

# 19 An Unsettled Question in Transport Economics: The Importance of Excess Capacity in Transport Infrastructure

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## 19.1 Introduction

When Hansen (1990) reported about competitive actions of airlines competing for hub dominance on an airport he argued on the basis of the assumption that there is no limit in the number of slots available to competing airlines. Unanswered is the question what would be the outcome of his analysis when capacity limits exist. Especially we want to pay attention to the question whether excess capacity is a necessary condition for a Pareto-efficient market outcome of competitive actions of users of infrastructure. In general terms the assumption needs to be discussed whether excess capacity is necessary to ensure competitive behavior between users of infrastructure. Monopolies try to maximize profits by tightening capacity margins (Helm et al. 1989).

## 19.2 Analysis

Does lack of capacity always leads to monopolistic market behavior between users? The issue of infrastructure capacity is important because investments related to the supply of 'overcapacity' by the owner of infrastructure creates a financial risk. Airport authorities in general are faced with indivisibility's in their investments on the airside of the airport. (Golaszewski, 2003) However the price of over capacity may also be justified by effect it has on market behavior of users. The Infrastructure investments should also be valued with respect to the influence they have on competitive behavior of users, not only of airlines but also it should be studied on all infrastructure such as pipelines, canals, ports, railroads etc. The issue is not on pricing policies of infrastructure. (Haralambides, 2002) It is also clear that the issue of the importance of excess infrastructure capacity in rapidly developing countries is less relevant. (Canning et al. 2000) Yet there is increasing interest for the subject in general. (Gomez-Ibanez, 2003)

It seems that Hansen is the first to pay attention to the role of infrastructure capacity for the functioning of markets, although it is not in the heart of his analysis. Excess capacity on infrastructure is a natural phenomenon and was the fundament of creating monopolies that then had to be controlled in order to prevent monopolistic behavior. Public utilities were created on the basis of this argument in the supply of water, gas etc to households. Nowadays distribution infrastructure networks are separated from production plants and the distribution infrastructure networks are open for all producers. This implies excess infrastructure capacity when demand shifts to more distant producers of for instance electricity. The inability to follow directly the shifting from consumers assumes excess capacity in the entire distribution infrastructure network. When excess capacity is not available users may express monopolistic behavior. It is clear that telecom infrastructure in the past during many decades faced capacity bottlenecks whereas nowadays technological advantages have created so much capacity that newcomers can easily be welcomed. Competitive behavior between telephone companies and other service providers is the rule and not an exception.<sup>1</sup>

The deregulation of some port related services such as pilotage and towage, was also based on the assumption that more suppliers will lead to more competition and lower prices for users of these services. In some cases economies of scale had to be given up in order to create a competitive environment. On airports the supply of ground handling services, which was mostly organized as a monopoly, became open to bidding by more than one supplier. When demand is growing the

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<sup>1</sup> see also ITU Handbook: <http://www.ictregulationtoolkit.org/en/PracticeNote.aspx?id=3238>)

expansion of ground handling services faces capacity bottlenecks in for instance baggage handling that cannot easily be abandoned. Mostly monopoly power stays in place. Small airports also try to attract other suppliers of ground handling services. However it is clear that airport authorities and users will face rising transaction costs. Existing ground handling companies as well as the unions of workers will oppose against the entrance of newcomers in the ground handling services markets. This is also true in some seaport services markets.

Hansen tries to explain the competitive behavior of airlines competing for dominance on a hub airport where slot space supply is regulated. He makes use of the assumption that there is ample slot space on the airport. Slot regulation means that the user has to bid on slot space. When there is only one major airline that uses the airport as a hub there will be no incentive to use all slots available to prevent a newcomer coming into the market. The hub airline will maximize profits on the basis of exploiting economies of scale, scope and density within its total operations. When a second airline would like to enter the airport slots will be asked for and the first airline also will ask for more slots in order to prevent the newcomer to exploit the benefits of scale scope and density available. Competition leads to oversupply of airline services to the customers and most likely to also to price competition. Ultimately one of the newcomers will have to leave the airport because of its financial inability to fight the others. In a non cooperative environment competition will ultimately lead to the leaving of one of the airlines of the airport. During the competitive fight between the airlines the use of slots will rise to higher levels than can be justified by their individual expected economies of scale, scope and density. It can be argued that contestable market behavior will also lead to more demand for airport slots than can be justified from a monopolistic point of view. Pareto efficiency is more likely to exist within a non-cooperative game for slots than before and after.

It is not in the interest of the airport to have no demand for slots at all at the end of the competitive game. The airport authority will try to look for policies that ensure the extension of the non-cooperative game because it promises a better financial result for the airside operations. Moreover it will lead to attractive supply of services to customers and better rents from landside property development.

The Hansen model is an excellent example how excess capacity helps the creation of a competitive market where Pareto efficiency is more likely to exist than in a monopolistic use of an airport. When no excess capacity exists the newcomer has almost no possibility to enter the market and emergence of the non-cooperative game will not start. The airport authority has almost no means to create contestable market demand for airport slots. Will this also be true for other entrance regulated infrastructure?

The interesting model of non-cooperative airport slot demand described by Hansen stimulates evaluation of other similar infrastructure markets such as waterways, seaports, and railroads.

### **19.3 Conclusion**

The Hansen model describes competitive games of airlines striving for hub dominance. He assumes that the resulting demand for airport space is not bound by capacity constraints during the game. He did not answer the question what the importance is of capacity constraints for the competitive game of airlines. We tried to relax the Hansen-assumption and we came to the idea that excess capacity is a necessary condition for the emergence of competition between users. Contestability is the sufficient condition for a more Pareto-efficient market outcome. Without Contestability a monopolistic market outcome is most likely the result after a competitive game. Without excess capacity a regulator has to force the incumbent user to hand over slots.

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