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## Best Practices of the Economic Development Impact Study of Airports

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BEST PRACTICES OF THE ECONOMIC DEVELOPMENT IMPACT STUDY OF AIRPORTS

**Introduction**

The study deals with reviewing and analysing the international benchmark examples developed for the economic impact study of airports. Based on the international literature, the methods and procedures are identified which are theoretically suitable for the economic impact study of airports. In addition to methodological clarity, the applicability of the method in the Hungarian context is also an important aspect, i.e. the proper data must be available and other limiting factors do not hinder drawing relevant and accurate conclusions from the analysis either. From the analyses on the international impact assessment of airports, the reports of the Airports Council International – ACI are significant, which are made every year always taking account of the current economic changes, economic challenges and the role of airports in economy. The ACI has attempted to study the economic impact of airports in several cases, from which three authoritative materials must be highlighted in terms of the present research. In the study, the ACI report 2010 entitled “An Outlook for Europe’s Airports, Facing the Challenges of the 21<sup>st</sup> Century” is reviewed, which gives an overview of the new challenges of the present. In addition, the report also points out that the economic development impact of airports is important, which nowadays not only influences but basically determines a region. Following this, the study entitled “The social and economic impact of airports in Europe” is examined, which gives an insight into what role the European airports have in boosting the accessibility and social development of regions, furthermore, the study touches upon the advantages attendant to the development of airports. Finally, the most recent report of the Airports Council International, the “Airport Economic Survey” from December 2009 provides an overview of the financial and economic factors determining the business environment of airports.

The last section describes two studies which due to their complexity are essential to be known for the profound analysis of the economic impact of airports. One of the studies is the methodological guide developed on the basis of indicators measuring the significance of airports and elaborated in the University of Valencia. The other one is the 2008 study developed within the Airport Cooperative Research Program, which defines the best methods and models by synthesising 30 case studies surveying the economic impact of airports.

## 1.1 Strategic challenges of the economic impact of airports

In the ACI's An Outlook for Europe's Airports (2010) report, the economic impact of airports is examined by setting up and analysing 4 crucial strategic challenges. In addition, the report deals with mapping the impacts of the economic and financial crisis beginning in 2008 on European airports, and presents the so-called new business models of airports. The outcomes of the liberalisation of European air transport have changed the rules of play concerning airlines and have forced them to implement business transformation process. Since the government does not intend to invest in the infrastructure of airports and in the unlimited access of airlines to airport superstores – where we can get products at the best prices – present Europe-wide, airports become self-financing, diverse and competitive businesses from mere infrastructure service providers dependent on public subsidy.

The global economic and financial crisis beginning in 2008 has even intensified the pressure of airports due to competition. While the airlines no longer pay the full costs of used infrastructure, the consolidation process in progress leads to that fewer but much more dominant airline groups will be established in the 500 airports of the European aviation network. The competition also increases abroad, because European airports will need to attract the flight passengers of the fast-developing countries to growing extent. The pressure of competition manifests itself in that the business transformation of airports will continue in the near future. It is already a fact that new business models have emerged regarding European airports, and in these models every airport aims at dominating its unique market position and increasing its economic and operational efficiency (ACI 2010).

The fact that airports become independent businesses allows them to become generators of local and regional economic growth, which means advantages both on national and on European level.

**The airports of Europe not only help local economy but basically determine it.** This situation reinforces the fact that air transport is the heart of the modern globalised economy and there simply would not be any feasible substitute of the 150.000 flights forming the air transport network connecting Europe.

If airports still form one of the bases of economic growth and positively affect creating jobs, then new market-based view will be required concerning their economic role in the European economy. According to the sustainability agenda, the new economic and technological principles will considerably change the whole sector after a time. As a consequence, political decision-makers and leaders have to treat airports as dynamic and

independent businesses; furthermore, European airports must be empowered to face and manage today's **4 crucial strategic challenges** (ACI 2010):

1. Challenge concerning capacities
2. Challenge of environment
3. Challenge of connectivity
4. Challenge of security

1. According to the ACI (2010) report, despite the world crisis **the demand for air services is expected to double by 2030**. It is true that European airports plan investment of 120 billion euros and a general 41% capacity expansion in the period between 2000 and 2015 until 2030, but it will be hardly sufficient. According to the forecasts of the Eurocontrol, by then they will not be able to satisfy 11-25% of the demands, which **will result in congestions of unpredictable extent**, in addition, it will have spill-over consequences in terms of environment and the competitiveness of European economies. For this reason solving the challenge regarding the capacity of airports should become the main priority of the transport policy of the EU.
2. The **challenge of environment** starts from the logic that turning every transport model into environmentally friendly is an ambitious but necessary political aim. This is an inestimable challenge for aviation, which has technological and economic consequences. European airports have lived up to these challenges and have taken several environmentally aware measures, which have facilitated developing environmentally friendly airports, among others, the ACI Europe and its members have officially contributed to the neutralisation of carbon emission. The environmental challenge reveals that the EU policy and regulations should coordinate the growing air transport with environmental objectives. For instance, the existing environmental taxes and other unreasonable economic measures should be abolished, since these do not result in significant environmental development.
3. The basic idea of the **challenge of connectivity** claims that Europe risks its economic and social benefits from the world market integrating to an increasing extent if it does not establish adequate relationships with the other continents of the world. However, due to outdated intergovernmental restrictions, the connection with many markets outside the EU is restricted. The solution of the challenge is considered to be that the new, market-based view of airports should be given priority in order to develop an unrestricted free air transport area with the USA and Canada. A further aim is to create

a Pan-European and a Mediterranean air transport area by 2013-ra, which includes every country neighbouring the EU. The challenge of connectivity has also set initiating negotiations with Brazil, Russia, India, China and Japan as an objective.

4. The starting point of the **challenge of security** is the claim that efficient protection is above all in the current geo-political environment, and that the current security system is no longer sufficient. After investigating security systems they have created the idea that only one step security system should be in the EU and worldwide, in which the control carried out in the airports of other countries – even the very distant ones – are acknowledged and thus they avoid duplication. The current state results in that the clientele experiences increasingly unpleasant situations in the course of flight, moreover, statements have proved that security costs at present account for a considerably high proportion, approximately 35% of the operation of airports. Consequently, it would be necessary to develop new technologies, however, it would mean further costs for the airports, and therefore it is crucial that the governments do their share properly in the responsibility of the large-scale security of citizens through public subsidy.

The ACI in its 2010 report publishes the structure of the European airport sector to demonstrate the growing competition between airports. According to the report, the economic and financial crisis of so far unimaginable scale which began in 2008 will advance the business transformation of Europe's airports. While the long-term principles of air transport remain, as air traffic is expected to double by 2030-ra, the market of air transport will show great differences in the next years and will further intensify the pressure induced by competition Europe-wide from the aspect of airports both in foreign and in national context. European air transport has reached high development level, in addition, they expect high increase of demand in the near future due to passengers arriving from fast-developing countries, where together with the increasing standard of living the desire for travelling by air and the required financial conditions increase to a huge extent. The fact itself that these future flight passengers are enticed to travel to Europe or across Europe will urge European airports to greater competition contrary to airports in other parts of the world. Europe-wide the crisis has accelerated the stabilisation of airline networks, but also of low-cost travel services. In general, similarly to other businesses, much fewer airlines will go to the 500 European airports, thus there will be winners and losers as well.

Despite all these prognoses, new business models emerge for airports in Europe, which are considerably different from traditional forms which basically contain three airport types: **central airport, regional central airport and leisure/low-cost airport**. One of main features of these new models is “personalisation”, that is, the unique market position and strengths of every airport are utilised. This increasing specialisation reflects the demand to provide for every airport the utilisation of its own competitive advantages through diversification and innovation. The progressing business transformation of European airports means benefit not only for the air transport system. It is essential that it allows for the airports to become generators of local and regional economic growth. As a result, the airports have a unique role in the economic life of their societies, offering much more far-reaching advantages both on national and on European level. In the new business model of airports, apart from the three airport types of the traditional model – central airport, regional central airport, leisure/low-cost airport – six new airport types are differentiated (Table 1.1).

*Table 1.1. New business model of airports*

<b>Name</b>	<b>Characteristic</b>	<b>Example</b>
Airport network	<ul style="list-style-type: none"> <li>Coordinated airport group on national and/or regional level</li> </ul>	Aena (Spain), LFV (Sweden), PPL (Poland), Manchester Airport Group (UK)
Federal, Central Airport	<ul style="list-style-type: none"> <li>Central airports where the alliance groups of the main air routes are connected</li> </ul>	London-Heathrow, Paris CDG, Frankfurt
Airport city	<ul style="list-style-type: none"> <li>Airport which provides all the main services of a city without leaving the site</li> </ul>	Munich, Zurich
Multifunctional centre	<ul style="list-style-type: none"> <li>Airport city with widely international relationships</li> </ul>	Amsterdam-Schipol
Airport as final destination	<ul style="list-style-type: none"> <li>Airport which provides retail/provider centre for its own society</li> </ul>	Athens
Business traffic	<ul style="list-style-type: none"> <li>Airport which is adjusted to business travels</li> <li>(scheduled and not scheduled)</li> </ul>	London City, Farnborough, Le Bourget
“Low-cost” base	<ul style="list-style-type: none"> <li>Airport which puts emphasis on low-cost (charter) airlines</li> </ul>	Bergamo, Charleroi, Lpndon-Stansted
Freight platform	<ul style="list-style-type: none"> <li>Airport which specifically supplies the demands of freight operators</li> </ul>	Liege, Leipzig

*Source: own construction based on ACI (2010)*

Nowadays, airports are not only the tools for boosting tourism but also attract the establishment of new businesses as a magnet. The proximity of an airport having good connections is one of the key factors of the establishment of companies. In addition, it facilitates the attraction of skilled labour force and fosters economic transformation. In the past years, the airports have actually made local economies capable of diversification, which have turned to the promising sectors instead of decreasingly significant ones. Furthermore, for islands and the most distant regions the airports of Europe mean survival. Therefore it is not surprising that airports have become own right economic communities. These economic communities around large central airports are nowadays called airport cities, reflecting the fact that airports are economic engines similarly to the area of metropolises served by them. Owing to the many-sided development, airport cities have become the destinations of business life, shopping and recreation, the new global transport and business centres of the 21<sup>st</sup> century. Similarly, smaller airports can be considered dynamically developing micro economies. Their specialisation and the utilisation of market niches, such as freight, business aviation or lower-cost “from one point to another” services are reflected by that they have attracted warehouses, business complexes, leisure activities and hotels, which complement their basic business activity. At the same time, these airports “offering niche service” will represent even higher proportion among airport types with their ever more diversified scope of activities and the resulting revenue sources in the near future.

Based on the facts and information revealed so far we can assert that European airports not only support their local economy, but often determine it, and as a consequence of the large-scale development around airports the possibility of further economic growth is huge. In analysing the economic development impacts of airports, it is worthwhile to touch on the job-creation capacity of airports. The ACI report 2010 provides an overview of the role of the different European airport types in economy. A very important message of the report is that the airports of Europe will have to face these four main strategic challenges in the next few years, furthermore, political decision-makers and leaders have to treat airports as dynamic businesses and provide the crucial political conditions required for a better air transport industry in order to develop the new, market-based view, in which airports can exert their impact intensifying economic growth.

## 1.2 Social and economic impact of the airports of Europe

Apart from the ACI report 2010 described in the previous section, we should not disregard the fact that air traffic is expected to double by 2030, thus the market of air transport will show even greater differences, which inevitably makes the already fierce competition of Europe's airports even more tight. Based on this, it is necessary to be able to assess the challenges which Europe's airports must face in the increasingly intensifying competition. In addition, it is important to clarify the role of European airports as the driving force of tourism development and as national and regional economic engine in furthering the accessibility and social development of regions. To analyse these issues, the ACI report 2004 entitled *The social and economic impact of airports in Europe* provides an adequate theoretical background, since the main objective of the report is to explain and expand the special social and economic impact of European airports.

The 2004 report also highlights the benefits resulting from the development of airports. Today it is widely acknowledged that Europe's airports have considerable economic and social impact on surrounding regions. These impacts are much more thorough for the direct impacts on the operational environment of an airport, because the availability of air services means advantages for regional business interests and for consumers as well. It is also important that the role of transport in economic development has also been recognised by the European Commission in its Transport White Paper (ACI 2004).

The 2004-report is a summarising and complex study taking account of the most possible aspects, which includes the wide-ranging methodology and definitions of the study pack of ACI Europe published in 2000, and it also serves to set up far-reaching tendencies using the data of the reports made in the previous years.

The report divides the general economic impact of airports basically into four categories. These four categories are defined as direct, indirect, induced and catalytic (multiplier) impact.

1. **Direct** impact: employment and income related entirely or for the most part to the operation of airports
2. **Indirect** impact: employment and income generated by the chain of suppliers and service providers in the economy of the examined areas
3. **Induced** impact: employment and income generated by the income spending of direct and indirect employments in the economy of the examined areas
4. **Catalytic** (multiplier) impact: the broader role of airports in the economy of the examined areas, i.e. employment and income produced by the impact on developing the



productivity of business life, attracting economic activities, capital inflow and incoming tourism

Apart from analysing the four significant economic impacts, the study also analyses the social impacts of airports and the consequences of other restrictions affecting capacity and demand for air transport. The An Outlook for Europe's Airports report, reviewed in the previous section, mentioned that **airports** can also be defined **as national and regional economic engines**. In the 2004 report the starting statement is that airports have infrastructural conditions required for several economic activities. We can define this broader economic role of airports as catalytic impact.

The multiplier impact of an airport is manifested primarily in increasing business efficiency and productivity, and exerts its impact by providing easy access to suppliers and customers – especially in the case of large distances. Global accessibility is one of the key factors of establishing business activities and of success for every region in Europe (ACI 2004). For the decisions of establishment of business activities, the possibility of access to markets and external and international transport connections is absolutely crucial and decisive factor.

The claim in the ACI 2004 report that airports as essential conditions of regional accessibility and social development is supported by that passenger and freight transport by air belongs in the basic components of modern global economy, it contributes to the living standard of Europe's population through its social benefit, whose significance increases in the enlargements of the European Union. It makes possible for distant and island states to join in Europe's circulation more thoroughly, which at the same time helps their social integration. Although airports are the main generators of economic welfare due to their direct and measurable economic impact, their most important function is still to ensure the development possibility of other businesses. Airports are the basic parts of regional economic infrastructure and expanding the access to air services may increase the growing potential of the region, which, on the other hand, increases the demand for air transport, resulting in a kind of circulation.

### 1.3 Direct and measurable impact of airport activity

From the general economic impact of airports, the direct impact is the employment and income related entirely or for the most part to the operation of airports. In analysing the direct impact, the report starts out from that airports advance employment directly on the site and in the surroundings, but also indirectly through the chain of suppliers and service providers. In addition, the incomes obtained in these direct and indirect activities generate demand for goods and services in the economy, and as a result further employees are employed.

The report refers to that **counting per every million passengers Europe's airports maintain 2950 jobs on national, 2000 on regional and 1425 on subregional level**, if they include the direct, indirect and induced employments. From the comparison of the surveys of 1998 and 2003, it turns out that the productivity growth of Europe's airports has increased to a considerable extent in the past years, which reflects partly the development of airlines that do not offer other services and the effort to decrease industrial costs. Airports and air transport are important contributors to regional welfare through the supply of goods and services and their tax payment and they greatly contribute to local, regional and national GDP. The analysts attempt its numerical estimation and they reach the conclusion that if they take into consideration the direct, indirect and induced impacts of airports on the area where they offer their services, they produce 1.4-2.5% of the national GDP.

### 1.4 Multiplier impact of airport activity

The multiplier impact of airports is actually the broader role of airports, that is, employment and income produced by the impact on developing the productivity of business life, attracting economic activities, capital inflow and incoming tourism. Airports facilitate economic growth on regional and national level, at the same time they exert attracting impact on a wide range of economic activities. The broader economic role of airports is called **multiplier-impact**, which derives from the potential impacts of the accessibility of air services on the region served by the airport. The catalyst-impact of a certain airport exerts its impact primarily in increasing business efficiency and productivity through providing easy access to suppliers and customers – especially in the case of middle and large distances. **The impacts of the role of airports can be observed:**

1. in establishment decisions and competitiveness of companies

- in attracting new in-flow of investments effected by foreign, particularly overseas companies
  - in maintaining the existing companies of the area, whether they are settling investment companies or originally locally operating ones
  - in extending existing companies in competition with other areas
  - it supports the export successes of the companies in the area by ensuring passenger and freight transport connections with key markets
  - it increases the competitiveness of the economy and the participant companies through fast and efficient passenger and freight transport, furthermore
  - it contributes to citizens' quality of life by guaranteeing the travel despite local environmental impacts
2. in attracting business and leisure visitors, thus incoming tourism into the area, generating income and employment in tourism industry

**Tourism** is also one element of the catalyst impact of airports. Considering the entire European Union, tourism gives 5% of employment and GDP, and 30% of the foreign trade of services. The other element of the multiplier–impact of airports is ensuring passenger and freight transport connections with key markets, which supports the export successes of the companies in the areas. As a result of the globalisation of production coupled with greater demand for productivity, the logistical factors of supply chains have become key factors of business success. The companies no longer want to store large quantity of non-productive stocks, thus it increases the demand to transport the goods from the supplier and deliver them to the final consumer “just in time”. The use of air freight as a means of transport increases; particularly in the case of valuable low-weight goods or in the case of products whose transportation is extremely urgent (e.g. medical products).

The ACI (2004) report emphasises that the development of express freight centres in airports can represent independent, considerable investments, which may result in wider economic impact. They mention the Fedex centre as an example in the CGD Airport in Paris, which represents an investment of more than 200 million euros.

The estimation of the economic impact of airports, particularly the quantification of the catalyst-impact is just as complicated as the analysis of the broader impact of airports considering the operation of the entire economy. It is hard to separate what characterises specifically the airports and what describes other, broad factors. However, the report presents

a study with the help of which the impact of the accessibility of air services on the productivity of business life can be quantified. It also results from the multiplier-impact of airports that airports are often considered to be the basic economic engines of economic development. This finding can be applied on national, regional and subregional level.

The fact is that airports increasingly become multifunctional interchanges. The position of their network offers strategic advantage, which allows attracting wide range of economic activities into their area as new development poles; a so-called airport city is created beside the existing city centres. The planning of these areas must be coordinated cautiously in order to ensure that the development of activities related to the airport do not lead to the overcrowdedness of the area of the airport itself. The planning of the airport-area must be included in the general planning of the city area for maximising the development potential of the multi-centre city. Creating developed public road connections between airports and relating areas has an important role in exploiting the total economic potential of airports and in carrying out their central functional activities. Connectivity and accessibility of air services is even more important in terms of much more remote areas of countries which do not have other local advantages. One way to measure the link between the access to business activities and air services is to examine the companies' spending on air transport. On the basis of this we can determine the so-called "air transport intensive" sectors, which comprises the industrial sectors that depend on the accessibility of air services. The companies participating in this scope of activities are much more influenced by the proximity of the airport and the accessibility of air services.

## **1.5 2008 Report of Transportation Research Board**

In 2008 a study was completed within the framework of the Airport Cooperative Research Program, which comprises the best methods and models assessing the economic impact of airports. The 2008 report is actually a synthesis, which processes information based on the questionnaire of about 70 organisations and contains more than 30 case studies that analyse the impacts of airports on the community and the economic impact of airports. Airport operator and management agencies carry out economic impact studies for several reasons. The report has summarised for airport types the objectives behind making the economic impact study of a certain airport.

According to the report, the main reason for the economic impact studies is to demonstrate the significance and economic value of the airport for the community. A further reason is to justify the existence of airport investments by communicating the results and to convince decision-makers to prevent the inappropriate utilisation of the airport surroundings and to primarily follow business directives that raise interest towards the region. Not in the least, the results of the economic impact study as supporting documentation is also used by the Federal Aviation Administration (FAA) to perform cost-benefit analyses related to the various developments of airports. The 2008 report synthesises and grades the most frequently used indicators by the reviewed studies for economic impact study of airports and examined areas. These are the following:

1. Employment
2. Wages
3. Local/ regional spending
4. Tourism
5. Air traffic levels
6. Cargo
7. Military and emergency services
8. Time savings
9. Other

It is obvious that **studying employment and income impacts is indispensable for the analysis of the economic impact of airports**, but of course the profound examination of several other areas is necessary to show the complex and relevant impacts of airports.

The report also unequivocally **specifies the 3 main methods, with which the economic impact of airports can be best assessed**:

1. Input–output method
2. Collection of benefits method
3. Catalytic method

The **input–output method** measures three different impacts: *direct*, *indirect* and *induced* impacts. The **direct impacts** include the employment and output generated directly by the airport. The **indirect impacts** contain the employment and output which are generated primarily by non-airport companies but whose scope of activity is restricted to the airport. The **induced impacts** include the multiplier-impact, which is generated by the continuous

waves of spending originating from the direct and indirect impacts of the airport and concerning the entire economy. In the input – output method, the entire economic impact of the airport is the total of the direct, indirect and induced impacts (TRB 2008).

The **collection of benefits method** comprises the qualitative and quantitative measures of the *benefits* and *costs* of an airport, such as *time savings*; *saved costs* by using air transport; *capacity improvement* by taking over the traffic of other airports, and the impact on business life, recreation, commerce and community aims.

A **catalytic method** is used for the measurement of “*spillover-impacts*”, i.e. it measures how the airport benefits the supply-side impacts of the economy, such as investment and trade impacts and impacts on overall productivity of the economy. In contrast to the collection of benefits method, catalytic impacts can be often quantified in financial terms.

The input–output- and the collection of benefits methods have been applied to measure economic impact for a long time, but the catalytic method is one of the most recent methods. The input – output method is the most wide-spread form the procedures, which typically measures the total of the direct, indirect and induced impacts. It is important to note that the exact definitions of these impact-areas may vary in the studies. The direct, indirect and induced impacts are sometimes considered to be first-round, second-round and third-round impacts. The third-round impacts are usually the largest, because these can be “indirectly” originated from the first- and the second-round impacts (TRB 2008).

## **1.6 Methodological proposal of the University of Valencia to analyse the economic impact of airports**

The professor of the University of Valencia, Jose G. Montavlo’s significant study is also authoritative in analysing the economic impact of airports. This study is in fact a methodological guide developed on the basis of the indicators measuring the significance of airports for the profound analysis of the economic impact of airports. The indicators measuring the significance of airports are founded on two basic criteria: **benefit from travelling** and **economic impact**.

The approach based on the benefit from travelling is closely connected to the cost-benefit analyses. The benefit is calculated based on time savings, reduction of costs, travel safety and other aspects. On the other hand, there are benefit criteria that are difficult to measure, such as protection of civilians in case of flood or forest fire; number of graduates in air transport; externalities resulting from the accessibility of particular areas of the country (Montavlo

1998). The other approach of analysing the significance of the airport is based on its economic impact. The studies on alternative methods measuring the economic impact of airports divide the economic impact basically into three categories: direct, indirect and induced. The most frequently used method for analysing these impacts is the input-output analysis.

The methodological guide, similarly to the previous studies, categorises the economic impact of airports as the following: direct, indirect and induced impact.

1. **Measuring the direct economic impact:** The Federal Aviation Administration (FAA) defines the direct economic impact as *airlines, airport control, permanent suppliers and other, the economic consequences of the airport activities of directly interested lease holders*. The description differentiates between **site** and **off-site** activities, on the other hand, the ACI report reviewed in the first section examine only the direct impacts of site activities. The FAA specifies the criterion to describe the direct economic impact, namely that these impacts must be the direct consequences of the economic events in the airport, while in the definition of the ACI it is based on the differentiation between site and off-site activities. In the everyday practice these two concepts are not sharply differentiated.

The information required for the economic assessment of the direct impacts can be obtained from the operators of airports or authorities, and the majority of the listed information can be gained via inquiry and survey.

2. **Measuring the indirect economic impact:** The indirect impacts are the consequences of the economic activities of off-site companies serving airport-users. Contrary to the analysis of the direct impacts, one method of analysing the indirect impacts is the questionnaire. The questionnaire method provides relevant information only if a properly large number of samples is available and the questions are clearly suitable for assessing the indirect economic impact.

3. **Measuring the induced economic impact:** The induced impact is the outcome of the multiplier impact resulting from the direct and indirect impacts. The multiplier impact is generated by circulation of expenditure concerning employment and income. However, it is important to analyse the induced impacts only in local or regional context because some of these impacts spill over to other neighbouring regions. The methods suitable for analysing the induced impacts can be divided into three groups.

- a) Economic base model
- b) Econometric model
- c) Input-output model

a) Economic base model: the **economic base theory** is the result of the modernisation of export base theory, which is already founded on the new division of economic sectors. Its starting point: for the dynamic improvement of output and development, usually the expansion of traded, or resource-dependent activities and the emergence of new ones are needed (Armstrong–Taylor 2000; Malecki 1997). The inflowing income may bring about spillover impacts with the help of certain regional multipliers, thus it may accelerate the economic development of the region. A circular and cumulative development process starts, which may preserve the continuous intensification of the competitiveness of the region in a self-inducing manner. The calculation process with the economic base model is quite simple, but it has many deficiencies. The traded and non-traded classification is very problematic, particularly for complex products; consequently it is difficult to draw accurate inferences in connection with the generated impacts.

b) The main objective of the approach with the **econometric model** is to estimate the macroeconomic model of the regional economy by considering different variables, for example consumption, income, taxes and public expenditures. Two problems may emerge in this procedure. It can cause a problem that most variables are determined on national level, not at all on regional level, or only very little data is available, from which it is not worthwhile to build a model. Furthermore, to answer what induced impact the airport has on the region it is necessary to have macroeconomic variables of regional level. Secondly, aggregation may also cause a problem, since we have to apply a multiplier based on estimation for very different products and services. As a conclusion, it is not certain that we can accurately measure the induced impacts with this method.

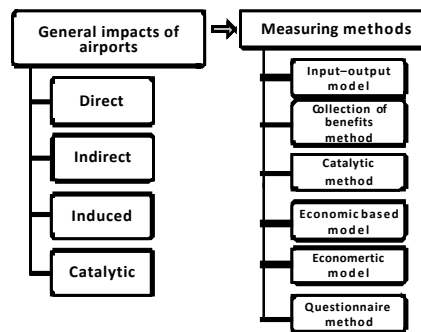
c) Applying the **input-output model** for measuring the induced impacts in analysing the sectoral and desegregated changes in demand. Its main advantage is that it takes into account the sectoral differences in calculating the multiplier. The potential shortcoming of the method is that large quantity of data is needed to make input-output tables, and these tables assume certain types of production relationships between the products. Despite these disadvantages, the input-output method is the most frequent approach to analyse regional economic impact. The economic and the econometric models can only serve as a fast and preliminary assessment of the economic impact.



## 1.7 Conclusion

The study has reviewed the best benchmark examples developed for the economic impact studies of airports. The first two sections include the reports of the Airports Council International (ACI), which provide an overview of the new challenges of the present, the financial and economic factors determining the business environment of airports and the role of European airports in the accessibility of regions and facilitating their social development. Apart from the ACI reports, we have reviewed the methodological guide which was elaborated in the University of Valencia based on the indicators measuring the significance of airports, and the 2008 study created within the framework of the Airport Cooperative Research Program, which defines the best methods and models by synthesising 30 case studies on the survey of the economic impact of airports.

*Figure Error! No text of specified style in document..1 General impacts of airports and their measuring methods*



*Source: own construction*

It has been revealed from the reviewed methodological studies that in analysing the economic impact of airports the first step is to identify what type of economic impact we encounter. We can divide the impacts of airports on the economy into four groups: direct, indirect, induced and catalytic (multiplier) impact. Different methods are indicated to measure these impacts in the literature (Figure 1.1).

It became clear from the reviewed studies that from the methods developed for the economic impact study of airports the input-output analysis is the most accepted and the most frequently used, at the same time, the multiplier analysis (catalytic method) is the newest method, whose great advantage is that the catalytic impacts can be often quantified in financial terms with the used methodology. A further finding concerning the impact of airports on the economy is that

it is not sufficient to examine only the impact on employment but the income impacts must be also quantified in the economic impact study of airports.

## 1.8 References

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