TECHNISCHE UNIVERSITÄT DRESDEN

"Friedrich List" Faculty of Transportation and Traffic Sciences

Institute of Transportation and Economics

THE SYMBOLIC USE OF PRICE DIFFERENTIATION

THE CASE OF HAMBURG AIRPORT

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Introduction

- Flight Noise has always been a Major Issue in Hamburg
- October 2001: Reorganisation of Airport Charges
  1. Historical Background
  2. Main Elements of the Charging Scheme
  3. Analysis of the Effects of the Tariff Structure
  4. Test of the Differentiation Elements on Aircraft Use
  5. Theoretical Framework

Additionally Related Issues

- Price Cap Regulation (RPI-2%)

- Variabilisation of Landing Fees:

Period	Average Degree of Variability (in Percentage)
Before 2002	37.64
After 2002	73.96

Noise Charges: Background

International Legal Framework

- Annex 16, ICAO Convention (Cap. 2,3,4)

National Legal Framework

- Air Transport Act (LuftVG)
  - Technical Aspects
- Flight Noise Protection Act (FluglärmG)
  - Protection Zones
- Aircraft Flight Noise Requirements (LSL)
  - Adoption of ICAO Annex 16
- Further Regulations by the Federal States

Noise Charges: History

Until October 2001

- Differentiated Charges according to Annex 16 ICAO
- Time based differentiated Charges (Day and Night)

Since October 2001

- Separation of Noise Charges from the rest Charges
- Introduction of 7 Noise Classes (Differentiation)
- Additional night Surcharges (100 % 10-11 p.m., 200% 11p.m.-06 a.m.)
- Additionally, Administrative and technical measures

Noise Charges: Aims

- Noise reduction (Penalization of Use of noisy Aircrafts)
- Revenue neutrality
- No discrimination of Air Carriers

7 price differentiated Noise Classes

1	2	3	4	5	6	7
Bis 71,9 dB(A)	72,0 bis 74,9 dB(A)	75,0 bis 77,9 dB(A)	78,0 bis 80,9 dB(A)	81,0 bis 83,9 dB(A)	84,0 bis 86,9 dB(A)	ab 87,0 dB(A)
5,50 €	**13,00 €**	**27,00 €**	**55,00 €**	**160,00 €**	**421,00 €**	**1.350,00 €**
AC69	AT722	A3181	A300F	A3006	A3004	AN12
AC6T	AT725	A3191	A3202	A3102	A3302	B7073
AC70	BA31	AJ25	A3211	A3103	A3303	B7272
AT42	BA461	AJ25	A3212	A3201	AN26	B727F
AT422	BE55	AN2	B7373	A3402	B7271	B7472
AT423	BE58	B7376	B7375	A3403	B747S	B7473
AT424	BE60	BA462	B7377	B7374	DC93	BA115
AT425	BN2	BA463	B7378	B7474	DC94	C141
ATP	C172	BBJ	B7572	B7573	FK28	DC103
BA41	C182	BJ40	B757F	B7673	LR24	DC86
BE02	C406	C337	BE40	B7772	MD81	IL62
BE10	C525	C340	BH06	C130	MD82	IL76
BE20	CJ1	C551	DA20	DC101	MD83	IL86
BE30	CJ2	C560	DA21	DC3	MD88	TU34

Effects (1)

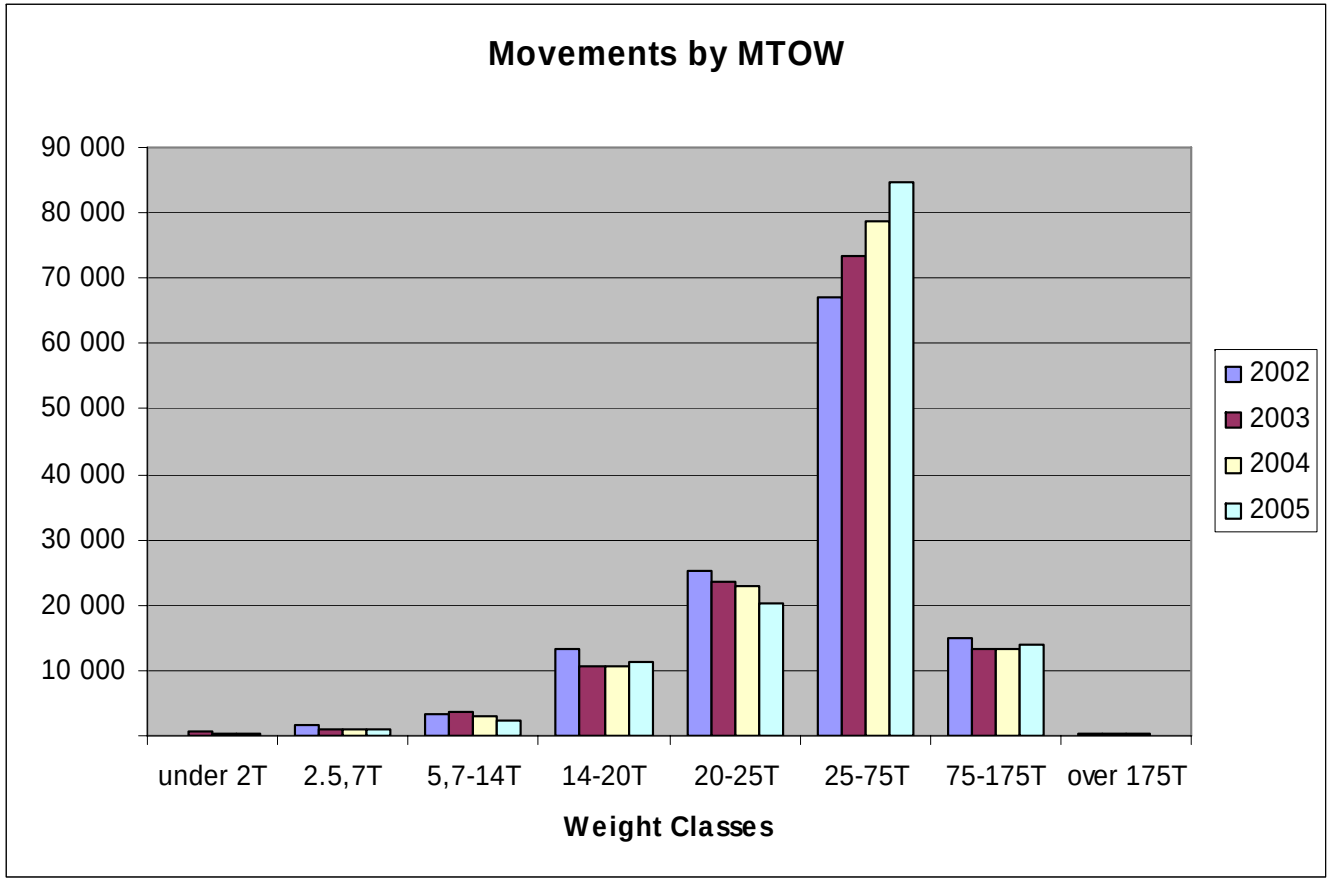
Charging Level

- Increasing Airport Activity
- Increasing Market shares for domestic services, decreasing for international ones

Market Shares in percentage				
	Passengers		Freight	
Year	domestic	international	domestic	international
2001	9.7	5.4	9.1	0.6
2002	9.6	5.2	9.7	0.5
2003	10.2	5.0	10.9	0.4
2004	10.1	4.7	12.2	0.4
2005	10.4	4.9	12.1	0.3

Effects (2)

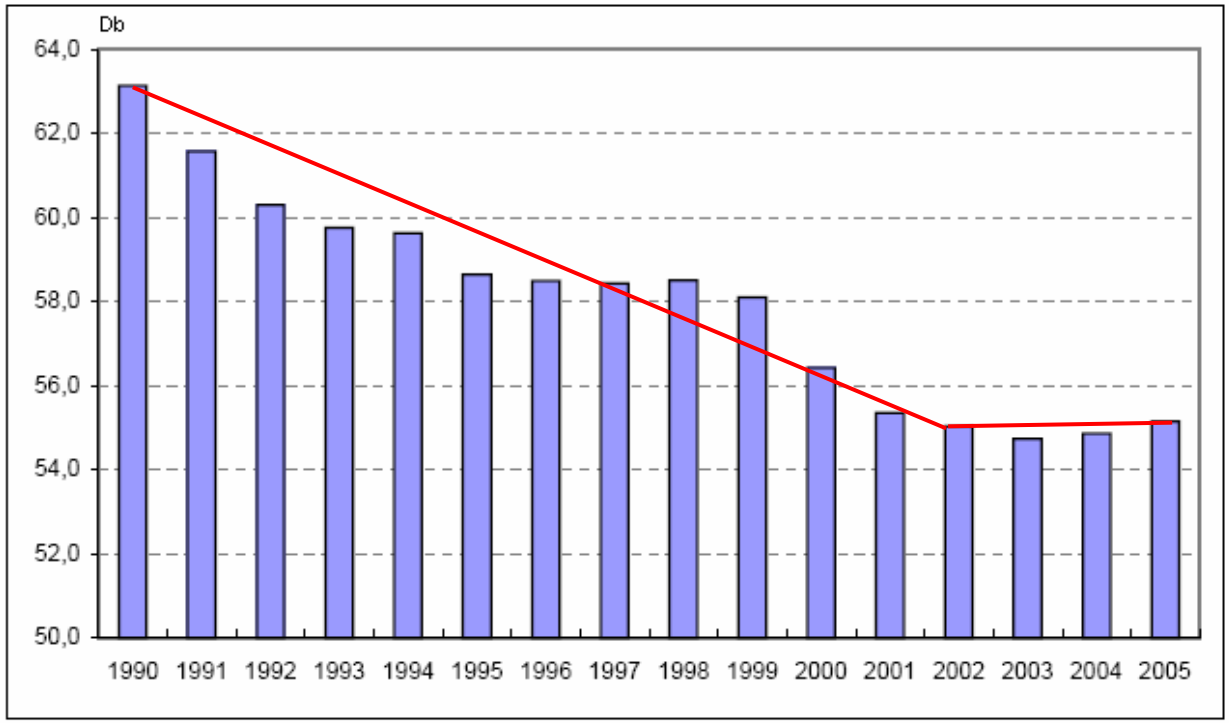
Additional demand with single-isle Aircrafts



Effects (3)

Noise

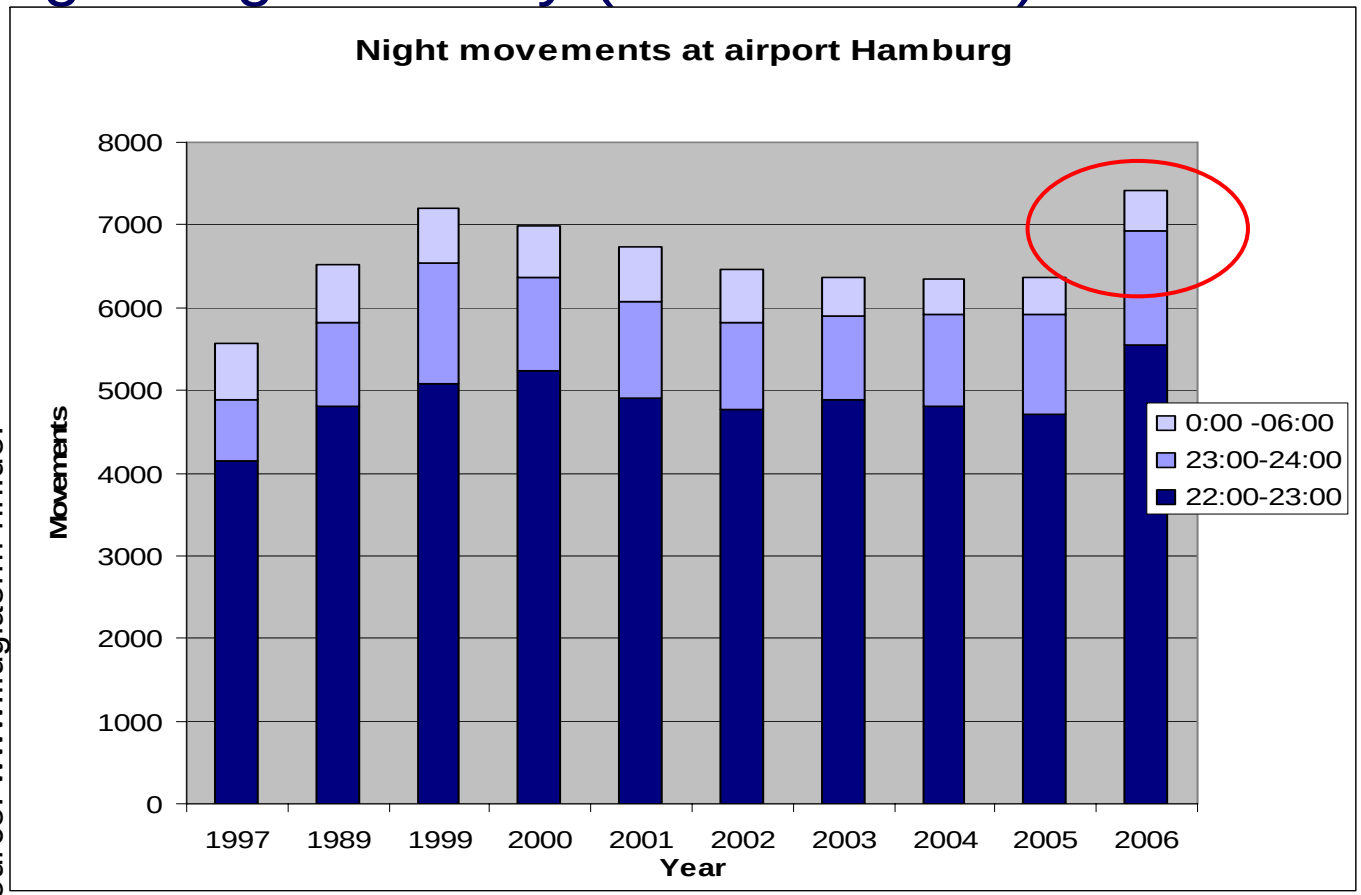
– Decreasing long run Noise Level



Source: Wylensek, (2006) 23.

Effects (4)

Declining Night-Flight Activity (but see 2006)



Source: www.fluglaerm-hh.de.

Heuristic Results

- Differentiation according to Noise Classes has no Effect on Aircraft Use
- Possible Effects of Time-Based Differentiation
- Users are Keen on Service Frequency – Charges Payable only per Passenger advance this Preference
- Effect of Variabilisation of charges on Aircraft Use is to be tested
- Demand in the End (Passenger) Market plays the Major Role

The Model (1)

- Multinomial Logit Model
  - Variables:
    - Take off weight
    - Noise Charge
    - Tariff Level (price Cap Regulation)
    - Surcharges for Night Flight Activity
    - Degree of Tariff-Variability
    - Aircraft Life Cycle

The Model (2)

Results:

Parameter	Value	Std error	t-test
Asc1*	-4.28	2.14	-7.35
TOW	+0.24	0.44	+2.00
Price Cap	+00001	+5.91	+0.00001
Noise Charge	-0.0005	+1.93	-0.0003
Variability	+0.00008	+3.47	+0.00002
Life-Cycle	+0.00006	+3.98	+0.00001
Night Surcharge	-0.0005	+5.64	-0.0003
Log-likelihood			-7,1618.69
Observations			2,680

*representative for all aircraft model specific variables

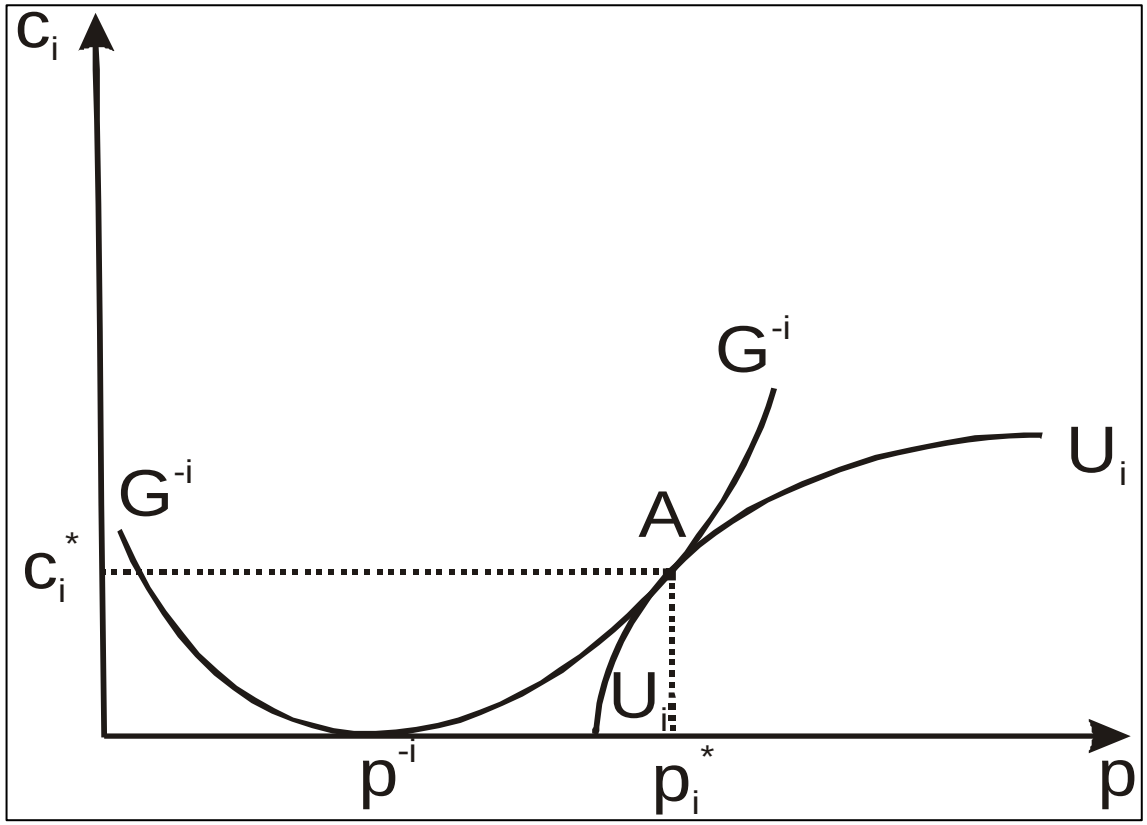
Explanations

- No Necessity for Separation due to ICAO Regulations
- Political Price Differentiation
- Administrative Measures
- Technical Aircraft Improvements

Results (1)

- The political Dimensions of differentiated Noise Charges
  - The Regulatory Practice invites Airlines to intervene within the Setting Process of the Pricing Rule
  - Environmental Organisations gained Voting Power within the last Decades
  - Airport has to show Sensibility
  - Price Differentiation is a good Means to alleviate Protests

Theoretical Framework: Grossmann/Helpman Approach



Policy Equilibrium. Source: Grossmann/ Helpmann, (2001) p.254.

Possible Solutions

Fine Differentiated Tariff Structures are desirable but also amenable to Political Manipulation

Less Differentiated Tariffs are suboptimal but less Manipulable

THANK YOU FOR YOUR ATTENTION!

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