

Airport Till Structure and Cost Allocation

1. Background

- 1.1 The goal of the Aviation Strategy¹ is to strengthen the competitiveness and sustainability of the entire EU air transport value network. Tackling limits to growth in the air and on the ground, in particular by boosting the efficiency of airport services, is one of the key priorities that the Commission has identified.
- 1.2 The Thessaloniki Forum of Airport Charges Regulators is tasked with 1) working on and making recommendations for a better common implementation of the Directive 2009/12/EC on Airport Charges (the ACD) and 2) promoting best practices in economic regulation of airports.² The ACD requires Member States to assign responsibility for supervising the setting of airport charges to Independent Supervisory Authorities (“ISAs”).
- 1.3 In this paper, the Forum first sets out the potential till structures which can be implemented at airports, and the broad associated features. It then goes on to discuss best practice principles and application of cost allocation methodologies.
- 1.4 This paper has been produced by the 2020 Working Group of the Thessaloniki Forum of Airport Charges regulators, taking into consideration the views of the airport and airline communities. The ISAs who participated in the preparation of this paper are those of Ireland, Italy, the Netherlands, and Spain.
- 1.5 This report has been adopted by the Thessaloniki Forum in January 2021.

¹ https://ec.europa.eu/transport/modes/air/aviation-strategy_en

² <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009L0012&from=EN>

2. Caveats

- 2.1 This report does not represent the views of the European Commission and does not in any way change the requirements of the ACD.
- 2.2 This report should not be used as a limitation or constraint for Member States to apply their own methodologies, having regard to specific circumstances, regulation or other reasons.
- 2.3 This report will be kept under review and changed as and when deemed necessary by the Thessaloniki Forum.

3. Overview of Airport Till Structures and Cost Allocation

Introduction

3.1 Airports generate revenue from aeronautical services provided to directly to airlines (such as a runway movement charge), but also from non-aeronautical services associated with this core aeronautical activity (such as carparks, food and beverage and airport retail). Where an airport is subject to some form of economic regulation, in general only the aeronautical services are regulated. The till structure at an airport refers to the extent to which costs and revenues associated with non-aeronautical services are taken into account in the level of Airport Charges payable for the provision of the aeronautical services. It is a key policy decision in relation to an airport. Broadly, there are three forms of airport till structure currently in use at Community airports:

- A single till approach has regard to all costs and revenues at an airport when considering the level of Airport Charges. Costs associated with non-aeronautical activities are therefore included in the cost base for calculating airport charges, while associated revenues are netted off, before Airport Charges are calculated. In the context of economic regulation, it is important to note that the non-aeronautical activities are not themselves regulated, but rather they are considered as part of the regulation of charges for the aeronautical services which are paid by the users of the airport.
- A dual till approach means that only costs associated with aeronautical activities are considered when setting Airport Charges, with costs associated with non-aeronautical activities being excluded. A cost allocation exercise is therefore required to appropriately allocate costs between the aeronautical and non-aeronautical tills. Revenues generated from the non-aeronautical activities are correspondingly excluded from the calculation of Airport Charges.
- A hybrid till approach lies between single/dual till, generally where separate aeronautical and non-aeronautical tills are maintained, with some portion (but not all) of the revenue from the non-aeronautical activities being offset against Airport Charges. A cost allocation exercise is therefore also necessary with a hybrid till approach.³ The offset may occur through either one or more specified non-aeronautical activities being included within the scope of the regulatory till, or alternatively by determining an overall contribution from non-aeronautical activities. We are not seeking to comprehensively address the topic of hybrid tills in this paper, but rather focusing on cost allocation.⁴

3.2 Within these broad structures, there are further potential variations which could be implemented by an ISA or an airport managing body. For example, in Ireland, Dublin Airport generally operates under a single till, except where stakeholders agree that costs and revenues associated with a particular non-aeronautical activity or

³ Where this paper refers to cost allocation between aeronautical and non-aeronautical tills in the context of a dual till approach, this should be taken to also apply in a hybrid till approach.

⁴ For example, the calculation of the quantum of non-aeronautical revenue to be used to offset Airport Charges is out of scope of this paper.

development should be excluded from the till (known as a till exit).⁵

- 3.3 In the context of the regulation of Airport Charges, a single till approach requires consideration of the costs and revenues associated with non-aeronautical activities at the airport. A dual till approach generally does not require this, but instead requires a full cost allocation exercise across the airport. The question of cost allocation is therefore generally less relevant in a single till airport, although it may be required in certain circumstances, such as where a till exit has occurred, or where the company which operates the airport also operates other businesses with certain costs being centralised.
- 3.4 The purpose of this paper is not to recommend any particular till structure. There are varying views among ISAs/Member States on appropriate till structures, depending on policy priorities. The basic mathematical result of the till structure in relation to Airport Charges is that, at airports with a profitable non-aeronautical business, a single till generally leads to lower Airport Charges relative to the counterfactual scenario where the same airport is operating under dual till. Conversely, dual tills generally lead to the operators of airports with market power being more profitable, all else equal.
- 3.5 Beyond this, there are a wide range of theoretical arguments which have been made by industry on this topic, with airline representatives generally in favour of a single till and airport representatives generally in favour of dual tills for regulated airports (it should be noted that operators of smaller, often unregulated airports often operate in line with a single till approach, which enables them to compete more effectively on aeronautical charges with other airports). Such arguments often focus on issues such as allocative efficiency or generating desirable incentives at the airport in question. The different arguments are also discussed in a significant body of academic work.⁶
- 3.6 It is not the purpose of this paper to explore the desirability or otherwise of the different till structures.

The role of the ISA

- 3.7 The till structure in place at airports has significant implications. For that reason, the Forum recommends that the Member State empowers the ISA to determine⁷ the till structure based on clear statutory duties and/or policy direction, where relevant, as part of any broader system of economic regulation in place.⁸ Where the ISA has this power, the till structure should be determined by the application of a clear and common legal assessment framework to ensure legal certainty and a level playing

⁵See for example: <https://www.aviationreg.ie/fileupload/2014-12-10%20CP3%20Dublin%20Airport%20City%20valuation%20and%20till%20exit.pdf>

⁶ For a review, see for instance: Czerny, A. I., Guiomard, C., & Zhang, A. (2016). Single-till versus dual-till regulation of airports: where do academics and regulators (dis) agree?. *Journal of Transport Economics and Policy (JTEP)*, 50(4), 350-368.

⁷ There are different processes that could lead to the outcome, such as a consultative approach.

⁸This is not a direct requirement of the ACD and is not the case in some Member States. Thus, the final decision on how to allocate this power rests with the Member State, it is not within scope of this paper to consider whether or not this should change in the future.

field. The ISA should only use this power where justified. In some cases, the ISA might take the view that allowing some or all of the airports under its regulatory jurisdiction to determine their own till structure is best aligned with achieving its objectives. The ISA's view on the suitability of a given till structure might evolve over time. Therefore, the ISA might decide to revise the till structure so as to take into account new factors or priorities. The ISA is responsible for implementation of national procedures on regulation of Airport Charges.

- 3.8 Where an airport is regulated under a dual or hybrid till structure, the assessment or oversight role of the ISA in relation to cost allocation is crucial. If the airport has market power in the provision of aeronautical services, it is incentivised to allocate costs to the aeronautical till rather than the non-aeronautical till. An accurate and fit-for-purpose cost allocation system is required to ensure that mis-allocation of costs is avoided. The rest of this paper discusses this cost allocation. Section 4 provides an overview of cost allocation systems and methodologies, Section 5 discusses principles and best practice, and Section 6 sets out some common complexities encountered by ISAs in this area as well as some sample solutions.

4. Overview of Cost Allocation Systems and Methodologies

- 4.1 In this section we focus on the main economic and methodological questions that arise when allocating costs between aeronautical and non-aeronautical activities in a dual till structure. The most commonly accepted principle of cost allocation is that costs should be allocated directly to activities where possible. In order to apply this principle, product specific or incremental costs for aeronautical and non-aeronautical activities must be identified. These direct costs are costs which are wholly and unambiguously incurred against specific activities. Also, common costs for both aeronautical and non-aeronautical activities must be identified. For example, specific costs for facades and walls of shops can be allocated to non-aeronautical activities, while depreciation costs of the structure of a terminal building, which contains both shops and gates, are treated as common costs.
- 4.2 The incremental costs form the lower bound for costs attributable to a specific activity. If these costs are covered by the attributable revenues, the result is that the aeronautical and non-aeronautical activities do not bear more costs than their respective stand-alone costs. The respective stand-alone costs of each activity form the upper bound of costs attributable to that activity. For aeronautical activities, the stand-alone cost is that of a hypothetical airport without non-aeronautical activities. For non-aeronautical activities, it is the cost of a hypothetical facility which provides all of the non-aeronautical services without any aeronautical activities.
- 4.3 It is economically justifiable to allocate common costs to both regulated and non-regulated activities, because in practice there are externalities and links between aeronautical and non-aeronautical activities. From a supply side perspective, supplying both activities leads to economies of scope. This would not have been the case if the activities were provided separately. In other words, both non-aeronautical activities and aeronautical activities would have been more costly if they were produced separately on a standalone basis. From a demand side perspective, it is also logical that a part of the common costs is allocated to non-aeronautical activities. In most cases, the shopping areas and car parking at an airport would not be economically viable without the aeronautical activities.
- 4.4 The central question in the common cost allocation in a dual till structure is how these costs should be allocated between aeronautical activities and non-aeronautical activities. In other words, how should the costs within the range from incremental to stand-alone costs of each separate activity be allocated?
- 4.5 Broadly speaking, two approaches to cost allocation can be distinguished. Firstly, methods can be applied that are based on cost accounting. In this approach, costs are allocated based on predefined calculation methods. Secondly, a market based approach can be applied. In this approach, (hypothetical) market conditions are the basis of cost allocation.

Cost Accounting Methods

- 4.6 Two cost accounting methods can be distinguished: the fully distributed cost

accounting method (the FDC method) and activity based costing (the ABC method). In the FDC method, the costs that are directly related to different activities are first allocated to these activities. A markup is then calculated for the common costs, which is added to the directly related costs. For the calculation of this mark up, different criteria are used, such as the revenue share of each activity, the proportion of the directly related costs as part of the total cost, or the production proportion of each activity as part of the total production.

- 4.7 Due to advancing automatization, complexity and integration of production processes, many companies, including airports, often have a high share of common costs. In this context, allocating costs by (only) applying the FDC method using general markups mostly leads to an inaccurate or unrealistic cost allocation. The ABC method seeks to address this issue. As with the FDC method, the ABC method first allocates the costs that are directly related to different activities, to these activities. With regard to the allocation of common costs, the ABC method uses a philosophy which differs from the FDC method.
- 4.8 The philosophy of the ABC method is that common costs are not caused by revenue or production capacity, but rather by the complexity and diversity of processes in a company. The ABC method attempts to allocate the common costs by causal relationships. As soon as the costs of the activities (departments) are known, the costs are allocated to each product depending on the extent that each product has *used* the services of the department (cost center). To determine the use of services, measurements are calculated. Examples of measurements are usage of square metres, labor hours, energy, data or traffic.
- 4.9 In many cases, airports with a dual till structure use a mix of cost allocation methods, with both activity based cost drivers and general markups. The application of general markups can be explained by the fact that it is not always possible to find a clear causal relationship between costs and activities. This could be especially the case for common costs that cannot directly be linked to the primary process, leading to arbitrary cost allocation. An example is the allocation of the cost of the senior management team of an airport operator. In that case, a markup could be more convenient.

Market Based Approach

- 4.10 In a market based approach, the allocation of common cost is basically determined by which buyers can bear the most costs. In a Ramsey pricing approach, common costs are inversely proportionally allocated in line with the price elasticity of demand, under the precondition that the total sum of charges is cost oriented. In this way, a given level of fixed costs is covered in the most efficient way. This can be explained as follows. If there are two groups of buyers with a different price elasticity of demand, the total demand of the buyers will decrease less when the cost are allocated to the group of buyers with the lowest price elasticity as opposed to when the costs are

allocated to the group of buyers with the higher price elasticity.⁹

- 4.11 The existence of economies of scope due the combined production of both aeronautical and non-aeronautical activities implies that both activities would be more expensive if they were produced on a standalone basis. This insight can be used to apply a commercial negotiation principle as a basis for cost allocation. Cost allocation would then be based on the result of a hypothetical commercial negotiation between two parties on a competitive market, that both know that they would be worse off if they were to produce their products standalone instead of together. This approach can be used as a sanity check for a Ramsey pricing method.

Choice of Method

- 4.12 Different criteria can be used for choosing the appropriate method. One important economic criterion is efficiency. For ISAs and for the aviation sector, practicality (including transparency) of the method is also very important.
- 4.13 As explained earlier, Ramsey pricing is seen as an efficient method to recover fixed costs. From an economic efficiency perspective, however, this is half the story. Ramsey pricing does not take into account externalities between different activities. This is especially a source of concern if these externalities exist for activities with strong economic links, such as aeronautical and non-aeronautical activities at airports. An example of these externalities is that the shopping areas and car parking at an airport would often not be economically viable without the aeronautical activities.
- 4.14 This can be explained as follows: Applying Ramsey pricing causes products with a low price elasticity of demand to become relatively more expensive and products with a high price elasticity of demand to become relatively cheaper. In practice, the products with a relatively lower price elasticity of demand are commonly the services that are economically regulated (the aeronautical activities). Therefore, by applying Ramsey pricing, a relatively large part of the costs may be allocated to aeronautical activities. This leads to the risk that the aforementioned externalities between aeronautical and non-aeronautical activities are not sufficiently accounted for in the allocation of costs.
- 4.15 Under Ramsey pricing, the reason for allocating most costs to the aeronautical till is the relatively low elasticity of demand for aeronautical services. That is also a key reason as to why the aeronautical till is regulated, so that the airport operator cannot take advantage of the same low elasticity in misusing the associated market power. It would therefore reverse the effect of implementing economic regulation.
- 4.16 Furthermore, information is needed about the price elasticities and the marginal costs. The ISA must have insight as to how different groups of buyers react to price changes over a period of time. As an ISA, it is not always easy to get the required data, which must also be reliable. The fact that externalities must also be taken into account makes it even more complicated for ISAs to use Ramsey methods.

⁹ For example, if the demand for aircraft parking is less elastic than the demand for car parking at an airport, this would involve allocating more costs to aircraft parking.

- 4.17 In practice, cost accounting methods are commonly applied to allocate cost between aeronautical and non-aeronautical activities in airports with a dual till structure. There is a lot of experience in the application of these methods and larger dual till airports tend to develop their existing accounting system into a cost allocation system based on cost accounting methods. A disadvantage of cost accounting methods is that they do not take into account demand side characteristics.
- 4.18 However, especially in the application of the ABC methods, it is possible to also reflect economies of scope resulting from the combined production of aeronautical and non-aeronautical activities in the allocation of common costs. A large part of the common costs can be allocated to aeronautical and non-aeronautical activities on the basis of allocation keys that reflect the use of means of production.
- 4.19 The following sections will elaborate on the practical side of the cost accounting methods.

5. Principles and Transparency Requirements for Cost Allocation

Principles

5.1 A cost allocation system can be applied to both forward looking cost allowances, and to regulatory accounts which are based on historical data. In this section, we set out some key principles for cost allocation systems. These principles are related to broader ICAO principles such as non-discrimination and transparency. The Forum recommends that key principles for a cost allocation system should be as follows:

- Relevance and/or cost relatedness: Costs must be allocated to aeronautical activities only to the extent that they are related to the aeronautical activities.
- Proportionality: Costs must be allocated in proportion to the use of the production factors for aeronautical activities and for non-aeronautical activities. This means that costs directly attributable are allocated either to the aeronautical or non-aeronautical activities. To this end, direct costs associated exclusively with aeronautical or non-aeronautical activities should be identified as much as possible. All other costs are allocated using quantifiable cost allocation keys.
- Objectivity: Parameters should, as far as possible, be objective.
- Accruals basis: Costs must be related to the relevant accrual period.
- Consistency and comparability over time: The methodology for cost allocation should be as stable as practicable over time.
- Cost efficiency in implementation of the allocation system: The costs of implementing and running the cost allocation system (in terms, for example, of software and labour costs) should be reasonable compared to the regulatory purpose.
- The operating costs and the costs of the operating assets, to the extent used for aeronautical activities, will be determined and allocated in accordance with acceptable accounting principles.
- Costs which are allocated to the regulatory accounts shall be traceable in the financial accounts (unless regulatory provisions allow otherwise¹⁰);

5.2 Cost allocation should be based on a clear definition of the services and infrastructure included in the segment relevant to aeronautical services.

5.3 Somewhat different approaches are taken in respect of the level of aggregation of services. Sometimes, bundles of services are allowed under national law, while in other cases bundles of services are allowed by the ISA, or only following user consultation. A bundle of services may include a combination of services associated with passenger processing, baggage, security, aircraft movements, parking, handling,

¹⁰ For instance, specific depreciation methods allowed for in the regulatory accounts may differ from financial accounts.

PRM or non-regulated activities.

5.4 The following costs are considered as non-relevant to determine charges (the list is non-exhaustive). As such, they should not be allocated to regulated services:

- Extraordinary costs which, in the light of the relevance criterion, are not attributable to the ordinary production process of airport services/activities provided to airport users, or that are unrelated to the airport.¹¹
- Costs of any kind arising from non-compliance with laws or regulations (e.g. fines, sanctions, associated legal costs).
- Accounting provisions.
- Financial costs, including monetary/currency/extraordinary changes in asset value¹² and interest costs, as they are covered by the reasonable profit of a service.¹³
- Taxes which are already taken account of in the WACC, to avoid double counting.
- The costs of incentive schemes put in place by the airport managing body (e.g. traffic growth or route incentive schemes).

5.5 The value of the assets serving the aviation activities and the derived costs must be based on or derived from the historical price.

5.6 These cost allocation principles should apply regardless of the till system that is in place (noting that cost allocation is more relevant in a dual till or hybrid till model), and regardless of whether the airport is part of a network.

5.7 Depending on the size of the airport or airport network, some concessions may be given on the degree of accuracy of the cost allocation, with a relatively simple system being permitted. This is due to the trade-off between regulatory efforts and burden on the one hand, relative to the benefit of reducing the risk of unbalanced cost allocation by the airport managing body. The level of detail applied should be decided considering the extent that it is likely to have any significant consequences. In other words, do not develop complicated models to split assets with insignificant value.

Transparency

5.8 The ACD states that transparency would provide air carriers with an insight into the costs incurred by the airport and the productivity of an airport's investments.

¹¹ In some jurisdictions, the costs arising from unused resources are not allowed.

¹² Noting that ordinary/regulatory depreciation is not considered non-relevant.

¹³ In general, costs of goodwill are also not allowed.

- 5.9 The Forum already stated in 2016¹⁴ that an airport should provide airport users with:
- A detailed explanation as to how the proposed charges are derived. The level of detail should be sufficient to allow airport users to analyse how charges are derived, assess whether they are based on costs and how they take account of the infrastructure and the quality of service required by airport users.
 - Detailed historic and forecast information on costs and commercial revenues. Historic costs and revenues from recent years should be provided for comparison purposes. As a general principle, the information should be detailed enough to allow users to make a full assessment of the costs and should include the methodology used to calculate the commercial costs and revenues as well as the forecasts. Drivers of costs and revenues should also be provided.
- 5.10 In the context of cost allocation, transparency requires that, among other things, the principles are clearly described and that the cost allocation can be traced through the airport's financial and regulatory accounts. The application of the cost allocation keys must also be traceable and clearly recorded. Consultation on cost allocation is key in reaching a shared understanding among the stakeholders of the cost allocation methodology, in relation to the underlying assumptions and the objectives to be achieved.
- 5.11 Information that the airport provides to ISAs and to users should be managed in accordance with article 7(3) of the Directive, which states that the information provided [...] *shall be considered as confidential or economically sensitive and handled accordingly. In the case of airport managing bodies that are quoted on the stock exchange, stock exchange regulations in particular shall be complied with.*
- 5.12 The cost allocation system should be clear to all the parties (ISAs, users, auditors) which have access to the system or whose role is to verify the system, so that these parties are able to see how the system is applied. The cost allocation system should therefore clearly describe which costs are included. Cost attributed to each activity, asset or service should be decomposable in its various cost components.
- 5.13 Costs in the regulatory accounts shall be verifiable through reconciliation with the data from general accounting and financial statements, or consolidated financial statements in the case of activities carried out by subsidiaries. The cost allocation system and methodology shall be auditable by an independent accountant, being traceable and reconcilable both to and from the source data (financial statements).
- 5.14 When describing the division of costs of business lines, a clear link should be made with the business line activity and how it is used for aviation activities. Furthermore the cost allocation system and methodology must allow a clear identification of assets, income and expenses allocated to each perimeter and an assessment of the relevance

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of the allocation keys used.

5.15 The cost allocation system should contain detailed information on:

- The corporate and organizational structure of the airport(s) in question and a description of the activities of the organizational units, including the way in which they serve the various activities of the airport(s).
- The administrative structure of the business units that are (partly) at the service of aviation activities, described in cost centres.
- An explanation of the allowed calculation methods (including depreciation methods and depreciation terms for different assets, the calculation of the Regulatory Asset Base and WACC) the forecasting process being used and the supervisory activities of the external accountant.¹⁵
- The principles for allocation and revenues for specific activities including the cost centres involved, the services of the cost centres, specific calculation methods, cost types and methods and frequency of measurement of allocation keys and costs.

5.16 Regulatory accounts should be drafted by the airport on a regular basis and should be certified by an independent auditor and submitted to the ISA as often as required by the regulatory system in place.

5.17 It is recommended that ISAs be empowered and well equipped to approve and review the cost allocation system and regulatory accounting system when deemed necessary and after a fixed period. In a dual till system, ISAs should oversee the cost allocation; this power is an indispensable part of the dual till system.

5.18 Consultation on the charging models should be carried out with the relevant stakeholders, as defined by legislation. The consultation should be meaningful, which implies that stakeholders are afforded the opportunity to genuinely influence the outcome. It should also be informed, meaning that stakeholders are provided with sufficient detail to allow them to understand the calculations which are the subject matter of the consultation, enabling them to provide informed responses.¹⁶

5.19 Given the potential information asymmetry between the ISA and the airport managing body, the ISA might not always be in a position to conduct a fully comprehensive analysis, especially at the earlier stages of regulation of a given airport. Therefore, as

¹⁵ The term forecasting process refers to the planning and control cycles. The planning and control cycle establishes the manner in which decision-making on the (multi-year) budgets occurs, and how an airport achieves objectives with regard to the maximum cost level to be realized. The forecasting process includes for instance the determination of prices and quantities that determine the amount of the costs and turnover.

¹⁶ For further discussion on consultation requirements, see the Forum paper from 2016: <https://ec.europa.eu/transparency/regexpert/index.cfm?do=groupDetail.groupDetailDoc&id=29018&no=1>

its knowledge of the airport cost structure improves, the ISA's views on the true cost drivers may develop on the basis of better information and evidence. Consultation and transparency are important to ensure that any changes are justified.

- 5.20 The airport should provide to airport users information concerning an overview of the regulatory accounting in the base year, in computer-editable format, showing the overall structure of allowed costs and revenues of each regulated service provided by the airport, as well as of the non-regulated products jointly considered.
- 5.21 In the case of an airport network, or of airports serving the same city or urban area, the information to be submitted by an airport to the ISA, including the regulatory accounting, and to users, including an overview of the regulatory accounting, may be required for each individual airport. This is to provide transparency over the cost allocation within the network and the extent of any cross-subsidisation between airports.¹⁷ In the case of very small airports, however, in certain circumstances the ISA might decide to accept accounts which do not distinguish between each individual airport, if it considers that it would be disproportionate to require this.

¹⁷ Cost relatedness at an airport network level is permissible under the ACD.

6. Complexities in Cost Allocation

- 6.1 As set out above, ABC systems are the most common cost allocation systems applied in the scope of airport charges regulation under dual till.
- 6.2 This section explores some common complexities that ISAs may face in relation to the assessment of cost allocation systems. It then sets out some examples of practical solutions which have been developed to mitigate some of these issues.
- 6.3 Within the scope of the ABC systems, these complexities can be grouped into two categories, the first one related to the implementation of the model and the general complexity of its design, and the second one related to the particular complexities of the process of cost allocation between aeronautical and non-aeronautical activities at airports.

General Complexities within the scope of ABC systems

- 6.4 Some international studies have pointed out that there are significant barriers and problems in the implementation of ABC systems, and found that the main factors which inhibit the implementation of these kind of systems are a lack of support and information, training and resources, software support, experience, and availability of human resources, and their perceived complexity.¹⁸
- 6.5 The findings also indicate that it is difficult to establish the key cost drivers for common and joint costs. Technical issues include the problem of identifying cost drivers. Other complexities include the identification and selection of activities, assigning resources to activities, assigning costs to products and problems with collecting the necessary data.
- 6.6 An airport is a complex organization. Hence, we can find all the general complexities mentioned above relating to the application of an ABC system, in an airport context. In particular, determining the whole range of activities involved in the provision of the services is one of the main issues.
- 6.7 The activities to be carried out by an airport may be different due to the airport structure itself, or the established internal operational structure. So, in practice, the identification of activities is resource intensive and requires very detailed information about the practical operation of the airport.
- 6.8 Sometimes identifying all these activities and delimiting them to the ideal level of accuracy is not possible. This issue is very relevant due to the fact that these activities should provide a homogeneous output in order to be allocated in a later stage to the service provided by the airport. Not all services provided by an airport are

¹⁸ <https://hbr.org/1995/07/tapping-the-full-potential-of-abc>
https://www.researchgate.net/publication/316433559_Implementation_Problems_of_Activity_Based_Costing_A_Study_of_Companies_in_Jordan
https://www.researchgate.net/publication/266850201_ABC_Evolution_Problems_of_Implementation_and_Organizational_Variables
https://www.scirp.org/html/5-2120026_18844.htm

homogeneous.

- 6.9 After defining the activities, it is necessary to assign the cost of the activities to the different services. Deciding which cost driver to use is not always straightforward and finding a fair driver is not always easy. There is often no obvious objectively fair method of cost allocation for common costs and therefore there is complexity and often a degree of arbitrariness associated with cost allocation.
- 6.10 Joint costs and common costs create particular cost allocation questions. By definition, such costs relate to more than one service but cannot be separately identified with an individual product or service.
- 6.11 To sum up, the determination of activities and the cost driver can be difficult to establish in practice. When this identification stage of activities and cost drivers is finished, the implementation of the system may also face further issues due to the amount of information needed to feed the model.
- 6.12 Finally, from the point of view of the information to be obtained, the detail of all the activities and the associated cost drivers require additional information that is not always available and must be created for this purpose, generating additional costs. The data used for ABC may be internal information of the airport manager and, as a consequence, it can be difficult for the regulator to trace the cost allocation due to the asymmetric position with respect to the airport managing body in terms of the availability of information and data. It is important that the regulated company is obliged to provide this evidence.

Particular complexities of cost-allocation between aeronautical and non-aeronautical activities

- 6.13 Airport business models have experienced a huge change in recent decades. This has resulted in, amongst other things, the enlargement or remodelling of terminals to offer a better retail and food & beverage experience.
- 6.14 Some studies show that the diversification of the airport business, complementing aeronautical services with other services involving purely commercial activities, allows airports to improve operational efficiency through the complementary demand between the aeronautical and non-aeronautical services.¹⁹
- 6.15 In this context, the application of a dual till or hybrid mechanism requires, as the economic literature indicates and as discussed in this paper, a proper separation of the costs shared by aeronautical activities and non-aeronautical activities within the airport. This is due to the existence of assets that are shared between regulated and non-regulated activities.
- 6.16 Thus, the main complexities identified in the cost allocation process with particular reference to airports are the following:

¹⁹ "Are Outsourcing and Non-Aeronautical Revenues Important Drivers in the Efficiency of Spanish Airports?" Beatriz Tovar, Roberto Rendeiro Martín-Cejas, Journal of Air Transport Management 15, 2009.

- On the one hand it is difficult to have an accurate register of assets which is up to date with the current usage of rooms and building. This can be a challenge in times of major construction works and where there are frequent changes in tenants and usage. On the other hand, these assets (and associated costs such as depreciation and cost of capital) could have a mixed use, generating allocation problems between activities.
- There are challenges in allocating the costs of resources, the need for additional information and metering devices and the time consumption of activity-based costing itself. A lot of time and resources are spent on recording, processing and presenting data, and also on updating the complex system. For instance, it is difficult to connect infrastructure resources (electricity distribution network, district heating network) with either the aeronautical or non-aeronautical activities (products, services, passengers).
- One of the main issues mentioned by ISAs relates to the items allocated indirectly to the tills. These items relate to the activities which are shared between the two tills or to the general expenses. For example, the allocation of overheads (management fees, accounting, financial analysis, cost of the personnel department) to services can be difficult at times.
- Allocation of profits and expenses related to passenger boarding bridges and particularly for those related to advertising on these units is a particular challenge in cost allocation.
- Allocation of the costs related to the access (roads, train station) to the airport is a controversial issue.
- Another recurrent issue is the allocation of the costs related to shared surfaces between aeronautical and non-aeronautical areas within an airport. In that case, the most common cost driver applied by airports is the square metres occupied by each activity. However this driver can be criticized because not all square metres have the same cost from a utilization point of view; it may lead to an underestimation of the costs apportioned to non-regulated activities, ignoring the positive externality of traffic on the commercial activities of the airports.
- The allocation of costs between aeronautical and non-aeronautical activities does not usually take into account that non-aeronautical activities may generate extra costs due to the optimization of the terminal buildings from a commercial perspective which may lead to a degree of oversizing from a passenger processing perspective, especially in the airports with a higher volume of passenger traffic and international flights. On the other hand, certain aspects of a terminal building, such as foundations or structural load bearing specifications, may be driven by requirements associated with aeronautical processes such as baggage handling systems. This level of incremental specification may be driven solely by the aeronautical activities.
- The fact that a pure accounting approach may not in all circumstances fully reflect

the economic reality of different activities and the dependencies between them could therefore be considered a limitation in terms of cost allocation between tills. In this regard, a regulatory adjustment, such as the example provided below of an adjustment made by the Spanish ISA, could be needed to reflect such situation.

- Finally, a specific challenge for cost allocation systems is that the airport staff are sometimes insufficiently able to describe or translate cost allocation principles clearly and transparently, so that they can be traced by airport users and supervisors. In addition, there are debates with the airport about the degree of accuracy of the cost calculation.

Example Solutions

- 6.17 ISAs and airport managers have developed different ways to address the limitations and complexities associated with cost allocation between aeronautical and non-aeronautical activities, and the allocation of common costs under dual and hybrid till structures. It is critical, in order to overcome these issues to the extent practicable, that ISAs have effective powers to supervise the cost allocation, reconsider the parameters of a costs allocation system, and identify possible solutions to these issues.
- 6.18 The discussion on complexities in this section should not be taken to mean that these cost allocation systems are not practicable or that workable solutions to these issues cannot be found.
- 6.19 As examples, we first describe the allocation of the terminal complex on the basis of square metres at Amsterdam Airport Schiphol.²⁰ We then set out an example of how the Spanish ISA (CNMC) addressed the concern that a pure accounting approach may ignore the economic reality of the dependencies between different activities. It is important to note that these are examples of approaches which were adopted in two specific sets of circumstances and we describe them as such; we are not suggesting or recommending these specific approaches as being generally applicable in all circumstances.
- 6.20 In general, the costs of the building are allocated as follows at Schiphol. The terminal complex is first divided into fourteen sections of buildings. The cost of a number of specific assets in a section of a building is allocated entirely to a specific user if they are used only by this specific user. If their use is shared, the purchase price and annual depreciation costs are divided on the basis of square metres. The metric used for the division of the floor surface is the number of rentable square metres of floor space, applying the S-NEN 2580 standard.²¹ A characteristic of this method of measurement is that certain parts of the building which are used jointly are not included in the rentable floor space (for instance, lifts and stairwells). The spaces which are included

²⁰Taken from Decision No.: 200057/76.BT37, 25 April 2007 of the Board of the Netherlands Competition Authority (now ACM), pursuant to the application by N.V. Schiphol Airport for approval of its system for allocating costs and revenues, in accordance with section 8.25g (1) of the Aviation Act.

²¹NEN 2580 is a standard certified in the Dutch real estate sector. It contains terms, definitions and determination methods for areas of land intended for buildings and for floor areas and contents of buildings or parts thereof. The standard had been adapted for use at Schiphol airport into S-NEN 2580.

in the rentable floor space are then allocated, on the basis of square metres, to the aeronautical activities and to the non-aeronautical activities.

- 6.21 The further allocation of rentable floor space is based on a number of specific rules (developed by Schiphol). One of the main rules is that the relevant square metres for shops in spaces used both for aviation activities and for shopping areas are calculated by determining the square metres of shopping area and—in addition to this—by attributing one additional linear metre of floor space of the adjacent part of the shared area to the shopping space.
- 6.22 Schiphol also makes a correction for the allocation of the costs of transit areas in Schiphol Plaza, a landside part of the building, above the railway station. A considerable part of this area would be attributed to aviation activities if the above-mentioned principle were to be applied strictly. This area is used for numerous purposes in the sense that it is also used for non-aeronautical passengers in transit, such as commuters employed at the Schiphol campus who do not arrive at Schiphol by aircraft. Schiphol further allocates the costs of these spaces on the basis of counts of passers-by, in which a distinction is made between aeronautical and non-aeronautical passers-by.
- 6.23 As noted above, a pure accounting approach may ignore the economic reality of different activities and the dependencies between them could therefore be considered a limitation in terms of cost allocation between tills. To address this issue, the Spanish ISA (CNMC), made a regulatory adjustment to AENA's cost allocation to reflect such situation, specifying an econometric model of AENA's network to measure how additional traffic increased the average income per passenger from non-aeronautical activities and how this situation is reflected in the cost of non-aeronautical activities.
- 6.24 There are other possible regulatory adjustments too, for example relating to depreciation, disallowances for inefficient capex, and treatment of assets under construction, including the utilization of *bottom up* or incremental approaches. As solutions have limitations based on the specifics of a given set of circumstances, there is no one size fits all solution.