

# **The joint venture terminal 2 at Munich Airport and the consequences: A competition economic analysis**

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## **Abstract**

The project terminal 2 at the Franz Josef Strauß Airport in Munich can be described as a unique process in Germany. The construction is a joint venture between an airport operating company (Flughafenbetreibergesellschaft München GmbH) and an airline (Deutsche Lufthansa AG). A vertical integration of an airline into a part of the airport infrastructure, a terminal, has been established for the first time. Discrimination incentives arise, that could not be recognized at the previous status quo, whereby all infrastructure facilities were operated exclusively by the respective airport company. To ensure competition at the level of flight providers, an access to the airport infrastructure without discrimination towards particular providers must, however, be guaranteed. Therefore this paper suggests several possible solutions for an efficient re-regulation. These focus on three problem areas, namely the award of slot and terminal infrastructure user rights, the regulation of airport user fees as well as the institutional setting of an optimal regulation authority.

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## 1 Introduction and problem definition

The joint project completed at Munich Airport is unique in Germany, as for the first time a terminal has been constructed in a joint venture between an airport operating company and an airline. This project represents a significant break with the previous status quo in the German and European model for airport terminal management. Prior to the Munich airport project, all existing terminals have been financed, planned and carried out by the respective airport operating company alone.<sup>1</sup> Furthermore the project is not a joint venture in the usual meaning between private enterprises because the Free State of Bavaria, the Federal Republic of Germany and the City of Munich are the exclusive owners of the airport operating company of Munich Airport. The project can therefore also be considered as a public-private-partnership (PPP). Outside of Europe, such a project would not be considered unusual. Particularly at American airports airlines are also involved in terminal facilities which, however, are usually purely financed by the private sector.<sup>2</sup>

Against this background and under consideration of the given air traffic infrastructure, the implications for competition and competition policy are worked out in the course of the paper.<sup>3</sup> Cost aspects are also taken into consideration. In addition, this paper analyses whether this development requires an alternative regulation.

In a first step the terminal project is introduced in paragraph 2. The two participating enterprises as well as the conditions and responsibilities of the project are presented in detail. In addition, an analysis of the incorporation of terminals into the airport infrastructure in general and of terminal 2 under consideration of the local conditions is performed. Effects on competition are addressed in paragraph 3. Three scenarios with regard to different ownership and regulation are developed which contain the case of a monopolistic airport operator, the case of the joint venture terminal 2 as well as terminal competition. Lastly, a conclusion and an outlook are presented.

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<sup>1</sup> Although partly privatized airports and therefore privatized terminals already exist in Germany, these private airport corporations, however, do not offer any air traffic services. See for a summary BECKERS, T. ET AL. (2003), pp. 12 ff.

<sup>2</sup> JFK airport in New York is one example.

<sup>3</sup> For a separation of the air traffic and the air traffic infrastructure sector see section 2.2.

## 2 Basics and object of the analysis

### 2.1 History of the joint venture terminal 2 and the current conditions

The airport Munich Franz Josef Strauß (Munich Airport) began operations on May 17th, 1992 and is situated approx. 28 km northeast of the centre of Munich. With a passenger volume of over 26 million and 383,000 flight movements in the year 2004, it is considered the second largest German airport and the eighth largest in Europe.<sup>4</sup> No other airport in Europe shows such high rates of increase in passenger numbers,<sup>5</sup> influenced particularly by the decision of Deutsche Lufthansa AG (DLH) in the 1990s to use Munich as its second German hub.<sup>6</sup>

Airport operator is the Flughafen München GmbH (FMG), share holders the Free State of Bavaria (51%), the Federal Republic of Germany (23%) and the city of Munich (23%).<sup>7</sup> The airport company is the sole owner and operator of the runways and of the airports original single terminal (terminal 1), which has a capacity of between 20 to 25 million passengers per year.<sup>8</sup> With an annual passenger volume of over 20 million since 1999 the terminal infrastructure at Munich Airport can be characterised as a bottleneck prior to the opening of the new terminal 2.<sup>9</sup> Constructing an additional terminal has consequently been urgently necessary from the view of the airport operator but also from the point of view of airlines and particularly of DLH. Due to the development of passenger numbers FMG and DLH announced in April 1998 their intent to build a new terminal together. This intention was put into writing in a "memorandum of understanding" between the two partners

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<sup>4</sup> Ranking of airports according to annual passenger volume, see MUNICH AIRPORT (2005).

<sup>5</sup> The passenger volume has more than doubled since 1992. In 2004, the increase amounted to 10.8%. See MUNICH AIRPORT (2005).

<sup>6</sup> See MUNICH AIRPORT (2004), p. 6.

<sup>7</sup> See MUNICH AIRPORT (2004), p. 9 and EC (2002), pp. GER-9 ff.

<sup>8</sup> Terminals provide docking stations for airplanes (Gate) and provide areas for custom, health and security services as well as for lounges in an immediate proximity to these stations. The passenger check in is traditionally also carried out here. See BECKERS, T. ET AL. (2003), p. 6.

<sup>9</sup> See MUNICH AIRPORT (2004), p. 6. The capacity problem is intensified by peak loads both over the day and over the year. The passenger emerge amounted on September 24th, 2004, the top day, to 105,040 while the average passenger emerge per day was 73,264. See MUNICH AIRPORT (2005).

on July 15th, 1998.<sup>10</sup> This was the first case in which an airport operator and an airline company agreed to finance and operate airport infrastructure together.

DLH, founded as a state owned national flag carrier in the 1950s, is one of the largest airlines worldwide. Measured in passenger volume, it is the number one carrier in international line haul and fifth in all line haul according to the IATA-Ranking 2003.<sup>11</sup> After first steps of privatization in the 1960s DLH was privatized completely on October 13th, 1997. To safeguard its position as a German airway, all shares were changed into registered shares with restricted transferability in 1997, which furnishes information about the nationality of the owners. Since the 1990s, DLH follows a two hub strategy with parallel use of Frankfurt am Main and Munich. In May 1997 Lufthansa was co-founder of Star Alliance, one of the largest global strategic alliances today. In addition, several cooperation agreements of global, European and regional nature were concluded.<sup>12</sup>

The intense cooperation between airport and airline company was already well underway during the planning and construction phase with the foundation of a project team (project team terminal 2) consisting of 30 experts of both partners. The team's goal was to build a terminal tailored to the customer needs and clearance processes of DLH.<sup>13</sup> This team has, together with an Advisory Council consisting of representatives of the free state of Bavaria, the Federal Republic of Germany, the city of Munich, FMG and DLH, taken on responsibility for the supervision of FMBau.<sup>14</sup> The basic conception of the joint venture is presented in figure 1.

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<sup>10</sup> See KLINGENBERG, C., KLINGELHÖFER, S. (2004), p. 112. First considerations and ideas for a new, second terminal go back to the year 1997.

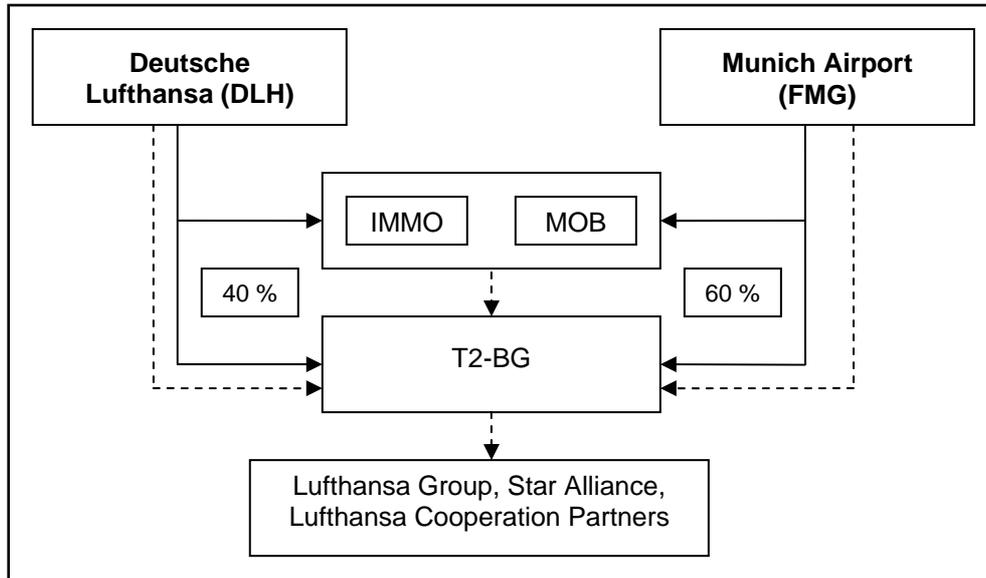
<sup>11</sup> IATA WORLD AIR TRANSPORT STATISTICS, see DLH (2005).

<sup>12</sup> See DLH (2005).

<sup>13</sup> See MUNICH AIRPORT (2004), p. 9.

<sup>14</sup> See KLINGENBERG, C., KLINGELHÖFER, S. (2004), p. 114. The FMBau has taken on the triggering of orders to planning offices, architects, building firms etc. as well as the supervision of these companies. The Free State of Bavaria, the Federal Republic of Germany and the city of Munich are involved in FMBau.

**Figure 1: The parties involved in the project terminal 2**



Source: *Representation of one's own* by analogy with KLINGENBERG, C., KLINGELHÖFER, S. (2004), p. 113 and Kerkloh, M. (2004), slide 11.

In order to separate ownership and operation most effectively, two companies for movables and immoveables (MOB and IMMO) as well as an operating company for terminal 2 (T2-BG) were set up. At all three companies, FMG holds a share of 60% and DLH of 40%. Decisions are taken jointly in accordance with the basis contract. The operating company rents movables and immoveables, part of the Munich Airport infrastructure, from MOB and IMMO. It also purchases ground handling from FMG and passenger handling from DLH.<sup>15</sup> It then sells the complete product consisting of handling and terminal use exclusively to Lufthansa Group, Star Alliance members and other Lufthansa cooperation partners who in return pay user fees to T2-BG. T2-BG gains additional revenue from the lease of areas for catering and retail.<sup>16</sup> T2-BG then distributes the arising profits to FMG and DLH in accordance with its shares. This also has to be described as new because for the first time an airline is benefiting from the profits of the Non-Aviation sector.<sup>17</sup>

<sup>15</sup> See KLINGENBERG, C., KLINGELHÖFER, S. (2004), p. 114 and KERKLOH, M. (2004), slide 11.

<sup>16</sup> The profits in the Non-Aviation sector in general exceed that one of the Aviation sector. The large revenues result from local rents and do not justify any regulation (see section 2.2).

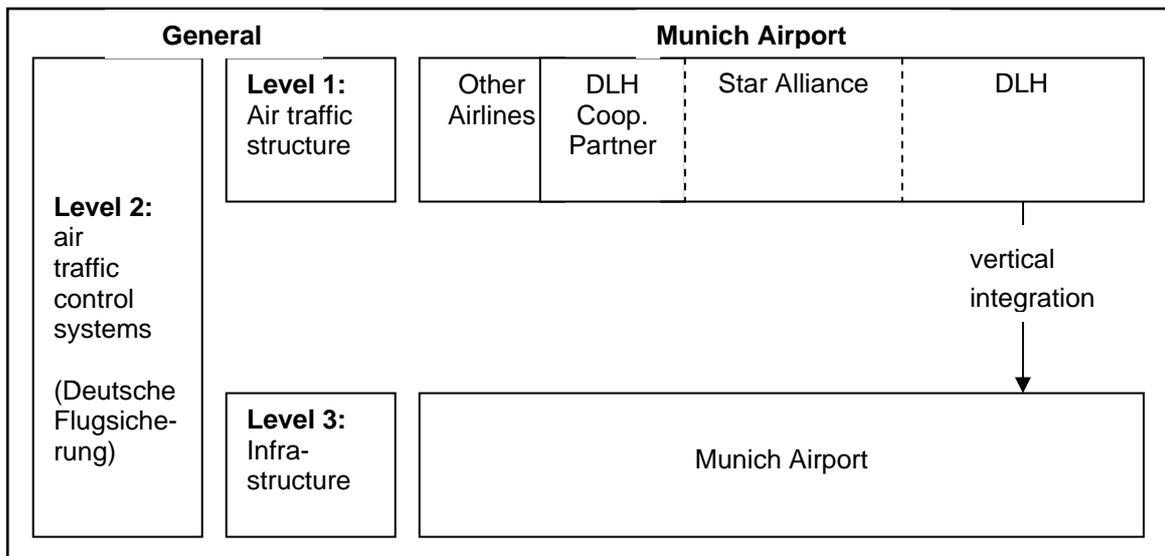
<sup>17</sup> For definition and classification of the Non-Aviation sector see section 2.2.

The new Terminal 2 began operations on June 29th, 2003, costing approx. 1.3 billion euros after completion of all work. 950 million Euros were spent for the bulk of the terminal, financed jointly by FMG (60%) and DLH (40%). FMG bore almost all other costs, for example for aprons and tunnels, connecting terminal and airport.<sup>18</sup> Terminal 2 can handle up to 25 million passengers per year. Overall capacity at Munich Airport has increased to 50 million passengers altogether through the construction of the second terminal, or almost double the original capacity.<sup>19</sup>

## 2.2 The position of Terminal 2 in context of air traffic sector structure in general and in Munich

The air traffic sector can generally be divided up into three levels.<sup>20</sup> Level 1 contains the supply of air traffic that is the real flight connections. The construction, operation and coordination of air traffic control systems are ascribed to the second level. Level 3 provides air traffic infrastructure, i.e. the construction and operation of airports including terminal facilities. An overview of this three-level-structure is given in the following figure 2.

**Figure 2: Comparison: Structure of the air traffic sector in general and at Munich Airport**



Source: *Representation of one's own* by analogy with Knieps, G. (1996), p. 68.

<sup>18</sup> See KLINGENBERG, C., KLINGELHÖFER, S. (2004), p. 116.

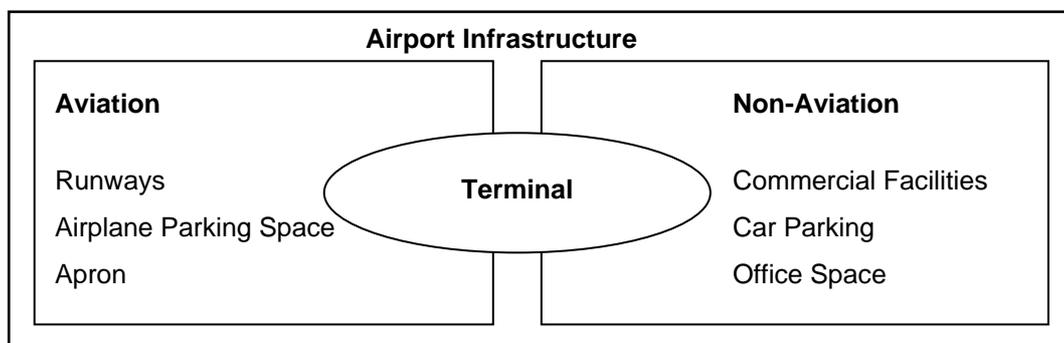
<sup>19</sup> See MUNICH AIRPORT (2005).

<sup>20</sup> See KNEIPS, G. (1996), p. 68.

For historical reasons, the three levels are vertically separated not only in Germany but also in Europe and in most non-European countries.<sup>21</sup> Such a vertically separated constellation also existed at Munich Airport prior to the construction of Terminal 2. DLH was only engaged in level 1, the supply of air traffic services, the coordination of air traffic management was carried out by Deutsche Flugsicherung and FMG has appeared as a supplier of airport infrastructure.<sup>22</sup> FMG remains active exclusively on level 3 after the joint venture. On the other hand, DLH integrates vertically into the level of airport infrastructure with this project. More exactly a backward integration is carried out from the view of DLH.<sup>23</sup>

The participation or vertical backward integration of DLH, however, does not refer to the entire level 3 but only to the special infrastructure facility terminal. Therefore, in order to evaluate the terminal project economically, a disaggregated analysis of airport infrastructure is necessary. At first a graphic presentation is carried out in figure 3.

**Figure 3: The connection between terminal, Aviation and Non-Aviation area**



Source: *Representation of one's own.*

<sup>21</sup> Exceptions are, e.g., the airport JFK in New York, where the terminals are owned by several airways and the airport Aeropuertos Argentina which is integrated into level 1 vertically forward by minority participation of Argentine LAPA airways. See SEREBRISKY, T. (2003), p. 2 f.

<sup>22</sup> Level 2 will not be addressed in the following since for German air traffic control nothing changed with the terminal 2 project. For a discussion of competition potentials at this level see e.g. EWERS, H.-J., TEGNER, H. (2002).

<sup>23</sup> For vertical integration see WILLIAMSON, O. (1986), WILLIAMSON, O. (1990), PICOT, A., FRANCK, E. (1993), pp. 181 ff. and LIPCZYNSKI, J., WILSON, J. (2001), chapter 9.

In principle, the airport infrastructure can be divided into Aviation and Non-Aviation sector.<sup>24</sup> The simplest form of dividing the facilities is to discuss whether they are necessary for the supply of air traffic services. Against the background of a competition analysis, the fact is important that none or hardly any relevant competitive concern can generally be ascribed to non-aviation facilities, such as commercial facilities, car parking and space for office.<sup>25</sup> These facilities are not essential for the supply of air traffic services and can moreover be duplicated outside of the airport.<sup>26</sup> Therefore they cannot by definition be considered essential facilities<sup>27</sup> and are excluded in the following analysis.<sup>28</sup>

Considering this, aviation facilities, such as runways, airplane parking spaces and aprons, are indispensable for air traffic. In addition, they cannot be easily duplicated at every location. Duplication may also be undesirable due to cost duplication.<sup>29</sup> Moreover costs are sunk in relevant ranges so that potential competitors can be deterred from market entry. In this context an airport can also be considered as a protected, incontestable and natural monopoly in the extreme case.<sup>30</sup> The construction of such facilities, such as runways, in addition is frequently hindered by politics or citizens' action groups so that altogether duplication is not possible at an airport or in its vicinity or at least long time periods must be estimated.<sup>31</sup> This problem is called a state or institutional barrier to

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<sup>24</sup> See KUNZ, M. (1999), pp. 3 ff.

<sup>25</sup> See e.g. EUROPE ECONOMICS (2001), pp. 12 ff.

<sup>26</sup> This also applies to other facilities or areas like catering and freight terminals or maintenance halls for scheduled inspections that are also duplicable.

<sup>27</sup> Facilities are regarded as essential if, firstly, they are indispensable to reach a customer and, secondly, cannot be duplicated with adequate means. See KIRCHNER, C. (1999), p. 95. These conditions correspond to the criteria of a (monopolistic) bottleneck. If the characteristics of a natural monopoly are given, a supplier can provide the facilities more cost-effectively than several and therefore no active substitute exists. No potential is available because of sunk costs. See KNEIPS, G. (2002), p. 61. It can also be impossible to duplicate a facility due to geographical conditions that prevent the construction of a second one.

<sup>28</sup> Thus, regulation questions get obsolete.

<sup>29</sup> Whether economies of scale are exhausted at the construction of an airport is discussed controversial in literature. See DOGANIS, R. (1992), PELS, E. (2000) and STARKIE, D. (2001 and 2002).

<sup>30</sup> In principle, there exists a natural monopoly up to a demand to the double least optimal plant size. See FRITSCH, M., WEIN, T., EWERS, H.-J. (2005), p. 191.

<sup>31</sup> See BRUNEKREEFT G., NEUSCHELER, T. (2003), p. 257.

enter. Taken together, the question about an optimal regulation inevitably arises for this kind of facility.<sup>32</sup>

The assessment of duplication and thus also the discussion of alternative regulation scenarios gets an additional dimension if an inter-airport view is considered. The fundamental question here is whether there exists the possibility of substitution of such facilities at other airports. For this analysis, the type of connection has to be taken into account. For origin and destination (O&D) traffic it can be assumed that the distance to the nearest alternative airport and therefore the additional travel time will influence the customer's decision to use an alternative airport.<sup>33</sup> The valuation of additional travel time will also differ for different user groups. Users with extremely time-sensitive travel demands, such as business travellers, will be less likely to use alternative airports since they have a high valuation of time and therefore high opportunity costs. Competition from surrounding locations in this respect does not take place. The calculation of the average tourist can be assessed quite differently because tourists are far more likely to spend time in order to save money than a business traveller (i.e. travel to a competing nearby airport with lower fares).<sup>34</sup> At transfer connections, in principle, it is possible to use alternative hub airports, but depending on the geographical location it can be connected with higher (time-) costs. In this respect it is general to name as not clear, whether an economically reasonable alternative is given per se.

Terminals take the characteristics of a kind of hermaphrodite position, as some parts of terminal infrastructure belong to the aviation and others to the non-aviation sector. Such a disaggregated analysis of facilities within a terminal (terminal infrastructure) is important to evaluate the economic impact of the joint venture. Gates, e.g., belong to the aviation sector and can be character-

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<sup>32</sup> This is valid notwithstanding of whether it is an airport operated publicly or privately.

<sup>33</sup> See BRUNEKREEFT G., NEUSCHELER, T. (2003), p. 267 f.

<sup>34</sup> For a tourist the use of a surrounding airport is always considered if he judges the saved journey time using the near facility lower than the price savings using the surrounding airport. These considerations can also be transferred to goods traffic because of a likewise little time preference. Therefore the use of alternative airports in goods traffic gets possible. In this sector, further traffic modes - transportation by truck, train or ship- in addition are also of importance. The inter airport view therefore must be enlarged by these transportation alternatives (intermodal competition). Altogether, a restricted possibility of substitution can be located for tourist and goods traffic. See BRUNEKREEFT G., NEUSCHELER, T. (2003), p. 267.

ised as essential for the supply of air traffic services. Also, they cannot easily be duplicated economically, since the number of gates at a given terminal can be assumed to be fixed. The possibility of constructing an additional terminal would have to be evaluated. Other facilities in the terminal building, such as cafés or restaurants, belong to the Non-Aviation sector because they are not indispensable for air traffic and furthermore duplicable as shown in the general explanations to the Non-Aviation sector. Thus, no competition problems exist. These facilities consequently also remain unconsidered in the further course.

The general explanations above apply to the terminal 2 in Munich in the same measure. The extensive gastronomic facilities and stores at Terminal 2 have to be assigned to the Non-Aviation sector. 18,000 square meters offer space for about 110 stores and restaurants in the central market place of Terminal 2. Altogether 112 Gates, distributed over three levels, belong to the Aviation sector. 75 parking positions exist, 24 with airline passenger bridges, 4 positions for regional airplanes and 47 on the eastern apron.<sup>35</sup> Terminal 2 was conceived as a transfer terminal while terminal 1 originally was constructed for O&D- traffic.<sup>36</sup>

### **3 Competition Analysis**

#### **3.1 Questions of ownership and regulation scenarios in theory and practice**

##### **3.1.1 Scenario I: The monopoly of airports as a previous status quo**

Until putting Terminal 2 into operation, the complete airport infrastructure in Germany has been to 100% in possession of the respective public or private airport operator, i.e. also the one in Munich.<sup>37</sup> In this regard, monopolistic structures can be recognised. The suppliers of airport infrastructure are principally not integrated vertically forward and do not offer any air traffic services. Since

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<sup>35</sup> See MUNICH AIRPORT (2004), pp. 12 ff.

<sup>36</sup> See MUNICH AIRPORT (2004), p. 7.

<sup>37</sup> The public hand is still the sole or majority owner of all 18 international traffic airports in Germany. Moreover, 21 regional airports as well as 350 smaller airports exist, which to a low part are operated purely private. In context of the privatization of major airports in Germany (e.g. Frankfurt am Main, Düsseldorf, Hamburg, Hanover, Saarbrücken) it only comes to partial privatizations. The airport operating companies are partly involved in several airports (e.g.: Hochtief Airport GmbH is involved both in Düsseldorf airport and in Hamburg airport). See BECKERS, T. ET AL. (2003), pp. 10 ff.

parts of the airport infrastructure belong to the aviation sector, i.e. particularly slots and terminals, and have already been characterised as bottlenecks, they have required regulation. The general intention is or should be to prevent the potential problems arising with the existence of a monopoly<sup>38</sup>, such as artificial shortage of supply<sup>39</sup> and to ensure an access free of discrimination to the airport infrastructure. Through this, competition at Level 1, supply of air traffic services, shall particularly be safeguarded.

The legal frame for German airports is outlined by the Luftverkehrsgesetz (LuftVG) and the Luftverkehrsziassungsordnung (LuftVZO). § 43 LuftVZO assigns the states as regulators (Landesluftfahrtbehörden) in which the federal has a right to object. A nationwide regulation authority does not exist. § 43 LuftVZO read in conjunction with § 6 LuftVG provides a regulation of landing, passenger and clearance fees as well as fees for aircraft parking.<sup>40</sup> Airports must have approved their charges by the aviation agencies of the states<sup>41</sup>, except for few exceptions on the basis of a cost plus regulation.<sup>42</sup> Problems arise among others by missing incentives for cost reduction and a potential conflict of interest of the public hand which appears as owner and regulator at the same time. A price regulation also can prevent efficient scarcity pricing.

According to §§ 6-10 LuftVG, moreover, the construction and the operation of airport infrastructure facilities are subject to a special project approval procedure. This stipulates a hearing of all objections of persons affected by the construction. As a consequence long planning and approval periods arise.<sup>43</sup>

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<sup>38</sup> A market failure is existent due to the natural monopoly and sunk costs.

<sup>39</sup> The possibility of avoiding an inefficient Cournot monopoly output by price regulation can be limited for capacity constrained airports. If capacity restrictions equal monopoly output, price regulation would have merely distributive effects. See BRUNEKREEFT, G., NEUSCHELER, T. (2003), p. 273. Moreover, airports may not have an incentive to reduce output due to the complementary relation of Aviation and Non-Aviation sector. A reduction of output in the aviation sector will consequently reduce output and profits in the Non-Aviation sector. See STARKIE, D. (2001), p. 126.

<sup>40</sup> See WOLF, H. (2003), p. 322 f.

<sup>41</sup> See HÜSCHEL RATH, K. (1998), p. 341 f.

<sup>42</sup> The airports Hamburg and Frankfurt am Main are subject to a Price Cap regulation.

<sup>43</sup> See WOLF, H. (2003), p. 60.

Council Regulation (EEC) 95/93 on common rules for the allocation of slots at Community airports forms the legal frame for the award of slots in the European Union and thus also in Germany. It is based on guidelines set by IATA. The queried aim is to provide efficient use and non-discriminatory access to airport slots. Core of the directive forms an administrative allocation of slots by a fixed priority order. The most important award criterion is the historical right, the so-called grandfather right. This means that an airline has the right to use slots it was assigned to at the same time during the preceding equivalent season.<sup>44</sup> In other words, an airline which has got once a surcharge keeps the right as long as it uses it.

This briefly outlined status quo and the regulation given have been discussed for a long time. On the one hand, particularly the privatization of airports is discussed.<sup>45</sup> On the other hand, the regulation with regard to slots and terminals (including airport gates) is in the focus to ensure a workable competition at the air traffic services level.<sup>46</sup> Without being able to lead a final discussion of the advantages and disadvantages of a privatization of airports in this place, two main arguments for a privatization shall be mentioned. Firstly, the incentives in the private industry under a suitable framework lead to an efficient performance.<sup>47</sup> This is not valid only in theory but can be derived empirically with a look at studies from other deregulated areas which prove clear efficiency profits.<sup>48</sup> Secondly, the primary objective of private enterprise can be considered, unlike that of public enterprise, to be economic success. The political influence on private enterprises is fundamentally less because of this.

The European slot allocation approach does not conform to the criteria of economic efficiency<sup>49</sup> and existing administrative procedures are likely to result in inefficiencies: firstly, the scarce airport capacity is not used by those airlines who value it most (allocative inefficiency). Secondly, compe-

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<sup>44</sup> See EEC 95/93, article 8, paragraph 1a.

<sup>45</sup> See e.g. BECKERS, T. ET AL. (2003) and WOLF, H. (2003).

<sup>46</sup> See e.g. BOYFIELD, K. ET AL. (2003) and JONES, I., VIEHOFF, I. (1993).

<sup>47</sup> Particularly the abolition of institutional market entry barriers is required.

<sup>48</sup> By this joint venture potential inefficiencies of purely public owned facilities, indicated by research results of the new political economy, can be reduced at least partly. This is due to the fact that DLH can bring in her know how and thus rise efficiency in technical and qualitative regard.

<sup>49</sup> See KALLFASS, H. (1990).

tion in the downstream market of airline services is prohibited (competitive inefficiency). In addition, the regulation is to be judged infrastructural inefficient since scarcity rents do not fall to the airports who could enlarge capacity by investments. The allocation of terminal capacities on the other hand lies in the responsibility of the airport operator to this day.

The long-term reform plans of the European Commission consider a correction of the directive 95/93.<sup>50</sup> The Commission particularly deliberates the introduction of slot trading and auctions. Of particular interest when considering this issue is that some suggestions include terminal capacity in the definition of a slot. The problem of terminals as a decisive bottleneck, often discussed in American literature, is taken up with that explicitly. In this meaning, a study of DotEcon suggests the auctioning of user rights for runways as well as stand and terminal capacity.<sup>51</sup> Considerations of the British regulation authority CAA for slot trading also contain thoughts about trading terminal capacity user rights.<sup>52</sup> A lack of attention to the possible bottleneck factor terminal within the US buy- sell-rule was criticized by many economists.<sup>53</sup>

### **3.1.2 Scenario II: The project terminal 2**

A new scenario in Germany emerged with regard to airport ownership by the joint venture terminal 2. Even though privatizations have already taken place before, three serious, competition policy relevant differences can be recognized: Firstly, the private enterprise is not engaged in the complete airport infrastructure. The private engagement refers just to one terminal. Secondly, DLH is not a private airport operator in the narrower sense but rather a genuine supplier of air traffic services. Therefore, the joint venture has to be considered as a vertical (backward-) integration by DLH. Thirdly, a close economic cooperation takes place by this project between an airline and a public airport operator.

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<sup>50</sup> See EC (2001).

<sup>51</sup> See DOTECON (2001), pp. 68 ff.

<sup>52</sup> See CAA (2001), p. 17.

<sup>53</sup> See HARDAWAY, R. (1986), pp. 45 ff.

Because of diverging ownership structures and their possible affects on competition the question occurs whether regulation is in need of a reform with regard to slots and terminal infrastructure. It is particularly necessary to analyze whether discrimination incentives arise, market power is transferred and effects on competition at the level of flight services are expected.

### **3.1.3 Scenario III: Terminal competition**

At American airports airline companies often operate terminals. As opposed to Scenario II, purely private operators can typically be identified here. These often conclude long-term, exclusive-use lease agreements of several decades on terminal use. Joint ventures between airlines can be found as well as the operation of entire facilities by a single airway. JFK airport is one example where several terminal operators can be found. DLH and three other airlines of the Star Alliance (Air France, Korean Air, JAL) are involved with 25% each at one of the terminals (terminal 1).<sup>54</sup> Furthermore the regulation of American airports is considerably different from German regulations. On the one hand, slots are not allocated according to "grandfather rights" but in general according to a first-come-first-serve principle. On the other hand, there is merely the regulation that sufficient terminal capacities should be offered in proportion to the slots at a given location.

Due to a different ideal or rather an alternative philosophy concerning terminal management and structure consequently a contrary picture including many independent operators arises. This – at least implicitly observable model – can be called "terminal competition". Such a competitive situation – which is economically desirable –, seems possible at the JFK airport due to the local conditions. The given situation stands out for two reasons: Firstly, altogether nine terminals and still more operators exist. Secondly, entrance of a new competitor is possible due to a free terminal (terminal 5) at any time. In this respect the existing competition disciplines the terminal operators so that a regulation appears to be unnecessary and an efficient terminal use is ensured.<sup>55</sup> This can be considered as a first best scenario.

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<sup>54</sup> See KLINGENBERG, C. (2002), Slide 21 and JFKIA (2005). Against this terminal 6 is only used by JetBlue.

<sup>55</sup> In addition, airlines can use alternative close-by airports.

However, such a competitive situation between terminals has to be described both factually and theoretically as rather unusual in the United States. Particularly the exclusive use, long-term lease agreements are regarded as an institutional market entry barrier by the majority of American economists. The problem is intensified by so-called "majority-in-interest" clauses which enable airways to prevent or delay capacity expansions at an airport.<sup>56</sup> As a consequence, the airport operators are restricted in their management, including the award and the approval of construction projects as well as in the last consequence (additional) leasing contracts. This contractual constellation is criticised as the most relevant market entry barrier for air carriers in the United States.<sup>57</sup>

Whether competition between alternative terminal providers is possible at all remains questionable in the opinion of some economists. The existence of several providers may inferre on exhausted economies of scale<sup>58</sup>, workable competition, however, is considered as less realistic as a stable cartel due to high sunk costs, few providers and very specific investments.<sup>59</sup> Moreover, political market entry barriers set narrow limits to the construction of competing terminals in Europe but also in the United States. In contrast the British Civil Aviation Authority (CAA) comes to a more positive assessment. Moreover, terminal competition could reduce the regulation base.<sup>60</sup> A final judgement cannot be presented in this paper. But as explained in chapter 3.1.2, such a competition was not the aim of the joint venture at Munich Airport and does not take place either.

### **3.1.4 Intermediate result**

The three scenarios introduced have shown the current German and international scientific discussion on an efficient regulation of airports. The focus of this paper is on the problem of the efficient regulation of terminal facilities. Furthermore, the effects of existing regulation on competition in

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<sup>56</sup> "Majority-in-interest"-Clauses (MI-clauses) assign special rights to the airline companies that carry out the majority of take-offs and landings. These contain a veto right to the construction of additional terminal capacity. MI-clauses are found at most hub airports in the USA. See FAA/EAST TASK FORCE STUDY (1999), p. IX and KNEIPS, G. (1996), pp. 102 ff.

<sup>57</sup> See e.g. HARDAWAY, R. (1986), pp. 45 ff. and MORRISON, S. A., WINSTON, C. (2000), pp. 22 ff.

<sup>58</sup> See KUNZ, M. (1999), pp. 5 ff.

<sup>59</sup> See STARKIE, D., THOMPSON, D. (1985), pp. 75 ff.

<sup>60</sup> See CAA (2001), p. 5.

the markets for flight services were discussed. With the participation of DLH into the terminal 2 the property structures in Munich approaches American conditions. Thus, the scientific discourse will increasingly discuss “American” questions. At least it could be shown that the Scenario 2 differs from today's Scenario 1 and adjusts to the American Scenario 3.

As discussed above, terminal competition presents a first-best solution. Every other state inevitably requires a regulation and therefore means a second-best solution. In the following it is therefore necessary to analyse the consequences of a change of the scenario on the competition: 1. between Munich Airport and alternative airports, 2. within Munich Airport and 3. between the airline companies. Moreover, the question on the necessity of a regulatory reform arises.

## **3.2 Assessment of the project terminal 2 and (re-) regulation approaches**

### **3.2.1 Potential effects on inter-airport competition**

To judge the impacts of the project terminal 2 on the intra-sectoral competition, it is necessary to categorize Munich Airport within the German, but also the international, airports. Munich Airport can be classified as a primary airport because it is a hub.<sup>61</sup> Besides Frankfurt am Main, it is the only facility of this kind in Germany. All others are to be classified into the categories of secondary airports, i.e. important ones that possess an attractive passenger catchment area and are attached from alternative network airline companies<sup>62</sup> to the respective hubs, and tertiary airports, all other airports with international air traffic.<sup>63</sup>

The Munich Airport therefore is mainly in competition with the airport Frankfurt am Main, but also with other European hub airports.<sup>64</sup> Secondary and tertiary airports can also compete with Munich Airport, but only to a lower extent. Hub airports also directly woo passengers like all other airports, but they are not in competition with secondary or tertiary airports for the hub-function. This is par-

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<sup>61</sup> A hub function is given, if passengers are flown from the airport of departure with relatively little airplanes to a central site, the hub airport, and are then transported from there to either another central site or directly to their ultimate destination with bigger airplanes. See KNEIPS, G. (1987), pp. 17 f.

<sup>62</sup> Network airline companies merely offer point-to-point connections.

<sup>63</sup> See BECKERS, T. ET AL. (2003), pp. 10 f.

<sup>64</sup> These primarily are the airports Zurich, Vienna and Milan. See EC (2002), GER p. 51 f.

ticularly because institutional market entry barriers like extremely long project approval procedures exist and in some cases subadditivity keeps potential competition away.<sup>65</sup>

From the point of view of Munich Airport, the cooperation with DLH brings considerable economic advantages compared to Frankfurt Airport or international competitors.<sup>66</sup> Firstly, the public airport operator only had to pay for 60% of the investment. In this respect, the corresponding public spending has been relieved to a not insignificant part. In addition, the DLH brings in know-how which is provided to the public airport almost free of charge. With the investment into the Munich infrastructure, the DLH furthermore commits itself with its air traffic services to the location for a longer period of time. This is because sunk costs occurred at the construction of terminal 2 in addition to the costs for the provision of the network. Due to the sunk costs, a comprehensible exit option for the airline, at least for the short and middle period, does not exist.<sup>67</sup> Even if a market exit has been planned for the long run, i.e. not using the Munich Airport as a hub anymore, costs would be irrevocably lost.<sup>68</sup> In addition, the terminal is tailored optimally to the needs of DLH so that a competitive advantage has arisen to the level of the air traffic services. As a genuine supplier of air traffic services, the DLH has a relatively low threatening potential. Thus the FMG could use its discrete power to raise prices due to its majority interest and increase its profits to the expense of the airline.

From the economic view on competition such a project seems to be unproblematic regarding inter-airport competition if the current German discussion on general privatization of airports is taken into account. In principle, the privatization of airports or parts of them and therefore also of terminals could be advisable and economically. In principle, there appears to be no problematic competitive situations with Scenario I in comparison to Scenario II.<sup>69</sup> A distortion of competition between

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<sup>65</sup> See BECKERS, T. ET AL. (2003), pp. 32 and 36.

<sup>66</sup> This is of course only valid as long as DLH appears as a supplier of air traffic services or shows corresponding passenger numbers.

<sup>67</sup> Furthermore the terminal shows the quality DLH wishes so that optimal traffic flight services can be offered.

<sup>68</sup> DLH could of course sell its share, but considerable losses are to be expected. A quantification of these losses is out of the scope of this paper.

<sup>69</sup> An efficient regulation of airports that would ensure competition in the markets for air traffic services will be discussed in the course of this work. See section 3.2.3 ff.

private and public airports is possible in Scenario I and II, because the public owned airports can always fall back upon a general tax income of their operators and furthermore because of a preferential political treatment. Such distortions can be avoided by a general privatisation of airports.<sup>70</sup> The advantage of the redress on general taxes has been changed into a disadvantage for the publicly operated airports, however, because lately the public registers are not filled to the extent of past years. Since the communes cannot -unlike the private operators- raise capital at the capital market, the private ones are in an advantageous situation especially regarding investment opportunities.<sup>71</sup> Yet, this advantage is relativised if the majority of public owned airports get financial resources from a private hand.

### **3.2.2 Potential impacts on intra-airport competition**

The participation of DLH in the project terminal 2 has no effect on intra-airport competition since terminal competition still does not take place at all. The main reason is that terminal 2 falls under the influence of the majority shareholder FMG, which is also the sole owner of terminal 1. Therefore a competitive relation between the completely public owned terminal 1 and terminal 2 cannot be expected. Even a future, potential competition can almost be excluded, since the structural and geographical prerequisites will not enable the construction of further competing terminals. Efficiency increasing potentials remain unexhausted. No first-best solution is possible at this location.

Such an assessment does not exclude the possibility of internal competition between the terminals. Such a competition, however, cannot be compared with the one on the market because the enterprise will maximise the overall profits instead of maximising the profits of the terminals individually. Inefficient supply of terminal infrastructure is not sanctioned by competitive providers, which would usually be the case with alternative enterprises. Therefore a market exit as the most extreme case is very unlikely.

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<sup>70</sup> This shall not be further discussed. See to this BECKERS, T. ET AL. (2003).

<sup>71</sup> The practice does point out that the public cash boxes apparently do not show the required volume any more, because privatizations are just performed in general due to financial scarcity.

### 3.2.3 Potential impacts on the air traffic competition

To judge the impacts on the flight traffic sector a short-term as well as a long-term consideration has to be made. Through this separation, the problem of scarce terminal capacity can be better dealt with. As a first effect, the construction of the new terminal doubled capacity. The bottleneck described above has therefore been overcome in the short or medium run. In the long term, however, a different picture could arise if total capacity would then be constrained due to increasing passenger volume. Such a situation is, e.g., forecasted by Munich Airport until 2015.<sup>72</sup>

From the DLH perspective, the advantages of this investment seem to predominate and result in competitive advantages.<sup>73</sup> On the one hand, DLH can optimally handle the demand of air traffic services because of the individual arranging of the terminal. On the other hand, DLH has purchased far reaching planning safety regarding terminal capacity at an important, European hub airport. Both advantages are valid in the short and in the long run. However, this explicit commitment could turn into a disadvantage if the framework conditions change in the long run. A Hold-Up problem, potentially resulting from the investment, could also occur.<sup>74</sup>

From a competitive point of view, the described constellation has to be regarded rather critically. Such an assessment takes into account that it is a public-private-partnership which means that the competitive advantages<sup>75</sup> only occur due to the participation of the public hand. The whole project could therefore also be interpreted as a (selective) support of DLH because FMG paid the larger part of the construction costs.<sup>76</sup> In addition, DLH could achieve better credit conditions due to the AAA-Ranking of the public hand.<sup>77</sup>

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<sup>72</sup> MUNICH AIRPORT (2005) estimates a passenger volume of 48.1 million per annum in 2015. This would indicate that capacity limits of terminal 1 and 2 would be reached.

<sup>73</sup> Otherwise, DLH would not have invested at all.

<sup>74</sup> Also compare to the explanations in section 3.2.1.

<sup>75</sup> These advantages for the DLH result from the optimized supply in the air traffic markets.

<sup>76</sup> In the context of the subsidy debate held generally such a terminal financing or partial financing could also put in order as a variety of a settlement bonus (here for an airline) or perhaps as a subsidy whose effects (follow-up costs) for the location cannot be assessed. It could be discussed consequently, whether these measures represent a regional or structure support. Furthermore it would have to be analysed whether it is not even an allowance violating European law. Such questions, however, are not object of this analysis.

<sup>77</sup> See PETZOLD, L. (2003).

Furthermore, the vertical integration of DLH into level 3 might cause a discriminatory, asymmetrical access to the terminal infrastructure.<sup>78</sup> As ascribed above terminal competition is not an option. Due to the participation of DLH in terminal 2, the German airline and the members of the Star Alliance can be suspected of a preferred treatment. The given regulations cause a conflict of interest because federation and country are regulators, airport operators, and shareholders of terminal 2 at the same time.<sup>79</sup> It is questionable whether a factual discrimination of terminal access can be prevented at all by the majority share of FMG. A clear indication for discrimination problems is that the complete terminal 2 is currently reserved for the DLH and the Star Alliance. This exclusive-use agreement contains half of the complete terminal capacity at Munich and is at least valid for 33 years according to the contract.

The problem of discrimination arises once scarcity appears. Such a capacity bottleneck cannot be recognized currently but in the long run.<sup>80</sup> In such a situation, competitors in the air traffic service markets could be replaced at least at Munich Airport by a discriminatory access and the position of the DLH could be strengthened and protected.<sup>81</sup> Generally, the problem of discrimination cannot be solved by an increase of the capacity in Munich since the local conditions do not allow for this, at least in any relevant time frame.<sup>82</sup>

The discrimination potential also depends on national and international substitutes for airlines, i.e. which additional airports can be approached and which costs of time as well as switching costs arise. At Frankfurt am Main, the sole national alternative primary airport to date, also considerable capacity bottlenecks exist. Hence a potential discrimination problem cannot be rejected. Whether sufficient and economically feasible capacities can be found abroad can not clearly be answered for

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<sup>78</sup> These difficulties correspond to the discussion around the competition effects of long-term exclusive use leasing contracts for terminals or gates at American airports which are identified generally as a market entry barrier. For a comprehensive summary see FAA/EAST TASK FORCE STUDY (1999), TRANSPORTATION RESEARCH BOARD (1999) as well as MORRISON, S., WINSTON, C. (2000).

<sup>79</sup> This means the regulator and majority operator will prefer the DLH. In this respect, no access free of discrimination ensured.

<sup>80</sup> It could also be assumed that at least DLH recognises the factor terminal as a future bottleneck and therefore participates in the joint venture.

<sup>81</sup> The discrimination of single airlines would not lead to turnover losses if scarcity prevails.

<sup>82</sup> Currently and also in future, terminal competition does not take place in Munich.

all airlines. It can be assumed, however, that alternative hub locations will be available only in the long run.<sup>83</sup> This can reduce the problem of discriminatory access to airport infrastructure at Munich Airport but this problem still remains when analyzing point-to-point connections.

### **3.2.4 Considerations and discussion of a new regulation**

As analysed above a discrimination problem can be identified in Munich with regard to the access to terminal 2. This problem is a result of the vertical integration of DLH into the airport infrastructure. As there is no competition between the terminals at Munich Airport neither at present nor to be expected in the future, this situation could have effects on air traffic competition at level 1. Before this background, a regulation to ensure discrimination-free access to terminal facilities is inevitable.

With regard to an efficient regulation, it has firstly to be taken into account that slots and terminals are to be considered 100% complementary. An airline can only offer flight services if the company is able to acquire adequate runway and terminal user rights for the respective flight connection. Therefore, both runways and terminals have to be described as essential facilities.

A reform of the existing regulation should therefore combine a corresponding share of terminal user rights with a slot.<sup>84</sup> In last consequence the exclusive use of terminal 2 through DLH and the members of the Star Alliance should be rejected. The allocation of the newly defined slot – including runway and the terminal user rights – should be organized according to market principles. The existing priority rule based on "grandfather rights" can be classified as an inefficient regulation relic and should therefore be abolished. An efficient slot allocation regime can be realised via auctions or scarcity prices possibly combined with slot trading.<sup>85</sup>

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<sup>83</sup> At point-to-point connections such a consideration is obsolete.

<sup>84</sup> The project Terminal 2 can theoretically be considered a first, rather indirect step in the direction of the award of such new, redefined slots.

<sup>85</sup> The introduction of a secondary market for gate and terminal capacities is suggested for example by HARDAWAY, R. (1986), p. 75. For a survey of alternative solutions see KNEIPS, G. (1996), pp. 105 ff.

Further more the question of optimal user fee regulation arises. This need refers to both terminal and landing fees. Today, the majority of airports -and also the Munich Airport- are regulated according to a rate-of-return principle. This has to be described as inefficient and should be replaced by a price cap regulation.

Apart from the need of efficient allocation mechanisms and price regulation another institutional change is necessary. This is due to the fact that regulators and airport operators are often identical. The given conflicts of interest can only be solved by implementing an accepted, credible and independent regulatory agency. The aeronautical authorities of the states, possessing the regulatory responsibility today, as well as the rights of the federation therefore have to be declined. It can be considered useful to create a new, nationwide autonomous regulatory agency.

The suggested re-regulation does not just seem applicable to Munich Airport but also for other German airports. Firstly, the inefficient regulation given in Munich also exists at other locations. Secondly, a similar project is not excluded at alternative airports so that the same discrimination potential could arise in principle. Such a regulation of terminals could be dropped only if competition between alternative terminal operators is possible at the specific location. In this sense it would be necessary to balance the proposed regulation scenario and the scenario III for each individual case. Due to the geographical conditions and the situation of most airports it is, however, to be accepted that a duplication of terminal infrastructure in Germany is generally and especially in comparison to America unlikely. Therefore terminal competition will remain the absolute exception.

#### **4 Conclusion and outlook**

The analysis has shown that the project terminal 2 by the DLH and the public airport operating company FMG causes considerable discrimination incentives at the Munich Franz Josef Strauß Airport. To avoid a discrimination of access to terminal 2, a re-regulation containing three central aspects is required: firstly, terminal user rights should be added to the slots since they are 100% complementary. Secondly, the so-defined slots have to be allocated according to market principles

and furthermore the existing user fee regulation must be replaced by a Price Cap rule. Thirdly, an independent regulatory authority needs to be installed. These re-regulation postulations are deduced from the fact that the first-best scenario of terminal competition in Munich cannot be realized. For the same reason the suggested regulation scenario should also apply to other airports since the same problems potentially arise.

A new regulation, particularly in Munich but also in general, becomes necessary to secure the economic advantages of deregulation of the air traffic sector. Basically, the economic success of this deregulation essentially depends on two main factors; namely on the reduction of legal market entry barriers and on free access to airport infrastructure. Since the reduction of legal market entry barriers can be regarded as almost completed within the European Union and is also identified and stipulated worldwide, the main emphasis remains on the second aspect. Not only slots but also terminals correspond to the concept of an essential facility. Therefore potential bottleneck problems also appear at terminals as worked out in this analysis.

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