizio-universale-postale>.

5.1.2 The economics of funding USO provision

For any USO postal operator—which generally has the requirement to ensure postal collection and delivery (i.e. end-to-end service provision)¹⁶³ five days a week, on a national basis—the costs of maintaining the network are significant, particularly in the context of a declining market.

¹⁶⁰ European Commission (1998), ‘DIRECTIVE 97/67/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 December 1997 on common rules for the development of the internal market of Community postal services and the improvement of quality of service’. This Directive was amended by Directives 2002/39/EC of 2002 and 2008/6/EC of 2008.

¹⁶¹ Until 2012, Poste Italiane was required to provide these services six days a week.

¹⁶² ERGP (2014), ‘Discussion paper on the implementation of Universal Service in the postal sector and the effects of recent changes in some countries on the scope of the USO’, ERGP(14)16, http://ec.europa.eu/internal_market/ergp/docs/documentation/2014/ergp-14-16-uso_en.pdf.

¹⁶³ Whereby the postal operator collects mail directly, and conducts all intermediate sorting and processing, before making final delivery to the individual’s premises.

Indeed, the postal cost base is substantially made up of fixed costs,¹⁶⁴ of which a large proportion relates to the cost of staff, who are required to maintain the national daily delivery and collection services.

Given the nature of the costs (notably delivery), any reduction in volumes will not see a reduction in costs to an equal degree). This reality of USO costs is a well-known feature of postal services. For example, a review for the UK government in relation to Royal Mail noted that:

It is better in my view to look at the USO as a total network embracing 'first mile' and 'last mile' **with a strong element of fixed costs irrespective of volume.** Your postman or postwoman has to deliver to your house or flat or business six days a week whether he or she has one letter for you or twenty [emphasis added]¹⁶⁵

As a result of the cost structure (high fixed costs), postal services are characterised by a high degree of economies of scale and scope. This means that increasing output/volumes can be done at a proportionately lower cost. This is a critical factor in this case, since the market has undergone a significant decline in volumes over the last ten years (see section 5.1.3).

Furthermore, in respect of USO operators, the move to market liberalisation in the EU has had implications for the financeability of the USO—i.e. opening up the market to competition poses a direct and potentially significant risk in terms of maintaining the USO. This, for example, can be caused by market entrants 'cherry picking' the most profitable regions to enter, and compete in, which would put a strain on any national (i.e. USO) network that served all regions, some of which may not be profitable.

In order to ensure that the USO operator continues to provide services in the face of declining volumes and market liberalisation, consideration must be given to how to support the USO operator and how the costs of providing the USO are recovered.

With this in mind, ahead of EU-wide market liberalisation in 2011, the Commission consulted on approaches to ensuring that EU USO operators would be able to continue to provide services, at affordable prices.¹⁶⁶

Under such considerations of USO financeability, there are two fundamental questions:

- how much does the USO cost?
- how should the USO be financed?

Understanding the (net) costs of providing the USO informs how much shortfall there may be—i.e. in the absence of any support/intervention, will the USP suffer losses, and if so how significant will they be? Once this is known, decisions can be made about how any shortfall in USO costs of provision are funded. Such considerations were set out by Oxera in a 2007 report for a number of EU postal

¹⁶⁴ That is, costs that are not significantly responsive to changes in volumes.

¹⁶⁵ Department for Business, Innovation and Skills (2015), 'Competition in the postal services sector and the Universal Service Obligation', Ninth Report, para. 17, <https://www.publications.parliament.uk/pa/cm201415/cmselect/cmbis/769/76906.htm>.

¹⁶⁶ Commission of the European Communities (2006), 'Accompanying document to the Proposal for a DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Directive 97/67/EC concerning the full accomplishment of the internal market of Community postal services - Executive Summary of the Impact Assessment', Commission Staff Working Document, <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52006SC1292>.

operators,¹⁶⁷ which included the following key measures/interventions that could be considered.

1. **Establishing a reserved area:** by setting aside a certain segment of the market in which competition is not allowed, the USO operator maintains its monopoly position, and as such has protection in respect of market share and revenue preservation.
2. **State funding (compensation/subsidy):** by giving money to the USO operator to directly cover any shortfall in cost of USO provision.
3. **Providing a tax exemption/rebate:** by giving a tax exemption to help reduce the costs of service provision.
4. **Creating a compensation fund:** in contrast to direct government monetary compensation, a compensation fund would require industry participants to finance any USO net cost.

We now turn to considering and describing the specific market context in respect of Poste Italiane, and the extent of the USO funding challenges it faces (and therefore the justification for the aid that it receives). This is important for this ex post assessment, since the market factors present in Italy (and Poste Italiane specifically) inform the scope for competition and, therefore, our approach to assessing competition effects in this case.

5.1.3 USO funding challenges specific to Poste Italiane

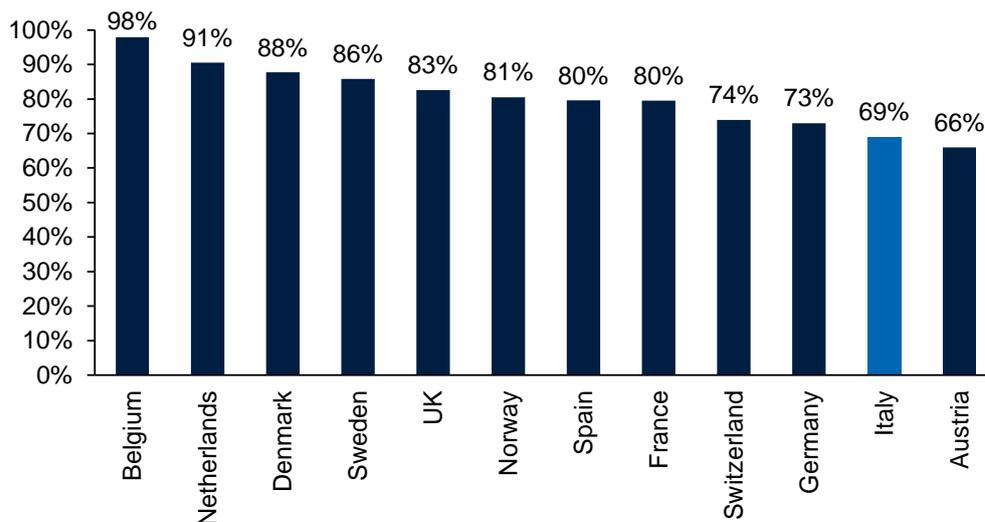
The Italian market is distinct from some other European countries in respect of mail services, for example in terms of differences in geographic factors and in consumer usage.

Given the structure of costs of maintaining a postal network, the costs per item tend to be lower in more densely populated areas. Therefore, countries with higher proportions of citizens living in urban areas may well face lower costs of serving (overall).¹⁶⁸ Figure 5.1 shows how Italy has a relatively low level of urbanisation, and therefore is likely to face a higher cost of serving the total population compared with other European countries.

¹⁶⁷ Oxera (2007), 'Funding universal service obligations in the postal sector', <http://www.oxera.com/Oxera/media/Oxera/Funding-the-USO-in-the-postal-sector.pdf?ext=.pdf>.

¹⁶⁸ However we note that this need not always be the case, for example, urban regions with many high rise buildings and apartments can lead to higher costs to serve when compared with rural regions (due to the high amount of time required to scale all the buildings and deliver all mail).

Figure 5.1 Proportion of inhabitants living in urban areas (2015)

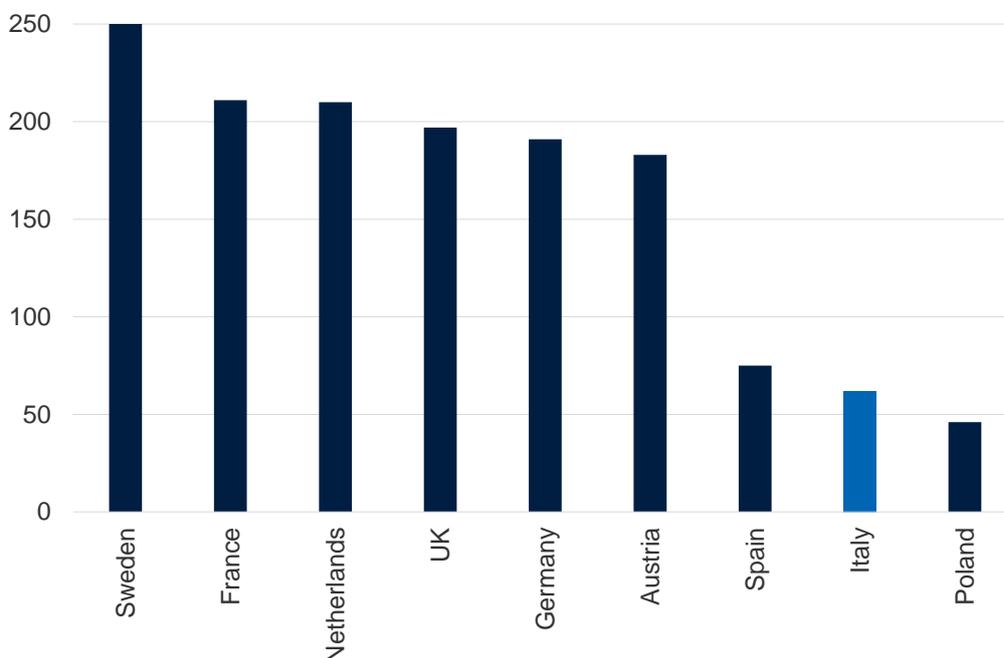


Note: Countries selected correspond to the top 12 EEA countries by 2016 total GDP.

Source: CIA World Factbook. See CIA website, 'The World Factbook', <https://www.cia.gov/library/publications/the-world-factbook/fields/2212.html>.

In Italy, historically low volumes of mail items per capita (relative to other European countries) mean that the costs have to be distributed across a smaller number of items (see Figure 5.2).

Figure 5.2 Total letter items per capita



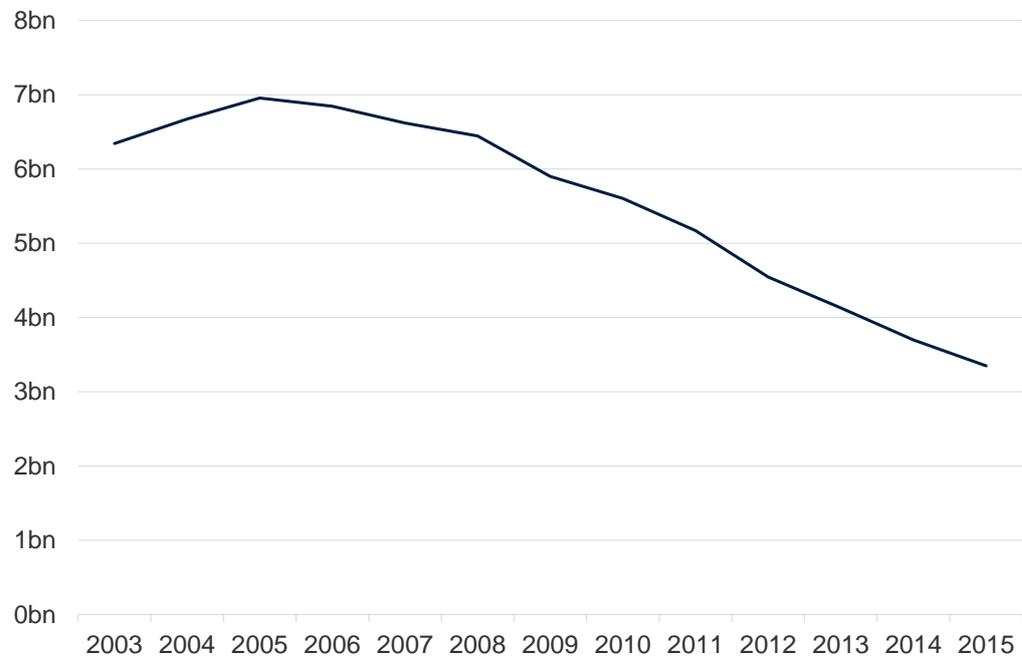
Source: Oxera, based on Ofcom and WIK data: Ofcom (2015), 'International Communications Market Report 2015: Post', Figure 7.1, https://www.ofcom.org.uk/data/assets/pdf_file/0024/26394/icmr_7.pdf.

In addition to low historical volumes, Figure 5.3 shows that there has been a significant decline in volumes in Italy over time, from just over 100 items per capita per year in 2007 to 50 in 2015, representing a decline of over 50% over

an eight-year period. In contrast, Germany and France have decreased by only around 5–10%.

The decline in volumes in Italy can be observed directly from Poste Italiane data, which saw total annual mail items fall from around 7bn in 2005 to about 3.5bn in 2015.

Figure 5.3 Poste Italiane total mail volumes (bn)

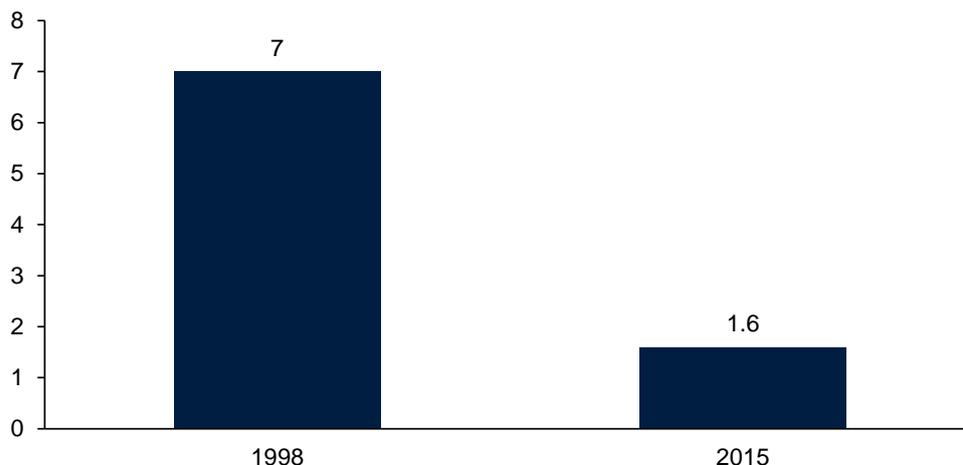


Source: Oxera, based on Poste Italiane annual reports.

The reduction in mail usage can be seen in the average monthly spend on postal services in Italy, which fell from €7 in 1998 to €1.6 in 2015 (a 77% reduction over 17 years).¹⁶⁹

¹⁶⁹ PostNL, 'European postal markets: 2017 an overview', https://www.postnl.nl/en/Images/European-Postal-Markets-An-Overview_tcm9-22110.pdf.

Figure 5.4 Total household monthly spending on postal services in Italy, 1998 vs 2015 (€)

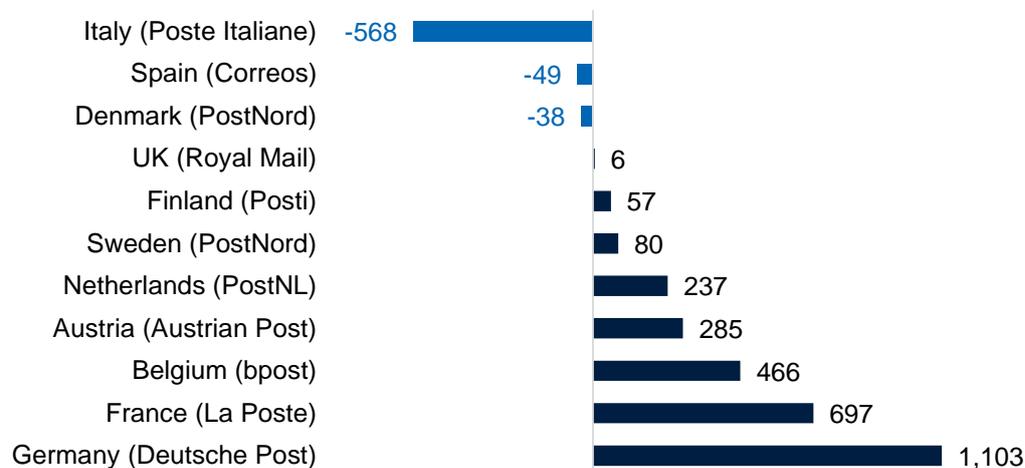


Source: Oxera, based on PostNL, ‘European postal markets: 2017 an overview’.

The market context, such as the declining industry-wide volumes, has had a significant impact on Poste Italiane in terms of the financing of the USO.

We note that profit margins, relative to other European USO operators, have been very low. Poste Italiane’s EBIT¹⁷⁰ for mail services was -€568 (i.e. negative) in 2015. While many factors could contribute to this, it is likely that falling mail volumes are a contributing factor.

Figure 5.5 Mail EBIT, 2015 (€m)



Source: Oxera, Italy value based on Poste Italiane 2015 annual report (the value in 2014 was €-504m). PostNL provides other country data.

Furthermore, we note that between 2014 and 2016, Poste Italiane accumulated operating losses of over €1.5bn¹⁷¹ for its postal service.

This reality was noted by the Commission in its decisions on the aid granted to Poste Italiane. For example, in its 2002 decision, the Commission noted that the

¹⁷⁰ Earnings before interest and taxes.

¹⁷¹ Corresponding to the EBIT for each of the three years, aggregated together. Source: Annual Reports of Poste Italiane.

high net costs for Poste Italiane in respect of providing the USO were contributed to by 'the small number of postal items per capita sent in Italy in relation to the extent of the network (one of the worst items/network ratios in Europe).'¹⁷²

5.1.4 Aid and measures granted to Poste Italiane

In order to address the financial shortfall in providing the USO, Poste Italiane has been granted certain aid and measures by the Italian government,¹⁷³ which we summarise below before explaining each in more detail.

- **Direct aid.** Poste Italiane has received direct aid in the form of annual monetary payments across the relevant period (i.e. 2000–17), equating to a total of around €6.5bn.¹⁷⁴
- **Further measures.** During the relevant period, Poste Italiane has received:
 - reserved areas, whereby no operator is allowed to compete with Poste Italiane for certain mail segments;
 - a VAT exemption on USO products.

Direct aid

The aid to Poste Italiane comes in the form of a yearly monetary support to compensate Poste Italiane for the net cost of fulfilling the USO. The Commission considered that the compensation over the 2000–15 period was state-aid-compatible with the internal market in a series of decisions:

- the 2000–05 period was considered in the Commission's decision of 26/07/2006 concerning the state aid case NN51/06 (hereafter 'the 2006 Commission decision');¹⁷⁵
- the 2006–08 period was considered in the Commission's decision of 30/04/2008 concerning the state aid case NN24/08 (hereafter 'the 2008 Commission decision');¹⁷⁶
- the 2009–11 period was considered in the Commission's decision of 20/11/2012 concerning the state aid case SA.33989 (hereafter 'the 2012 Commission decision');¹⁷⁷
- the 2012–19 period was considered in the Commission's decision of 04/12/2015 concerning the state aid case SA.43243 (hereafter 'the 2015 Commission decision').¹⁷⁸

¹⁷² European Commission (2002), 'COMMISSION DECISION of 12 March 2002 on the aid granted by Italy to Poste Italiane SpA (formerly Ente Poste Italiane)', L 282/29, *Official Journal of the European Communities*, para. 131, <https://publications.europa.eu/en/publication-detail/-/publication/ed33152e-f673-4fca-a4f4-46902992d1a3/language-en>.

¹⁷³ The most recent Commission decision in relation to this aid can be found at European Commission (2015), 'State aid: Commission approves State financing for Poste Italiane's universal service obligation', press release, 4 December, http://europa.eu/rapid/press-release_IP-15-6250_en.htm.

¹⁷⁴ Equating to €5.95bn from 2000 to 2015, with a further €0.5bn estimated to be granted for 2016 and 2017 on the basis of the 2015 Commission decision (see previous footnote).

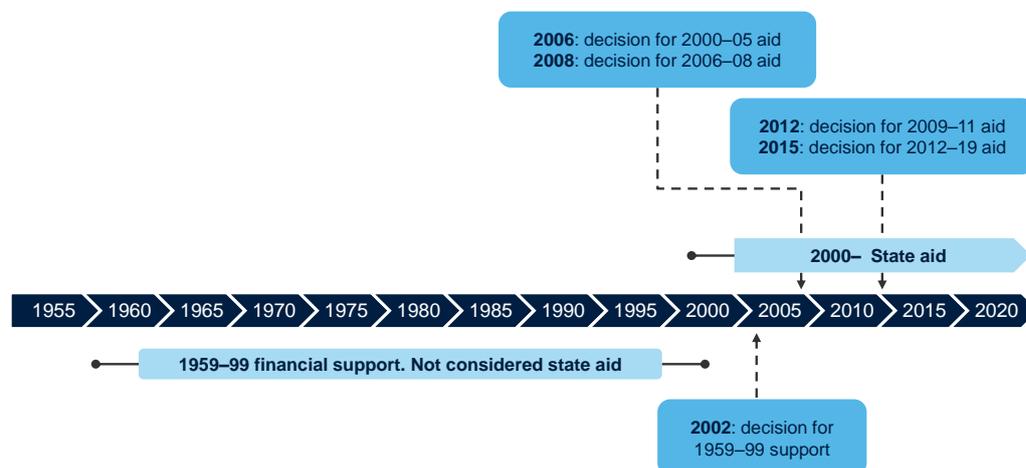
¹⁷⁵ OJ C291 of 30.11.2006: State aid case NN 51/06 – Italy Poste Italiane SpA - State compensation for universal postal service obligations 2000-2005.

¹⁷⁶ OJ C145 of 11.06.2008: State aid case NN 24/08 – Italy Poste Italiane SpA - State compensation for universal postal service obligations 2006-2008.

¹⁷⁷ OJ C77 of 15.03.2013: State aid case SA.33989 – Italy Poste Italiane SpA - State compensations for the delivery of the universal service over 2009-2011 and State compensations for reduced tariffs offered to publishers, not-for-profit organisations and electoral candidates over 2009-2011.

Poste Italiane, also received financial support from 1959 to 1999. In its decision 2002/782/EC of 12/03/02,¹⁷⁹ the Commission decided that this past support did not constitute state aid. Figure 5.6 provides a timeline of the financial support the Italian state provided to Poste Italiane from 1955 to present. In what follows we consider only the aid granted from 2000 on.

Figure 5.6 Financial support from the Italian state to Poste Italiane (1955 to present)



Source: Oxera, based on European Commission decisions.

In all cases in the 2000–15 period, the Commission performed an ex ante assessment of the planned aid measure, comparing the funding received against the costs borne by Poste Italiane for the provision of the USO. The Commission concluded that the amount of direct payment did not lead to overcompensation of the extra costs of the USO entrusted to Poste Italiane.

Table 5.1 summarises the yearly amounts of state aid granted to Poste Italiane from 2000 to 2015, as per the relevant Commission decisions.

Table 5.1 State aid granted to Poste Italiane for the USO in 2000–15, as per the Commission decisions

Year	Direct aid (€m)
2000	439
2001	439
2002	429
2003	415
2004	336
2005	359
2006	370
2007	371
2008	364
2009	372
2010	364
2011	357

¹⁷⁸ OJ C104 of 04.12.2015: State aid case SA.43243 – Italy Poste Italiane SpA - State compensations for the delivery of the universal service over the periods 2012-2015 and 2016-2019.

¹⁷⁹ European Commission (2002), 'COMMISSION DECISION of 12 March 2002 on the aid granted by Italy to Poste Italiane SpA (formerly Ente Poste Italiane)', L 282/29, *Official Journal of the European Communities*.

Year	Direct aid (€m)
2000	439
2012	327
2013	343
2014	336
2015	329

Source: Oxera, based on Commission decisions.

Each year, the Italian postal services regulator (Autorità per le Garanzie nelle Comunicazioni, AGCOM) is tasked with conducting an ex post analysis to determine whether the aid was sufficient to cover the net cost of providing the USO. In the event that the net cost is higher than the compensation, a compensation fund to which all alternative operators are required to contribute is activated to the benefit of Poste Italiane. This provision was set out by decree 261/1999, and established that the authority would determine the fee yearly. For the years when the fund was functional, the fee was 3% of the relevant gross revenues of the licensees for registered mail only. We have not obtained data on the amount of revenue raised through this mechanism.¹⁸⁰

Further measures

The direct aid in the form of monetary compensation (outlined above) has been complemented by two measures during the period of analysis: a reserved area that was gradually reduced over recent decades, and a tax exemption. Neither of these measures is what aid is traditionally considered to comprise, albeit they can result in competitive distortions.

As regards the reserved area, it preceded the implementation of the Postal Directive, which mandated the gradual market liberalisation. However, in this initial stage, there were still private competitors with licences to provide local services. The regulation that was in place then prohibited these local providers from competing with Poste Italiane, with the expectation that this would restrain them from undermining the advantages of the reserved area. We understand that this regulation was not generally enforced.

For that matter, the Directive 97/67/EC established a harmonised reserved area and left without affecting the local licences. It also set the scene for future gradual revisions of the areas to be 'reserved'. As the Commission noted, 'in principle, the universal service is not reserved. However, the Directive also acknowledges that the provision of the universal service might require special compensation, in order to ensure its sustainability.'¹⁸¹

The scope of the reserved area evolved over time; in 2003 (when the reserved area was reduced to only mail items below 100g) and then in 2006 (when it was reduced further to cover only mail items below 50g). In 2011, the market was liberalised, with the exception of notifications of judicial acts and of sanctions following infringements to the traffic code, which remain fully reserved to Poste

¹⁸⁰ In addition to the state compensations for the delivery of the universal postal service, the Italian state notified to the Commission aid from reduced tariffs for publishers, not-for-profit organisations and electoral candidates in the 2009–11 period. In the 2012 decision, the Commission considered that this compensation also amounted to state aid and decided it was compatible with the internal market. At 2016 year-end, Poste Italiane was due €83m from the state for electoral subsidies, the most significant source out of the three mentioned above. This accounts for 8% of the total sum due from the state to Poste Italiane. See Poste Italiane 2016 Annual report, p. 113.

¹⁸¹ See the 2002 Commission decision, para. 13.

Italiane.¹⁸² Figure 5.7 illustrates the evolution of the reserved area in the Italian postal market since its introduction in 2000.

Figure 5.7 Evolution of the reserved area in the Italian postal market since its introduction in 2000



Source: Oxera research.

As regards the tax exemption, it applies to all services falling within the scope of the USO. The VAT rate in Italy was 20% from 1997 to 2011, when it rose to 21% before increasing further to 22% in 2013.¹⁸³ As such, the VAT exemption in effect reduces the direct mail costs to USO items by some 22%.

This measure gave rise to concerns from the Italian competition authority, Autorità Garante della Concorrenza e del Mercato (AGCM), about possible competition problems in the market for business services.¹⁸⁴ Under EU legislation, VAT exemptions should apply to USO services and exclude any individually negotiated contracts, which are mostly large business contracts. However, this conflicted with national law in Italy, which allowed for individually negotiated contracts to benefit from a VAT exemption.

Poste Italiane was therefore offering individually negotiated contracts free of VAT, which competitors considered to be an unfair advantage since they had to include VAT in their individual offers. AGCM decided that Poste Italiane had abused its dominant position, but no fine was imposed given that Poste Italiane was complying with Italian law. In 2014, following a change in the national legislation, the VAT exemption stopped applying to individually negotiated contracts.¹⁸⁵

¹⁸² See AGCOM website, 'Servizio universale', <https://www.agcom.it/servizio-universale-postale>.

¹⁸³ See European Commission website, 'VAT rates applied in the Member States of the European Union', http://ec.europa.eu/taxation_customs/sites/taxation/files/resources/documents/taxation/vat/how_vat_works/rates/vat_rates_en.pdf.

¹⁸⁴ See AGCM (2012), 'A441 - Postal Services - investigation launched into Poste Italiane for possible abuse of dominant position in liberalized postal services', press release, 14 March, <http://www.agcm.it/en/newsroom/press-releases/1989-a441-postal-services-investigation-launched-into-poste-italiane-for-possible-abuse-of-dominant-position-in-liberalized-postal-services.html>.

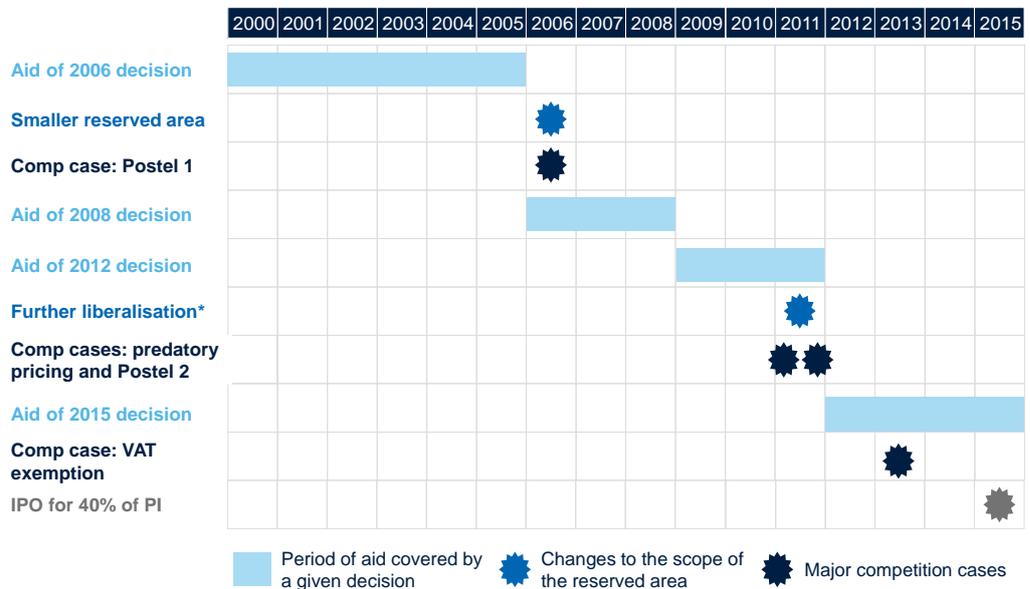
¹⁸⁵ See AGCM (2013), 'A441 - Postal services: Antitrust Authority, Poste has abused its dominant position as regards exemption from vat. within 180 days poste must apply vat to individually-negotiated postal services so as not to discriminate against competitors', 23 April, <http://www.agcm.it/en/newsroom/press-releases/2039-a441-postal-services-antitrust-authority-poste-has-abused-its-dominant-position-as-regards-exemption-from-vat-within-180-days-poste-must-apply-vat-to-individually-negotiated-postal-services-so-as-not-to-discriminate-against-competitors.html>.

5.1.5 Definition of the relevant market

Over the last 20 years, the Italian postal sector has experienced significant technological and regulatory changes, with important implications for any market definition exercise. The gradual replacement of physical letters by email and the rise of express courier services might have led to changes in the scope of the relevant market. Similarly, regulatory changes, such as changes in the scope of the USO, as well as changes to market conditions and liberalisation of certain services, will also act to alter relevant market considerations. Figure 5.8 presents some of these events in light of the aid that Poste Italiane has received over 15 years.

Given these developments, it may not be appropriate to define a single relevant market for the entire period of the assessment. We consider that an appropriate way forward will be a more practical approach based on defining a focal market but then identifying all relevant associated markets potentially affected by the aid.

Figure 5.8 Events occurring from 2000 to 2015 with important implications for the postal sector in Italy



Notes: Postel 1 refers to a discrimination case in the hybrid mail delivery market in which Poste Italiane was found to have favoured its subsidiary, Postel, and was fined. Postel 2 refers to a discrimination case in the market for the delivery of bulk mail. Poste Italiane was found to have favoured its subsidiary, Postel, and the case was settled with commitments. * The entire postal market was nearly fully liberalised in 2011. The markets for the notification of judicial acts and for the delivery of fines following infringements to driving rules remain reserved to Poste Italiane. Source: Oxera research.

Precedents on market definition relevant to this case

There are two major pieces of European legislation on competition in the postal sector: the Postal Directive, and the Postal Notice of 1998 (hereafter ‘the Postal Notice’).¹⁸⁶

¹⁸⁶ European Commission (1998), ‘Notice from the Commission on the application of the competition rules to the postal sector and on the assessment of certain State measures relating to postal services’, *Official Journal of the European Communities*, 98/C 39/02.

The Postal Notice in particular refers to market definition a number of times. Specifically, it notes the difference between 'the general letter service', which concerns the delivery of items of correspondence to the addresses shown on the items, and 'the express mail service'. Noting that:

In addition to faster and more reliable collection, transportation and delivery of the postal items, an express mail service is characterised by the provision of some or all of the following supplementary services: guarantee of delivery by a given date; collection from the sender's address; delivery to the addressee in person; possibility of a change of destination and addressee in transit; conformation to the sender of delivery; tracking and tracing; personalised treatment for customers and the offer of a range of services according to requirements. Customers are in principle prepared to pay a higher price for this service.¹⁸⁷

Within the general letter category, the Postal Notice highlights that different markets could be defined on the basis of different levels of the value chain:

Different activities can be recognised within the general letter service, which meet distinct needs and should in principle be considered as different markets; the markets for the clearance and for the sorting of mail, the market for the transport of mail and, finally, the delivery of mail.¹⁸⁸

The Postal Notice makes a number of additional remarks, including that services that benefit from special rights, such as services in a reserved area, constitute a distinct market.¹⁸⁹ As suggested by the use of 'in principle', the Postal Notice's remarks are guidelines. Indeed, European competition precedents show examples of relevant markets having been defined both in accordance and at odds with the Postal Notice.¹⁹⁰ For example, in a case of discriminatory pricing by Deutsche Post, letter transportation services were considered within a market distinct from the market for collection and pre-sorting services, in line with the Postal Notice.¹⁹¹ By contrast, the Dutch competition authority considered transport, sorting, distribution and delivery services within the same product market in a case of abuse of a dominant position by TNT.¹⁹²

In this case, the decisions of the Italian national regulatory authority and national competition authority appear especially pertinent for our considerations of the relevant market. For example, AGCOM's decision n. 728/13/CONS¹⁹³ sets out the product market based on the market for sending multiple mail items. It concludes that the relevant market is that for standard bulk mail services as well as bulk mail services that offer some dimension of track and trace. Express postal services fall outside the scope of this analysis, given that they are outside

¹⁸⁷ European Commission (1998), 'Notice from the Commission on the application of the competition rules to the postal sector and on the assessment of certain State measures relating to postal services', *Official Journal of the European Communities*, 98/C 39/02, para. 2.4.

¹⁸⁸ European Commission (1998), 'Notice from the Commission on the application of the competition rules to the postal sector and on the assessment of certain State measures relating to postal services', *Official Journal of the European Communities*, 98/C 39/02, para. 2.5.

¹⁸⁹ European Commission (1998), 'Notice from the Commission on the application of the competition rules to the postal sector and on the assessment of certain State measures relating to postal services', *Official Journal of the European Communities*, 98/C 39/02, para. 2.2.

¹⁹⁰ Kjølbjerg, L. and Malamataris, C., 'Postal services and competition law: An overview of EU and national case law', e-Competitions no. 77572.

¹⁹¹ Beer, B. (2005), 'A German Court confirms a decision of the Bundeskartellamt and adds an additional milestone in the EC recent decisions concerning consolidators in the postal sector (Deutsche Post)'.

¹⁹² Groenevelt, D. (2009), 'The Dutch Competition Authority dismisses alleged predatory pricing, tying and bundling, discriminatory pricing and foreclosure through exclusive and/or multi-year contracts in the postal market (Sandd/TNT)', December.

¹⁹³ AGCOM (2013), 'Delibera n. 728/13/CONS. Determinazione delle tariffe massime dei servizi postali rientranti nel servizio universale l'Autorità', <https://www.agcom.it/documents/10179/540185/Delibera+728-13-CONS/031435b0-c9e2-44c8-9612-d5fdbaf9dbf?version=1.1>.

the USO. Finally, AGCOM concluded that for the services in scope, the relevant geographic market was national.

Market definition: product dimension

In terms of determining the relevant product market, we note that the Commission has generally segmented the mail delivery services markets along the following dimensions.¹⁹⁴

- **Domestic and cross-border mail.**¹⁹⁵ Although both domestic and cross-border deliveries might have been affected by the aid, cross-border deliveries account for only a small proportion of non-express postal deliveries, in both the USO and non-USO markets (at around 4-5%).¹⁹⁶
- **Business mail and mail for residential customers.**¹⁹⁷ Although deliveries from both residential and business customers might have been affected by the aid, the business segment is much more significant in volumes (72% of Poste Italiane's deliveries in 2015 were either B2B or B2C versus 8% of C2C deliveries).¹⁹⁸
- **Addressed and unaddressed mail.**¹⁹⁹ In the case of Poste Italiane, unaddressed mail accounted for only 1% of Poste Italiane's postal revenues in 2014.²⁰⁰
- **Standard and express.** Express mail services are outside the scope of the USO. They are offered by separate entities with a dedicated network and consumers do not substitute between express and standard services.

Therefore, we consider that the relevant product market should be domestic, addressed business mail. This conclusion is consistent with AGCOM's finding that the various bulk mail offerings of Poste Italiane²⁰¹ and its rivals form a single market for sending multiple mail items. This conclusion stems from the nature of these products, featuring: high volumes of items sent; demand stemming mainly from medium and large business clients; high competitive pressure; and significant substitutability by consumers.²⁰²

As regards standard versus express mail services, we note that the Commission considers that standard and express delivery form separate markets because of limited demand- and supply-side substitutability between the two types of service.²⁰³ Since express services are also outside the scope of the USO, the extent of potential competitive distortions from the aid is limited to this market. We also note that express mail has only accounted for a fraction of Poste Italiane's turnover during the relevant period.²⁰⁴

¹⁹⁴ See case COMP/M.6503 – *La Poste/Swiss Post/JV*, section 1.1.

¹⁹⁵ See case COMP/M.3971 – *Deutsche Post/Excel*, paras 23–24.

¹⁹⁶ See Ecorys, 'Country sheet: Italy', section 1.5.

https://circabc.europa.eu/webdav/CircaBC/FISMA/markt_consultations/Library/postal_services/studies/italy.pdf.

¹⁹⁷ See case COMP/M.5152 – *Posten AB/Post Danmark A/S*, paras 15–17.

¹⁹⁸ See Ecorys, 'Country sheet: Italy', section 1.4.2.

¹⁹⁹ COMP/M.5152 – *Posten AB/Post Danmark A/S*, paras 16–17.

²⁰⁰ See Ecorys, 'Country sheet: Italy', section 1.5.

²⁰¹ *Prioritaria Pro, Posta Massiva, Posta Time*.

²⁰² AGCOM (2013), 'Delibera n. 728/13/CONS. Determinazione delle tariffe massime dei servizi postali rientranti nel servizio universale l'Autorità', para. 91.

²⁰³ Express services provide additional value and are faster and more reliable overall than basic postal services. This difference is reflected in the higher price. Standard mail services may also differ from express mail services in terms of applicable regulatory requirements and network logistics (See case COMP/M.102 – *TNT/Canada Post, DBP Postdienst, LaPoste, PPT Post and Sweden Post*, para. 20).

²⁰⁴ For example 0.7% in 2007. See Ecorys, Ecorys, 'Country sheet: Italy', Table 0.15.

Furthermore, on the basis of the information we have gathered, we understand that enhanced features²⁰⁵ contained in express post services in Italy, are important service characteristics for certain customers—i.e. some customers would continue to buy such services in the face of a small but significant and non-transitory increase in price.

From discussions with Italian postal companies, we also understand that the networks for providing express postal services in Italy are distinct and separate from other services, indicating a limitation in the degree of supply-side substitutability between express and standard services. In addition, we note that the price and margins made on express services are different from those obtained through standard mail services.

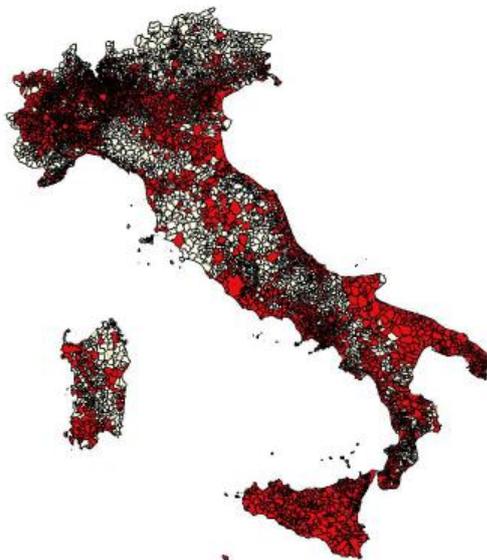
On this basis, we consider that express mail is not part of the focal product market.

Therefore, we consider that the focal product market should be domestic, business mail (excluding express services) that is addressed.

Market definition: geographic dimension

Poste Italiane's network covers the entirety of Italy, for both mail delivery and mail collection services. Alternative operators are present across the country, but 17–27% of the population is covered by Poste Italiane only for mail delivery services. Figure 5.9 illustrates this coverage.

Figure 5.9 Italian postal delivery network coverage in 2016



Note: White colouring denotes areas covered by Poste Italiane's network only; red colouring denotes areas served by Poste Italiane and at least one alternative operator.

Source: AGCOM, 'Allegato B alla delibera n. 651/16/CONS. Documento per la consultazione pubblica sul "Riesame delle previsioni in materia di accesso alla rete e all'infrastruttura postale di Poste Italiane"', p. 14.

²⁰⁵ 'Speed of delivery' and 'track and trace features'.

In previous decisions covering different countries, the Commission has found that the market for mail delivery services is national in scope, irrespective of its precise segmentation.²⁰⁶

Indeed, it does not seem appropriate to define the market at a sub-national level (e.g. regional or local), as Poste Italiane is the designated USP across the entire national territory, and the same price, access and contractual conditions apply across the country.

In line with this, in 2013, AGCOM found that all markets it examined were national, by virtue of the homogeneity of economic requirements offered by postal operators across the country, and given Poste Italiane's position as the national USP.²⁰⁷

Based on the information set out above, the relevant geographic market for this case is national.

However, we emphasise that the national scope does not rule out the possibility of distortive effects to competition on a sub-national basis. For example, higher-cost-to-serve rural or less prosperous areas of the country would be unlikely to have attracted competitors even in the absence of the aid.

Conversely, areas with a lower cost to serve, or areas with higher population density (facilitating more efficient network scale) would be more likely to see market entry and competition.

5.2 Identification of the potential distortions to competition

We now consider the potential distortions to competition from the interventions.

With the market definition set out above as a starting point, in theory we would assess the competition effects on the specific market identified. After this we could also consider the effects on other related markets. From this perspective, while the market definition identifies a narrow market, the effects could be more widespread, and as such, the market definition is not a definitive or limiting factor in assessing competition affects.

Furthermore, given information availability, assessing impacts on competition for each specific market segment may not be possible. This is in fact the case (as we set out below) in that, while we can assess the impact on competition from the reserved area, the data available to us did not enable us to segment this, for example by addressed/unaddressed letter mail and business vs residential letter mail.

Owing to the reality of having imperfect data, our competitive assessment (presented in section 5.3) differs from the formulaic market definition, and instead assesses the impact on any mail services from the change to the reserved area.

Furthermore, given the single postal network in question (i.e. that of Poste Italiane) and that the single network provides many different services and products, it is indeed appropriate to consider the wider effects and implications of

²⁰⁶ See the following Commission decisions: IV/M.102 - *TNT/GD Net*; IV/M.787 - *PTT Post/TNT-DG Net*; IV/M.843 - *PTT Post/TNT/GD Express Worldwide*; IV/M.1168 - *Deutsche Post/DHL*; IV/M.1410 *Deutsche Post/Danzas*.

²⁰⁷ AGCOM (2013), 'Delibera n. 728/13/CONS. Determinazione delle tariffe massime dei servizi postali rientranti nel servizio universale l'Autorità'.

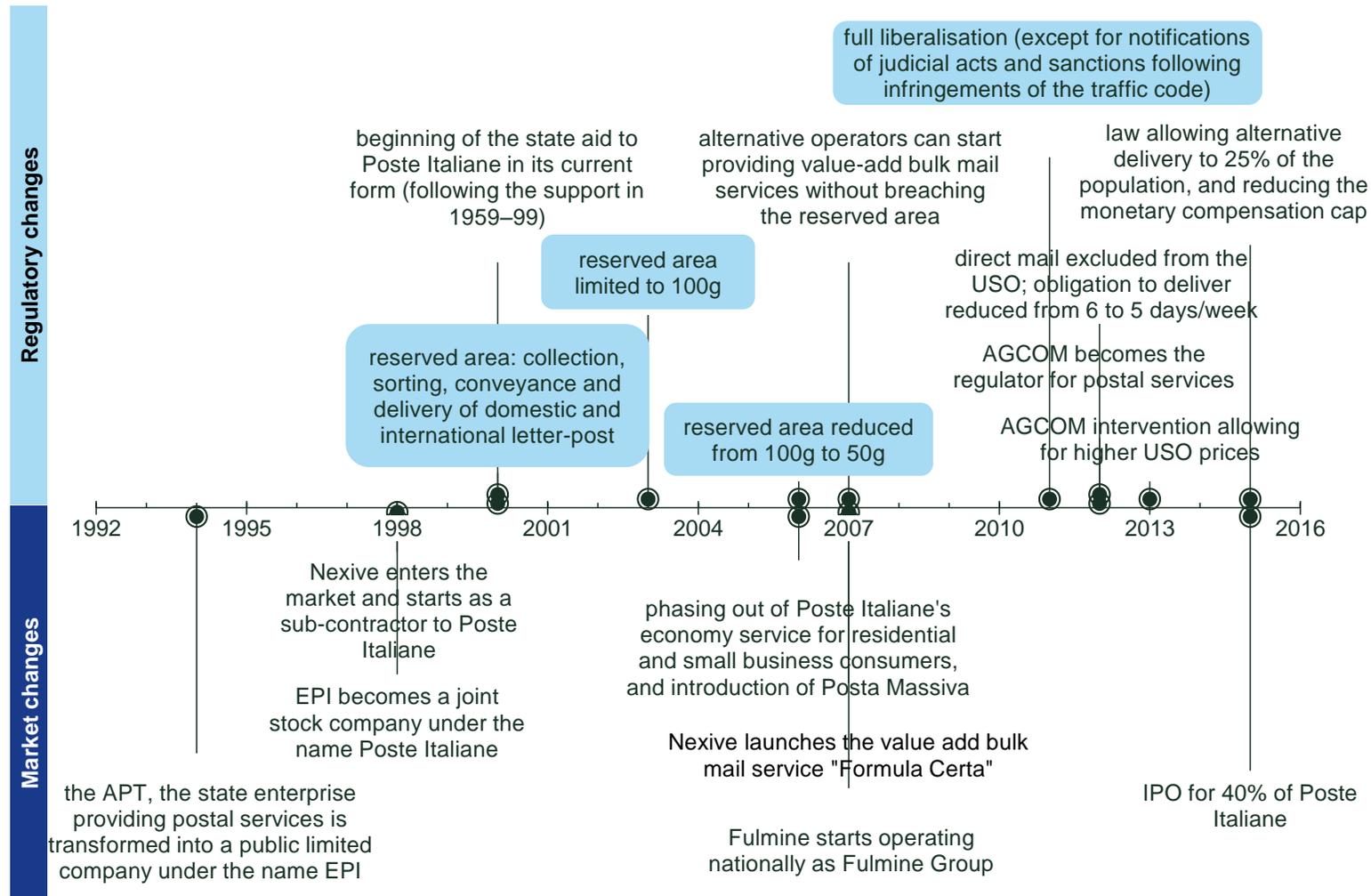
the interventions, and not to constrict the assessment to looking only at a subset of services, on the basis of a market definition exercise.

Therefore, while the market definition certainly provides an important first step in understanding the market, and with full information, can allow a methodical assessment of the competition effects, it is still appropriate to consider competition effects on other (associated) markets. Therefore the precise scope of the relevant market is not deterministic, in regard to the conclusions that can be drawn from a more thorough competition assessment.

5.2.1 Market and regulatory developments

The postal case study stands out in terms of the timeframe of the relevant aid to be assessed—spanning several decades. There have also been various regulatory and market changes over the relevant period, as illustrated in Figure 5.10 below.

Figure 5.10 Regulatory and market changes taking place over the relevant period in the Italian postal sector



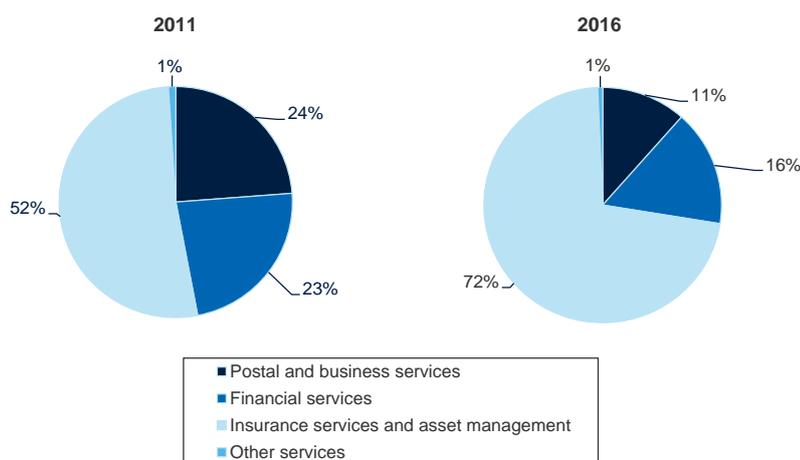
Note: The light blue frames denote events relating to the reserved area.

Source: Oxera, based on data from public documents and stakeholder interviews.

In light of the market context set out in section 5.1, we note that in assessing competition effects from interventions, there are several challenges that must be taken into account. We summarise these below.

1. **Singularity of Poste Italiane’s operations.** The recipient of the aid and measures (Poste Italiane) is a USO provider, which means it has a significantly different business compared with other operators.²⁰⁸ Furthermore, Poste Italiane is an unconventional USO provider, in that it relies heavily on financial and insurance services. In recent years, the revenues obtained from services distinct from the postal service have increased significantly (see Figure 5.11).²⁰⁹

Figure 5.11 Revenue sources for Poste Italiane



Source: Oxera analysis based on Poste Italiane’s Annual Reports

2. **Non-existence of an adequate counterfactual.** The ‘aid’ as generally defined would comprise solely the monetary compensation (as set out in Table 5.2 below). Assessing the impact of the aid is complex because we cannot compare it against an aid-free counterfactual—i.e. we cannot observe the world in which the aid was not provided, and it is not possible simply to use a competitor as a benchmark, since that competitor will not have the USO (and therefore will not have the same network composition and costs).
3. **Plurality of measures granted to Poste Italiane.** There are two additional interventions (reserved area and tax exemption) that could also have an impact on competition. Assessing these measures is complex, but in the case of the reserved area, there was a natural experiment in 2011 following the change to the reserved area in respect of ‘up to 50g’ items (this natural experiment forms our competition assessment in section 5.3).
4. **Duration of the aid.** The duration of the aid and interventions (i.e. from 2000 to 2017) poses a challenge from a conceptual and data-gathering perspective.

²⁰⁸ For example, until recently, Poste Italiane was obliged to collect and deliver mail five days a week, across the entire country. This regulation has recently been relaxed to fewer days per week.

²⁰⁹ Ensuring a complete assessment of the aid given to a firm considers how the aid may affect the entity in the provision of other services (notwithstanding any accounting separation rules). In cases of overcompensation, the benefits to the firm (and distortions to the market) may materialise in services different from those for which the aid was granted.

5. **Market trends.** The relevant period also corresponds to significant change in the postal market, for example in relation to declining volumes, people switching to online substitutes, and spending on postal services (especially letters) declining.

The factors described above mean that any attempt to isolate the specific effects on competition from a particular intervention (state aid or measure) will be prone to a significant degree of uncertainty.

5.2.2 Competition and USO financeability: the trade-off

For member states, a key objective in relation to postal services is ensuring that the provision of universal service is guaranteed on a sustainable basis.

Indeed, this objective is included in the EU postal legislation. For example, the EU Postal Directive notes as part of market reform that:

It is appropriate to continue to provide for the possibility for Member States to reserve certain postal services to their universal service provider(s). These arrangements will enable the universal service providers to complete the process of adapting their operations and human resources to conditions of **greater competition without upsetting their financial equilibrium and thus without jeopardising the safeguarding of universal service.** [emphasis added]²¹⁰

Securing the sustainability of the USO has generally been the principal objective of national regulators following guidelines set out in the EU Postal Directive,²¹¹ i.e. it takes precedent over other objectives, including that of promoting competition.

While competition can bring benefits to consumers in the form of lower-price and higher-quality services, it also can threaten the financeability of the USO provider, which would then require intervention to ensure USO sustainability.

In other words, the more competition that is introduced, the greater the risk of ensuring the financial sustainability of the USP and the greater the need for state aid or other measures to support the USP.

This creates a delicate balancing act that needs to be achieved, whereby enough competition is introduced to create consumer benefits, without (too significantly) damaging the financial sustainability of the USP.

As a result, more competition may not lead to the most desirable or efficient outcome. Since, while increased competition may lead to lower prices, this may not be desirable, if for example the USP (as a result of that increased competition) needs state aid (monetary compensation) that amounts to more than the price reductions (savings for consumers).

²¹⁰ European Commission (2002), 'DIRECTIVE 2002/39/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 10 June 2002 amending Directive 97/67/EC with regard to the further opening to competition of Community postal services', para. 23, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:176:0021:0025:EN:PDF>.

²¹¹ European Commission (2008), 'Directive 2008/6/ec of the European Parliament and of the Council of 20 February 2008 amending Directive 97/67/EC with regard to the full accomplishment of the internal market of Community postal services', *Official Journal of the European Union*, <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0006&from=EN>.

5.2.3 Approach to considering the competition implications of aid and measures granted to Poste Italiane

A key starting point when considering the nature of any aid or measure in the postal market is whether the measure is competitively neutral. In other words, the aid or measure (needed to support the sustainability of the USO) needs to avoid (or at least minimise) distortions to competition in the relevant market.

That is, the mechanism should ensure that efficient entry in the relevant service market is not deterred, and inefficient entry is not promoted, and that operators assume a non-discriminatory share of the USO burden. We discuss this in more detail below.

Conceptual competition implications in respect of aid and measures in this case

We now turn to assessing the forms of aid and measures that Poste Italiane has received over the relevant period, and the key competition considerations for each. We summarise these in Table 5.2.

Table 5.2 The competition considerations for different aid/measures

Aid/measure	Competition considerations
Direct aid (monetary compensation)	<p>There is no a priori reason to suggest that state funding (monetary compensation) per se would prevent entry into the postal market of operators that are more efficient than the USP.</p> <p>More specifically, with funds being raised by general taxation, competitors would not have to directly assume the USO burden, and therefore the implication of allocating the direct aid is competition-neutral.</p> <p>However, care needs to be taken when estimating the net costs borne by the USP as a result of the USO. If, for instance, the USP is over-compensated, state funding might create a negative impact on competition in the markets where the USP is active—the operator might use the extra revenues to subsidise the prices of certain services</p>
Reserved area	<p>This measure directly prohibits market entry and therefore has direct implications for competition.</p> <p>The determining success of this measure will depend on whether, in the absence of the measure, there would be a significant amount of entry from inefficient operators.</p> <p>The more entry is expected to involve exploitation of artificial price–cost margins created by the imposition of the USO, the more this mechanism, by preventing this entry, would appear to avoid inefficient entry.¹</p> <p>Competition concerns may arise if the USP is also active in the competitive segment of the market and seeks to leverage its market power in this segment. Some of these concerns could, however, be mitigated with adequate competition law and regulatory controls.</p>
Tax exemption	<p>Offering differential treatment for VAT for the USP over other operators will introduce some differentiation in conditions which could act to distort competition.</p>

Note: ¹ However, a relevant consideration here is whether governments/regulators weight the negative implications of inefficient entry as highly as the positive impact of efficient entry. In some cases, even the potential for competition may be seen as sufficient to justify removing the reserved area, even if it also introduces the potential for cream-skimming.

Source: Oxera analysis.

5.2.4 Competition implications to be tested

In this subsection, we set out the hypotheses we would want to test with regard to the competition implications of the aid and measures granted to Poste Italiane over the relevant period.

As set out above, there are some complicating factors that have limited the extent to which we were able to assess the impacts on competition. Furthermore, some data limitations mean that we were not able to test in full the possible concerns. Below, we describe the type of analysis that would have been desirable to conduct, if we had had access to all possible information. Owing to data limitations, our ability to explore the hypotheses described below has been substantially limited.

The effect of the monetary aid, the reserved area and the tax exemption on market entry decisions

Hypothesis: In the absence of any aid or measures, would there have been greater market entry, and would any such entry be 'efficient'?

Economic theory dictates that entry into a market will occur when there are positive expected net returns to an investment. The likelihood of a potential entrant taking the step into a market is closely related to what the new market equilibrium will be in terms of prices and quantities, provided the best response of the incumbent firm.

When a firm enters the market, it takes into account only the additional gains it may benefit from and not the detriment for incumbents. This externality may turn into a market inefficiency if certain conditions are met. Namely, entry will be inefficient if the new entrant does not increase the market size but steals business, and additionally the fixed costs account for a big proportion of a firm's expenses.

At first glance, it seems that the demand for postal services in Italy would not grow in the presence of a higher number of operators. In addition, it is a market with high fixed costs. However, although these conditions are present, it is unclear whether in the absence of the aid and measures granted to Poste Italiane, there would have been any entry at all. Without any knowledge in this regard, it follows as an even bigger challenge to determine how far above the level of aid is from the level necessary to avoid inefficient entry.

The data necessary to assess whether the benefits were responsible for avoiding inefficient entry is not available. In order to estimate the effect of the different types of aid on the likelihood of entry into the market, it would be necessary to have yearly and segmented data (by weight) on market entry, volumes and revenues. In addition, it would have been useful for the aid to vary not only by year but also across segments.

The benefits granted to Poste Italiane could also have impeded efficient entry. In the absence of the aid, an operator with a more efficient cost structure might have been able to compete successfully across some, or all, market segments. The aid, in that sense, might have allowed Poste Italiane to maintain prices sufficiently low as to deter an entrant that could have been able to win over the market in the absence of intervention.

To estimate the likelihood of this happening, we would need the evidence set out in previous paragraphs, and information regarding the costs for firms supplying

particular segments. The evolution of costs for providing segmented services per operator would be useful to assess whether there was an increase or a decrease in the average cost following entry.

In addition, the unpromising future of letter mail would have deterred entry more heavily in those segments with the higher sensitivity to e-substitution. While parcel and express services seem to have a potential for growth, the letter market does not show signs of an important recovery. The sensitivity to digitalisation would have to be accounted for when estimating the isolated effect of the measures granted to Poste Italiane on market entry.

The effect of the monetary aid, the reserved area and the tax exemption on market prices

Hypothesis: In the absence of any aid or measures, would prices of postal services be higher or lower? Ideally, each of the measures from which Poste Italiane benefits could be independently linked to prices.

The monetary aid is a lump-sum amount, and therefore the effect it has on the equilibrium output should be, at most, limited. However, this is an industry with a large proportion of fixed costs, so the monetary aid could help relax the burden put on prices to recoup these costs. The extent of this pass-through would be a relevant measure to assess the effect of the aid on market outcomes.

The price discrimination per segment of the market adds an extra layer of complexity to the analysis. It is likely that there is some degree of cross-subsidisation between segments with higher and lower margins. In the absence of the direct aid, the firm's need to cross-subsidise may be larger, and it may be inclined to raise the prices in segments with high willingness to pay. The aid, in that sense, might have relaxed this need, allowing for a significant price decrease in the high-margin segments.

In addition, an incumbent firm may be readier to increase prices when the threat of entry is relatively low. Therefore, the effect of any aid or measures on prices will depend on whether, and to what extent, the aid or measure had a deterring or encouraging effect on market entry.

Poste Italiane's special regime as a USO provider involved monetary transfers, reserved areas and tax exemptions.²¹² The combined effect implies that even if the monetary aid alone would allow entry to be optimal, the reserved area provision would block it. This poses a methodological difficulty to pin down the extent of the effect of either of the three types of aid on entry and, by extension, prices.

An estimation of the pass-through from the monetary aid to prices could be attempted only in a scenario with no reserved areas. However, even in their absence, it would be necessary to have, for all operators, yearly and segmented data on prices, costs, volumes and revenues. The result may indicate how sensitive average prices are to the state aid, albeit not at a specific disaggregation per weight category. Owing to data limitations, however, we have not been able to assess such effects in this study.

Cost-benefit assessment of the aid and measures granted to Poste Italiane

²¹² The reserved area is a regulatory measure that does not entail the transfer of State resources, and the VAT exemption is considered not to be imputable to the State.

Building on the assumption that the hypothesis above could be tested, one could compare the potential benefits from the aid to the cost of providing it. As a consequence of the aid, consumer prices and the volume of mail delivered may vary with respect to a free-market threshold. The associated variation in consumer welfare should then be put in the balance against the cost of administering the state intervention.

Additional measures of the welfare effect for consumers derived from the aid would include improvements in the quality of the service and, more generally, any performance indicator relevant for consumers.

In order to balance out all of these issues to the cost of the aid, the data required would include a yearly account of the monetary transfers granted to the USO provider and the evolution of prices, quantities and quality in a factual and counterfactual scenario. During this study we were unable to gather such data from stakeholders (owing to it being commercially sensitive).

The impact on competition in the relevant market as a result of the reserved area

Hypothesis: What impact did the reserved area have on competition: would prices have been higher or lower in the absence of any reserved area?

As far as possible, we explored how the reserved area has affected competition. We used the 2011 removal of the reserved area to conduct a before-after counterfactual analysis. We were then able to see if prices increased or decreased as a result of the removal of the reserved area (and the introduction of competition). We benchmarked the prices against international and domestic comparators, to try and capture wider market trends, and provide information on whether price changes are actually attributable to other (macro) factors.

In assessing this, we made use of the information we gathered from public sources, and anecdotal information acquired from stakeholder interviews.

5.3 Competitive assessment

In this section, we analyse whether the measure provided to Poste Italiane in the form of a reserved area had an impact on competition.

We will test this question by considering the changes to the reserved area over time, and employing analysis in respect of key indicators of competition (including prices and market shares) to observe the possible impacts on competition. The remainder of this section is structured as follows:

- **the scope of the reserved area: which shock we should test.** We assess the three possible regulatory shocks we could test and conclude that the 2011 change to the reserved area (which acted to liberalise sub-50g mail items) provides the best opportunity to observe the effects on competition from a change to the reserved area;
- **assessing the impact of the reserved area on competition.** We analyse market shares, prices and quality metrics to assess the impact on competition from the liberalisation of sub-50g mail items;
- **conclusions on competition effects.** We conclude our analysis, stating that on the basis of the evidence analysed, it is not clear that the liberalisation of

the sub-50g mail segment led to a positive outcome for consumers in the form of lower prices or higher quality of service.

5.3.1 The scope of the reserved area: which shock we should test

Following the implementation of the Postal Directive providing for gradual market liberalisation, the 'reserved area' was modified in 2000, as regards domestic²¹³ letter mail.²¹⁴

As mentioned earlier, the scope of the reserved area has evolved over time, first in 2003 (when the reserved area was reduced to just letter mail below 100g) and then in 2006 (when it was reduced further to cover just mail items below 50g). In 2011, the market was liberalised, with the exception of some niche²¹⁵ segments.²¹⁶

In addition to the regulatory developments, competition gained an important impulse in 2007 when competitors were allowed to provide bulk mail non-USO value-added services. Despite their added value (a barcode allowing customers to 'map' deliveries), these services are substitutable with some of the USO products offered by Poste Italiane. This, however, was not exactly a de-scoping of the reserved area, as much as an allowance for services to compete against those provided under the USO.

The first question is which change(s) to the reserved area is most interesting to examine in terms of its effects on competition. That is, which date should be used for the purposes of our before-after counterfactual assessment (and which mail segment).

The three options in terms of market shocks are:

- **2003:** this 'shock' was the liberalisation of letter mail above 100g.²¹⁷ In this case, we would look to assess the impact on competition for letters above 100g (i.e. what happened to market shares and prices for letters above 100g after 2003);
- **2006:** this 'shock' was the liberalisation of letter mail between 50g and 100g.²¹⁸ In this case, we would look to assess the impact on competition for letters between 50g and 100g (i.e. what happened to market shares and prices for letters between 50g and 100g after 2006);
- **2011:** this 'shock' was the liberalisation of letter mail under 50g. In this case, we would look to assess the impact on competition for letters below 50g (i.e. what happened to market shares and prices for letters below 50g after 2011).

In considering which of these to test, and noting the other market changes that would introduce complexity in observing competition effects, we start from the position that we should assess the shocks that are likely to have the most material impact on competition, since these are the shocks for which we are most likely to be able to observe an effect.

²¹³ In addition to international.

²¹⁴ See Ecorys, 'Country Sheet: Italy', and European Commission 2008, decision, para. 8.

²¹⁵ Notifications of judicial acts and of sanctions following infringements to the traffic code, which remain fully reserved to Poste Italiane.

²¹⁶ See AGCOM website, 'Servizio universale', <https://www.agcom.it/servizio-universale-postale>.

²¹⁷ This weight limit shall not apply if the price is larger than or equal to 3 times the public tariff for an item of correspondence in the first weight step of the fastest category.

²¹⁸ This weight limit shall not apply if the price is larger than or equal to 2.5 times the public tariff for an item of correspondence in the first weight step of the fastest category.

The most material impact on competition is likely to come from the mail segments with the letter volume. This is because all of the mail segments relevant for the reserved area are standard letters, albeit for slightly different weight categories.

We therefore need to understand what proportion of all letter mail falls into the following three categories: i) over 100g; ii) between 50g and 100g; and iii) under 50g.

Ideally, we would be able to directly observe from Poste Italiane the proportion of letter mail by weight in each year from 2000 to today; however, we have not been able to acquire such information during this project (owing to its confidential nature).

However, while we were not able to observe data on Poste Italiane's volumes by weight, we were able to find other information that indicates that the vast majority of letter mail is under 50g. For example, we observed that in other countries, for example Poland²¹⁹ and Estonia,²²⁰ about 90% of domestic letter mail was less than 50g (from 2005 and 2007). This would indicate that only 10% of letter mail is above 50g, meaning that the 2003 and 2006 shocks may not be material enough (in terms of total mail volumes) to discern a material impact on competition.

This hypothesis is supported by further evidence (from countries such as Ireland and Austria, which also had reserved areas and underwent a change in scope) that a change in reserved area for letter mail from 100g to 50g is unlikely to significantly affect competition. For example:

Change in reserved area from 100g to 50g does not appear to have any material impact on the market share of the NPO [national postal operator]. This is probably due to customers requiring a "one stop shop" for their mailing needs.²²¹

The reduction of the reserved area (from 100g to 50g) seems to have had hardly any impact on the market structure in this segment.²²²

This international evidence supports the view that the 2011 shock (i.e. liberalisation of sub-50g letter mail) is likely to be the most significant (and therefore interesting) for the purposes of assessing the effects on competition of a change to the reserved area. This position is supported in a 2008 Ecorys report, which notes how the 50g reserved area corresponds to the major share of addressed mail, and that the reserved area in this regard is a material barrier for competitors:

An important reason for the persistent dominance of Poste Italiane (notably in universal services) may be the fact that the 50 grams threshold of the reserved area covers a major share of the market for addressed mail deliveries²²³

²¹⁹ Ecorys, 'Country sheet: Poland',

https://circabc.europa.eu/webdav/CircaBC/FISMA/markt_consultations/Library/postal_services/studies/CS%20Poland%20final.pdf.

²²⁰ Ecorys, 'Country sheet: Estonia',

https://circabc.europa.eu/webdav/CircaBC/FISMA/markt_consultations/Library/postal_services/studies/estonia.pdf.

²²¹ Ecorys, 'Country sheet: Ireland',

https://circabc.europa.eu/webdav/CircaBC/FISMA/markt_consultations/Library/postal_services/studies/ireland.pdf.

²²² Ecorys, 'Country sheet: Austria',

https://circabc.europa.eu/webdav/CircaBC/FISMA/markt_consultations/Library/postal_services/studies/austria.pdf.

²²³ Ecorys, 'Country sheet: Italy'.

On the basis of this evidence, we consider that the 2011 change (liberalisation of sub 50g mail) was likely to be the most material change to the reserved area during the relevant period in terms of scope for impact on competition.

5.3.2 Assessing the impact of the reserved area on competition

We now turn to assessing the impact of the 2011 change to the reserved area on competition, on the basis of market shares, prices and quality of service.

Market shares

A common starting point for any competition assessment is to examine market shares. Before the liberalisation of sub-50g mail, some interim steps were taken to limit the concentration in the market. For instance, from 2007, a percentage of the mail collected by Poste Italiane, including registered items, had to be delivered by competitors.²²⁴ In addition, some local postal companies operated at a limited geographical scope. This allowed for a non-zero market share for operators different from Poste Italiane. In particular, TNT Post was present in the market even before the liberalisation of sub-50g mail, exerting a competitive pressure through its bulk mail service. A rough estimate places the market share pre sub-50g mail liberalisation of Poste Italiane between 85% and 95% in the bulk mail segment.

Following liberalisation of this mail segment (in 2011), it would be useful to ascertain how market shares evolved, including by how much Poste Italiane's market share was eroded by competition.

Owing to data confidentiality, we have not been able to obtain information on volumes (or market shares more generally) for specific weight categories of mail, for Poste Italiane or for any other Italian mail operator. However, we have been able to obtain a rough understanding of market shares through third-party information.

A June 2014 report from ERGP²²⁵ notes that Poste Italiane had at that time 'the vast majority of the letters market', corresponding to around 90% of revenue. Given that the vast majority of letter mail (around 90% on the basis of international evidence) is under 50g, we can conclude that even after three years of liberalisation, Poste Italiane retained a very high share of the sub-50g mail segment.²²⁶ This indicates that there has not been significant market entry.

Furthermore, the ERGP report notes that there was only a single other nation-wide operator in this segment, which further indicates that in the letters market in general (and the sub-50g segment specifically) the 2011 liberalisation has not resulted in significant competition.

Prices

The second metric we use to inform our analysis on competition is that of prices. Here, we assess what the impact on prices as a result of the 2011 change to the reserved area might have been.

²²⁴ Ecorys, 'Country sheet: Italy'.

²²⁵ See ERGP (2014), 'ERGP report on end-to-end competition and access in European postal markets', p. 63, http://ec.europa.eu/internal_market/ergp/docs/documentation/2014/ergp-13-38rev1-report-on-end-2-end-competition-clean-adopted_en.pdf.

²²⁶ Given that Poste Italiane had 90% share of all letter mail items, then assuming that 90% are sub-50g, this means that Poste Italiane had a share of sub-50g mail of at least 89%.

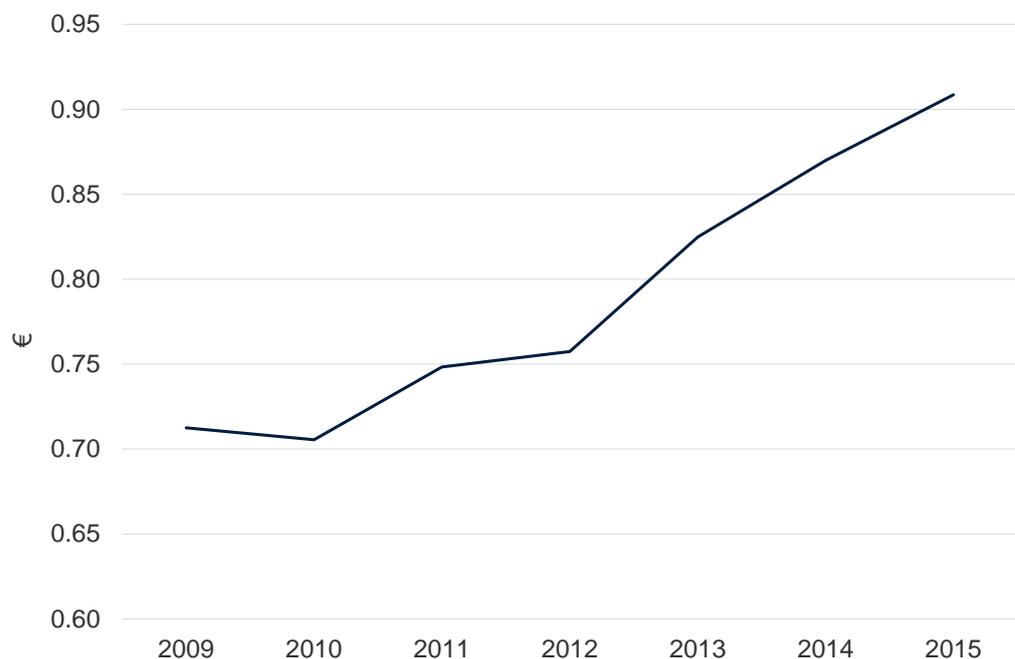
During our information-gathering process, we were able to acquire data on nominal prices for mail by weight and service for Poste Italiane over time, as well as other European postal operators. In addition, we have calculated the implied prices per mail segment of Poste Italiane by dividing the revenues and volumes obtained from the Annual Reports. Albeit less granular, this indicator better reflects the market price for the different mail segments, as it weights implicitly the volumes transacted per weight segment.

We can analyse how Poste Italiane's prices evolved (following the 2011 change to the reserved area) for sub-50g mail and how this compares with other mail offered by Poste Italiane, as well as prices in other countries. This can help to inform any impact on competition from the 2011 change to the reserved area.

However, a price assessment for sub-50g mail should be taken with caution. A cautious approach suggests that there might have been a divergence between the prices for sub-50g USO products, and those for sub-50g non-USO products. While a partial review of the USO rates might hint that these were essential to the liberalisation of the market, this is in fact contradicted when stepping back to capture a bigger picture.

We start by considering the change in rates in Poste Italiane's USO service, from 2009 to 2015 (owing to data availability). We observe that USO prices went up following the removal of the 50g reserved area in 2011. In Figure 5.12, we present the average price across all priority mail items. As noted above, 90% of these volumes are likely to relate to sub-50g letters.

Figure 5.12 **Poste Italiane average priority mail revenue, 2009–15 (€)**



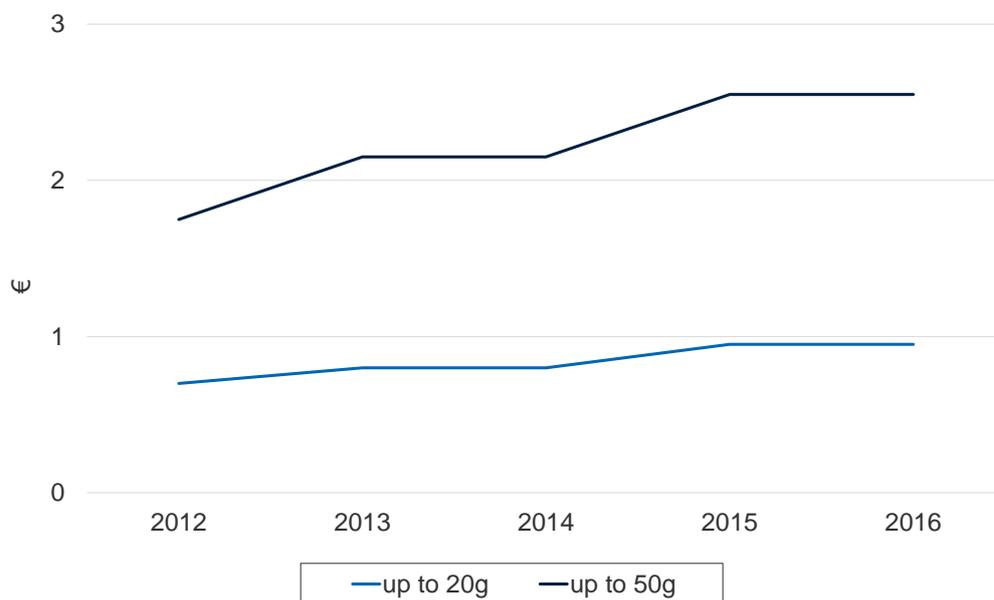
Source: Oxera, based on Poste Italiane annual reports.

We see that the price for priority (USO) mail items increased significantly from about €0.70 in 2010 to over €0.90 in 2015.

We can see a similar trend from looking at the tariff price listed by Poste Italiane in respect of its 'Posta 4' service, which shows that sub-20g and sub-50g mail

prices have been increasing in recent years. Owing to data limitations, we only have information available from 2012, however the trend is clear.

Figure 5.13 Poste Italiane USO tariffs by mail weights, 2012 to 2016 (€)



Source: Oxera, based on Poste Italiane data.

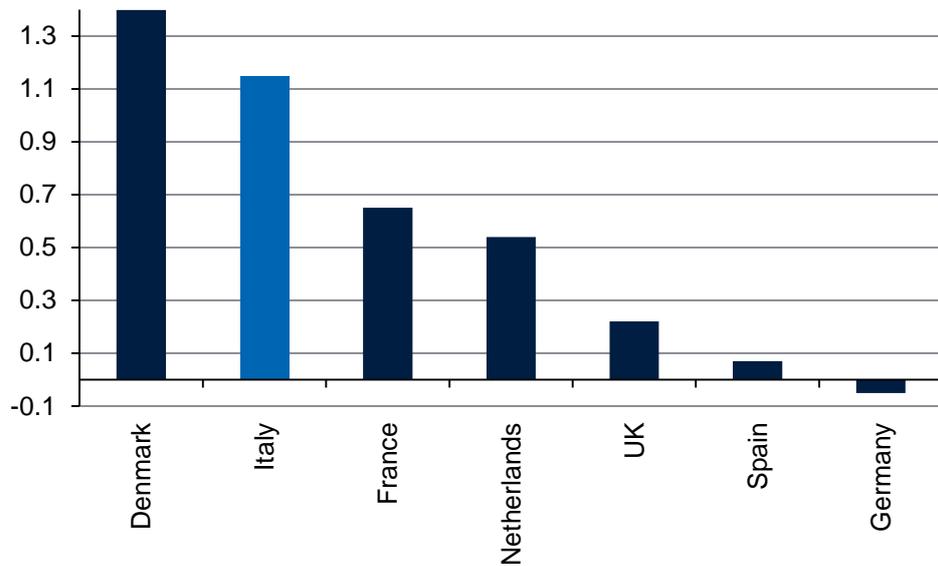
In Figure 5.13, we see that prices for sub-20g increased less significantly than prices for sub-50g items.

In the context of these price changes, we note that inflation in Italy has been historically low. In fact, while tariff prices for ‘up to 50g’ items increased by over 40% from 2012 to 2016, indexed inflation over the same period was only 2.6%.

To further inform the analysis, we compare the tariffs for up to 50g items (i.e. those that were open to competition in Italy from 2011) with those tariffs in other European countries.

With the exception of Denmark, Italy experienced the greatest absolute price increase in up to 50g items between 2011 and 2016—i.e. €1.15, some eight times the absolute price increase observed in Spain over the same period. This price increase is specific to the sub-50g USO product.

Figure 5.14 Absolute price changes from 2011 to 2016, for up to 50g items (€)

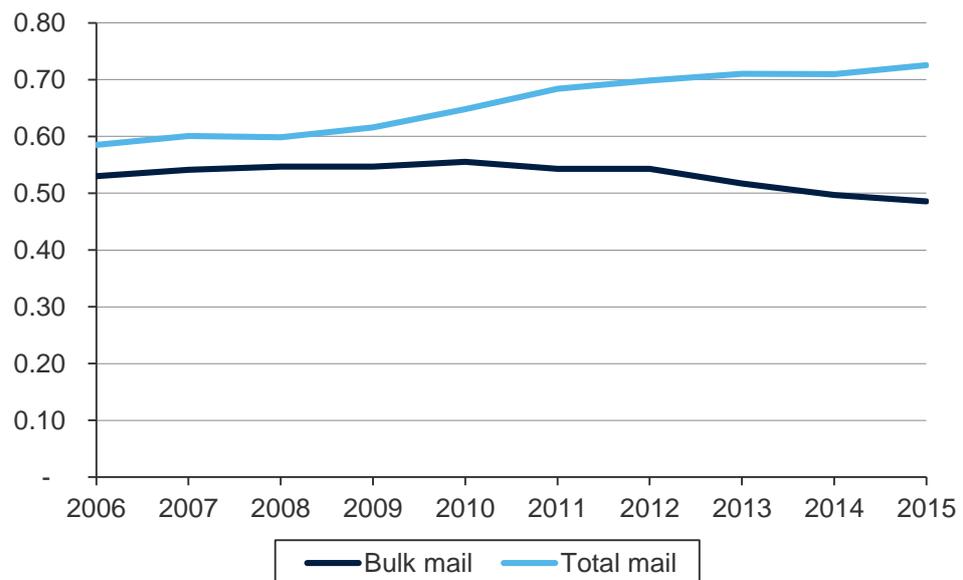


Source: Oxera, based on PostNL data.

The evidence set out above shows that, following the removal of the reserved area on up to 50g items, the price for USO letter items increased significantly, both in absolute terms and relative to benchmarks.

So far our analysis has only looked at the prices of Poste Italiane’s USO products. When considering the entire range of postal services (i.e. USO and non-USO), or even only the bulk mail, the story is quite different. The average revenues per unit, which are equivalent to the implied average prices, do not show a pronounced increase, as can be seen in Figure 5.15.

Figure 5.15 Implied average price for bulk mail and total mail



Source: Oxera analysis based on Poste Italiane’s Annual Reports.

It is worth noting that the service of sub-50g mail is included within bulk mail, and actually represents most of the volume of this category. The implied prices have been fairly stable for the bulk mail segment, with a slight declining trend that can be traced to the liberalisation of 2011. The average price for total mail, on the other hand, shows an increasing trend, which accelerated in 2009 and stabilised again in 2011.

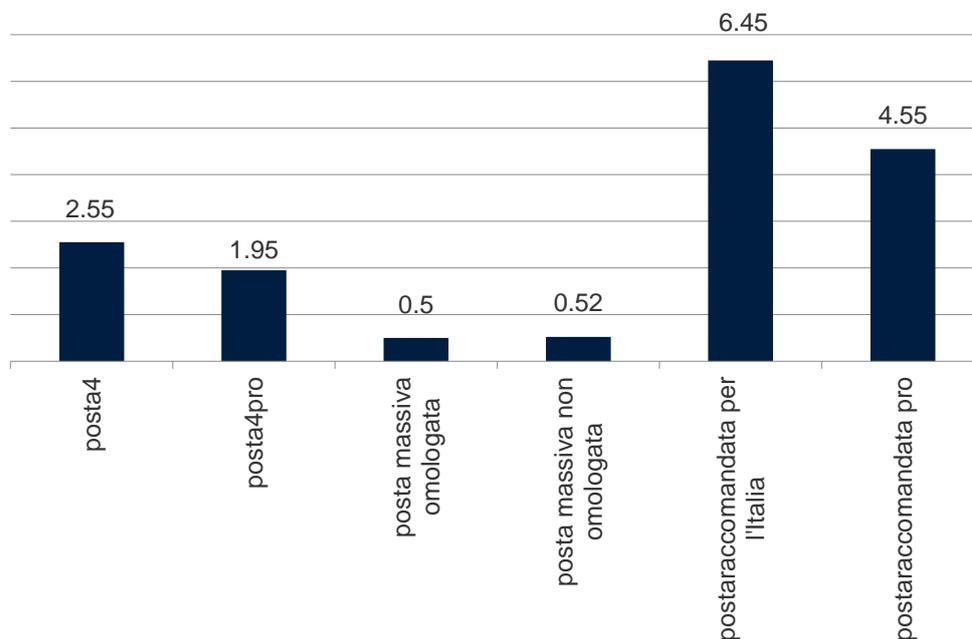
The evidence shown in Figure 5.13 seems to be at odds with that presented above. This can be explained by the strategy that Poste Italiane has followed in response to the liberalisation of the market. The rate increments have been limited to those services that fall under the USO. In those segments, competition has tended to be weak and Poste Italiane has been able to increase prices.

However, for the services outside the USO, the prices have remained stable. In 2011, following the liberalisation of the market, Poste Italiane started to set its prices according to the geographic scope of the delivery.²²⁷ This scheme substituted its unique tariff for the 'Posta Massiva' service, and was further used as the main variable to respond to competitive pressures.

This period also saw a general transition from physical to digital means of communication. Specifically, volumes in the letter market reduced significantly, which in turn constrained the firm's capacity to cover the fixed costs. The pricing strategy of Poste Italiane is partially a response to this market trend, as much as it is to the liberalisation of the market.

In Figure 5.16, we present the different forms and prices of sub-50g mail delivery services currently offered by Poste Italiane.

Figure 5.16 Poste Italiane tariffs for the sub-50g mail 2017 (€)



Note: ¹ For posta massiva (bulk mail), the tariffs presented are for metropolitan deliveries.

² For posta4 services (priority mail), the tariffs presented are for standard sizes.

³ Posta Raccomandata is the product name for registered mail.

²²⁷ See Unione Stampa Periodica Italiana (2011), 'Le nuove tariffe postali ROC dal 1 settembre 2011', 5 August.

Source: Oxera analysis based on Poste Italiane. See Poste Italiane (2017), 'Tariffe dei servizi postali universali in vigore dal 10 gennaio 2017: servizi universali per l'interno', <https://www.poste.it/prodotti-servizio-universale-listino.pdf>.

As an aside, we note that in addition to limiting the scale and scope of the aid, the liberalisation of the postal market entailed the gradual shift away from regulated prices. For example, as of 2014 AGCom granted the option to increase the tariffs of USO services to 'fair and reasonable' levels, without prejudice to the safeguard cap for priority and registered mail for retail customers.²²⁸ This effectively lifted the price cap regulation that was in place for several segments, and gave Poste Italiane some freedom to increase prices.²²⁹

The combination of a staggered increase in the number of liberalised segments and an increased (albeit still limited) freedom to set prices in USO services provides a difficult setting for analysis. The price choices made by Poste Italiane, even in the fully liberalised segments, might be at least a partial response to the tariff regulation in other segments. In that sense, the firm faces an optimisation problem of price discrimination with regulatory restrictions.

Quality of service

The final metric we use to assess effects on competition from the 2011 change to the reserved area is changes to the quality of service.

Since our assessment of prices appears to show a divergence between those of non-contestable, USO products and contestable, non-USO products, we analyse whether it is the case that the price increases have been offset/compensated for by an increase in quality of service, and whether for the products with a higher degree of competition, there has been an effect on quality as well. Provided a price and quality assessment, are consumers better off overall?

A good metric of service quality in the mail industry is the proportion of mail that is delivered within the target timeframe. So, what proportion of mail that it is claimed will reach its final destination within one working day will actually meet this target delivery time?

Ideally, we would analyse this quality metric for the sub-50g letter segment both before and after the 2011 'shock', but we were not able to obtain data on the performance metrics for mail by weight. However, we were able to observe data across all priority and registered letter mail. Priority corresponds to letters that are targeted to reach their destination within one working day, and registered letters are tracked and targeted to reach their destination within three days. The former has a higher average cost, is less contestable and faces significantly less competition than the latter.

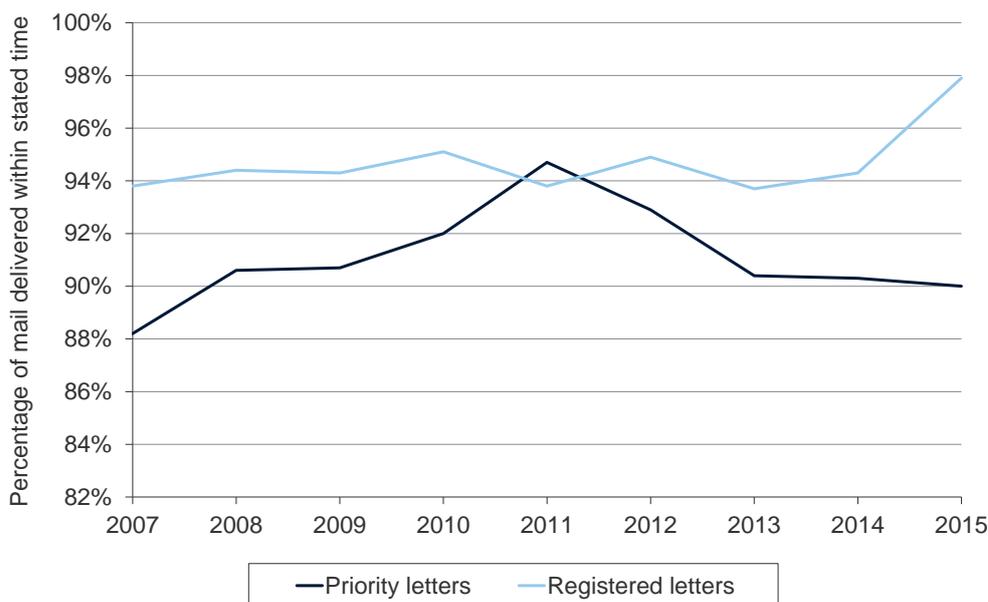
Since, as noted above, the majority (possibly around 90%) of letter volumes are under 50g, we can make the assumption that the majority of the mail items captured by these quality metrics are for sub-50g mail.

Figure 5.17 shows the evolution of this quality of service metric for priority and registered mail. We observe that in the case of registered mail, there is no material increase after 2011, and for priority letters there is a material decline after 2011.

²²⁸ AGCom (2013), 'Resolution 728/13/CONS'.

²²⁹ See Poste Italiane Group (2015), 'Interim Financial Report at 30 June 2015'.

Figure 5.17 Mail delivered within the designated target timeframe



Source: Oxera, based on Poste Italiane Annual Reports.

This evidence indicates that following the liberalisation of the 50g mail segment, the quality of service for priority mail dropped. We do note however that both priority letters and registered mail remained above the regulatory targets for quality throughout the 2007–15 period.²³⁰

This is potentially due to the costs of meeting these service requirements, in the face of falling volumes. In contrast, quality of service for registered mail increased, this is likely to be due to the competitive pressure in this mail segment from the companies such as Nexive and Fulmine.

5.4 Conclusions on the impact of aid on competition

In conclusion, the removal of the up to 50g reserved area in 2011 widened the scope of competition in the postal market. The resulting market outcomes, namely entry, market shares, prices and quality, are in line with increased competition, albeit to different degrees.

The evidence indicates that Poste Italiane raised its prices on the USO segments in which competition was limited; this could result partly from volume decline (and therefore higher unit costs), but could also be due to competition. Among the portfolio of mail services offered by Poste Italiane, bulk mail has shown characteristics of a highly competitive market. Customers who need to send non-urgent mail can choose from a variety of companies that offer this service, which translates into relatively low prices.

The quality of service also seems to be driven by the intensity of competition in the market. The quality of the priority mail and the registered mail services was similar in 2011, when the sub-50g weight segment was liberalised. However, in the years after, competition intensified in the registered letters, while it remained limited in priority mail. Potentially as a result, the quality in the registered mail

²³⁰ From 2007 to 2015 the target for priority letters was 89%. For registered letters, the target was 92.5% until 2015, when it reduced to 90%.

remained high, contrasting the decline observed in priority mail. We have not been able to prove causality in this regard.

Finally, as regards entry and market shares, the evidence suggests that the liberalisation gradually allowed private operators to offer an increasing number of services. We have been unable to pin down the effect that the removal of the sub-50g reserved area had on market shares because the available data of sales and volumes is not granular enough. However, market trends show that other competitors (and most notably Nexive) have achieved important leaps into several market segments, helped by technological developments that have added value to their services. These firms have managed to steal market share away from Poste Italiane, albeit not to the extent as to eliminate its majority share.

In this respect, it is important to note that while the liberalisation of a large segment such as the sub-50g mail has opened the door to potential entry by increasing the range of services that new competitors can provide and thus allowing them to enjoy economies of scope, we may still see only limited entry to the market. This is because the postal market involves high fixed costs and significant economies of scale. The installed capacity of Poste Italiane might act as a deterrent to competition.

Put differently, Poste Italiane's incumbent advantages (in terms of economies of scale and scope), and its established mail network (for providing the USO) may mean that it is the most efficient operator at delivering mail up to 50g.

In conducting this analysis, we have faced constraints in respect of data availability. With access to more data, it would be possible to better isolate the effects of the aid on competition. For example, with access to information on what types of mail segments consumers see as substitutable (which would be likely to evolve significantly over time),²³¹ we would be able to understand the degree to which different mail segments constrain each other (in terms of pricing). This would help to inform an assessment of how prices are constrained by liberalising different mail segments.

Our analysis also highlights the challenges in conducting a competition assessment in the postal market. In addition to the challenges with gathering the requisite data, there are material conceptual challenges linked to testing hypotheses about impacts on competition. For example, the ongoing (as opposed to one-off) nature of the aid, the shifting market trends (from both the demand and the supply side), and various regulatory changes (such as market liberalisation) make isolating specific impacts of competition from any one factor a challenge.

²³¹ For example, due to changing tastes and preferences in light of growing electronic substitutes.

6 Environmental aid to a starch producer in France

Executive summary

Roquette Frères S.A. (RF), a producer of starch and starch derivatives in Beinheim in the Alsace region of France, received aid to construct a wood-fuelled biomass plant. The aid was from the 'Fonds Chaleur' scheme organised by the French Environment and Energy Management Agency (ADEME), which supported a number of biomass plants.

In the absence of the aid, the biomass plant would not have been constructed, and instead RF would have produced heat using gas. The construction of RF's biomass plant was completed in December 2011. The aid was approved by the Commission in November 2010.¹ Over the same period, ADEME funded the construction of several other biomass plants in France.

The aid has achieved its objective of promoting the production of heat from renewable energy and more effectively mobilising renewable energy through the construction of a boiler employing renewable sources (i.e. biomass).

Potential competitive effects of the aid

Potentially, the markets for natural gas, electricity, carbon credits, heat, starch, wood and wood chips could have been distorted by the aid. However, for the reasons explained in this section, any competitive effects of the aid are most likely to occur in the local market for energy wood.

The markets for natural gas, electricity and carbon credits are unlikely to be affected, as they are large international commodity markets, while the market for heat is unlikely to be affected as there is no local heat market in Beinheim. Similarly, the wider market for heat contracting is unlikely to be affected by a plant of the scale of RF. Although the market for starch could potentially be affected; Oxera's analysis shows that the aid was unlikely to have distorted this market.

Market definition

There are three broad categories of wood: timber wood (which is of high quality and is used for furniture and construction); low-quality wood (which is used for paper, panels and packaging), and the lowest-quality wood (which is generally used as energy wood).

Within each of these broad categories, there are several subcategories. Within these categories, most products are substitutable. For the purposes of assessing the competitive effects of aid to RF, the relevant product market is the market for low-quality wood.

Low-quality wood, unless transported by sea, is too heavy relative to its value to be transported over long distances. After considering the sourcing strategies of energy buyers, it is appropriate to define the relevant geographic market as the area within a 400km radius around Beinheim.

The impact of aid on competition

We have assessed whether demand for wood from RF, as well as the other biomass plants in France that received government support under ADEME's scheme, distorted the local wood market, thereby adversely affecting other local wood buyers in France, such as paper, panel, packaging or pulp manufacturers.

The following three hypothesis have been tested:

- did demand and the price of wood increase in France as a result of aid to RF ('hypothesis 1')?
- did competition for wood increase, and did this lead to higher costs and lower profits for local businesses that also use wood as an input, such as paper and panel manufacturers ('hypothesis 2')?
- did aid to RF have a negative impact on the business outlook, investment plans or decisions of other wood buyers in France ('hypothesis 3')?

The quantitative analysis we have undertaken has been supplemented by insights from interviews with stakeholders and companies operating in the relevant markets.

Building on the Commission's approach to assessing possible distortions to competition set out in its 'Guidelines on State aid for environmental protection and energy', the results from

testing the above hypotheses are discussed below.²

Hypothesis 1: did demand and the price of wood increase in France as a result of aid to RF?

As a result of the relatively low level of demand from RF's plant alone, it is unlikely that the local market for low-quality wood has been distorted as a result of aid to RF. However, it is noticeable that demand for energy wood in the local market increased significantly over the 2010–13 period. This is likely to be due to demand from the five major biomass plants supported under ADEME's scheme in the local region, in addition to low winter temperatures and high fossil fuel prices. The evidence also shows that higher demand led to the price of low-quality industry wood rising significantly after 2011 at both national and local levels.

As supply can only react slowly to changes in demand, at least initially, this led to sourcing difficulties. These difficulties might have been more pronounced, as the evidence from the French market shows that buyers of energy wood tended to purchase industry wood, as the price of energy wood increased.

Hypothesis 2: did competition for wood increase and did this lead to higher costs and lower profits for local businesses that also use wood as an input, such as paper and panel manufacturers?

Both energy and industry wood prices in Alsace, and at the national level, increased significantly over the 2012–14 period, suggesting that both types of wood are substitutable in the French market. This is supported by comments from interviewees that high demand for energy wood led to increased demand for low-quality industry wood. Indeed, the price of low-quality industry wood increased the most significantly at the national level.

There is evidence that competition for low-quality wood in France intensified, and as a result, buyers extended the areas over which they procured wood. This implies that higher prices for low-quality wood adversely affected other competing buyers of low-quality wood.

Hypothesis 3: did aid to RF have a negative impact on the business outlook, investment plans or decisions of other wood buyers in France?

There is evidence that companies active in the local market for pellets and panels experienced a significant increase in their material costs over the period. As this led to a decline in companies' profitability in these sectors in the 2012–14 period, this implies that the aid might have adversely affected the profitability of companies in the pellets and panels sectors in France.

Based on interviews with competing wood buyers, there are examples of companies reducing their activities due to the higher wood prices, or in some cases, exiting the French market. In contrast, others invested in expanding their storage capabilities in order to store greater amounts of energy wood when prices are relatively low, and investing in boilers that are flexible in terms of their fuel intake.

However, an analysis of employment trends in the sector yields mixed results. Although employment in the panels sector in the local economy in France slightly decreased in 2013, it subsequently recovered. In contrast, employment in other sectors does not appear to have been affected by the high wood prices. Therefore, it cannot be decisively concluded whether the aid led to negative business outlooks for competing wood buyers or the exit of companies competing for low-quality wood as an input.

Overall conclusions

Overall, due to RF's relatively small size compared with the local market for low-quality wood, it is unlikely that aid to RF alone distorted competition. However, there is evidence that ADEME's Fonds Chaleur scheme, together with the impact of the cold winter temperatures and the higher fossil fuel prices, led to competitive distortions in the French market. Evidence from the interviews and data analysis suggests that demand for low-quality wood increased, prices increased significantly, buyer competition intensified, and the profitability of certain segments of the French market, such as the panels sector, was adversely affected.

Sources: ¹ European Commission (2010), 'Aide D'Etat N 650/2009—France, Projet de construction d'une chaufferie biomasse sur le site industriel de Beinheim', C(2010)7684 final, 17 November. ² European Commission (2014), 'Communication from the Commission, Guidelines on state aid for environmental protection and energy 2014–2020', *Official Journal of the European Union*, 28 June, section 6.2.6.

6.1 Description of the aid and its objective

Following the Commission's approval in November 2010, the French Environment and Energy Management Agency (ADEME) granted investment aid to construct a wood-fuelled biomass boiler in Beinheim in the Alsace region of France.²³² The boiler was constructed by Roquette Frères S.A. (RF) to supply heat to its local starch plant.²³³

6.1.1 Background

ADEME introduced a scheme, 'Fonds Chaleur', to support wood-fired biomass plants throughout France. The aim of the scheme was to promote the production of heat from renewable energies, to promote employment and investment in that sector, and to better mobilise renewable energies. For example, in the Grand Est region, ADEME supported 17 biomass plants over the 2009–14 period, including the RF plant.²³⁴ The objective of the scheme was to reduce carbon dioxide emissions by increasing the use of renewable energy to produce heat.

In the absence of the scheme, the French government considered that investment in wood-fired plants would not take place, and that there would be no corresponding reduction in carbon dioxide emissions.

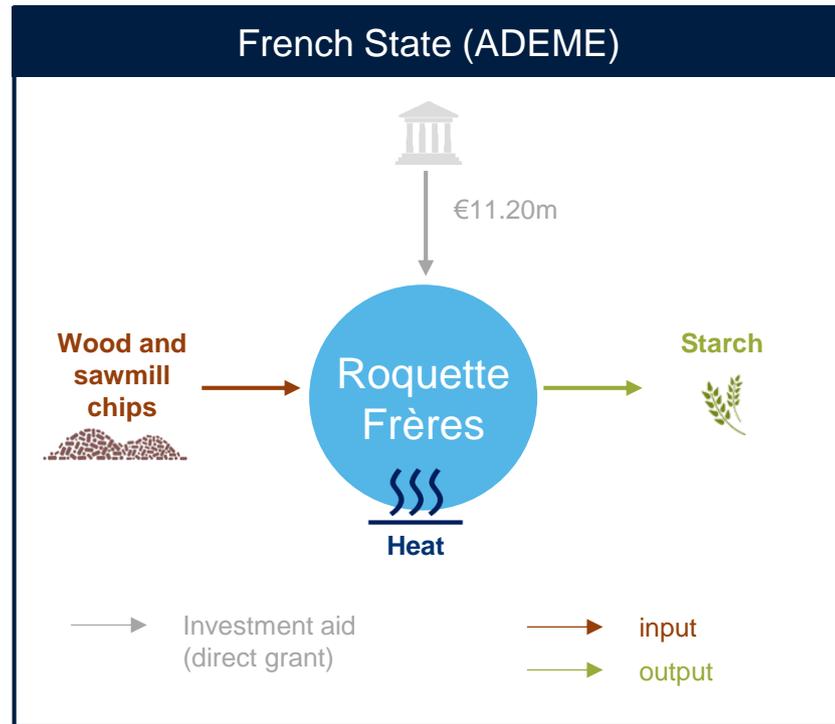
ADEME provided €11.2m of investment aid to RF in order to construct the biomass plant. The total eligible costs, according to the notification, amounted to €21.4m. Figure 6.1 illustrates the heat production process, with wood being used to produce heat, which in turn is used to produce starch.

²³² European Commission (2010), 'Aide D'Etat N 650/2009—France, Projet de construction d'une chaufferie biomasse sur le site industriel de Beinheim', C(2010)7684 final, 17 November.

²³³ RF is a French industrial group operating worldwide that processes starch and produces a number of starch products.

²³⁴ ADEME (2014), 'Fonds Chaleur: Bilan des 6 premiers appels à projets BCIAT', press release, <http://www.presse.ademe.fr/wp-content/uploads/2014/12/Bilan-BCIAT-2009-2013-VDef.pdf>, accessed 15 May 2017.

Figure 6.1 State aid scheme for the construction of the wood-fuelled biomass boiler at RF's site in Beinheim



Source: Oxera.

RF's biomass boiler has a capacity of 43MW²³⁵ and became operational in December 2011.²³⁶ It uses wood and sawmill chips from a 100km area around Beinheim.

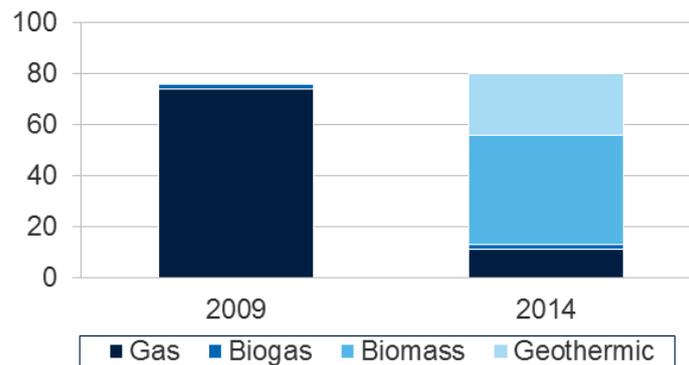
As shown in Figure 6.2, while gas represented the main source of heat in 2009, at the time the aid was approved to RF, it was anticipated that biomass and geothermal energy²³⁷ would supply the majority of RF's heat supply by 2014, with gas used for some heat production and as a reserve supply.

²³⁵ MW measures the capacity of a plant. 43MW implies that, in each given hour, at peak load, the plant can generate 43MW of heat. ktoe is a measure of quantity. One ktoe implies that the heat produced by a plant over one year is equivalent to the energy contained in 1,000 tonnes of oil.

²³⁶ Cappelle, A. (2013), 'Roquette opte pour une chaudière à bois et la géothermie', *Industrie & Technologies*, 1 January, <https://www.industrie-techno.com/roquette-opte-pour-une-chaudiere-a-bois-et-la-geothermie.22797>, accessed 24 January 2017.

²³⁷ Apart from the aid for the biomass boiler, ADEME also supported RF's construction of a geothermal heat plant.

Figure 6.2 Steam consumption produced for RF (MW thermal)



Source: Oxera analysis, based on Renewable Energies Transfer System (2011), 'The Roquette company renewable energy mix', Best Practice case study, ADEC, France.

6.1.2 The Commission's assessment

In June 2009, the Commission approved the ADEME aid scheme for the development of renewable energy.²³⁸ In December 2010, the Commission approved the aid to RF under the scheme for the construction of a biomass-fuelled heating plant. The Commission considered that the aid would meet a common interest objective, the aid was appropriate and necessary, and the amount of aid was considered to be limited to the minimum amount necessary.²³⁹ In January 2011, the Commission approved additional aid to RF for the construction of a geothermal heating plant on the Beinheim site.²⁴⁰

The Commission assessed the potential for the aid to create competitive distortions in the final product market (the starch market), the heat market, as well as the wood and sawmill chip markets.

The French authorities compared the cost to RF of producing heat using gas with the cost to RF of producing heat using biomass under different carbon and gas price scenarios. The Commission concluded that the aid would be unlikely to benefit RF by leading to lower production costs.

The Commission also concluded that the aid would not significantly affect the heat market, since the only site within reach of the biomass plant is the RF plant in Beinheim.

The Commission considered that the aid would not have any significant impact on the wood and sawmill chip markets, as RF's procurement strategy was diversified and limited to its needs for the Beinheim site.

²³⁸ European Commission (2009), 'Aide D'Etat N 584/2008—France, Régime d'aides aux énergies renouvelables de l'Agence pour le Développement et la Maîtrise de l'Energie 2009-2013', C(2009)4539 final, 17 June.

²³⁹ European Commission (2010), 'Aide D'Etat N 650/2009—France, Projet de construction d'une chaufferie biomasse sur le site industriel de Beinheim', C(2010)7684 final, 17 November.

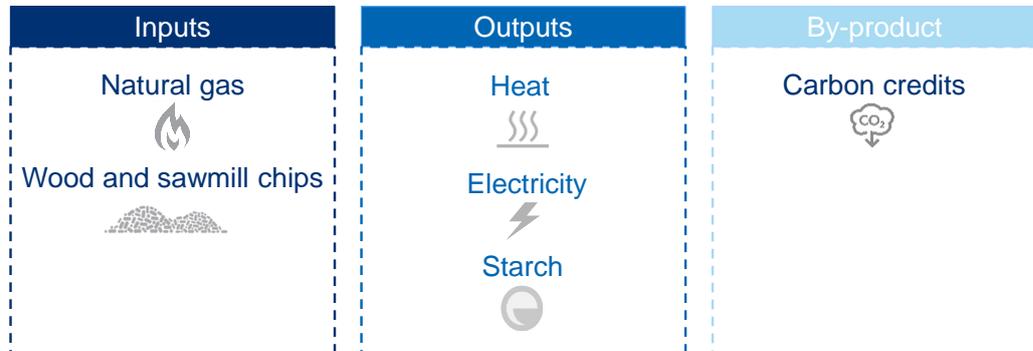
²⁴⁰ European Commission (2011), 'Aide D'Etat N 715/2009—France, Projet de construction d'une chaufferie géothermique sur le site industriel de Beinheim', C(2010)9524 final, 12 January.

6.1.3 Identification of the relevant affected markets

Potential candidate markets affected by the aid and market selection

The first step of the assessment of the competitive effects of the aid is to identify the markets most likely to have been affected by the aid. These are highlighted in Figure 6.3.

Figure 6.3 Markets potentially affected by the environmental aid



Source: Oxera.

The markets related to the inputs required for heat production are as follows.

- The market for **natural gas**. Before the aid, RF produced heat from natural gas. While the need for heat production from natural gas would be significantly reduced as a result of the biomass boiler, the aid is unlikely to have significantly affected the market for natural gas, since the natural gas requirements of RF's Beinheim industrial site do not account for a substantial portion of the overall market. Gas is a commodity, and gas prices, similar to oil and coal prices, are not likely to be influenced by factors at a local level.
- The market for **wood and sawmill chips**. RF's biomass boiler uses wood and sawmill chips to produce heat. According to the plan agreed by the French authorities and RF, which covered the expected lifetime of the biomass boiler, the chips must be procured from diversified sources within a 100km area around Beinheim. It is possible that aid to RF might have affected the market for wood and sawmill chips, for the following reasons. First, the demand for wood from the plant relative to local supply may be relatively large. Second, energy wood is generally not transported over long distances. Third, there are alternative uses for wood and sawmill products in other local industries such as paper and panel production.

The markets related to the outputs are as follows.

- The market for **heat production**. RF will produce heat for itself. Although this was also the case before the aid was provided and would be the case in the absence of the aid, RF could have considered purchasing heat from external sources. However, Oxera's analysis has shown that it is unlikely that the market for heat has been negatively affected by aid to RF. This is because there is no local market for heat in Beinheim since there are no other potential heat buyers and there is no facility to transport heat (a so-called heat grid). Furthermore, it is unlikely that the large (potentially European or even global) market for heat contracting is distorted as a result of aid to the biomass plant in Beinheim.

- The national market for **electricity production**. RF could use the steam from biomass energy to produce electricity and sell or use this electricity (i.e. as combined heat and power, CHP, production). We are not aware that RF planned to produce electricity from biomass energy. Furthermore, the production of electricity from the Beinheim site compared with the production across the French electricity market is not likely to be significant.
- The international market for **starches and starch derivatives**. Although RF produces corn and wheat starches and starch derivatives on the Beinheim site, any impact of aid to RF on the starches and starch derivatives market is likely to be limited. This is because cost savings between 2011 and 2016 from producing heat using wood instead of gas are limited—see Box 6.1, in which we set out our assessment of the impact of aid to RF on the starches and starch derivatives market.

Box 6.1 Assessment of the likely impact of aid to RF on the starches and starch derivatives market

Step 1: Estimating heat production cost functions

In the Commission’s decision relating to RF’s biomass plant, the French authorities compared the cost to RF of producing heat from wood-fuelled biomass and from natural gas under different carbon and gas price conditions.¹ From this analysis, we have calculated cost functions for heat production for both technologies, under different scenarios for the evolution of carbon and gas prices.

Step 2: Calculating heat cost savings

Using the heat production cost functions and projections of carbon and gas prices, we have estimated the cost of generating heat from gas and biomass, as well as the price of heat produced using geothermal technology.¹

The resulting estimate of RF’s current costs of heat production has been compared with the cost of heat in the counterfactual scenario, where it is assumed that no aid is received by FR, and therefore only natural gas would be used to generate heat.

Step 3: Assessing RF’s overall production cost savings

According to the French Starch Union, energy costs represent 10–15% of the total production costs of starch.² Using this data, we have estimated RF’s overall production cost savings resulting from the aid. This shows that, on average, RF did not benefit from cost savings following the aid over the period 2010–16.

Figure 6.4 RF’s total starch production cost savings from aid (%)

Year	Cost Savings (%)
2010	-1.4%
2011	0.1%
2012	1.1%
2013	1.5%
2014	-0.8%
2015	-1.4%
2016	-5.8%

Source: Oxera analysis.

Figure 6.4 shows the cost savings from the biomass plant as a percentage of the total costs of the production of starch. Over the majority of the period, the cost savings were not significant; although, cost savings did increase significantly in 2016.

However, over the full period, on average, the aid is unlikely to have had any significant impact on RF’s production costs, and is therefore unlikely to have affected competition in the starches

and starch derivatives market.

Notes: ¹ Carbon price data was obtained from Bloomberg for the period 2010–16. The price of gas paid by RF in 2010 provided in the Commission's November 2010 decision was used. Projections were derived by applying the annual growth rate in the market price of the Title Transfer Facility (TTF) over the 2011–16 period. The TTF is a virtual trading point for natural gas in the Netherlands. ² USIPA (2015), 'Reforme de l'ETS pour la periode 2021-2030', p. 1.

Source: Oxera.

A market related to the by-products of the wood market is as follows.

- The market for **carbon credits**: RF received carbon credits based on its production of heat using gas. When RF starts producing heat from biomass, it will be able to sell its extra carbon credits. In previous competition assessments, the Commission considered that the market for trading carbon dioxide emission rights constituted a separate product market.²⁴¹ In this case, this market is not of particular significance to warrant an in-depth analysis of the impact of the aid on competition, due to the relatively small number of credits compared with the total size of the European carbon market.

In the remainder of this analysis, we therefore focus on the market for wood and wood chips. This is for three main reasons: first, demand for wood from the plant may be relatively high compared with local supply; second, energy wood is generally not transported over long distances; and third, there are alternative uses for wood and sawmill products in other local industries, such as paper and panel production.

Market definition

In order to assess the impact of the aid on competition, we have assessed the relevant market—i.e. the market for wood and sawmill chips—along two main dimensions: the product dimension and the geographic dimension.

Informed by Commission decisions, the market definition should be driven by local circumstances. Therefore, our assessment draws heavily on market reports for the wood market in Alsace and on insights from interviews with market participants.²⁴²

The wood industry is comprised of three types of products based on the quality of wood and the final usage of the wood (as summarised in Figure 6.5).²⁴³

1. **Timber wood**—high-quality wood that is used in the furniture and construction markets as well as high-end packaging markets. As illustrated in Figure 6.5, the residuals from timber wood processing feed into the lower-quality wood (namely, industry and energy wood). Sawmill residuals include sawmill chips, sawdust and shavings, barks and splinters, which are used by pulp mills, panel mills and energy producers, and also to produce pellets.
2. **Industry wood**—low-quality wood that is used for the production of paper, panels²⁴⁴ and packaging. Residuals from trituration serve as inputs for energy wood.

²⁴¹ See, for example, Case COMP/M. 3868 DONG/ELSAM/ENERGI E2.

²⁴² Fibois Alsace (2016), 'Actualisation de l'observatoire de la production et e la consommation de biomasse bois en Alsace', August.

²⁴³ Gipeblor website, 'Organisation de la filière bois', <http://www.gipeblor.com/R-13-A1-0-organisation-de-la-filiere-bois.html>, accessed 23 February 2017.

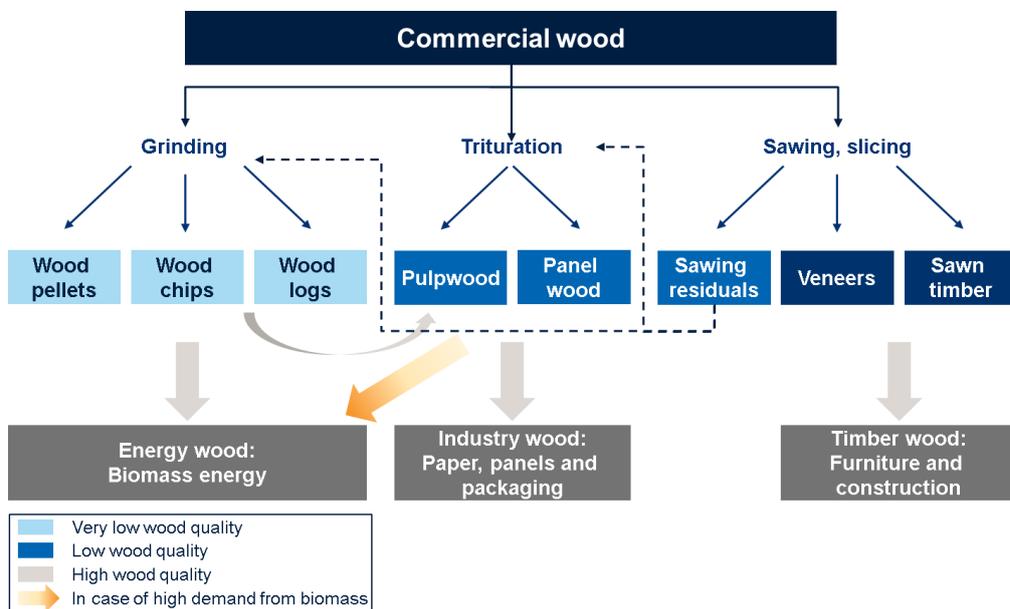
3. **Energy wood**—the lowest-quality wood, which is used in energy production.

These products may take several forms. In Alsace specifically, producers of biomass energy use the following three types of wood:²⁴⁵

- wood logs, which currently represent the largest source of energy wood.²⁴⁶ In Alsace, demand for wood logs is mostly from private individuals (89%);
- Wood chips, which are mainly used for district heating or industrial use including co-generation. Pulp mills can also use wood chips in their production process;
- wood pellets, which are mainly used in residential heating.²⁴⁷

For the purposes of market definition, we assess the substitutability of these different types and forms of woods in the subsequent sections.

Figure 6.5 Overview of the structure of the wood industry in Alsace



Source: Oxera analysis, based on the interview with Fibois Alsace, and Gipeblor’s website.

Market definition: product dimension

In general, the relevant product market comprises those products that are regarded as close substitutes. Therefore, all wood products that could be used as energy wood could potentially be within the relevant product market.

We have examined the key features of the commercial wood market to understand the extent to which consumers (demand-side substitution) or

²⁴⁴ Panels include, for example, wood chipboard, oriented strand board and medium density fireboard. Based on the Wood Panel Industries Federation website, ‘About WPI’, http://wpif.org.uk/About_WPI/, accessed 27 February 2017.

²⁴⁵ Fibois Alsace (2016), ‘Actualisation de l’observatoire de la production et e la consommation de biomasse bois en Alsace’, August.

²⁴⁶ Fibois Alsace website, ‘La ressource et les différents combustibles’, <http://www.fibois-alsace.com/fr/ressource-differents-combustibles/la-ressource-et-les-differents-combustibles.html>, accessed 23 February 2017.

²⁴⁷ Fibois Alsace (2013), ‘Actualisation des données alsaciennes du Schéma Régional Climat Air Energie – Volet biomasse bois’, November.

suppliers (supply-side substitution) will respond to an increase in price. However, given that commercial forests can serve both low- and high-quality wood, the product definition has primarily been informed by the degree of demand-side substitutability.

Demand-side substitution

Biomass plants can use different inputs, depending on the technical features of the boiler. For example, the Teesside biomass plant in North Yorkshire, UK, can use a range of possible inputs, including agricultural residues, which implies that a broad market definition would be appropriate.²⁴⁸ On the other hand, the biomass plant in Lynemouth in Northumberland, UK, can only burn wood pellets that comply with the plant's specification, leading to a narrower product market comprising high-quality hardwood pellets.²⁴⁹

In this case, RF's boiler was capable of using both wood logs and wood chips to produce heat from biomass, and planned to use both sources in equal proportions. Hence, the market for wood logs and wood chips is considered to represent the narrowest possible product market.

There appears to be limited, if any, demand-side substitutability between high-quality wood (i.e. veneers and sawn timber) and low-quality wood used for industry and energy production in the Alsace region, as a result of the significant price differences.²⁵⁰ As mentioned above, furniture and construction industries purchase only high-quality wood that is not used by industry and energy providers.

This finding is supported by Commission decisions. For example, in its decision relating to the co-firing of biomass material by peat plants in Ireland, the Commission considered that high-value virgin wood fibre, such as sawlogs, was not affordable for such a use.²⁵¹

Energy providers use the lowest-quality wood that cannot be used by other industries. However, when the differential in prices between the different qualities of wood is sufficiently small, energy wood buyers also tend to use industry wood.²⁵² For instance, packaging companies in Alsace have indicated that in the past the price of industry wood has been sufficiently close to the price of energy wood, resulting in increased demand.²⁵³ In particular, Fibois Alsace estimated in 2013 that 14% of the wood harvested in Alsace could be used by energy producers in addition to the paper, panels and packaging industries.²⁵⁴

According to Fibois Alsace, a trade association:

Energy wood is of the lowest quality, no one else uses it. Problems arise when low-end wood is not sufficient, and energy buyers may then use wood of slightly higher quality which is used for paper, panels and packaging.²⁵⁵

²⁴⁸ European Commission (2015), 'State aid SA.38796 (2014/N) – United Kingdom. Teesside Dedicated Biomass CHP Project', January.

²⁴⁹ European Commission (2015), 'State aid SA.38762 (2015/C) (2014/N) – United Kingdom Investment Contract for Lynemouth Power Station Biomass Conversion'.

²⁵⁰ Interview with Forêts & Bois de l'Est on 28 February 2017.

²⁵¹ European Commission (2011), 'State aid SA.31861 (2011/N) – Ireland Biomass electricity generation', October.

²⁵² Interview with Fibois Alsace on 16 February 2017.

²⁵³ Fibois Alsace (2016), 'Actualisation de l'observatoire de la production et e la consommation de biomasse bois en Alsace', August.

²⁵⁴ Fibois Alsace (2013), 'Actualisation des données alsaciennes du Schéma Régional Climat Air Energie – Volet biomasse bois', November.

²⁵⁵ Interview with Fibois Alsace on 16 February 2017.

For these reasons, industry wood and energy wood are likely to be substitutes in the French market, and therefore form the same market. On the contrary, timber wood is unlikely to be a substitute since it would be too expensive for use as energy wood.²⁵⁶

Supply-side substitution

In terms of supply-side substitution, we have considered whether wood producers would switch production between different products.

When the price differential between industry wood and energy wood is sufficiently small, industry wood producers may be more willing to sell to energy producers, due to the lower quality requirements. This means that energy producers need to undertake fewer quality and administrative checks.

The differential in terms of price between wood for energy use and paper, panels and packaging is small. If the price of energy wood is close enough to the price of industry wood, some forest owners say they prefer to sell their wood for energy because requirements are less constraining than those for heavy industries.²⁵⁷

Market definition: geographic dimension

The type of wood that can be used by a wood-fuelled biomass plant affects the definition of the relevant product market. At the same time, types of wood also differ in terms of the distance over which it is economical to transport the wood. For example, in the state aid decisions on the Drax and Lynemouth power plants in the UK, the discussion focused on industrial-grade, hard-wood wood pellets. There is a global market for this type of wood, which Drax and Lynemouth were able to access due to the presence of deepwater ports close to their plants.²⁵⁸

In RF's case, however, wood logs and wood chips are used, which are relatively inexpensive relative to their weight and are generally locally sourced. The Commission, for example, considers that:

for economic reasons raw materials used by the wood pellet industry can normally be only transported over limited distances. Manufacturing plants of semi-finished pulpwood products source wood supply from within an average distance of approximately 100km to 150km.²⁵⁹

In support of this, Fibois Alsace confirmed that:

since low quality wood is cheap, transport costs add up to the product cost quickly. Procurement is thus a short circuit, the supplier is located in a radius from 100 to 150 km in general.²⁶⁰

Table 6.1 provides details on the extent to which different wood products are locally sourced. At least 90% of wood logs and wood chips that are produced in Alsace are also sold in the region. Similarly, a high share (64%) of the sawmill by-products produced in Alsace are also sold in the region.

²⁵⁶ Interview with Forêts & Bois de l'Est on 28 February 2017.

²⁵⁷ Interview with Fibois Alsace on 16 February 2017.

²⁵⁸ European Commission (2015), 'State aid SA.38762 (2015/C) (2014/N) – United Kingdom Investment Contract for Lynemouth Power Station Biomass Conversion'; and European Commission (2016), 'State Aid SA.38760 (2016/C) (ex 2015/N) – United Kingdom Investment Contract for Biomass Conversion of the first unit of the Drax power plant'.

²⁵⁹ European Commission (2016), 'State Aid SA.38760 (2016/C) (ex 2015/N) – United Kingdom Investment Contract for Biomass Conversion of the first unit of the Drax power plant'.

²⁶⁰ Interview with Fibois Alsace on 16 February 2017.

However, as shown in Table 6.1, a significant proportion of sawmill by-products are not sold in Alsace; therefore, it is evident that the relevant market for these products is wider than Alsace.

Table 6.1 Local market for low-quality wood products in Alsace

Product	% of Alsatian production used in Alsace	Typical delivery radius of producer (km)
Wood logs	90%	30
Wood chips	99%	54
Sawmill by-products—sawmill chips	34%	Not known
Sawmill by-products—sawdust and shavings	69%	Not known
Sawmill by products—barks and splinters	12–95%	Not known
Wood pellets	No pellet mill in Alsace before 2012; now percentage unknown	66.8

Source: Fibois Alsace (2016), 'Actualisation de l'observatoire de la production et de la consommation de biomasse bois en Alsace', August.

There is a degree of local competition between wood producers, although producers that are located further away could still form a competitive constraint for wood producers in Alsace. The Commission has commented on this spatial aspect of market definition in previous decisions:

since the price of wood between different uses and different markets tends to correlate, there is a risk that market distortion will extend to other producing regions.²⁶¹

In fact, while energy wood is typically not transported over long distances, industrial players in Alsace would, if needed, source raw materials over a longer distance.

- Pellet producers may source materials from the Champagne-Ardenne and Meuse regions, where there is local demand.²⁶² In periods of exceptionally high demand for wood, producers may also purchase materials from the Massif Central region, where supply may be more plentiful.²⁶³
- Packaging companies have indicated that the price of wood products is closely related to the price of energy wood. According to packaging companies, 'they have seen their sourcing radius increase from 30km to 50km, on average, and up to 70km when demand for energy wood is strong'.²⁶⁴

We have considered the boundary of the relevant geographic market around the RF plant, and in particular, the extent to which a wood supplier in a neighbouring region could exert a competitive constraint for RF's wood suppliers.

²⁶¹ European Commission (2016), 'State Aid SA.38760 (2016/C) (ex 2015/N) – United Kingdom Investment Contract for Biomass Conversion of the first unit of the Drax power plant'.

²⁶² Interview with Fibois Alsace on 16 February 2017.

²⁶³ Interview with Fibois Alsace on 16 February 2017.

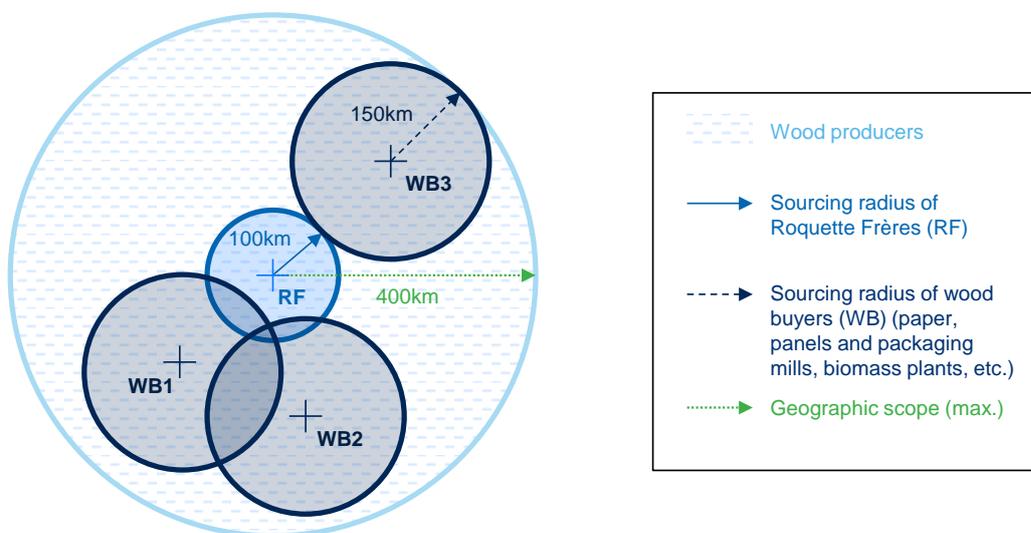
²⁶⁴ Fibois Alsace (2016), 'Actualisation de l'observatoire de la production et de la consommation de biomasse bois en Alsace', August.

As shown in Figure 6.6, producers form a competitive constraint within a maximum distance of 400km around RF. This can be explained by RF sourcing its wood from within a 100km radius of RF ('RF100'), while industry wood buyers source wood within a radius of 100–150km.²⁶⁵

If wood producers within the RF100 area were to increase their prices, wood buyers (labelled 'WB' in Figure 6.6) could switch to producers outside the RF100 area. However, it is unlikely that other wood buyers would extend the distance over which they procure wood beyond 150km.

Therefore, producers form a competition constraint within a maximum radius of 400km around RF.

Figure 6.6 Maximum area within which wood producers outside RF100 exert a competitive constraint



Source: Oxera analysis.

Conclusion on the relevant product and geographic markets

There is a degree of demand-side and a limited degree of supply-side substitution between industry wood and energy wood. Hence, the relevant product market is considered to be the market for low-quality wood, including wood logs, wood chips, wood pellets, pulpwood, panel wood and sawing residuals. Owing to the sourcing radius of RF, which is 100km, and the sourcing radius of other potential wood buyers, which is 150km, the relevant geographic market could be up to 400km around Beinheim.

In the following subsections, we set out our assessment of the competitive pressures faced by wood suppliers in the area.

6.2 Identification of the potential distortions to competition

6.2.1 Describing the counterfactual

To study the impact of aid on competition, we have compared the current competitive situation with what would have happened if the aid had not been granted (the counterfactual).

²⁶⁵ European Commission (2010), 'Aide d'Etat N 650/2009 – France – Projet de construction d'une chaufferie biomasse sur le site industriel de Beinheim', November; and interview with Fibois Alsace on 16 February 2017.

According to the Commission, in the absence of the aid, RF would not have constructed the biomass plant, as the expected return would have been below the level required. Therefore, RF would have supplied its own heat using natural gas.²⁶⁶

6.2.2 Identifying the testable hypotheses on the market(s) where the aid might have had an impact

The following hypotheses have been tested to analyse the impact of the aid on competition.

Hypothesis 1: the aid granted to RF and/or the aid provided under the Fonds Chaleur programme increased demand for low-quality wood in the local market. Since supply could not adjust immediately, the price of low-quality wood increased.

In order to test this hypothesis, we have:

- assessed whether demand has increased since the start of RF's biomass operations, based on an assessment of annual data on regional demand for different types of wood and the regional supply of wood, in order to understand the demand and supply balance;
- examined whether higher demand has led to price increases. In particular, we have examined the evolution of prices over time (before and after RF was constructed) for several wood products at the national and regional level.

Hypothesis 2: higher prices for low-quality wood as a result of the aid to RF adversely affected other competing buyers of low-quality wood such as pulp mills, packaging and panel manufacturers, increasing their costs and decreasing their profits.²⁶⁷ The intensity of buyer competition also increased.

In order to test this hypothesis, we have:

- assessed whether an increase in demand and prices has led to increased buyer competition in the market for wood, and whether companies therefore sourced wood from further away;
- examined whether increased wood prices led to increased costs and to decreased profitability for competing wood buyers. This assessment is based on insights from interviews and financial data from competing companies in the local market (see section 6.3.1).

Hypothesis 3: the aid to RF adversely affected the activities of other buyers competing for low-quality wood, leading to the cancellation of investment decisions and even the exit of other companies in the French market competing for low-quality wood as an input.

In order to test this hypothesis, we have:

- checked whether companies in France competing for wood have changed their sourcing, investment and employment policy as a result of financial

²⁶⁶ European Commission (2010), 'Aide D'Etat N 650/2009—France, Projet de construction d'une chaufferie biomasse sur le site industriel de Beinheim', C(2010)7684 final, 17 November, p. 2.

²⁶⁷ It is assumed that as these companies would compete in other markets that are not affected by increases in wood prices, they would not be able to pass on the higher costs to consumers.

difficulties. The evidence is based on insights from interviews and employment figures.

6.3 Competitive assessment

6.3.1 Description of the assessment methodology

Building on the approach to assessing the impact of aid on competition as set out in the Commission’s ‘Guidelines on State aid for environmental protection and energy’, the key steps involved in testing each of the hypotheses are described in Table 6.2.²⁶⁸

Table 6.2 Assessment methodology for the environmental aid case study

Hypothesis	Analysis	Method used
H1	Analysis of demand and supply	Summary of qualitative evidence in interviews; Before and after analysis: <ul style="list-style-type: none"> • Did demand for different types of wood increase at both the regional and national level? • Did demand rise faster than in other areas not affected by the aid? • How did supply respond to changes in demand?
H1	Analysis of prices	Summary of qualitative evidence in interviews; Before and after analysis: <ul style="list-style-type: none"> • Did price increase? • Was any increase in price caused by greater demand?
H2	Analysis of buyer competition	Summary of qualitative evidence in interviews; Before and after analysis: <ul style="list-style-type: none"> • Did the aid lead to an increase in buyer competition in the market for wood? • Did the aid lead to companies purchasing wood in markets that are located at a greater distance? • Did the aid affect import and exports into the local region?
H2	Analysis of the profitability of wood buyers	Summary of qualitative evidence in interviews; Before and after analysis: <ul style="list-style-type: none"> • Did the costs of purchasing wood also increase for competing buyers? • Did the aid adversely affect the profitability of competing buyers of wood?
H3	Analysis of investment and employment policy	Summary of qualitative evidence in interviews; Before and after analysis: <ul style="list-style-type: none"> • Did any companies competing for wood change their sourcing strategies, investment plans and levels of employment as a result of the aid? • Did the aid adversely affect the profitability of companies competing for wood?

Source: Oxera.

²⁶⁸ European Commission (2014), ‘Communication from the Commission, Guidelines on state aid for environmental protection and energy 2014–2020’, *Official Journal of the European Union*, 28 June, section 3.2.6.

6.3.2 Hypothesis 1: did demand and the price of wood increase in France as a result of aid to RF?

Based on quantitative analysis and informed by insights from interviews, we have examined demand and supply before and after the aid in the local markets for which data is available—namely, Alsace and Lorraine.

Demand

Before the launch of ADEME's biomass funding programme, Fonds Chaleur, in 2009, approximately 300 heating plants in Alsace required around 150,000 tonnes of wood per year.²⁶⁹ From 2009 onwards, based on the Fonds Chaleur programme, five major new projects began in the Grand Est region, including RF in Beinheim, two projects in the region around Strasbourg, an electricity plant in Saint Louis and a cogeneration plant in Urmatt.²⁷⁰ As a result, demand from energy producers increased significantly over the 2010–13 period as a result of projects supported by ADEME.²⁷¹ At the same time, demand for wood for energy production increased from 150,000 to 500,000 tonnes per year.²⁷²

RF uses approximately 150,000 tonnes of wood per year.²⁷³ In comparison, total demand from the four major local industry players—Burgo Ardennes, Kronospan Luxembourg, Norske Skog and Unilin—amounts to nearly 4m tonnes a year.²⁷⁴ All interviewees acknowledged that additional demand for wood from RF alone had not affected the local wood market,²⁷⁵ but there was general agreement that the increase in the total demand for wood from energy producers did have an adverse effect on the market in Grand Est in 2013 and 2014. However, in addition to the aid, the increase in demand is also likely to have been due to the particularly cold winters in 2013 and 2014 as well as high fossil fuel prices.²⁷⁶ From 2014 on, demand has declined, mainly as a result of less severe winter weather.²⁷⁷

There is strong evidence that demand for the different types of energy wood increased in Alsace after 2012 (as shown in Figure 6.7). The increase in the use of sawmill residuals is particularly pronounced, which supports the views of some interviewees that, whereas in the past, sawmill residuals were considered waste, the residuals can now be processed and sold as energy wood.

²⁶⁹ Interview with Fibois Alsace on 16 February 2017.

²⁷⁰ Over the 2009–14 period, ADEME supported 17 biomass projects in the Grand Est region. According to the interviews, wood buyers voiced concerns that the five major projects supported by public funds, including RF's project, had led to significant price increases in the wood market.

²⁷¹ Interview with Unilin on 15 March 2017.

²⁷² Interview with Fibois Alsace on 16 February 2017.

²⁷³ Interview with Fibois Alsace on 16 February 2017.

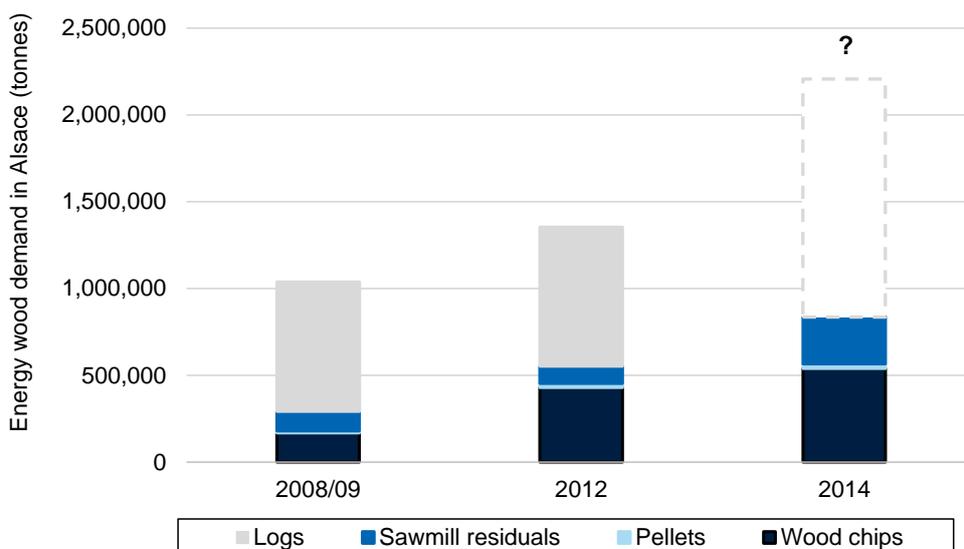
²⁷⁴ Interview with Burgo Ardennes on 29 March 2017.

²⁷⁵ Interview with Fibois Alsace on 16 February 2017, and with Copacel, Unilin and Burgo Ardennes on 9, 15 and 29 March 2017 respectively.

²⁷⁶ Interview with Fibois Alsace on 16 February 2017, and Forst BW on 6 April 2017.

²⁷⁷ Interview with Burgo Ardennes on 29 March 2017, and Copacel on 9 March 2017.

Figure 6.7 Energy wood demand in Alsace (tonnes)

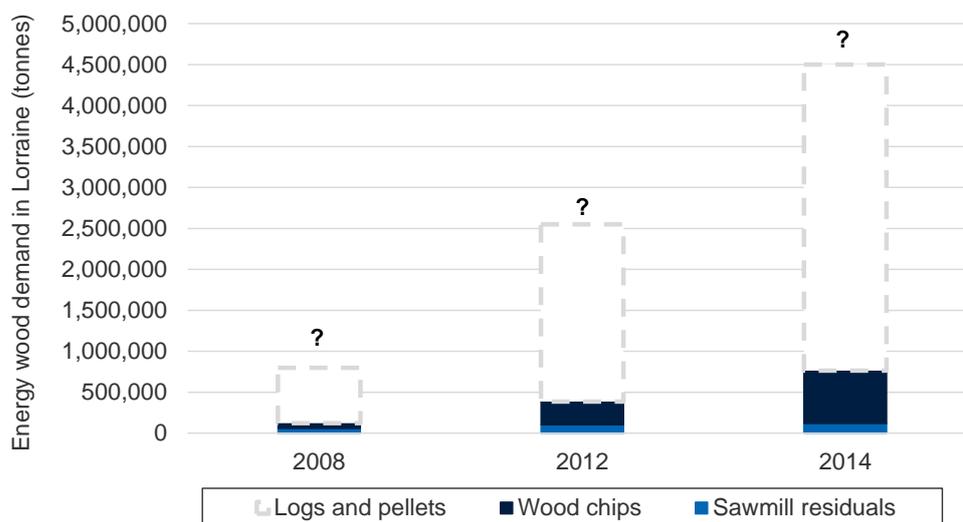


Note: The periods—2008/09, 2012 and 2014—were selected because the majority of the required data was available for these years. Data on demand for wood logs was not available for 2014. Therefore, it has been assumed that the growth of demand for wood logs is equal to the growth of demand for sawmill residuals and wood chips. The question mark indicates that this data is missing and the estimated demand for wood logs in 2014 has been extrapolated.

Source: Oxera analysis, based on Fibois Alsace (2016), 'Actualisation de l'observatoire de la production et e la consommation de biomasse bois en Alsace', August.

Demand for wood chips and sawmill residuals in Lorraine has evolved in a similar way to the trend in Alsace (see Figure 6.8), with demand for wood chips and sawmill residuals increasing substantially between 2012 and 2014.

Figure 6.8 Energy wood demand in Lorraine (tonnes)



Note: The periods—2008, 2012 and 2014—were selected as the majority of the required data was available for these years. Data on demand for wood logs and pellets was not available for Lorraine. It has therefore been assumed that the ratio of wood logs and pellet demand to demand for wood chips and sawmill residuals is the same as in the Alsace region. The question

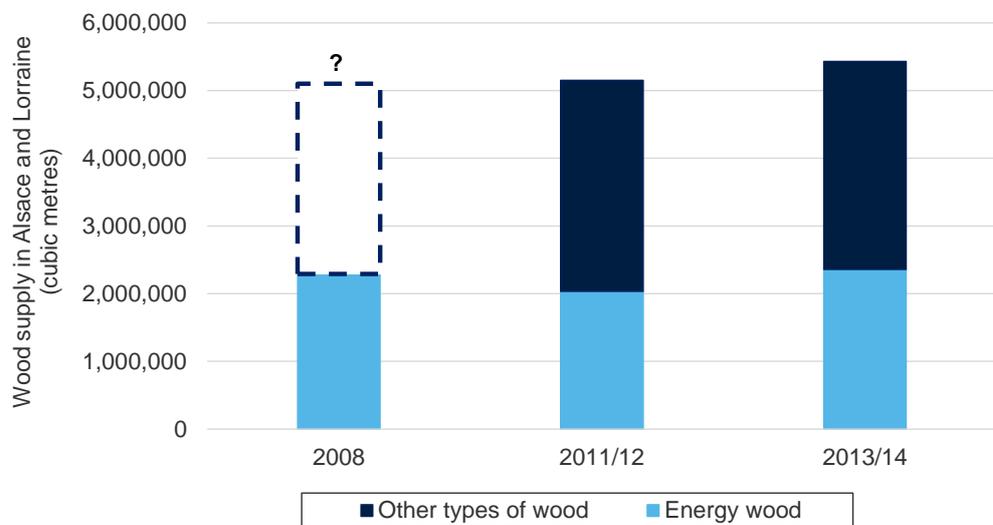
marks indicate the missing data, and that the estimated demand for logs and pellets has been extrapolated.

Source: Oxera analysis, based on Remy, Q. (2015), 'Observatoire et animation de la filière bois-énergie en Lorraine', study supervised by Gipeblor and AgroParisTech.

Supply

The evolution of total wood supply and the share of energy wood supply for Alsace and Lorraine are shown in Figure 6.9. Although both wood supply and energy wood supply increased between 2011/12 and 2013/14 (i.e. before and after the aid) wood supply is not able to adapt immediately to increased demand. In the long term, however, it is understood that the French government is planning to implement a new policy to increase the supply of wood by 2030.²⁷⁸

Figure 6.9 Wood supply in Alsace and Lorraine (cubic metres)



Note: Data on energy wood supply were converted from tonnes to cubic meters based on the assumption for hardwood chips provided by Agreste, i.e. $1\text{m}^3 = 0.75$ tonnes. Data on the supply of other types of wood was not available. Therefore, for the purposes of the illustration, it has been assumed that the ratio of the supply of energy wood to the supply of other types of wood is the same as in 2011/12. The question mark indicates the missing data, and that the data on the supply of other types of wood in 2008 has been extrapolated.

Sources: Oxera analysis, based on Fibois Alsace (2016), 'Actualisation de l'observatoire de la production et e la consommation de biomasse bois en Alsace', August; Remy, Q. (2015), 'Observatoire et animation de la filière bois-énergie en Lorraine', study supervised by Gipeblor and AgroParisTech; and Fibois Alsace website, 'Chiffres clés et schéma', <http://www.fibois-alsace.com/fr/chiffres-cles-et-schema/chiffres-cles-et-schema.html>, accessed 6 May 2017.

According to the interviewees, the supply of energy wood has developed, as a result of the demand from the supported biomass plants.²⁷⁹ However, Copacel—the Association of French Paper Industries—acknowledged that there was sufficient demand for low-quality wood such that the market could have accommodated the entry of several new suppliers. However, interviewees identified that sourcing difficulties were caused as a result of supply being slow to adapt to the sudden increase in demand, for two main reasons:

²⁷⁸ Interview with Burgo Ardennes on 29 March 2017.

²⁷⁹ Interview with EBM Thermique on 15 March 2017.

- first, the forest industry generally takes a significant time to adapt to changes in demand;²⁸⁰
- second, some energy producers' sourcing strategies included types of wood that were initially intended to be used only as industry wood.²⁸¹

Box 6.2 Potential for additional analysis of the demand and supply balance in the environmental aid case study

If further data had been available, more hypotheses could have been tested, and more sophisticated techniques could have been used to examine the evolution of demand and supply in the market, as described below.

For example, if supply and demand indicators had been available for a number of other local wood markets, such as Lorraine, Lichtenstein and Baden-Württemberg, we could have examined the evolution of demand across the overall market, as well as potential spillover effects into other markets.

If detailed data was available for each type of wood product, it would also have been possible to assess how demand shocks are transmitted from one market to another. This could have included an assessment of how high demand for wood logs could affect demand for wood chips, given the substitutability between the products.

If more data points were available, econometric methods could have been used to disentangle the effects of winter temperatures and the price of fossil fuels on the demand for wood.

Source: Oxera.

Prices

Since demand for low-quality wood was particularly high over the 2011–13 period, this led to increased buyer competition between industrial users and energy producers, which correspondingly led to price increases.²⁸² Energy wood prices rose, reaching levels of the price of industry wood over the period.²⁸³ Pulp mills experienced a doubling in wood prices over the period.²⁸⁴ For panel manufacturers, the price of log wood and wood chips increased by 16% and 12% respectively. While the upward trend in wood chip prices began prior to 2011, the price of log wood only increased after 2011.²⁸⁵

Unilin considers that these price increases were caused by the aid to biomass heating plants. According to Burgo Ardennes, in 2013 and 2014, the French National Forest Office (ONF) organised public auctions of wood. Burgo Ardennes proposed a price of €36 per tonne while an energy producer proposed €43 per tonne. As a result, Burgo Ardennes sourced its wood requirements from a wider area.²⁸⁶

To understand the impact of the aid to RF as well as the Fonds Chaleur scheme, we have assessed whether prices in the local market (in Alsace) rose faster than prices in the national market (in France). Figure 6.10 compares the evolution of prices before and after the start of RF's operations in December 2011.²⁸⁷

²⁸⁰ Interview with EBM Thermique on 15 March 2017, and Forst BW on 6 April 2017.

²⁸¹ Interview with Unilin on 15 March 2017.

²⁸² Interview with Copacel and Burgo Ardennes on 9 and 29 March 2017 respectively, and the written statement from Copelba received on 15 March 2017.

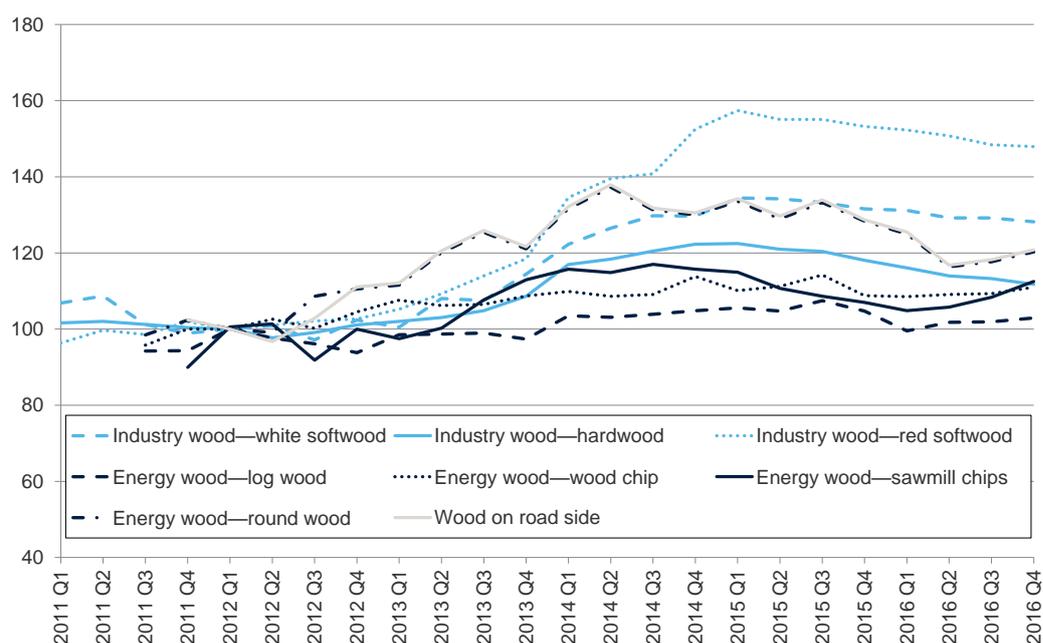
²⁸³ Based on the interview with Forêts & Bois de l'Est on 28 February 2017. Industry wood is typically used in the panel and paper industries.

²⁸⁴ Interview with Copacel on 9 March 2017.

²⁸⁵ Interview with Unilin on 15 March 2017.

²⁸⁶ Interview with Burgo Ardennes on 29 March 2017.

²⁸⁷ Cappelle, A. (2013), 'Roquette opte pour une chaudière à bois et la géothermie', Industrie & Technologies, 1 January,

Figure 6.10 National (French) wood prices (index change in %)

Note: Before 2011 Q1, the price series data was not available. As shown in the figure, no data is available for certain price series at particular points in time. The evolution of prices for energy round wood was relatively close to the average. The series is therefore not visible, as it coincides with the evolution of the price of the wood on road side.

Source: Oxera analysis, based on Ministère de l'Agriculture, de l'Agro-alimentaire et de la Forêt (2017), 'Les indices de prix du bois énergie sylvicole, Les indices de prix du bois de trituration', February; and Ministère de l'Agriculture et de l'Alimentation (2017), 'Les indices de prix du bois de trituration', <http://agreste.agriculture.gouv.fr/IMG/xls/indicesprixbois2017T1bssef.xls>, accessed 8 May 2017.

As shown in Figure 6.10, in general, prices were relatively stable between the first quarter of 2011 and the first quarter of 2012. After this period, prices increased until the first quarter of 2015, before stabilising or even declining.

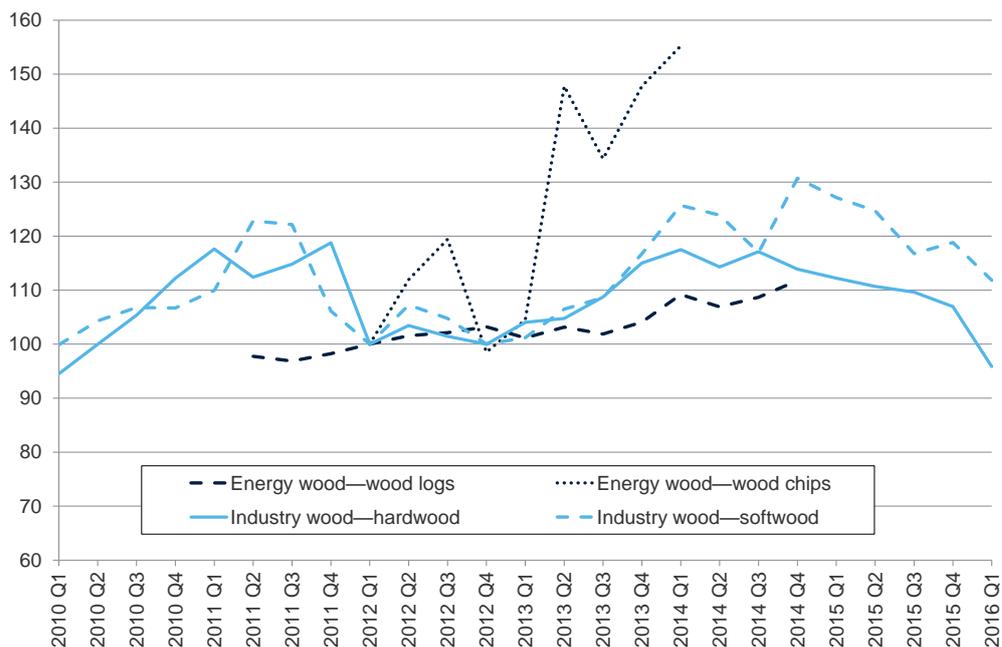
Over the period, the price of low-quality industry wood rose significantly.²⁸⁸ In contrast, low-quality energy wood (sawmill chips, wood chips and log wood) exhibited only a small increase in price, providing no evidence that there was a shortage in these products at the national level.

These trends suggest that the price of products for which there are competing uses (such as low-quality industry wood, which may also be used by buyers of energy wood) rose faster compared with other products.

<https://www.industrie-techno.com/roquette-opte-pour-une-chaudiere-a-bois-et-la-geothermie.22797>, accessed 24 January 2017.

²⁸⁸ Specifically, white and red softwood.

Figure 6.11 Wood prices in Alsace (index change in %)



Source: Oxera analysis, based on Fibois Alsace (2015), ‘Observatoire des prix des bois et des volumes commercialisés en Alsace’, March, http://www.fibois-alsace.com/UserFiles/File/espace-professionnel/Observatoire/Document-professionnel-03_15.pdf.

Figure 6.11 shows that wood prices in the Alsace region evolved in a similar way to national trends, with prices increasing after the first quarter of 2012.²⁸⁹

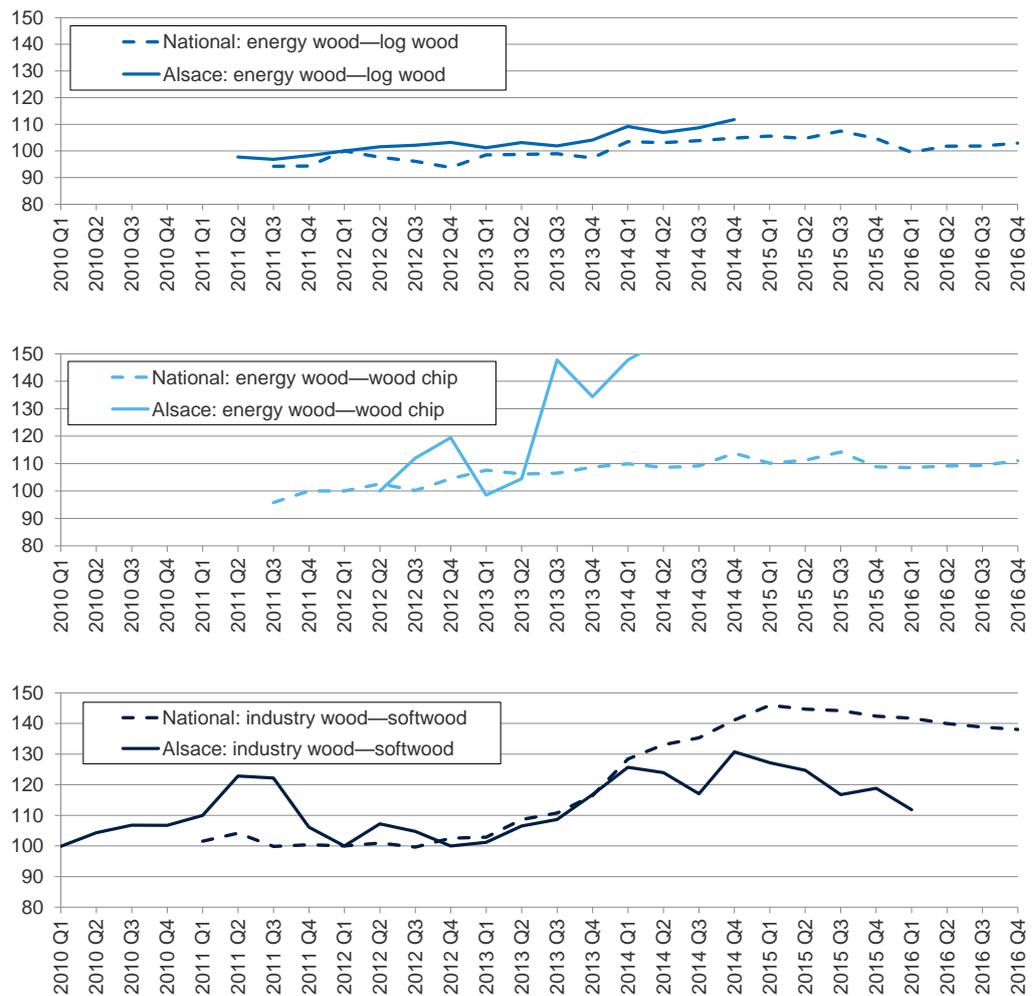
Prices of both types of energy wood for which data is available—namely, wood logs and wood chips—increased after the first quarter of 2012. As the price of wood logs increased, the price of wood chips also rose, but to a lesser extent. Since the prices of both types of energy wood are positively correlated, this suggests that these products can be considered substitutes.

Prices of hard and soft industry wood increased after the first quarter of 2012 until the first quarter of 2014, before subsequently declining.

Figure 6.12 compares the growth rate of prices for log wood, wood chips and low-quality industry wood (industry softwood) before and after the aid. Log wood and wood chips are used as fuel by the RF plant and the other biomass plants supported by the Fonds Chaleur scheme. The price of industry softwood may be affected when buyers that normally use energy wood instead purchase low-quality industry wood.

²⁸⁹ It is noticeable that the price series are more volatile; however, this is likely to be as a result of the estimates of prices being based on a smaller number of observations.

Figure 6.12 Wood prices in Alsace (index change in %)



Source: Oxera analysis, based on Ministère de l’Agriculture, de l’Agro-alimentaire et de la Forêt (2017), ‘Les indices de prix du bois énergie sylvicole, Les indices de prix du bois de trituration’, February, <http://agreste.agriculture.gouv.fr/IMG/xls/indicesprixbois2017T1bssef.xls>, accessed 8 May 2017; Fibois Alsace (2015), ‘Observatoire des prix des bois et des volumes commercialisés en Alsace’, March, http://www.fibois-alsace.com/UserFiles/File/espace-professionnel/Observatoire/Document-professionnel-03_15.pdf.

As shown in Figure 6.12, the price of wood chips in Alsace increased faster than national trends, with prices almost doubling between the first quarter of 2012 and the second quarter of 2014. This suggests that the aid might have affected the local price of wood chips and wood logs.

The price of low-quality industry wood in Alsace increased in line with national trends between the end of 2012 and the start of 2014. This suggests that the market for industry softwood could be national, and that national and local markets were driven by the same factors—i.e. winter temperatures, demand for energy wood and high fossil fuel prices, as well as the impact of the aided plants.

In contrast, the price of log wood, both in the Alsace region and nationally, increased far more slowly than either industry softwood or wood chips.

Box 6.3 Potential for additional analysis of prices in the environmental aid case study

Oxera's analysis has compared the evolution of different national and local prices before and after the start of RF's operations. If price series in the Alsace region had been available over a longer period, this would have enabled econometric analysis to be undertaken. This would have meant that the impact of the aid on prices could be identified separately from other drivers of prices, such as winter temperatures and the price of fossil fuel.

If price series had been available for different geographical markets and for different products, econometric analysis could also have been undertaken to model the correlation—both over time and across locations—of the different wood prices and drivers of wood prices.

Source: Oxera.

Conclusion

Demand for energy wood increased significantly over the 2010–13 period. Due to the relative size of RF, it is unlikely that this was caused by RF alone. Instead, the significant increase in demand is likely to be due to a combination of the five major biomass plants supported under ADEME's Fonds Chaleur programme, in addition to low winter temperatures²⁹⁰ and high fossil fuel prices.²⁹¹ The available evidence suggests that the five major biomass plants supported by the Fonds Chaleur scheme are likely to have affected the market in France.²⁹²

As supply can only react slowly to changes in demand, at least initially, this led to sourcing difficulties, and because some energy wood suppliers may also use industry wood, this led to a tight market for low-quality wood. However, after 2014, the supply of energy wood increased, due to warmer winter temperatures, with the supply of sawmill residuals increasing in response to demand.

The views of interviewees that high demand for energy wood increased demand for low-quality industry wood seems to be supported by the price of low-quality industry wood rising significantly after 2011 at both the national and local level. At the local level, the price of wood chips and log wood rose faster than at the national level.²⁹³ These findings are consistent with prices of low-quality wood increasing as a direct result of higher local demand, which is likely to have been driven, at least partly, by aid to the five major biomass plants in the region.

A relevant point here is the importance of the design of aid schemes. The Fonds Chaleur programme incentivised companies to switch from burning natural gas to burning wood, which raises the potential for artificially increased wood prices as a result of increased demand. The aid scheme could have incentivised companies to burn by-products of their production process instead of wood. If technically feasible, this would have helped to avoid any competitive distortions in the wood market.

²⁹⁰ Consensus from the interviews undertaken by Oxera.

²⁹¹ The natural gas price in France for medium-sized industries increased by 12% between 2011 and 2013 and decreased by 13% between 2013 and 2015. Based on Eurostat data, 'Gas prices by type of user', <http://ec.europa.eu/eurostat/tgm/refreshTableAction.do?tab=table&plugin=1&pcode=ten00118&language=en> accessed 15 May 2017.

²⁹² This conclusion assumes that demand would have remained constant in the absence of the aid.

²⁹³ It should, however, be noted that a comparison of prices at the national level with the local level assumes that both the national and local markets are driven by the same factors. If local prices rise quickly, this is likely to be due to factors in the local market such as the subsidised biomass plants. However, it is likely that national prices have also been affected by government support to biomass plants in other regions of France. This potential bias makes it less likely that it will be possible to observe prices increasing at the local level above the increase in national prices. For this reason, it is possible that the findings underestimate the impact of the aid.

6.3.3 Hypothesis 2: did competition for wood increase and did this lead to higher costs and lower profits for local businesses that also use wood as an input, such as paper and panel manufacturers?

Analysis of buyer competition

The interviews with market participants revealed that, in addition to energy producers, panel manufacturers, pulp mills, packaging manufacturers, charcoal producers and participants in the agronomy sector, also use wood resources.²⁹⁴ Most of these producers/manufacturers struggled to source affordable wood resources in 2013 and 2014, and several buyers changed their sourcing strategy as a result.

Some buyers switched to higher-quality wood or to different products.²⁹⁵ For example, the panel industry in Alsace is now using 30% recycled wood (compared with 0% in 2007) in order to reduce its exposure to price shocks.²⁹⁶ However, recycled wood cannot be used for all types of panels, such as packaging and pulp.²⁹⁷ As a result of the significant rise in price, Unilin—a panel manufacturer in Champagne-Ardennes—started a long-term partnership with alternative wood suppliers to undertake joint R&D, and invested in increased wood storage capacity.²⁹⁸ EBM Thermique—a biomass-fired combined heat and power producer in Alsace—invested in equipment for its biomass plant that enabled either wood chips or farming residuals to be used, in order to reduce exposure to the wood market.²⁹⁹

Increased competition for wood resources also led to buyers procuring resources from a wider area.³⁰⁰ For example, although pulp mills in France typically purchase wood within a maximum distance of 300km around their plant, an interviewee commented that, in light of the tightness of the wood market, they could import wood from the Baltic countries or South America.³⁰¹ Indeed, in 2013 and 2014, Burgo Ardennes imported 100,000 tonnes of wood from Latvia and Unilin imported wood from the Baltics, despite the costs of such imports being approximately 50% higher than the costs of purchasing wood in the local region.³⁰²

To assess the impact of the aid on the intensity of buyer competition, we have examined the trade balance of the Alsatian wood industry, the areas served by sellers of wood, and the procurement strategies of wood buyers.

The trade balance of the Alsatian forestry and wood harvesting sector³⁰³ evolved from a deficit of approximately 12.5m in 2009 to a deficit of approximately 7.5m in 2015. This implies that the Alsace region imported less wood in 2015 than in 2009. While this does not support the hypothesis that buyers in Alsace were forced to purchase wood from alternative markets, it is possible that such a highly aggregated statistic does not fully capture the underlying trade

²⁹⁴ Interview with Unilin on 15 March 2017.

²⁹⁵ Interview with Forêts & Bois de l'Est on 28 February 2017

²⁹⁶ Interview with Fibois Alsace on 16 February 2017.

²⁹⁷ Interview with Copacel on 9 March 2017, Unilin on 15 March 2017, and Forêts & Bois de l'Est on 28 February 2017.

²⁹⁸ Interview with Unilin on 15 March 2017.

²⁹⁹ Interview with EBM Thermique on 15 March 2017.

³⁰⁰ Interview with Fibois Alsace on 16 February 2017.

³⁰¹ Interview with Copacel on 9 March 2017.

³⁰² Interview with Unilin on 15 March 2017, and Burgo Ardennes on 29 March 2017.

³⁰³ Fibois Alsace (2016), 'Evolution des importations et des exportations de produits bois en Alsace'. Data source: Agreste.

movements. In order to assess this, we have analysed detailed data on the imports and exports of wood products to/from Alsace over the 2012–14 period.

Table 6.3 shows the average area (in km) served by wood chip and wood log suppliers in different regions in France in 2012 and 2014. On average, across France, the area over which wood supplies are procured across France and Alsace has increased by 13% and 15% respectively over the period.

Table 6.3 Average delivery radius of wood chips and sawlogs (km)

Region	Wood type	2012	2014	% increase ¹
Alsace	Wood chips	49	54	10%
Alsace	Wood logs	26	30	15%
Bourgogne	Wood chips	66	67	2%
Champagne-Ardenne	Wood chips	44	57	30%
Franche-Comté	Wood chips	39	40	3%
Lorraine	Wood chips	48	64	33%
Picardie	Wood chips	100	54	-46%
Grand Nord Est	Wood chips	58	56	-3%
Average		47	53	13%

Notes: ¹ Overall change in sourcing radius over the 2012–14 period.

Source: Adib, ApprovaLBois, Fibois Alsace, Gipeblor, Valeur Bois and Nord Picardie bois (2012), 'Suivi de l'évolution du bois énergie sur les régions du Grand Nord Est de la France – Données 2012'; and Adib, ApprovaLBois, Fibois Alsace, Gipeblor, Valeur Bois, Nord Picardie bois and France Bois Régions (2014), 'Suivi de l'évolution du bois énergie et du bois d'industrie sur les régions du Grand Nord Est de la France – Résultats 2014'.

Table 6.4 shows that, in both Alsace and Lorraine, 50% of industrial wood buyers increased the area over which they source wood. In Alsace, the area over which wood is sourced increased by 30–50km, on average, extending up to 70km in extreme cases.

Table 6.4 Average increase in the sourcing radius in Alsace and Lorraine*

	Alsace	Lorraine
Share of industrial companies that increased their sourcing radius	50%	50%
Average increase in the sourcing radius for industrial companies that experienced an increase in prices	30–70km ¹	35km

Notes: ¹ 0–50km, in extreme cases up to 70km.

Source: Fibois Alsace (2016), 'Actualisation de l'observatoire de la production et de la consommation de biomasse bois en Alsace', August; and Remy, Q. (2015), 'Observatoire et animation de la filière bois-énergie en Lorraine', study supervised by Gipeblor and AgroParisTech.

Box 6.4 Potential for additional analysis of buyer competition

If more detailed information on the sourcing strategies of buyers had been available, this would have enabled other indicators of the intensity of competition to be assessed. This could have included: the number of entities registering for wood auctions, indicators of general market sentiment, as well as activity on online platforms for wood purchases (e.g. from search engines for different wood products).

Source: Oxera.

Analysis of the profitability of wood buyers

Pulp milling, panel manufacturing and packaging are highly competitive and capital-intensive sectors, operating in commoditised global markets where the price of the final product is crucial.³⁰⁴ For instance, a number of companies in the French pulp industry are currently loss-making as local players cannot match the level of prices internationally.³⁰⁵ Wood resources account for 40–60% of the costs of the production of pulp.³⁰⁶ In the panel industry, the cost of wood accounts for approximately 20% of the final price of panels, but can increase to approximately 30% during periods of peak wood demand.³⁰⁷

According to the interviewees, manufacturers absorbed the increase in wood prices through lower profit margins. Since these companies face global competition, it is plausible to assume that they are not able to pass on the price increase to consumers. For example, Burgo Ardennes experienced increased costs of 30–35% in 2013 and 2014, which were absorbed through lower profit margins.³⁰⁸ Similarly, while Unilin was profitable before 2011, the company experienced losses over the 2011–14 period, due to a general slowdown in consumption as well as higher wood prices.³⁰⁹

Unilin suggests that a number of smaller panel manufacturers, such as certain subsidiaries of the German Sonae Group, and another manufacturer in Saint Dizier in France, exited the market over this period.³¹⁰ Copacel considers that paper mills will continue to exit the market until a new equilibrium with fewer players is reached.³¹¹

Since 2015, conditions in the panel industry have improved, with new applications for panels being introduced.³¹² However, both the panel and the pulp industry raised concerns that more projects of the size of RF, in addition to the plants that are currently supported, could have a detrimental impact on their future profitability.³¹³

In order to verify the qualitative evidence from the interviews, 39 wood buyers operating in the local market, which might have been affected by the increase in local wood prices, were identified.³¹⁴ From this initial wide group, a sample of 15 companies from the packaging, panel, pulp and pellets sectors were selected for which the necessary financial data at the local level was available.³¹⁵ Table 6.5 provides details for each of the selected companies.

³⁰⁴ Interview with Copacel on 9 March 2017.

³⁰⁵ Interview with Copacel on 9 March 2017.

³⁰⁶ Interview with Copacel and Burgo Ardennes on 9 and 29 March 2017 respectively.

³⁰⁷ Interview with Unilin on 15 March 2017.

³⁰⁸ Interview with Burgo Ardennes on 29 March 2017.

³⁰⁹ Interview with Unilin on 15 March 2017.

³¹⁰ Interview with Unilin on 15 March 2017.

³¹¹ Interview with Copacel on 9 March 2017.

³¹² Interview with Copacel on 9 March 2017.

³¹³ Interview with Copacel on 9 March 2017; EBM, Cobelba.

³¹⁴ The potentially affected companies were identified based on information provided by the interviewees, local trade associations and the Orbis database.

³¹⁵ Out of the set of 15 companies, two companies represent the packaging sector, five companies represent the panels sector, seven companies represent the pulp and paper sector, and one company represents the pellets sector. It is possible that this sample suffers from selection bias, as companies that exited the market over the period would not have been identified.

Table 6.5 Selected companies for the financial analysis

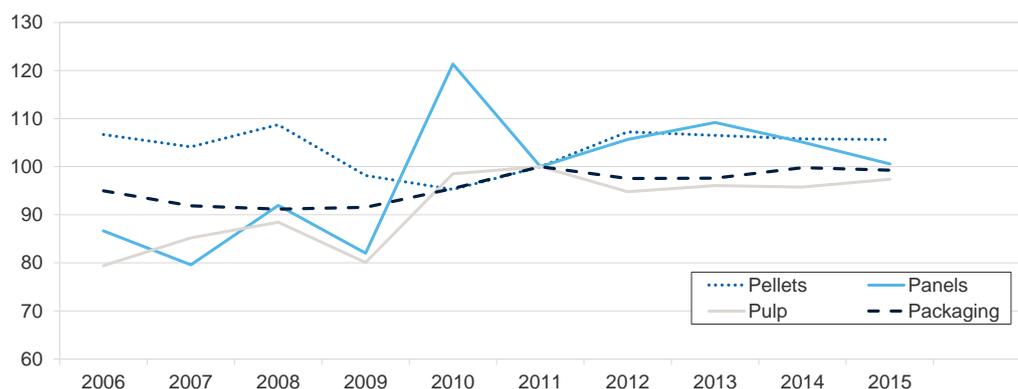
Region	Company	Sector	Source
Lorraine	Saint Jean Emballages	Packaging	Gipeblor member
Belgium	Paletterie François	Packaging	Interview
Champagne-Ardenne	Unilin	Panels	Interview
Lorraine	Ober	Panels	Gipeblor member
Luxembourg	Kronospan Luxembourg	Panels	Interview
Franche-Comté	Ikea Industry	Panels	Interview
Franche-Comté	Compagnie Francaise du Panneau	Panels	Interview
Alsace	Cenpa	Pulp/paper	Orbis
Lorraine	Papeterie des Vosges	Pulp/paper	Gipeblor member
Belgium	Burgo Ardennes	Pulp/paper	Interview
Lorraine	Norske Skog	Pulp/paper	Interview
Alsace	Papeteries du Rhin	Pulp/paper	Orbis
Lorraine	Lucart	Pulp/paper	Orbis
Lorraine	Munksjö	Pulp/paper	Gipeblor member
Belgium	Industrie du Bois Vielslm (IBV)	Pellets	Interview

Source: Oxera, based on Orbis.

To assess the impact of the aid on companies' costs for materials, raw material costs relative to revenues by sector over the 2006–15 period have been examined (as shown in Figure 6.13).

Both the pellets and panel industries experienced higher material costs between 2012 and 2014. However, it is noticeable that raw material costs relative to revenues in both sectors prior to 2011 were relatively volatile, implying that a causal relationship with the aid may be less likely.

Figure 6.13 Evolution of the share of raw material costs relative to buyers' revenues (index)



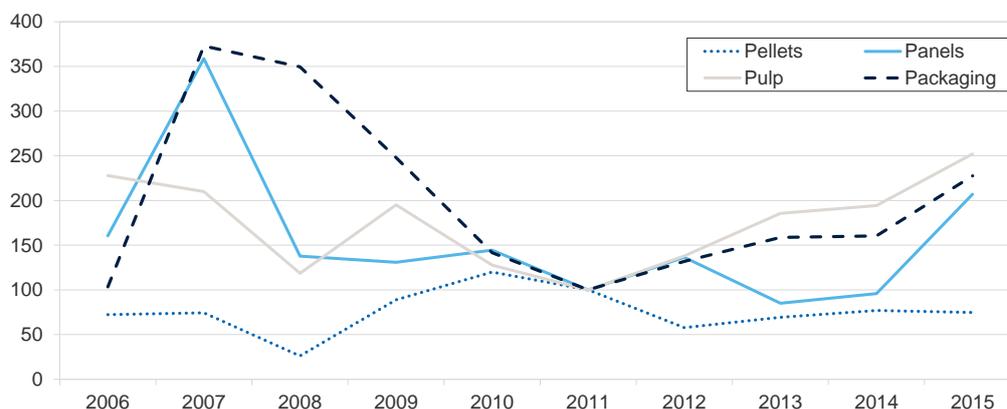
Source: Oxera analysis, based on Orbis.

In order to assess whether the profitability of competing wood buyers has been adversely affected by the aid, the evolution of selected companies' EBITDA margins have been considered.³¹⁶

³¹⁶ The focus on the EBITDA (earnings before interest, tax, depreciation and amortisation) margin controls for differences in tax and depreciation profiles across countries. However, it is important to note that this analysis does not enable controls to be introduced for the business cycle.

Figure 6.14 shows the evolution of wood buyers' EBITDA margins in each sector over the 2006–15 period, which shows that margins have evolved differently across the sectors. Margins in both the pulp and packaging sectors improved over the 2011–15 period, while margins in the pellets sector declined in 2012 before slowly starting to recover in subsequent years. In contrast, the average margins of panel manufacturers increased in 2012 before declining in 2013 and 2014, before recovering in 2015.

Figure 6.14 Evolution of wood buyers' EBITDA margins (index)



Source: Oxera analysis, based on Orbis.

Summary

Over the period, competition for low-quality wood in France intensified, and as a result, buyers procured wood from a wider area. While RF alone is unlikely to have led to distortions in the market, this finding is consistent with the supported biomass plants under the ADEME programme affecting the French market. The finding also implies that higher prices for low-quality wood adversely affected other competing buyers of low-quality wood in France.

In the interviews, representatives of the pulp, panel and packaging sectors suggested that input costs increased by up to 30%. However, based, however, on the available data, we did not identify such significant cost increases.

The profitability of companies in the panels sector has deteriorated over the period following the aid, which may have been caused by higher material costs. These results are consistent with high prices for low-quality wood adversely affecting competing buyers of low-quality wood.

6.3.4 Hypothesis 3: did aid to RF have a negative impact on the business outlook, investment plans or decisions of other wood buyers in France?

Analysis of investment and employment policy

One of the interviewees, Unilin, stated that it temporarily closed some production lines in 2013, as a result of not being able to source wood at reasonable prices. This resulted in the company reducing the hours that its employees were required to work in the short term as well as permanent layoffs in the medium term.³¹⁷ Unilin also indicated that some of the smaller panel manufacturers in both Germany and France ceased operations.

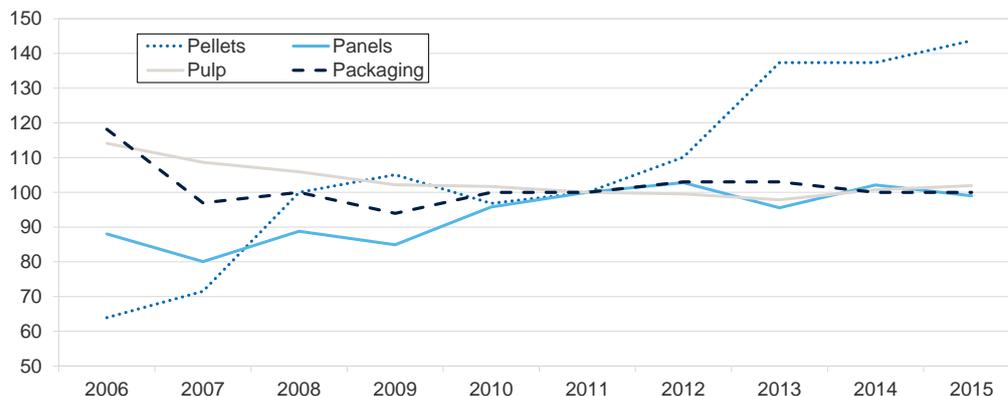
³¹⁷ Interview with Unilin on 15 March 2017.

Some companies changed their investment behaviour due to high wood prices, as explained below.

- Unilin invested in expanding its storage area, in order to be able to store greater quantities of wood when prices are lower.³¹⁸
- In Lorraine, three industrial wood users invested in upgrading their production plants to enable recycled wood to be used as an alternative input.³¹⁹
- EBM Thermique invested in flexible boilers that are able to use either wood chips or farming residuals, in order to reduce their exposure to high wood prices.³²⁰

We have examined trends in employment by sector for the same sample of companies underpinning the profitability analysis. As shown in Figure 6.15, employment in some sectors has remained relatively stable. In particular, employment slightly increased in the packaging sector in 2012 (+3%), while it slightly decreased in the pulp sector (-2%) and in the panels sector (-4%) in the same year.³²¹

Figure 6.15 Evolution of employment by buyers (index)



Source: Oxera analysis, based on Orbis.

³¹⁸ Interview with Unilin on 15 March 2017.

³¹⁹ Gipeblor and AgroParisTech (2015), 'Observation et animation de la filière Bois Energie en Lorraine'.

³²⁰ Interview with EBM Thermique on 15 March 2017.

³²¹ It is noticeable that the number of employees in the one company representing the pellets sector increased significantly from 2011 on. However, significant weight should not be attached to this finding, given that it represents only one company.

Box 6.5 Potential for additional analysis of employment and investment policy

We have considered the trends in the costs of raw materials relative to buyers' revenues, profitability (as measured by EBITDA margins), and trends in overall employment. However, data on investments was not available; therefore, we could not assess the impact of aid on companies' investment plans, other than through qualitative insights provided by the interviewees.

If the necessary financial data had been available for all competing buyers in the market five years before and after the aid, this would have enabled more robust analysis to be undertaken. In particular, this would have enabled the impact of the aid to be estimated, while controlling for other factors such as the declining demand for paper and the overall business cycle. For example, if more data had been available, the analysis could have been undertaken more accurately by using a control group—i.e. a group of similar companies that are not exposed to the higher local wood prices but otherwise are exposed to similar trends and profitability. Any differences relative to the control group would most likely be attributable to the aid.

Source: Oxera.

Summary

Based on the interviews we conducted, there are examples of companies reducing their activities due to higher wood prices, or in some cases exiting the market, while others invested in expanding their storage capabilities or introducing more flexible fuel processes.

Although employment in the panels sector in France slightly decreased in 2013, it recovered in subsequent years. In contrast, employment in other sectors does not appear to have been affected by the high wood prices. Therefore, it cannot be decisively concluded whether the aid led to negative business outlooks for competing wood buyers or the exit of companies competing for low-quality wood as an input.

6.4 Conclusions on the impact of the aid on competition

Building on the Commission's approach to assessing competition set out in its 'Guidelines on State aid for environmental protection and energy', three key hypotheses have been examined, as outlined below.

Hypothesis 1: did aid granted to RF and/or the aid provided by the Fonds Chaleur programme increase demand for low-quality wood in the local market?

In light of the size of the RF biomass market, it is unlikely that demand from RF alone significantly affected the overall market. However, it is noticeable that demand for low-quality wood in the local market increased significantly over the 2010–13 period. This is likely to be due to three main factors: ADEME's Fonds Chaleur programme, which supported five major biomass plants in the local region; low winter temperatures; and high fossil fuel prices. The evidence also shows that the higher demand led to the price of low-quality industry wood rising significantly after 2011 at both the local and national levels.

As supply can only react slowly to changes in demand, at least initially, this led to sourcing difficulties. These difficulties might have been more pronounced, with buyers of energy wood purchasing industry wood instead as the price of energy wood increased.

Hypothesis 2: did higher prices for low-quality wood adversely affect other competing buyers of low-quality wood such as pulp mills, packaging and panel manufacturers? Did the intensity of buyer competition in France also increase?

Both energy and industry wood prices in Alsace, and at the national level, increased over the 2012–14 period, suggesting that both types of wood are substitutes. This is supported by comments from interviewees that high demand for energy wood in France led to increased demand for low-quality industry wood. Indeed, the price of low-quality industry wood increased most significantly at the national level.

There is strong evidence that competition for low-quality wood in France intensified. Indeed, the buyers interviewed unanimously acknowledged that competition for local wood resources has increased. As a result, buyers procured wood from a wider area over the 2012–14 period. This illustrates that higher prices for low-quality wood adversely affected other competing buyers of low-quality wood.

Hypothesis 3: did aid to RF lead to a negative business outlook, the cancellation of investment decisions and even the exit of other companies competing for low-quality wood as an input?

Buyers in the French pulp and panels sectors that we interviewed commented that they experienced a significant increase in the costs of their raw materials. Analysis of financial indicators for a selected sample of companies active in the local market in the pellets, packaging, pulp and panels sectors shows that material costs increased in the pellets and panels sectors. This led to a decline in companies' profitability in these sectors in the 2012–14 period; however, both sectors recovered by 2015. This result implies that the aid might have adversely affected the profitability of companies in the pellets and panels sectors.

Based on the interviews, there are examples of companies reducing their activities due to higher wood prices, or in some cases exiting the market, while others invested in expanding their storage capabilities in order to store greater amounts of energy wood when prices are relatively low, and investing in boilers that are flexible in terms of their fuel intake.

However, an analysis of employment trends in the sector yields mixed results. Although employment in the panels sector slightly decreased in 2013, it subsequently recovered. In contrast, employment in other sectors does not appear to have been affected by the high wood prices. Therefore, it cannot be decisively concluded whether the aid led to negative business outlooks for competing wood buyers or the exit of companies competing for low-quality wood as an input.

Overall conclusions

The aid has achieved its objective of promoting the production of heat from renewable energy and more effectively mobilising renewable energy through the construction of a boiler employing renewable sources (i.e. biomass).

Overall, due to RF's relatively small size compared with the local market for low-quality wood, it is unlikely that aid to RF alone distorted competition.

However, there is evidence that the Fonds Chaleur scheme, combined with the impact of cold winter temperatures and higher fossil fuel prices, led to

competitive distortions. Given that the effects of the Fonds Chaleur scheme and the impact of the cold winter cannot be disentangled, the results must be interpreted with care. Evidence from the interviews and data analysis suggests that demand for low-quality wood increased, prices increased and buyer competition intensified. We found mixed evidence on whether the profitability of certain segments of the market, such as the panels sector, was adversely affected.

Efficient design and implementation of the aid scheme might limit distortions to the wood market; this could mean, for instance, accounting for the cumulative effect of biomass projects or allowing biomass plants to source energy wood only. Of course, such rules must always be designed with care, so as not to cause distortions themselves.

7 Conclusions

7.1 Contributions of the study

Building on the approach in merger control and antitrust investigations, Oxera has developed a framework that can be used to examine the impact of state aid on competition, as set out in this report. Our framework focuses only on the impact on competition, although, in some circumstances, further insights could be gathered by assessing the impact of the aid on competitors.

In addition, we have assessed the actual impact of aid on competition in four different case studies.

Our report therefore provides a two-fold contribution.

- **Methodological framework:** we have developed a framework that can be applied to assess whether state aid creates distortions to competition. While the framework has been designed for ex post evaluations, similar techniques can readily be used to estimate the expected impact of the aid on competition for ex ante compatibility of aid assessments. As the impact of aid on competition is likely to vary according to the type of aid, the framework has been designed to be applicable to a range of aid measures.
- **Empirical analysis in four case studies:** we have applied the methodological framework to examine the actual impact of aid in four cases, where aid was granted for different purposes. This included aid for the expansion of capacity at a regional airport in the UK, R&D&I aid for the development of new and improved silicon-on-insulator substrates in France, compensation for the incumbent postal operator in Italy for the provision of a USO under the SGEI Framework, and aid to construct a biomass plant in France.

Based on the results from the case study analysis, in these conclusions, we consider the following two questions:

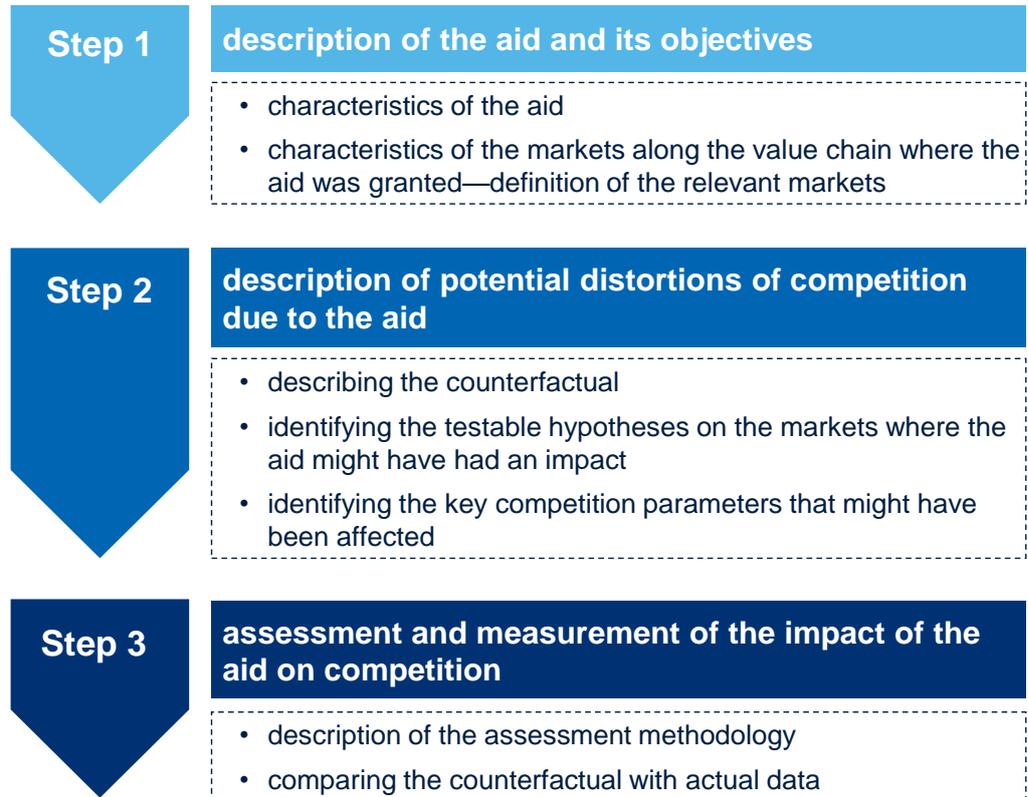
- to what extent can existing tools from competition policy be used to assess the impact of state aid on competition?
- to what extent may the impact of state aid vary according to the type of aid?

These questions are discussed in turn in the following sub-sections.

7.2 To what extent can existing tools from competition policy be used to assess the impact of state aid on competition?

Oxera's framework for ex post assessments, summarised in Figure 7.1 below, consists of three main steps that follow the overall structure of an impact assessment tailored to the state aid context.

Figure 7.1 Analytical framework to assess the impact of state aid on competition



Source: Oxera.

As explained in this report, the framework focuses on the development of the testable hypotheses and the approach to identifying indicators of competition upon which the impact of the aid can be examined.

These techniques are similar to those used in antitrust or merger assessment, although applying the same tools to state aid highlights some of the implementation challenges, as outlined below.

Market definition and competition assessment

Tools commonly used in antitrust and merger analysis can be applied to assess the impact of aid on competition. However, it is important that the application of such tools is tailored to state aid assessments. In merger control and antitrust, the aim of the assessment is typically to identify potential effects that distort competition arising from (increased) market power.³²² In contrast, the aim of state aid control is to identify possible competitive distortions arising from changes in firm behaviour triggered by the receipt of aid. It is possible that aid will affect competition between firms more immediately than consumers. As such, the market definition exercise in state aid assessments relies more on the supply side than in merger control and antitrust.

It is also important that the market definition exercise considers the competitive forces beyond the short and medium run, as highlighted in the R&D&I case study. Given that state aid often enables lower prices, improved quality and/or

³²² Such assessments usually focus on the consumers' welfare and the impact on prices or quality, while in the context of state aid, the focus is more on the forces driving competition than on consumers' welfare.

greater innovation, it is possible that the aid benefits consumers, at least in the short term. Likewise, in the airport case study, we observe that total passenger traffic increased at Newquay Airport immediately following the aid, but also note that the aid might have represented one of the factors that contributed towards the demise of Plymouth Airport. It means that, in the short run, the aid might have benefited consumers, while in the medium run, the available options, at least for some passengers, might have reduced. It is therefore possible that the impact of the aid could have differing effects over both the short and long term.

The airport case study also shows that in state aid assessments it may be advisable initially to consider a relatively wide market definition in order to test whether certain hypotheses are supported by the data. Empirical analysis can then be undertaken to provide a more precise assessment of the competitive effects of the aid.

Describing the counterfactual

Building on the Commission's 2014 guidance, this report describes different approaches that may be followed to define the appropriate counterfactual in ex post evaluations. These approaches rely on techniques that are similar those used in merger and antitrust investigations.

However, differences may arise where the assessment is undertaken on an ex post rather than an ex ante basis. The counterfactual in ex ante assessments resembles the counterfactual in merger assessment, i.e. the factual (what happens with the aid) and the counterfactual (what happens if the aid is not granted) are both unknown. In addition, in ex ante assessments the counterfactual describes the performance of the company had it not received the aid (e.g. profitability, sales, investment levels), while in ex post assessments the counterfactual describes the performance of the market would had the aid not been granted.

The factual and counterfactual scenarios in ex post assessments are similar to the counterfactual in antitrust: the factual is known while the counterfactual is unknown.

Measuring the impact on competition

Measuring the impact requires comparing the counterfactual with actual data. There are several approaches to comparing. The simplest approach is qualitative. It is based on examining the evolution of key variables of interest (such as firms' R&D&I expenditure) in the factual and in the counterfactual. This approach is only appropriate if there are no significant factors other than the aid itself that explain effects on competition.

If several effects that influence competition occur at the same time, the descriptive analysis will not be conclusive and more sophisticated techniques such as econometrics should be used to compare the counterfactual with actual data.

Data availability

We prepared this report based on information that market participants volunteered and/or that was publicly available. As highlighted in this report, if further data had been available, we could have tested additional hypotheses and undertaken a more in-depth assessment of the actual impact of aid on

competition for the R&D&I, energy and post cases. For the airport case study, more detailed data was available from the public domain.

The data we obtained for three of the cases (i.e. excluding the airport case study) did not allow us to estimate a number of effects separately, as a result of the lack of granularity and consistency in the data. Furthermore, as we highlighted in the R&D&I case study, it is important to be able to consider a sufficiently long time period in order to ensure that the full effects of the aid are captured.

Our experience from the case studies therefore suggests that without the authority to formally require parties to provide the information, obtaining all of the necessary data to enable the full set of hypotheses to be tested is unlikely to be feasible.

Nevertheless, as shown in this report, meaningful conclusions on the impact of specific aid on competition can often already be drawn based on public information and the analytical framework developed in this study. Obtaining access to confidential information through formal means would allow for even more robust ex post assessments of state aid.

7.3 To what extent may the impact of state aid vary according to the type of aid?

We selected the four case studies in order to cover a diversity of aid objectives, economic sectors and amounts of aid. We have provided further details on the approach followed to select the case studies in Appendix A1.

Table 7.1 provides an overview of the characteristics of the aid instruments that we have considered in our study.

Table 7.1 Summary of the aid characteristics and conclusions

Industry	Aid objective	Form of aid	Amount of aid	Impact on competition
Air transport	Regional aid	Annual payments from 2006–11	€46.8m; ¹ of which €6.6m was used directly to enhance the airport's capacity ²	Possible distortive effects
High-tech	R&D&I	One-off payment in 2007	€80.0m	Unlikely to be significant
Post	SGEI	Annual payments from 2000–17	€6.5bn	Some effects identified, but insufficient data available
Energy	Environmental protection and energy saving	Annual payments from 2009–14	€11.2m	Possible distortive effects

Note: ¹ This is calculated as the costs financed by EU sources (£22.m) and national sources (£24.3m). For further details, see European Commission (2009), 'State aid N 269/2009 – United Kingdom Newquay Cornwall Airport Development', 2 July, para. 55. ² This is calculated assuming that the proportion of the total costs relating to the capacity expansion, 14%, has not changed from the 2007 decision and that the aid intensity, 69%, is equal across the four categories of costs, namely, the airport transition infrastructure, the airport's interim development strategy (capacity expansion), post-transition CAA licence, and land purchase. For further details, see European Commission (2007), 'State aid No N 303/2007 – United Kingdom Newquay Cornwall Airport Development', 23 October, p. 6 and European Commission (2009),

'State aid N 269/2009 – United Kingdom Newquay Cornwall Airport Development', 2 July, para. 73.

Source: Oxera.

From the case studies that we have analysed, we can draw the following conclusions about the different dimensions that are relevant in assessing the impact of aid on competition.

- **Relative amount of the aid:** in the R&D&I and energy case studies, we noted that the amount of aid was small relative to the market size (less than 1%), and we concluded that the aid was unlikely to have distorted competition. In contrast, in the airport case study, the aid represented about 51% of the total revenues in South West England, and we concluded that the aid may have caused distortions to competition. Therefore our analysis suggests that the relative size of the aid is informative about the likely magnitude of the distortions to competition.

Table 7.2 Relative size of the aid in the case studies

Case study	Amount of aid	Size of the market	Relative size of the aid
Regional aid to Cornwall Airport Newquay	£46.8m; ¹ of which £6.6m was used directly to enhance the airport's capacity ²	£91m (average from 2007 to 2011)	51% ³
R&D&I aid to Soitec	€80.0m (in 2007)	€16,5bn (in 2007)	<1%
SGEI aid to Poste Italiane	€6.5bn (from 2000 to 2017)	€73 ⁴ (average from 2000 to 2017)	9%
Environmental aid to Roquette Frères	€11.2m	€5.8bn (in 2012)	<1%

Note: the relative size of the aid compares the total amount of the aid, and a yearly measure of the market size. ¹ This is calculated as the costs financed by EU sources (£22.m) and national sources (£24.3m). For further details, see European Commission (2009), 'State aid N 269/2009 – United Kingdom Newquay Cornwall Airport Development', 2 July, para. 55.

² This is calculated assuming that the proportion of the total costs relating to the capacity expansion, 14%, has not changed from the 2007 decision and that the aid intensity, 69%, is equal across the four categories of costs, namely, the airport transition infrastructure, the airport's interim development strategy (capacity expansion), post-transition CAA licence, and land purchase. For further details, see European Commission (2007), 'State aid No N 303/2007 – United Kingdom Newquay Cornwall Airport Development', 23 October, p. 6 and European Commission (2009), 'State aid N 269/2009 – United Kingdom Newquay Cornwall Airport Development', 2 July, para. 73. ³ The relative size of the aid is based on the total amount of the aid. If it is, instead, based on the aid that was used to directly enhance the airport's capacity, it would represent approximately 7% of the market size. For the SGEI case study, we used the average revenues of Poste Italiane, as no information about the market value was available. ⁴ The postal market size is based on revenues from Poste Italiane over the relevant period, since for much of the relevant period it was the sole provider of relevant services.

Source: European Commission, Oxera.

- **Breadth of the aid:** in the energy case study, we concluded that the existence of the Fonds Chaleur scheme might have affected competition, while it is unlikely that aid granted to RF alone would have created any distortions. This suggests that aid schemes that cover a number of companies in the same industry or market are more likely to affect competition than aid granted to only one company. Equivalently, granting aid

to a company serving the majority of the market may have a greater impact on competition than granting aid to a company serving a smaller proportion of the market.

- **Frequency of the aid:** in the airport and post case studies, the aid was granted on a yearly basis in markets where entry represents a key driving force of competition.³²³ Granting aid on a rolling basis in markets that are characterised by a degree of entry and exit is more likely to confer a competitive advantage to companies relative to potential entrants. In these cases, it is expected that the aid will have a greater impact on competition than in cases where the aid is provided only at one point in time. In the energy and R&D&I case studies, aid is provided only at one point in time in markets where demand and supply are likely to adjust to developments only over the long term. Our analysis suggests that aid that is provided only over a short period of time is less likely to affect competition, particularly in those markets where supply and demand are not able to adjust quickly in response to developments.³²⁴

The conclusions set out above are based on the results from ex post evaluations of aid measures. It is plausible that similar conclusions would apply to ex ante assessments of the compatibility of aid. On the basis of these conclusions, the impact of aid on competition is likely to differ depending on the circumstances of each case. It is important therefore that the state aid assessment reflects the specifics of each case, investigate (at least at a preliminary stage) all relevant markets although one may ultimately focus on a subsets of markets where the impact is likely to be the greater. Understanding the market specifics and the competitive dynamics in each market is therefore essential to assess the impact of the aid on competition.

³²³ In the airport case study, the infrastructure development at an airport led to the opening of new routes that competed with existing ones. In the post case study, market liberalisation led to the entry of new postal operators in the Italian market.

³²⁴ Our research did not allow us to gain insights on the relative magnitude of the impacts of aid aimed at reducing fixed costs, and aid aiming at reducing operating costs. However, if we presume that aid granted on a rolling basis is more likely to affect operating costs, and aid granted as a one-off is more likely to affect fixed costs, the insights we highlight in relation to the frequency of the aid might be applicable.

A1 Approach to case selection for this report

In line with the Commission’s tender specifications, Oxera’s assessment of the impact of state aid on competition is based on four cases of state aid granted five to ten years ago.

The initial list of cases was compiled from the Commission’s state aid case register³²⁵ using the search criteria set out in Table A1.1.

Table A1.1 Search criteria used to identify the initial list of state aid cases

Field	Criteria
Decision date	Decision between 1 January 2006 and 31 December 2011
Economic sector (NACE code)	NACE codes for those economic sectors where Oxera has relevant competition experience—energy, transport, water and waste, telecoms, and consumer electronics ¹
Decision type	Decision not to raise objections; decision to initiate the formal investigation procedure; positive decision ²
Primary objectives	Environmental protection; regional development; research, development and innovation (R&D&I); and services of general economic interest (SGEI)
Case type	Ad hoc cases ³

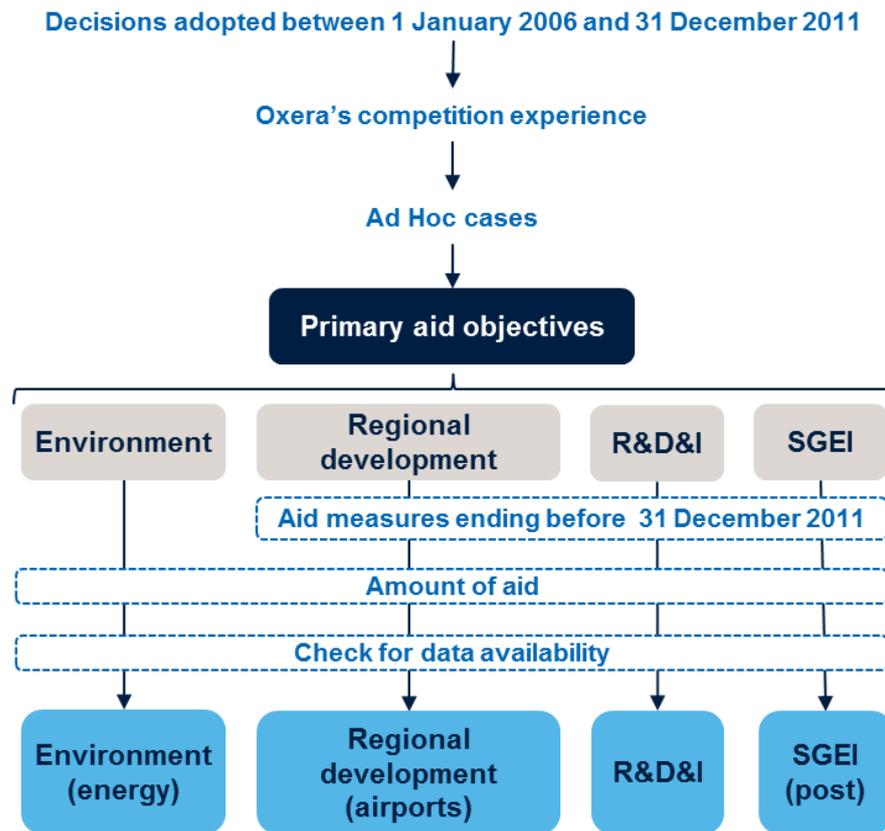
Note: ¹ To ensure a representative sample of R&D&I cases, the shortlist of R&D&I cases has been derived from cases for which NACE codes are not listed in the Commission’s register. ² We note the Commission’s preference for cases that were not subject to a formal investigation; therefore, a number of cases that were subject to formal investigation were not considered during the case selection process. ³ We understand the Commission’s preference for the study to focus on cases of individual aid (i.e. either ad hoc aid or awards of aid to individual beneficiaries on the basis of an aid scheme). Based on further investigation by Oxera, individual aid granted under schemes is likely to result in difficulties identifying the counterfactual, as typically a number of firms have received aid under the scheme. Therefore, the shortlist includes only ad hoc cases.

Source: Oxera.

Based on the above criteria, we identified an initial list of environmental, regional development, R&D&I and SGEI cases, as described in Figure A1.1.

³²⁵ The state aid case register can be accessed at European Commission website, ‘State aid Cases’, http://ec.europa.eu/competition/state_aid/register/.

Figure A1.1 Case selection process



Source: Oxera.

We undertook the following additional checks on the initial list of cases.

- **End date.** For regional development, R&D&I and SGEI cases, aid measures that ended after 31 December 2011 were excluded. This was to ensure that sufficient data is available for the period after the aid measure had been implemented. However, as environmental aid provided to the energy sector tends to be provided on a long-term basis, we have not applied the cut-off date to environmental aid cases in energy.³²⁶
- **Amount of aid.** We have checked the individual decisions, as well as the budgets published in the Commission's *Official Journal*. We understand that the reported amounts refer to indicative budgets, in order to proxy the amount of aid, so we have followed the approach recommended in the Commission's state aid scoreboard methodology.³²⁷ We have excluded a number of cases

³²⁶ As an example, the UK scheme of feed-in tariffs to support the generation of renewable electricity from low-carbon sources (SA.33210) was envisaged to start in 2011 and end in 2037.

³²⁷ Following the methodology set out in the scoreboard, the aid element for grants and tax exemptions is assumed to be equal to the budget indicated in the decision. The aid element for soft loans (including repayable advances and reimbursable grants) and tax deferrals is assumed to be 15% of the budget indicated. The aid element for guarantees is assumed to be 10% of the capital value. Based on European Commission (2015), 'Conceptual and methodological remarks', http://ec.europa.eu/competition/state_aid/scoreboard/index_en.html, accessed 17 November 2016.

for which the aid element was small (i.e. less than €3m),³²⁸ and cases for which the aid element was unknown.³²⁹

- **Data availability.** We have checked whether annual accounts of the beneficiaries of the initial list of state aid cases are available from public domain sources, such as Orbis and Companies House. A number of cases have been excluded on the basis that no (or very limited) data was available on the beneficiaries of the case.

In addition, we have made a small number of further adjustments to narrow down the set of cases:

- an R&D&I case was excluded on the basis that most of the beneficiaries of the case were research institutes;³³⁰
- a regional development aid case from the energy sector was excluded, as the large energy projects were captured under the environmental protection objective;³³¹
- a small number of cases were excluded due to conflicts of interest (i.e. cases in which Oxera is currently involved in litigation or appeal);
- a small number of cases were excluded where Oxera does not have staff with the relevant language skills, as this would significantly complicate the extraction of data and the ability to liaise with the beneficiaries and their customers and competitors.³³²

The final selection of cases was based on Oxera's expertise, potential data availability, and was subject to the agreement of the Commission.

³²⁸ This threshold is in line with the Commission's transparency system for R&D&I, under which projects over €3m are recorded. Changing the threshold down to €1m or up to €5m does not affect the selection of cases included in the shortlist.

³²⁹ For example, an unlimited state guarantee.

³³⁰ N603/2007, 'Soutien de l'All en faveur du programme GENESIS'.

³³¹ N676/2009, 'Improvement of the quality of electricity provision in Murcia'.

³³² Oxera has excluded two Czech cases due to lack of sufficient language skills.

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