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GROUND HANDLING BUSINESS AT NON – EUROPEAN BIGGEST WORLD AIRPORTS AS A PROBLEM OF MARKET STRUCTURES

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Abstract. In the paper we analyse the market structures of ground handling at the biggest non-European passenger and cargo airports in accordance with the ACI list of the most important world airports in 2014. Using the IATA IGHC database as of spring 2015, our analysis revealed that out of Europe double digit numbers of providers are rare what contrasts with situation in Europe where ground handling markets were deregulated by the Council Directive 96/67/EC. The analysis also brought that the monopolistic structures of ground handling markets were more specific for the regions of Asia and the Middle East. Airports as ground handling providers were not found within the analysed sample in North America, Latin America, Africa and Australia and Oceania, while this arrangement was to a larger extent present at the analysed Asian airports. Asia and the Middle East biggest airports are identified by us as candidates for further deregulation of ground handling arguing by forecasted demand for air services in the regions, although expected deregulation may be curbed by national regulators.

Keywords: airports, ground handling, deregulation, market structure, monopoly, duopoly, product portfolio, global expansion.

JEL Classification: L1, R40.

1. Introduction

To provide air traffic services air carriers have to handle passengers, baggage, cargo and aircraft on ground. According to the European Commission (2011) ground handling services as services which cover all ground-based aviation related activities carried for airlines at airport are a key function in the aviation value chain.[1] ICAO (2010) in its official definition contained in the Annex 6 to the Convention on International Civil

[1] Proposal for a regulation COM (European Commission 2011) 824 estimated costs for ground handling services represent about 5 to 12% of airlines operating costs. Ground handling services also impact on flight delays as expressed by SITA (2010): "One of the greatest opportunities for airlines and other airport-based companies is to improve the efficiency and flexibility of ground handling to lower operting costs and reduce flight schedule delays".

Aviation Operation of Aircraft Part I defines ground handling as "services necessary for an aircraft's arrival at, and departure from, an airport other than air traffic services". In the definitions, operational approach to ground handling is emphasized although ground handling is also an interesting economic issue market structures of ground handling services including.

Ground handling services may be delivered to airlines under different market structures depending on subjects participating in the delivery of ground handling services. In principle, airports, airlines and independent ground handling companies are involved in ground handling business as suppliers. While airports and independent ground handling companies are so called third parties in the delivery of ground handling services for airlines, airlines may deliver the services for themselves or provide services for other airlines. When airlines deliver ground services to other airlines this is considered as the delivery by third parties. When airlines self- handle themselves on the ground this is so called self-handling. Thus, third party vs self-handling are two options for airlines.

Airlines ground handling strategies depends on many factors, mainly on business model applied. Following low cost (cost cutting) strategy airlines may prefer the outsourced delivery of ground handling services while full service network airlines typically rely more on the in- house delivery of ground handling services keeping in this way ground operation under their control. However, strategies of airlines towards ground handling are in a state of flux. Some full service network airlines have converted their ground handling strategy from in-house concept to complete outsourcing. Further full service network airlines have taken over ground operation from airports. Some airlines have expressed their interest to be more active in the delivery of ground handling services as a third party provider.

At local, i.e. one airport level, there are different market structures for different categories of ground handling services. It gives the enormous complexity to this issue as every category of ground handling services represents a specific market with a specific market structure (Tomová, Kirschnerová 2015). Moreover, there can be a different access (i.e. regulatory) regime for domestic and foreign airlines operation what add further complexity to the issue.

Thus, the structure of ground handling markets depends on regulatory measures which open the market more or less for self-handling providers and/or third party providers of ground handling. Within third party portion of the market (i.e. not considering self-handling) we can theoretically distinguish the market structures according to numbers and types of ground handling suppliers. An airport may be the only third party provider of ground handling services at the airport, or airlines as third party providers compete with the airport at the airport for ground handling services, or third party handling is accessible only for independent ground handling companies at the airport or there may be a duopoly of the respective airport and an airline, etc.

In this paper we investigate market structures of ground handling focusing on the most important (i.e. the biggest world airports out of Europe). In general, ground handling economic problems are not sufficiently covered by the aviation economic literature and non-European coverage of the topic is still very poor.

2. Previous research

Economic research of ground handling business has been mostly aimed at Europe reflecting in this way deregulation of ground handling markets as initiated by the Council Directive 96/67/EC of 15 October 1996 on access to the ground handling market at Community airports. The Directive have been introducing two freedoms – freedom of self-handling and freedom of third party handling into the system, although for some airports limited access with regard to the market access freedoms still exist at some airports in some countries. In generally, application of the Directive have brought more competition among the providers of ground handling and more options for airlines to choose among competing third party handlers or to be self-handled. Impact of the Directive were investigated in Study of the Impact of Directive 96/67/EC on Ground Handling Services (ACR 2009), also in Study on the quality and efficiency of ground handling services at EU airports as a result of the implementation of Council Directive 96/67/EC (SH&E 2002). Both studies have found the number of ground handling providers airports increased due to deregulation. Ahsbash (2008) reviewed fundamental changes of ground handling markets at European airports as a consequence of deregulation, and similarly, Müller *et al*. (2008) investigated deregulated ground handling markets at German airports. Ground handling markets at Brussels airport were analysed by Meersman *et al*. (2011), Burghouwt *et al*. (2014) examined the situation at Amsterdam Schiphol airport. Global expansion of several independent ground handling companies was documented by WTO (2007) study as a consequence of deregulation of ground handling markets in the world.

According to the state of our current knowledge, only Barbott (2012) tried to cover the issue theoretically. She examined effects of different market structure s in ground handling on consumer surplus using Cournot's theory and considering ground handling as complementary goods.[2] Her findings revealed impacts of market structure on consumer surplus.

Ground handling markets at airports out of Europe have been only slightly touched by the work of Tan (2010) letting thus a space for further investigations.

[2] Several practitioners and theoretists as well consider ground handling production as a joint production with the production of air traffic services and reject to analyze ground handling services as complementary goods.

3. Methodology and data

In our research we worked with the IATA IGHC database (as of spring 2015) which contains the data about ground handling providers – members of the IATA IGHC covering airports worldwide. However, we had to extract and consequently process the data what was exhausting and time consuming process as the database does not provide the data in this format. Then, we reviewed the market structures ground handling markets at 74 non-European airports. The choice of airports came of the top 100 lists of the biggest airports in the world, both in passenger and cargo segment. We gathered the data for 27 airports in Asia, 8 airports in the Middle East, 26 airports in the North America, 7 airports in Latin America, 3 airports in Australia and Oceania, 3 airports in Africa. We were led by the following research questions:

Are market structures of ground handling at the most important airports in non- European regions similar to situation in Europe? (In Europe, at the most important airports, ground handling markets are neither monopolistic nor duopolistic nowadays. As a result of deregulation of ground handling markets relatively high numbers of third party providers compete there (Tomová 2013) although historically – before liberalisation of air transport market in the European Union – just monopolies or duopolies prevailed in the European Union ground handling markets).

Are there typical market structures at the world regions differing one region against the other one? Or are there mainly country versus country differences? (Ground handling markets are primarily driven by national regulatory measures therefore country versus country differences can be expected in the issue more).

What is a share of airports in the position of a third party provider at the airports we analysed? (When an airport delivers ground handling services as one of the third party providers it may abuse its position (Barbott 2012) and distort competition).

How many independent providers has full portfolio of services in its supply at the airport? (This is important when considering global expansion of ground handling companies (Tomová, Kirschnerová 2015). Due to the fact a shift to multiproduct companies operating ground handling globally can be assumed).

In our analyses we split the market structures of ground handling distinguishing the following market structures:

- Monopoly of an airport (so called centralized model); denoted in the following tables as M/Airp,
- Monopoly of an independent ground handling company; denoted in the following tables as M/IGHc,
- Monopoly of an airline; denoted in the following tables as M/Airl,
- Duopoly of an airport and an independent ground handling company; denoted in the following tables as D/Airp-Airl,
- Duopoly of an airline and an independent ground handling company; denoted in the following tables as D/Airl-IGHc,

- Duopoly of an airport and an airline; denoted in the following tables as D/Airp –Airl,
- Duopoly of two airlines; denoted in the following tables as D/Airl-Airl,
- Duopoly of two IGHc; denoted in the following tables as D/IGHc-IGHc
- Diversified market structures with more than two providers; denoted in the following tables as DivS.

Our approach to the topic is similar with the methodology of (ACR 2009) and (SH&E 2002) studies covering the European Union ground handling markets after deregulation. The studies revealed the numbers of ground handling suppliers and types of ground handling suppliers.

4. Results and findings

In the following tables the results of the processed IGHC IATA data are contained informing about the market structure at the biggest world non-European airports.

As contained in Table 1, in Asia, ground handling markets at the analysed airports differ. About 48% airports in the sample had diversified structures of ground handling markets with more than two providers, however, Hong Kong International Airport was the only Asian airport in the sample which achieved double digit number of ground handling providers. Duopolistic markets were observed at 22% airport and monopolistic markets at about 30% airports. Monopolistic market structures were represented by monopoly of an independent ground handling provider, monopoly of an airline and monopoly of an airport as well. Mainly in the analysed Chinese airports we revealed monopoly as prevailing form of market structure in the delivery of ground handling services. In Hong Kong, Taiwan and Turkey a more diversified structures dominated. In Japan we observed diversified structures and duopoly as well. Airports as providers of ground handling services were observed at about 30% airports.

Using the information in Table 2, Airports in the Middle East did not achieve double digit number of ground handling providers. Half of the analysed airports experienced diversified market structures of ground handling. The rest was represented by monopoly of independent ground handling providers. Diversified market structures were typical for the analysed airports in Israel and The United Arab Emirates, while Qatar and Saudi Arabia kept monopolistic structures of the markets. Only one airport in the sample exploited monopoly power as a ground handling supplier.

As contained in the Table 3 on the following page, at the analysed airports in Latin America all three market structures (diversified market structures, duopolistic markets and monopolistic markets) were observed. None of the airport achieved double digit number of ground handling providers and airports in the analysed sample were not involved in the delivery of ground handling services. In the case of diversified market structures, none of the airports achieved double-digit number of ground handling suppliers indicating a different situation in comparison with the European Union biggest world airports.

Table 1. Ground handling providers (IATA IGHC members) at the biggest world passenger and cargo airports in Asia (Source: processed and compiled by the authors from the IATA IGHC database)

Airport	Country	Total number of providers	Number of airlines – providers	Number of indep. providers	Airport as a provider	Market structure
Taiwan Taoyuan International	Taiwan	6	5	0	+	DivS
sIndira Gandhi International	India	4	1	3	–	DivS
Chennai International		3	2	1	–	DivS
Chhatrapati Shivaji International		2	1	1	–	D/Airl-IGHc
Bengaluru International		2	1	1	–	D/Airl-IGHc
Soekarno-Hatta International	Indonesia	1	0	1	–	M/IGHc
Narita International	Japan	5	2	2	+	DivS
Kansai International		3	2	1	–	DivS
Fukuoka		3	2	1	–	DivS
Tokyo (Haneda) International		2	2	0	–	D/Airl-Airl
Naha International		2	2	0	–	D/Airl-Airl
New Chitose		2	1	1	–	D/Airl-IGHc
Incheon International	Korea	3	1	1	+	DivS
Jinnnah International	Pakistan	4	0	4	–	DivS
Ninoy Aquino International	Phiilippines	4	1	2	+	DivS
Singapore Changi	Singapore	1	1	0	–	M/Airl
Subarnabhumi International	Thailand	4	2	2	–	DivS
Tan Son Nhat International	Vietnam	4	2	1	+	DivS
Hong Kong International	Hong Kong	10	3	6	+	DivS
Chengdu Shuangliu International	China	2	1	1	–	D/Airl-IGHc
Pudong International		1	0	0	+	M/Airp
Beijing Capital International		1	1	0	–	M/Airl
Guangzhou Bai Yun International		1	1	0	–	M/Airl
Shenzen International		1	0	1	–	M/IGHc
Tianjin Binhai International		1	1	0	–	M/Airl
Hongqiao International		1	0	1	–	M/IGHc
Ataturk International	Turkey	6	2	4	–	DivS

Table 2. Ground handling providers (IATA IGHC members) at the biggest world passenger and cargo airports in the Middle East (source: processed and compiled by the authors from the IATA IGHC database)

Airport	Country	Total number of providers	Number of airlines – providers	Number of independent providers	Airport as a provider	Market structure
Ben Gurion Intern.	Israel	5	2	3	–	DivS
Doha Intern.	Qatar	1	0	1	–	M/IGHc
King Khaled Intern.	Saudi Arabia	1	0	1	–	M/IGHc
King Abulaziz Intern.		1	0	1	–	M/IGHc
Dubai Intern.	The United Arab Emirates	5	0	5	–	Div/S
Abu Dabi International		4	1	3	–	Div/S
Sharjah International		5	0	4	+	DivS
Dubai World Central Al Maktoum International		1	0	1	–	M/IGHc

Table 3. Ground handling providers (IATA IGHC members) at the biggest world passenger and cargo airports in Latin America (source: processed and compiled by the authors from the IATA IGHC database)

Airport	Country	Total number of providers	Number of airlines – providers	Number of indep. providers	Airport as a provider	Market structure
Aeor.Int. De la Cuidad de México	Mexico	5	1	4	–	DivS
Aer. Int. de Azeiza	Argentina	3	1	2	–	DivS
Guarulhos Int.	Brasil	3	2	1	–	DivS
Viracopos Intern. AO		1	0	1	–	M/IGHc
Aeropuerto Int. El Dorado	Columbia	2	2	0	–	D/Airl-Airl
Aeropuerto Internacional Arturo Merino Benitez	Chile	1	1	0	–	M/Airl
Aer.Int. Jorge Chávez	Peru	3	1	2	–	DivS

As contained in Table 4, in Africa at three of the analysed airports a diversified market structure was revealed, and Cairo International Airport achieved a double digit number of ground handling providers represented mainly by independent ground handling suppliers. None of the analysed airports in the sample was involved in the provision of ground handling services.

Table 4. Ground handling providers (IATA IGHC members) at the most important passenger and cargo airports in Africa (source: processed by the authors from the IATA IGHC database)

Airport	Country	Total number of providers	Number of airlines – providers	Number of indep. providers	Airport as a provider	Market structure
Cairo Int.	Egypt	10	1	9	–	DivS
Jomo Kenyatta Int.	Kenya	4	0	4	–	DivS
OR Tambo Int.	The Republic of South Africa	4	0	4	–	DivS

Similarly as in the case of Latin America and Africa, none of the analysed airports in Australia and Oceania was involved in the provision of ground handling services as well as none of the airports achieved double digit number of ground handling providers (Table 5). Slightly diversified structure of ground handling markets was observed at the analysed Australian airports while Aucklad International airport in New Zealand had a duopolistic market structure of its ground handling.

Table 5. Ground handling providers (IATA IGHC members) at the most important passenger and cargo airports in Australia and Oceania (source: processed and compiled by the authors from the IATA IGHC database)

Airport	Country	Total number of providers	Number of airlines – providers	Number of indep. providers	Airport as a provider	Market structure
Sydney International	Australia	3	1	2	–	DivS
Melbourne		3	1	2	–	DivS
Auckland International	New Zealand	2	1	1	–	D/Airl-IGHc

In the analysed airports in the North America, the airports were not involved in the provision of ground handling services and none of the analysed airports achieved a double digit numbers of ground handing providers. At the only airport in the sample ground handling market was monopolistic, duopoly was recorded for three airports. At about 85% analysed airports diversified market structures were observed with Los Angeles International AO at the head in this respect counting eight providers.

Based on the findings in Table 6 we can summarize the analysed biggest world airports in North America, Australia and Oceania, Africa and Latin America were not involved in the provision of ground handling services. It implies that due to this arrangement airports cannot abuse their power to distort the competition being one among competing providers. Monopolistic provision of ground handling services was found in a larger extent at the analysed Asian biggest airports and the analysed airports in the Middle East's. In the list of analysed North American airports the only case of monopolistic

Table 6. Ground handling providers (IATA IGHC members) at the most important passenger and cargo airport in the North America (source: processed and compiled by the authors from the IATA IGHC database)

Airport	Country	Total number of providers	Number of airlines – providers	Number of indep. providers	Airport as a provider	Market structure
Memphis Int. Airport	US	4	1	3	–	DivS
Ted Stevens Anchorage Int. Airport		2	0	2	–	D/IGHc-IGHc
Louisville International Airport		1	1	0	–	M/Airl
Miami International Airport		4	1	3	–	DivS
Los Angeles International AO		8	1	7	–	DivS
John F. Kennedy Int. Airport		6	3	3	–	DivS
O´Hare International Airport		5	1	4	–	DivS
Indianapolis Int. Airport		2	1	1	–	
Newark Liberty Int. Airport		3	1	2	–	DivS
Hartsfield-Jackson Atlanta Int. Airp.		5	1	4	–	DivS
Dallas/Ft Worth Int. Airport		3	1	2	–	DivS
Cincinnati/Northern Kentucky Int. Airport		2	1	1	–	D/Airl-IGHc
Oakland Int. Airport		4	1	3	–	DivS
George Bush Intercontinental Airport		3	1	2	–	DivS
LA/Ontario Int. Airport		4	1	3	–	DivS
Honolulu Int. Airport		3	1	2	–	DivS
Philadelphia Int. Airport		4	1	3	–	DivS
San Francisco Int. Airport		8	2	6	–	DivS
SeattleTacoma Int. Airport		5	2	3	–	DivS
Sky Harbor Int. Airport		3	1	2	–	DivS
Logan Int. Airport		3	2	1	–	DivS
Washington Dulles Int. Airport		3	1	2	–	DivS
Denver International Airport		3	1	2	–	DivS
Detroit Metropolitan Wayne County Airport		3	1	2	–	DivS
Toronto Pearson Int. Airport	Canada	4	2	2	–	DivS
Vancouver Int. Airport		4	2	2	–	DivS

provision was found. At the analysed Latin American airports as well as African and Australian Oceanian airports duopoly or a more diversified market structures were typical. As a whole, working with 74 analysed cases monopoly was found at 20% airports, duopoly at 15% airports and more diversified market structures was revealed at 65% airports. However, the only three of non-European analysed biggest world airports in passenger and cargo airports, i.e. 4% of the sample investigated recorded double digit numbers of ground handling providers. This is a different in comparison with Europe where deregulation of ground handling markets made the markets more accessible and the numbers of providers increased importantly mainly in the biggest airports.

As our investigation included also services portfolio we were aimed to find how many of the providers at the analysed airports supply markets with the full range of ground handling services according to the categories of IATA IGHC (eight categories), Such approach is reasoned by the fact that evolution of the industry is expected to shift to multiproduct ground handling companies competing globally. Further argument is in the status of competition among ground handling providers which may be different among providers with complete and uncomplete portfolio of services.

Table 7. Number of the providers at the biggest world airports out of Europe with full portfolio of services (source: processed by the authors from the IATA IGHC database)

World Region	Asia	Middle East	Latin America	Africa	Australia and Oceania	North America	Total
Number of providers with full portfolio of services	10	5	1	2	2	0	20
of which independent providers	1	4	1	2	0	0	8

As contained in Table 7, from the handlers which operated ground handling services at the analysed airports in Asia only 12.5% provided full portfolio of services. In the Middle East almost 22% of the providers provided full portfolio of services, in Latin America only one provider had such attribute, in Australia and Oceania two providers, In Africa two providers and no such provider of this type was found in the North America. It means that multi-service providers with full portfolio of ground handling services represent only small portion of the providers operating ground handling at the analysed airports (8.2%). The respective share of independent ground handling providers with full portfolio of ground handling services compared to all providers at the analysed airports is even minor counting only 3.3%.

With regard to the presence of so called global ground handling companies, we were focused on the presence of two ground handling giants at the analysed airports Swissport and Menzies.

Table 8. Presence of two global giants on ground handling markets at the analysed airports in world regions out of Europe (source: processed by the authors from the IATA IGHC database)

World Region	Swissport		Menzies	
	Number of airports with Swissport presence	Share of the analysed airports in the region	Number of airports with Menzies presence	Share in % of the analysed airports in the region
Asia	4	14 %	3	11%
Middle East	1	13%	0	0%
Latin America	5	71%	2	29%
Africa	2	67%	1	33%
Australia and Oceania	0	0%	3	100%
North America	22	85%	9	
Total	34	45%	18	24%

As it can be seen in Table 8, Swissport had established ground handling operation at 34 airports within the analysed group what represents 45%. Menzies had established ground handling operation at 18 airports within the analysed group what represents 24 %. From this finding results that global giants in ground handling business which expand internationally are important players at the biggest airports out of Europe and full geographical coverage and extension of their geographical network may be expected in future.

6. Conclusions

In this paper we investigated the market structures of ground handling markets at the biggest world passenger and cargo airports out of Europe covering the regions of Asia, the Middle East, Latin America, Africa, Australia and Oceania and North America. Our analysis revealed that out of Europe double digit numbers of providers are rare what contrasts with situation in Europe where ground handling markets were deregulated. Only three of the analysed airports recorded such double digit numbers of ground handling providers. Our analysis also brought that monopolistic structure of ground handling markets was more specific for the analysed airports in Asia and the Middle East, while at the analysed airports in Africa, Australia and Oceania and Latin America this market arrangement was not found. Airports as ground handling providers were not revealed within the analysed sample in North America, Latin America, Africa and Australia and Oceania, while this arrangement was to a larger extent present at the analysed Asian airports. Although in the cases when an airport is not an operator of ground handling services and market structure is not monopolistic it may prefer one of the providers present at the airport from several reasons, for instance if such provider is a national flag carrier. Airport portion in the ownership of ground handling providers (joint stock companies) is a further problem connected with market power abuse.

At the analysed airports ground handlers with full portfolio of services represented only marginal share in the total number of providers at the airports what makes the problem of market structures attributable to specific ground handling services even a more complex issue. Of this number, independent ground handling companies with full range of supplied services counted even less. On the other hand, our analysis confirmed international expansion of key global handlers Swissport and Menzies at the biggest world passenger airports out of Europe.

Our analysis showed there can be expected further deregulation of ground handling markets at the biggest world airports – mainly in Asia and the Middle East as they were identified by us as the regions in which monopolistic or duopolistic structures still exist in a larger scale. On the other hand, just these two regions are so called high growth aviation regions and increased demand for passenger and cargo air services is predicted in these regions in future (Boeing 2015; Airbus 2015). In a situation of monopoly and duopoly, the supply of ground handling services may be limited not meeting increasing demand what will generate pressure on deregulation of ground handling markets in the regions. Higher competition due to deregulated markets with higher numbers of competing ground handling providers can impact prices and quality of ground handling services delivering in this way competitive benefits for the analysed airports and consumer surplus to customers (Barbott 2012). This aspect is extremely important for those of the analysed airports which compete each other as international hubs.

Further deregulation of ground handling markets will boost global ground handling players like Swissport and Menzies to expand more at the biggest airports and exploit in this way network economies typical for global business (Tomová 2011a, 2011b).

In our paper we worked with the data of IATA IGHC what can be objected as self-handling part of the markets is not clearly discoverable and only the IATA IGHC members were covered, however according to our current and best knowledge such analysis focused on non- European world regions has not been realized so far.

In general, contemporary economic aviation research should concentrate more on the topic of market structures in world ground handling by theoretical and empirical studies. In theory, contemporary economic research have not answer yet whether the provision of ground handling services is joint production or production of complementary goods what is essential to recommend an optimal market structure for ground handling markets at airports in different contexts. Taking into account Barbott (2012) approach to this issue, we are not aware of any more theoretical considerations of the problem. Empirical investigations realized so far were concentrated to view the issue at local, i.e. one airport level and network nature of ground handling business which is typical for expanding global ground handling giants is not sufficiently covered nor by theory neither by empirical research. Competition of handlers running their business on network of airports each other as well as their competition with local players at local level is a further rail for contemporary economic research. Such research could help in answering

the question about potentially global nature of ground handling business and its impact on aviation in future. As deregulation of ground handling is being prepared in some countries (CAPA 2014) regulators of ground handling markets in these countries with monopolies or duopolies of handlers at their airports can demand this research output to open ground handling markets effectively, i.e. for the benefits of final consumers of air services. On the other hand, insufficiency of the big global data will be certainly a limiting factor in such effort and creating such big global ground handling databases will probably accompany research activities in the field.[3]

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