6. COMPETITION (2)

Readings for Lecture 6

- Tomeš, Z., Kvizda, M., Jandová, M., & Rederer, V. (2016). Open access passenger rail competition in the Czech Republic. *Transport Policy*, *47*, 203-211.
- Hunold, M., & Wolf, C. (2013). Competitive procurement design: Evidence from regional passenger railway services in Germany.
- Preston, J., & Almutairi, T. (2013). Evaluating the long term impacts of transport policy: An initial assessment of bus deregulation. *Research in transportation economics*, *39*(1), 208-214.

Learning Objectives

- Advantages and disadvantages of open access rail competition x competitive tendering
- Open access rail services in Central Europe
- Competitive tendering of regional rail services in Germany
- Competition on the market x competition for the market in British bus industry

6.1 Competition in the market – Railways, Czech Republic

Czech railway passenger market

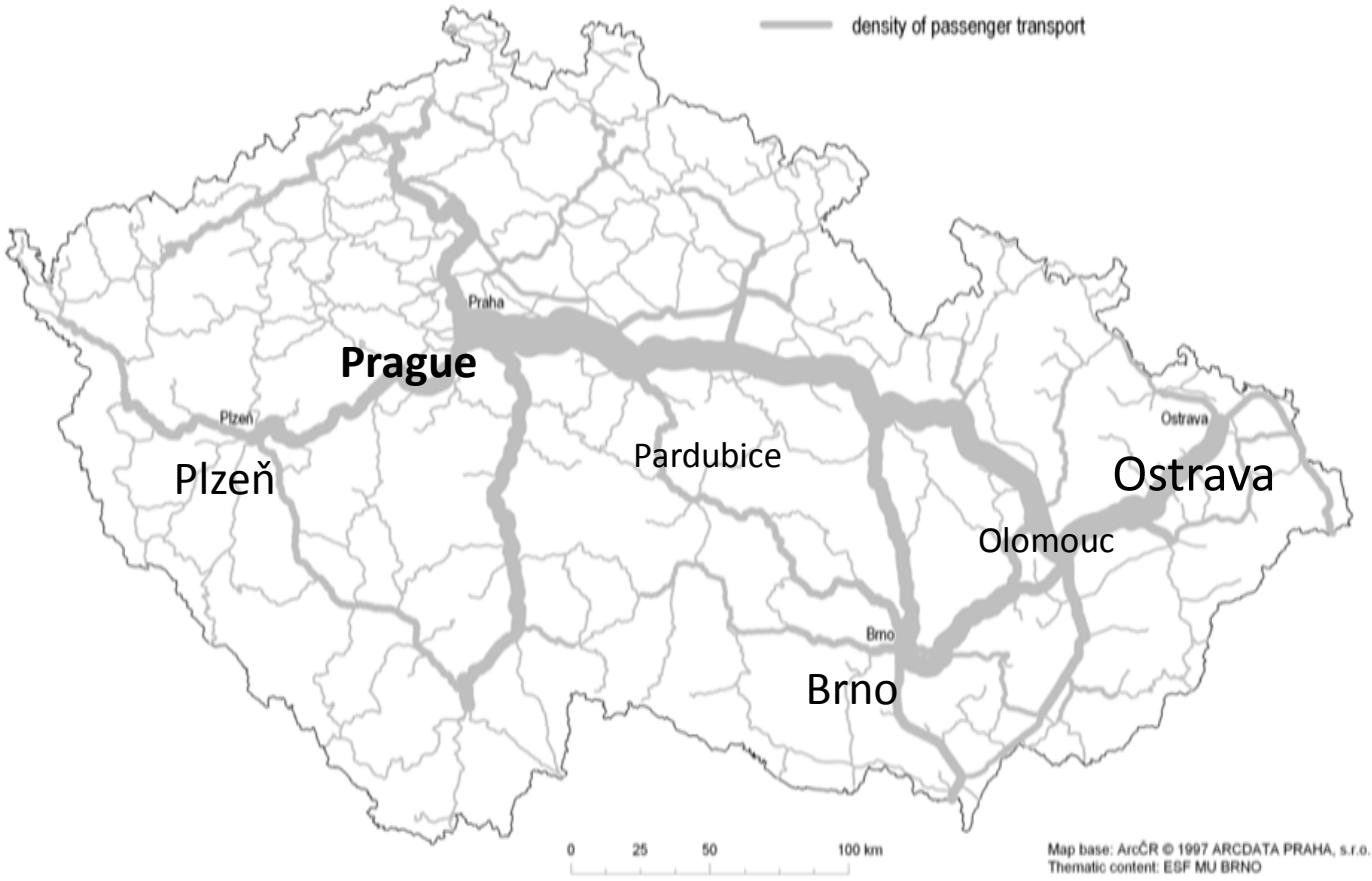
	1995	2000	2005	2010	2015
Passenger-Kilometers (billions)	8.0	7.3	6.7	6.6	8.3
Modal Share of Railways (%)	10.8	8.3	7.3	7.5	8.6
Private Operator's Market Share (%)	0.0	0.0	0.1	0.2	5.0

Source: Eurostat

Public and commercial services

- All regional services are PSO; financed by regions;
  2009 – 2019 direct awarding of all services to ČD
- Long distance services
  - semi-fast trains – PSO; direct awarding to ČD
  - IC trains – commercial services of ČD
  - open access on two mainlines
    2011: Prague – Ostrava – (Slovakia/Poland)
    2016: Prague – Brno – (Vienna/Bratislava/Budapest)

Geography



* densiiy of rail passenger flows; year 2009

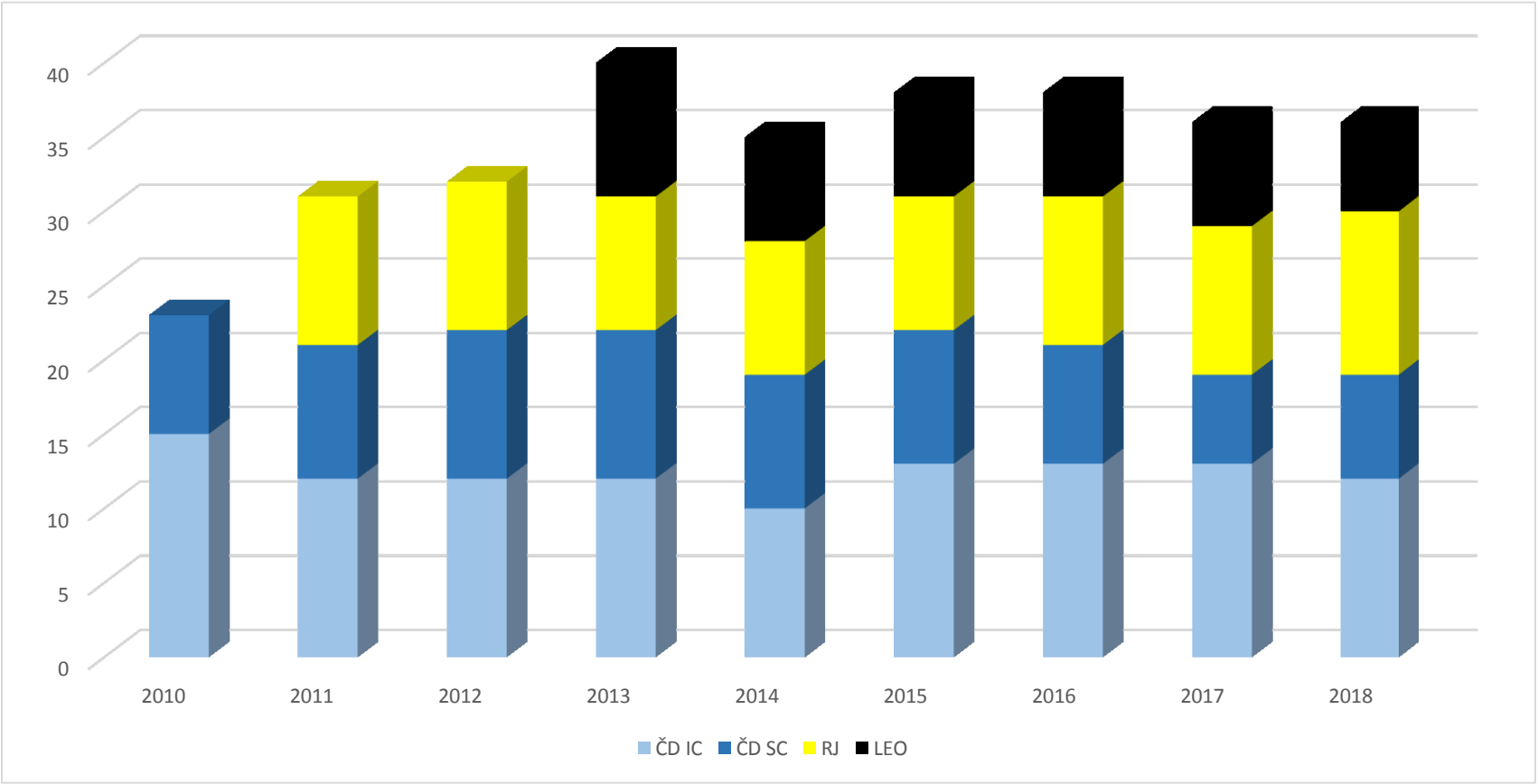
Source: ČD

Open access on Prague - Ostrava

- Before September 2011 → high density of traffic, low intermodal competition, two brands of ČD services – SC (Pendolino), IC (standard), high fares, subsidies, no competition
- September 2011 → withdrawal of public subsidies; the open access entrance of the first private competitor RegioJet
- January 2013 → the entrance of the second private competitor LeoExpress
- 2011 - 2018 → intensive price and non-price competition of the operators

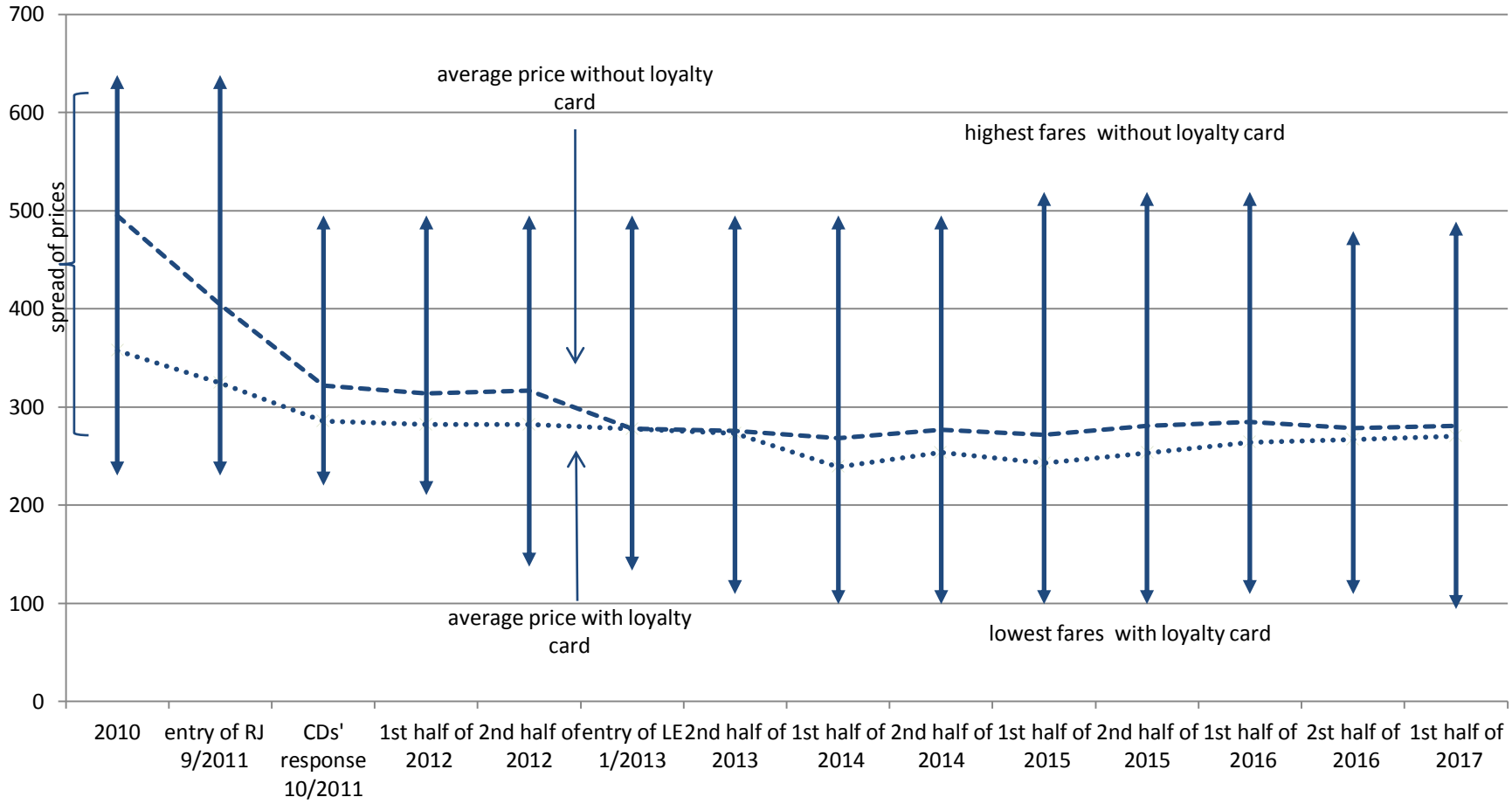
Service differentiation

Frequency



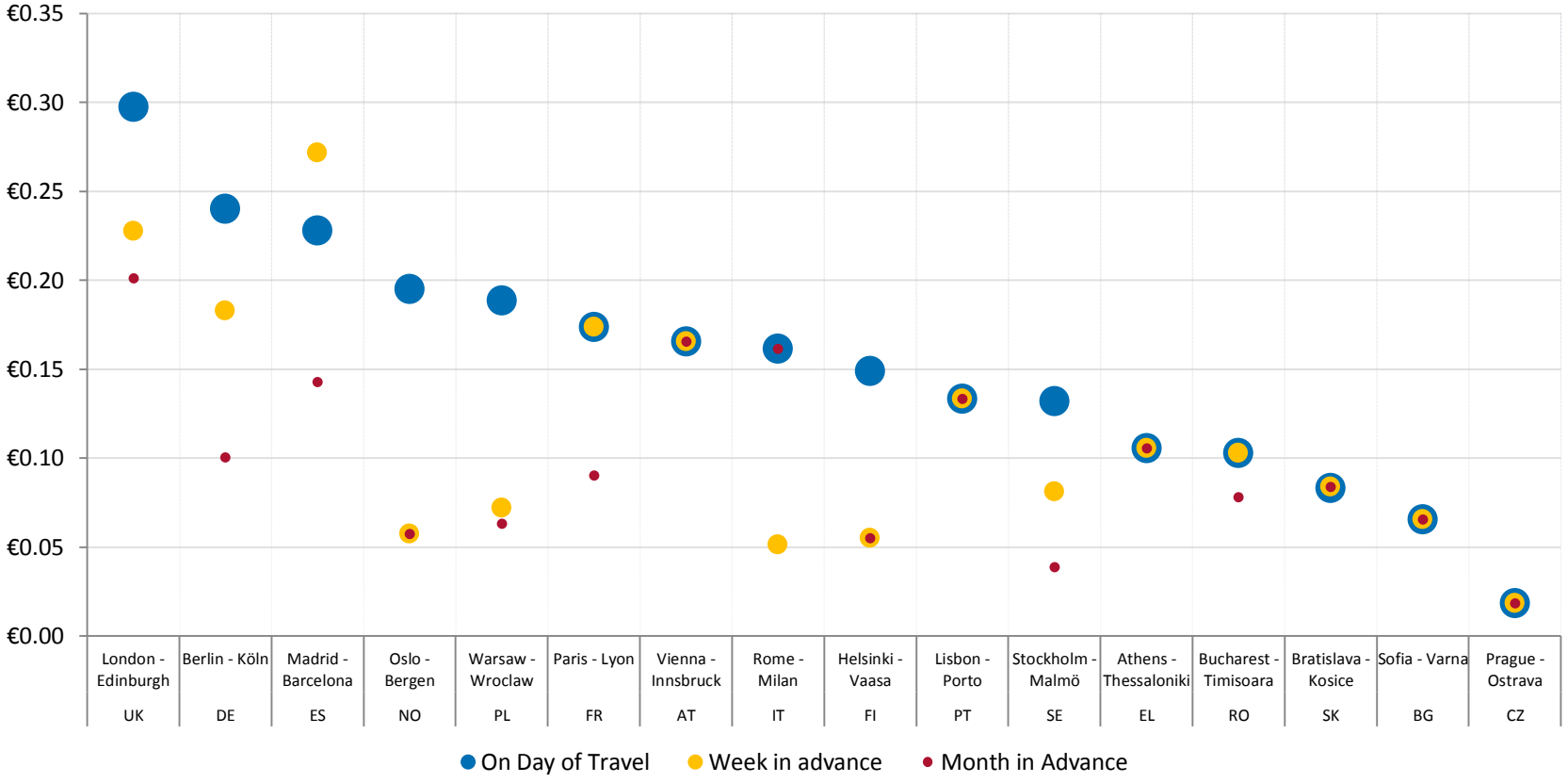
* daily, one-way

Prices



* CZK per one way ticket

Interurban fares above 300 km: peak single (PPP-adjusted fare EUR per km); 2015



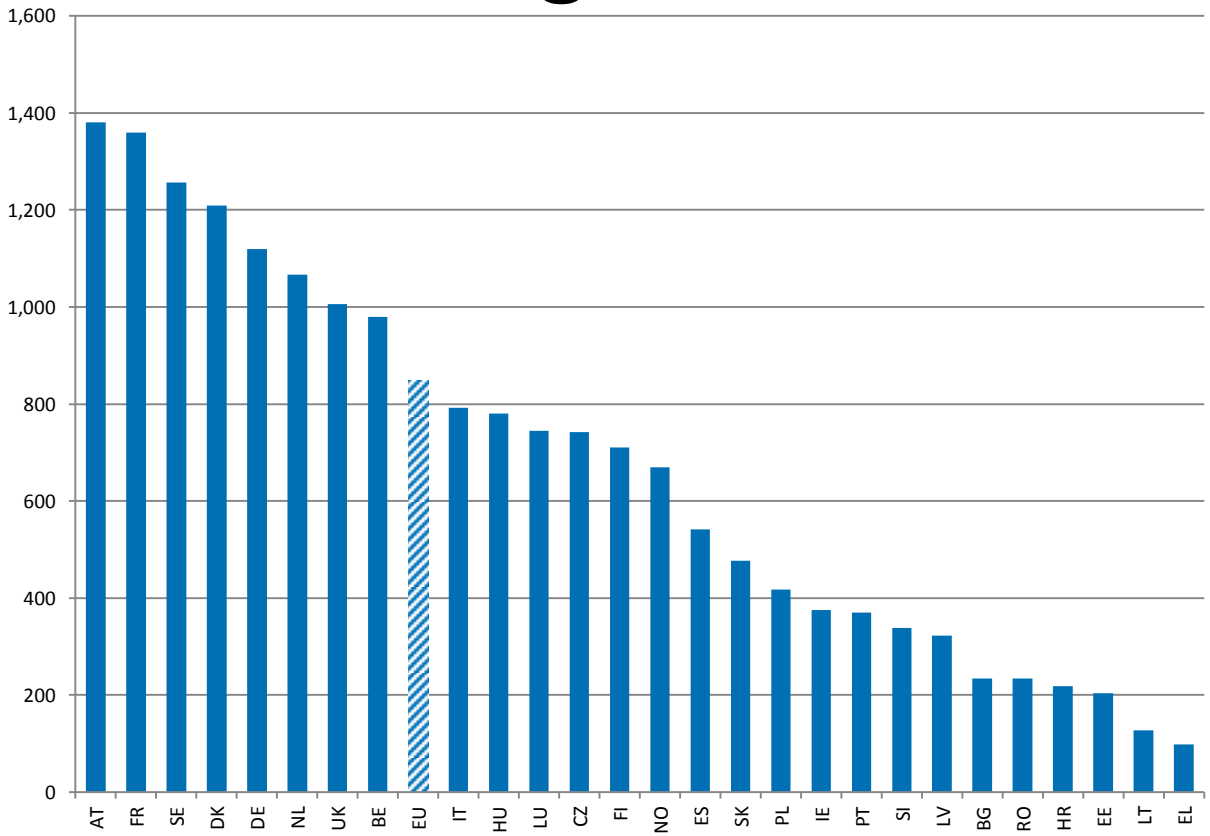
Source: EC (2016)

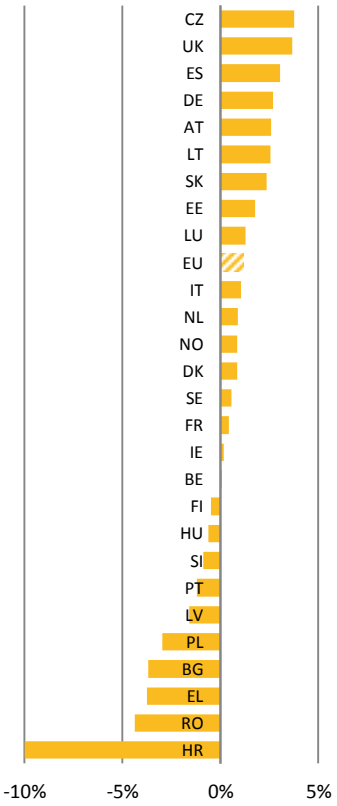
Passengers

	ČD SC	ČD IC	Regiojet	LeoEx	**TOTAL**
2010	1,3	2,3			**3,6**
2011	1,3	2,3	0,1		**3,7**
2012	1,1	2,1	1,1		**4,3**
2013	1,0	1,8	1,5	0,7	**5,0**
2014	1,2	1,5	2,4	0,9	**6,0**
2015	1,3	1,5	3,0	1,1	**6,9**
2016	1,3	1,6	3,1	1,1	**7,1**
2017	1,4	1,7	3,3	1,1	**7,5**

* millions; own estimation

Propensity to travel by rail (2014) and its average annual change since 2009





(p-km per year per inhabitant)

Source: RMSS 2016

Market shares

	ČD SC	ČD IC	RegioJet	LeoExpr	TOTAL
2010	36%	64%			100%
2011	35%	62%	3%		100%
2012	26%	48%	26%		100%
2013	20%	36%	30%	14%	100%
2014	20%	25%	40%	15%	100%
2015	19%	22%	43%	16%	100%
2016	18%	23%	44%	15%	100%
2017	18%	23%	44%	15%	100%

Revenues and profits

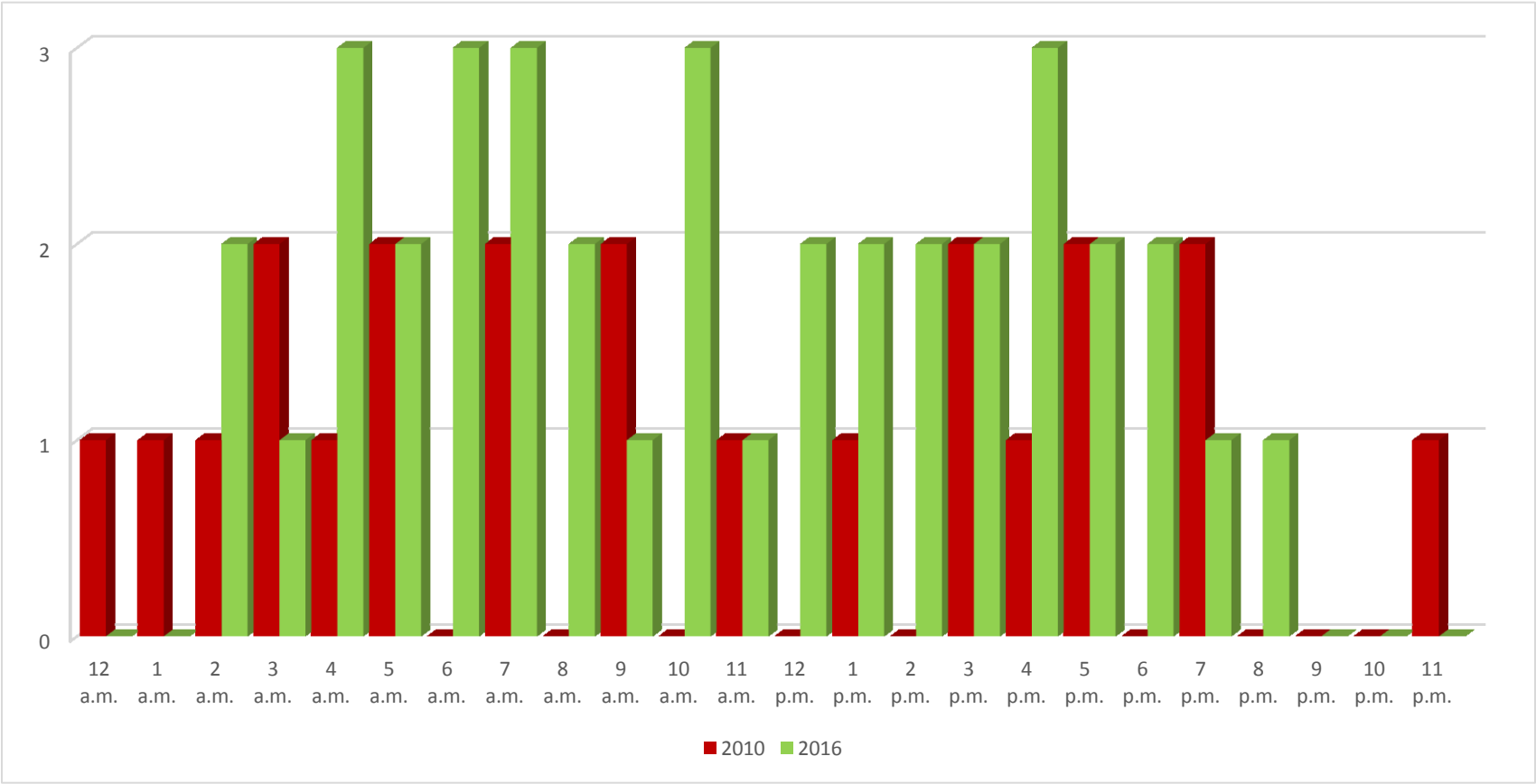
	2012		2013		2014		2015	
	Rev	Profit	Rev	Profit	Rev	Profit	Rev	Profit
Regio	246	-76	318	-93	523	-42	718	+41
Leo	11	-78	193	-159	178	-137	258	-84
ČD	19 500	-517	19 900	-1 795	20 723	-865	21 075	-1 395

- mil. CZK
- RegioJet and LeoExpress - data for Prague-Ostrava;
- ČD – data for all Czech passenger rail network

Rolling stock

	2010	2011	2012	2013	2014	2015	2016
Average Number of Coaches per Train	8.9	7.2	7.3	7.0	6.7	7.6	7.5
Average Number of Seats per Train	465	408	353	336	333	373	384
Total Daily Capacity (Number of Seats)	10 687	12 649	11 282	13 437	11 650	14 186	14 594

Timetable



Number of Passenger Trains Departing from Ostrava to Prague on Weekdays (number of trains per hour)

Regulation challenges

- Infrastructure capacity (charges, priority rights)
- Anticompetitive behaviour (predatory pricing)
- Conflicts with PSO operations (priorities, financing)
- Weak regulation
- Tariff integration

Assessment

+ better quality of services
+ higher frequency of trains
+ lower prices for customers

- strains on infrastructure capacity
- conflicts with PSO operations
- tariff disintegration

References

- Tomeš, Z., Kvizda, M., Jandová, M., & Rederer, V. (2016). Open access passenger rail competition in the Czech Republic. *Transport Policy*, *47*, 203-211.
- Tomeš, Z., Kvizda, M., Nigrin, T., & Seidenglanz, D. (2014). Competition in the railway passenger market in the Czech Republic. *Research in Transportation Economics*, *48*, 270-276.

6.2 Competition in the market – Railways, Central Europe

Introduction

Open access passenger rail services in Central Europe:

1) Austria on the Vienna–Salzburg line from 2011
2) the Czech Republic on the Prague–Ostrava line from 2011
3) Slovakia on the Žilina–Košice line from 2014.

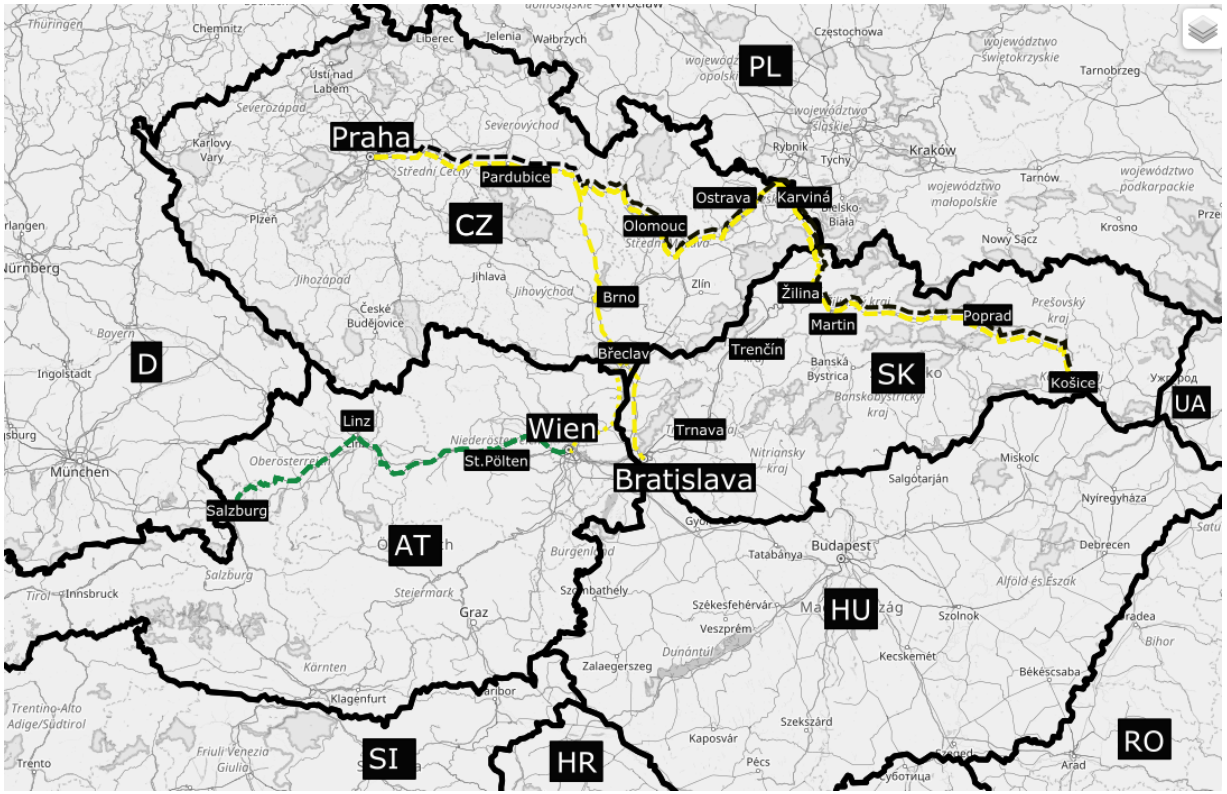
The paper compares the impacts of open access entries on the development of national railway markets. The comparison consists of:

1) entry barriers
2) business model
3) market developments
4) regulatory challenges

Railway passenger market

	Austria	Czech Republic	Slovakia
Area (1000 km^2)	84	79	49
Population (million)	8.5	10.5	5.4
Length of railway lines (th. km)	5.1	9.5	3.6
Share of electrified lines (%)	70	34	44
Passenger-killometres (billion)	12.0	7.6	2.6
Fare box revenue as % of TR	56	50	33
PSO as % of total services	71	93	91

Open access services in CE (2018)



Access charges

	InterCity	Suburban	Freight
Austria	4.2	2.0	3.4
Czech Rep.	1.2	0.6	3.4
Slovakia	1.8	1.6	2.8

EUR/trainkm

Frequency

	2010	2012	2014	2016	2018
Austria (Vienna–Salzburg)	ÖBB 37	ÖBB 37 WB 13	ÖBB 35 WB 14	ÖBB 35 WB 15	ÖBB 35 WB 29
Czech Republic (Prague–Ostrava)	ČD 23	ČD 22 RJ 10	ČD 19 RJ 9 LE 7	ČD 21 RJ 10 LE 7	ČD 19 RJ 11 LE 6
Slovakia (Žilina–Košice)	ŽSSK 20	ŽSSK 18	ŽSSK 16 RJ 2 LE 0	ŽSSK 16 RJ 8 LE 1	ŽSSK 19 RJ 3 LE 2

Daily train departures; one-way

Market effects

	Δ Prices	Δ Ridership	Δ Revenues	Δ Frequency (proxy for Δ Costs)
Austria 2010–2016 Vienna–Salzburg	−(20..25)%	+(20..25)%	-10%..0%	+35%
Czech Rep. 2010–2016 Prague–Ostrava	−42%	+97%	+14%	+65%

Profits

	2012	2013	2014	2015	2016
WESTbahn	−23.5	−14.5	−10.3	−5.4	-8.7
RegioJet	−2.8	−3.4	−1.6	+1.5	n.a.
LEO Express	−2.9	−5.9	−5.1	−3.1	-4.2

mil. EUR

Regulatory challenges

- The need for dedicated regulator
- Predatory pricing
- Conflicts between OA and PSO services
- No tariff integration
- Infrastructure capacity around big cities

Conclusions

- Demand → undoubtely positive impact of open access services (innovations, marketing, frequency, quality, prices, ridership)
- Supply → questionable/negative impact of open access services (rising unit costs, stagnating revenues, financial losses, cherry-picking, long term sustainability)
- Regulation → significant challenges (vertical structure, infra capacity, priority rights, operators disputes, predatory pricing, anticompetitive behaviour)

References

- Tomeš, Z. – Jandová M. (2018): Open access passenger rail services in Central Europe. *Research in Transportation Economics*. 2018. In print

6.3 Competition for the market

Hunold, M., & Wolf, C. (2013). Competitive procurement design: Evidence from regional passenger railway services in Germany.

Introduction

We study competitive awarding procedures of short haul railway passenger services in Germany from 1995 to 2011 by means of a newly collected data set. In particular, we use regression techniques to investigate:

- the determinants of the number of bidders,
- the identity of the winning bidder,
- the subsidy level.

Germany regional tendering

- Competitive tendering of regional railroad passenger services in Germany has developed since the liberalization of the railroad sector in 1994.
- The central goal is to implement a decent level of service quality, while keeping public subsidies at a low level.
- Towards this, an intermediate goal is to induce entry of new operators that provide alternatives to the still dominant operator DB Regio.
- This operator is not only the incumbent of most transport services, but is additionally integrated with the network operator in the publicly owned holding Deutsche Bahn AG (DB).
- Reinforced by substantial asymmetries between the incumbent and the entrants, designing awarding procedures that attract an adequate number of bidders and select the most capable one remains a challenge.

Development of the awarding procedures

	Non-competitive	(Mio train-km)	Competitive	(Mio train-km)
1995	0	(0.0)	1	(0.5)
1996	5	(3.8)	4	(4.7)
1997	4	(5.3)	8	(15.5)
1998	3	(2.8)	8	(8.7)
1999	1	(0.1)	8	(11.1)
2000	3	(0.8)	2	(0.6)
2001	9	(31.8)	6	(13.6)
2002	8	(3.4)	15	(21.5)
2003	8	(159.9)	11	(21.5)
2004	9	(238.2)	14	(23.7)
2005	11	(40.7)	14	(21.0)
2006	2	(2.7)	14	(28.4)
2007	5	(12.4)	16	(34.0)
2008	6	(7.3)	13	(26.1)
2009	3	(4.4)	15	(51.3)
2010	12	(23.4)	23	(67.4)
2011	1	(1.3)	9	(18.7)
Total	90	(538.4)	181	(368.2)

Hypotheses

- The identity of the winning bidder
- The number of bidders in competitive awarding procedures
- The subsidy levels

The identity of the winning bidder

- ***Hypothesis 1.*** *DB is more likely to win when profit risks are high.*
- ***Hypothesis 2.*** *DB is more likely to win if used vehicles are admitted.*
- ***Hypothesis 3.*** *DB is more likely to win if no financial support for new vehicles is offered.*
- ***Hypothesis 4.*** *DB is more likely to win a contract if the contract volume is large.*
- ***Hypothesis 5.*** *DB is more likely to win a contract if it is the incumbent.*
- ***Hypothesis 6.*** *DB is more likely to win a contract if the number of bidders is low.*

The number of bidders

- **Hypothesis 7.** *The number of bidders is higher if less other awarding procedures take place at the same time.*
- **Hypothesis 8.** *The number of bidders is higher if a) DB has fewer competitive advantages and b) the contract duration is higher.*

The subsidy level

- **Hypothesis 10.** *The resulting subsidy level is lower if the number of bidders is higher.*
- **Hypothesis 11.** *The resulting subsidy level is lower for net contracts.*
- **Hypothesis 12.** *The required subsidy level is lower if the network length and frequency of service increase.*
- **Hypothesis 13.** *The required subsidy level is lower if a) used vehicles are admitted and b) financial support for new vehicles is offered.*

Data

Table 2: Descriptive statistics

	mean	sd	min	max	count
DB wins	0.35	0.48	0.00	1.00	268
DB incumbent	0.81	0.39	0.00	1.00	208
Number of bidders	3.59	1.93	1.00	11.00	169
Subsidy (EUR per train-km)	8.70	4.66	0.31	32.12	112
Auction	0.55	0.50	0.00	1.00	182
Competitive awarding	0.68	0.47	0.00	1.00	268
Used vehicles	0.62	0.49	0.00	1.00	186
Vehicle support	0.34	0.47	0.00	1.00	178
Net contract	0.60	0.49	0.00	1.00	253
Duration	9.40	4.48	1.00	22.00	268
Train-km (Mio. km per year)	3.25	8.12	0.00	98.10	267
Network length (km/100)	1.51	1.41	0.07	9.09	234
Frequency (train-km/network-km)	1.89	5.75	0.00	85.39	233
Electrified	0.36	0.48	0.00	1.00	239
Simultaneous awardings	26.26	10.82	0.00	47.00	268
Years 1995-2003	0.38	0.49	0.00	1.00	268
Years 2004-2007	0.32	0.47	0.00	1.00	268
Years 2008-2011	0.30	0.46	0.00	1.00	268

The identity of the winner

	DB wins				
	(1)	(2)	(3)	(4)	(5)
	OLS	OLS	OLS	IV-OLS	Probit
DB incumbent	0.21**	0.28**	0.33***	0.38***	1.23***
	(2.65)	(2.71)	(3.02)	(3.52)	(2.92)
Electrified	0.14*	0.29**	0.26**	0.25*	0.86***
	(1.92)	(2.86)	(2.38)	(1.99)	(2.63)
Frequency (train-km/network-km)	0.04***	-0.00	-0.01	-0.01	0.01
	(3.13)	(-0.18)	(-0.23)	(-0.32)	(0.12)
Network length (km/100)	0.10***	0.06***	0.07***	0.07***	0.24***
	(5.87)	(3.40)	(3.30)	(2.92)	(3.13)
Duration		0.02*	0.02**	0.01**	0.06**
		(1.84)	(2.25)	(2.53)	(2.20)
Auction		-0.05	-0.05	-0.02	-0.24
		(-0.60)	(-0.63)	(-0.17)	(-0.80)
Used vehicles		0.24***	0.20**	0.14	0.70**
		(3.25)	(2.73)	(1.50)	(2.50)
Vehicle support		-0.10	-0.10	-0.06	-0.30
		(-1.11)	(-1.20)	(-0.67)	(-0.98)
Net contract		0.18**	0.12	0.01	0.42
		(2.53)	(1.53)	(0.04)	(1.64)
Number of bidders			-0.05**	-0.11**	-0.17**
			(-2.49)	(-2.73)	(-2.30)
Constant	-0.09	-0.36**	-0.19	0.01	-2.45***
	(-1.53)	(-2.22)	(-1.00)	(0.05)	(-3.01)
Agency dummies	No	No	No	Yes	No
Observations	178	128	127	127	127
Adjusted R^2	0.151	0.195	0.217	0.151	

Robust, agency-adjusted standard errors; in parantheses: t-values; * p < 0.1, ** p < 0.05, *** p < 0.01

Dependent variable is 1, if DB wins the awarding, otherwise 0. Probit output: Coefficients.

Instruments: simultaneous awardings, regional competitiveness, awarding year.

F-test for joint significance: 3.33 (p<.043).

The number of bidders

	Bidders				
	(1)	(2)	(3)	(4)	(5)
	OLS	OLS	OLS	Poisson	Poisson
DB incumbent	0.87*	0.68	0.59	0.24*	0.20
	(2.08)	(1.50)	(1.20)	(1.71)	(1.36)
Electrified	0.14	-0.41	-0.10	-0.12	-0.03
	(0.49)	(-1.22)	(-0.23)	(-1.32)	(-0.32)
Frequency (train-km/network-km)	0.07	0.01	-0.25	0.00	-0.06
	(0.52)	(0.08)	(-0.98)	(0.04)	(-1.12)
Network length (km/100)	-0.04	0.10	0.11	0.02	0.03
	(-0.29)	(0.75)	(0.95)	(0.60)	(0.90)
Simultaneous awardings	-0.06**	-0.03	-0.04	-0.01	-0.01
	(-2.27)	(-1.02)	(-0.71)	(-1.34)	(-1.35)
Duration		0.05	0.07	0.02*	0.02***
		(1.61)	(1.44)	(1.90)	(2.68)
Auction		0.09	0.88**	0.05	0.27**
		(0.29)	(2.16)	(0.62)	(2.29)
Used vehicles		-0.55**	0.01	-0.13	0.01
		(-2.20)	(0.02)	(-1.57)	(0.07)
Vehicle support		-0.15	-0.26	-0.01	-0.06
		(-0.27)	(-0.42)	(-0.07)	(-0.41)
Net contract		-1.49***	-0.50	-0.41***	-0.17
		(-3.93)	(-0.89)	(-4.39)	(-0.71)
Awarding year		-0.05	-0.12	-0.01	-0.04**
		(-0.45)	(-0.91)	(-0.32)	(-2.50)
Constant	4.33***	99.37	235.56	17.78	74.86**
	(5.20)	(0.47)	(0.93)	(0.35)	(2.52)
Agency dummies	No	No	Yes	No	Yes
Observations	154	127	127	127	127
Adjusted R^2	0.101	0.142	0.285		

Robust, agency-adjusted standard errors; in parantheses: t-values; * p < 0.1, ** p < 0.05, *** p < 0.01

Dependent variable is the number of bidder in a competitive awarding.

Agency dummies are highly correlated with net contract and explain percent of the latter's variance.

F-Test for joint significance of agency dummies in OLS has value 3.9 (p<.001).

The subsidy level

	Subsidy				
	(1)	(2)	(3)	(4)	(5)
	OLS	OLS	OLS	OLS	IV-OLS
DB incumbent	-2.33	-2.14	-2.12	-2.26	-2.36
	(-1.37)	(-1.11)	(-1.39)	(-1.51)	(-1.57)
Electrified	-0.72	-0.53	-1.24	-1.28	-1.30
	(-1.38)	(-0.78)	(-1.22)	(-1.31)	(-1.36)
Frequency (train-km/network-km)	-0.05	-0.49	-0.53	-0.52	-0.51
	(-0.29)	(-0.73)	(-0.92)	(-0.92)	(-0.92)
Network length (km/100)	0.13	-0.07	0.01	0.06	0.10
	(0.71)	(-0.29)	(0.05)	(0.33)	(0.44)
Number of bidders		0.01		-0.39*	-0.66
		(0.07)		(-2.12)	(-1.54)
Duration			0.08	0.09	0.09
			(0.53)	(0.54)	(0.54)
Auction			1.14	1.09	1.06
			(1.17)	(1.02)	(0.90)
Used vehicles			1.41	0.94	0.61
			(1.12)	(0.74)	(0.50)
Vehicle support			0.72	0.49	0.33
			(0.71)	(0.50)	(0.32)
Net contract			-2.56***	-3.46***	-4.10***
			(-3.73)	(-4.56)	(-3.30)
Awarding year			-0.02	-0.09	-0.13
			(-0.13)	(-0.60)	(-0.87)
Constant	10.24***	10.96***	46.38	183.72	281.25
	(5.45)	(4.58)	(0.16)	(0.64)	(0.91)
Observations	84	73	57	57	57
Adjusted R^2	0.028	0.008	0.179	0.192	0.176

Robust, agency-adjusted standard errors; in parantheses: t-values; * p < 0.1, ** p < 0.05, *** p < 0.01
Dependent variable is the subsidy level in the first year of operation.

Differences between competitive and direct awarding (mean comparison)

	Non-competitive	N	Competitive	N	Difference	p-value
DB wins	0.36	86	0.34	182	0.02	0.75
DB incumbent	0.71	41	0.84	167	-0.13	0.05
Subsidy per train-km	10.76	27	8.04	85	2.72	0.01
Used vehicles admitted	0.82	39	0.56	147	0.26	0.00
Net contract	0.80	74	0.53	179	0.27	0.00
Cost pass through	0.90	40	0.90	135	0.00	0.95
Rolling stock financial support	0.39	38	0.32	140	0.07	0.40
Duration	8.85	86	9.65	182	-0.81	0.17
Train-km	5.81	85	2.06	182	3.74	0.00
Network length	1.50	63	1.51	171	-0.01	0.98
Simultaneous awardings	23.40	86	27.62	182	-4.23	0.00
Regional competitiveness	0.27	86	0.38	182	-0.11	0.00
Years 1995-2003	0.45	86	0.35	182	0.11	0.09
Years 2004-2007	0.33	86	0.32	182	0.01	0.91
Years 2008-2011	0.22	86	0.34	182	-0.11	0.06
Observations	268					

Summary

We find that there are more bidders when the contract duration is high and the revenue risk low. The dominant operator is more likely to win contracts if it is the incumbent, the network is large, the contract duration is high, when used rolling stock is admitted and when there are few other bidders.

6.4 British buses

Preston, J., & Almutairi, T. (2013). Evaluating the long term impacts of transport policy: An initial assessment of bus deregulation. *Research in transportation economics*, *39*(1), 208-214.

British bus reform

- Local buses in Britain, outside London, were 'deregulated' in 1986 (**competition on the market**)
- By contrast, in London, the 1984 London Regional Transport Act introduced a system of comprehensive tendering (**competition for the market**)
- This paper examines the long term impacts of these changes.

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Demand

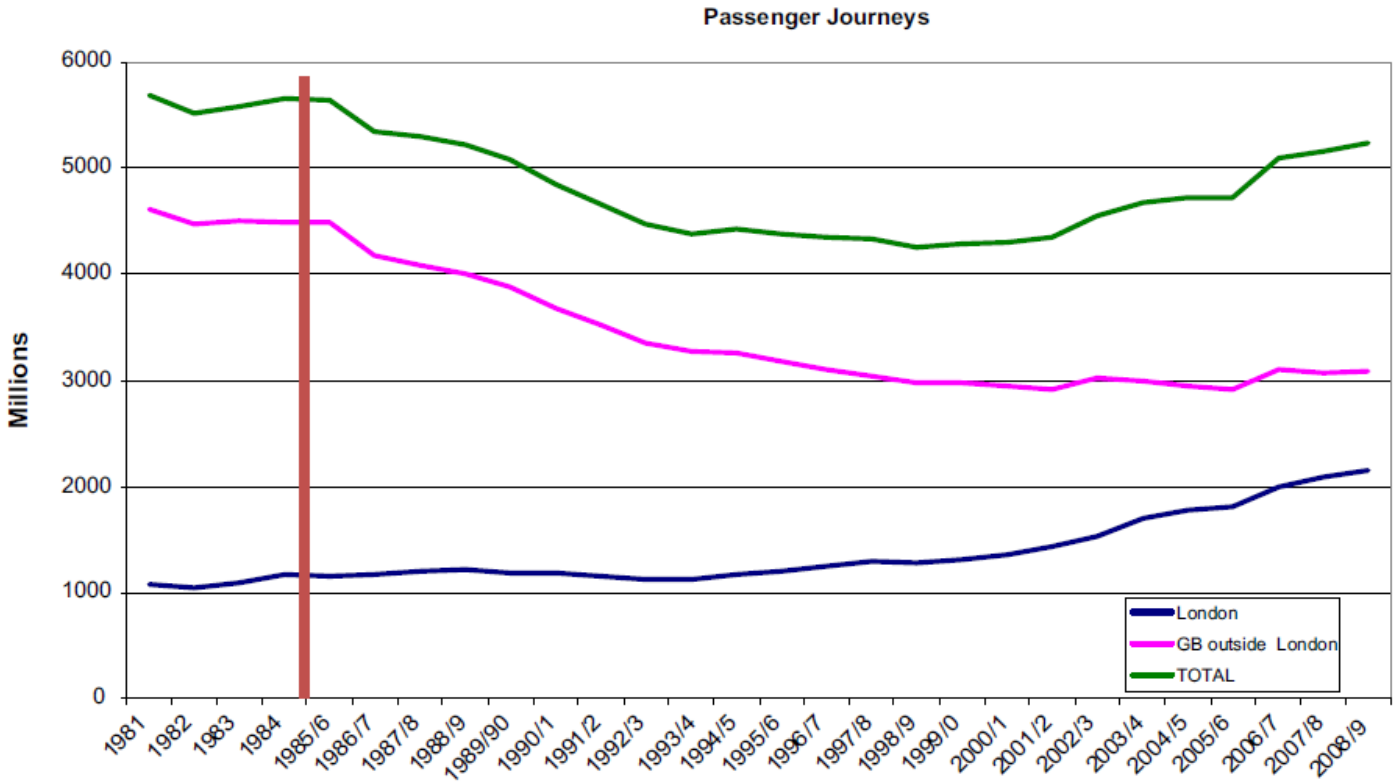

Fig. 1. Trends in local bus demand (passenger journeys, millions).

Supply

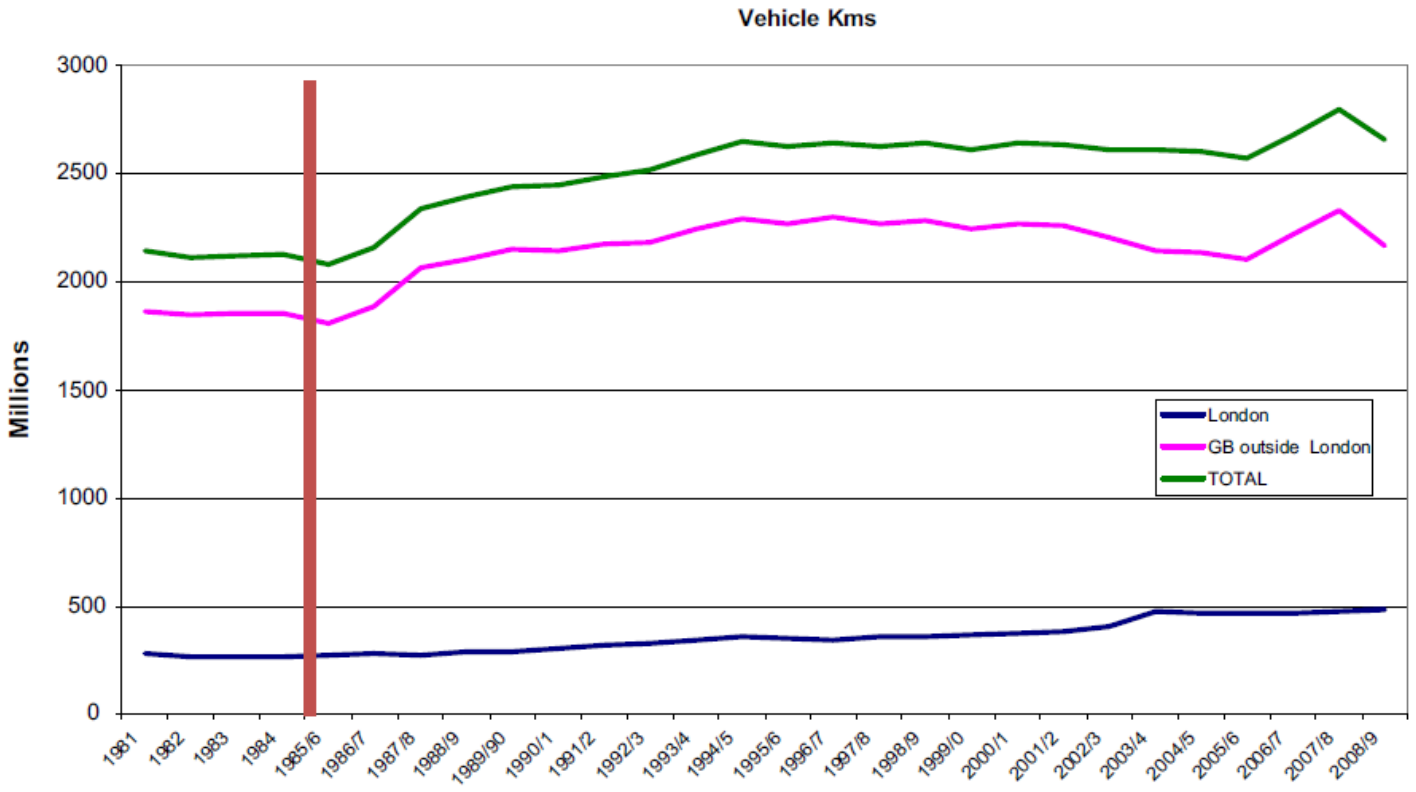

Fig. 2. Trends in local bus supply (vehicle kilometres, millions).

Fares

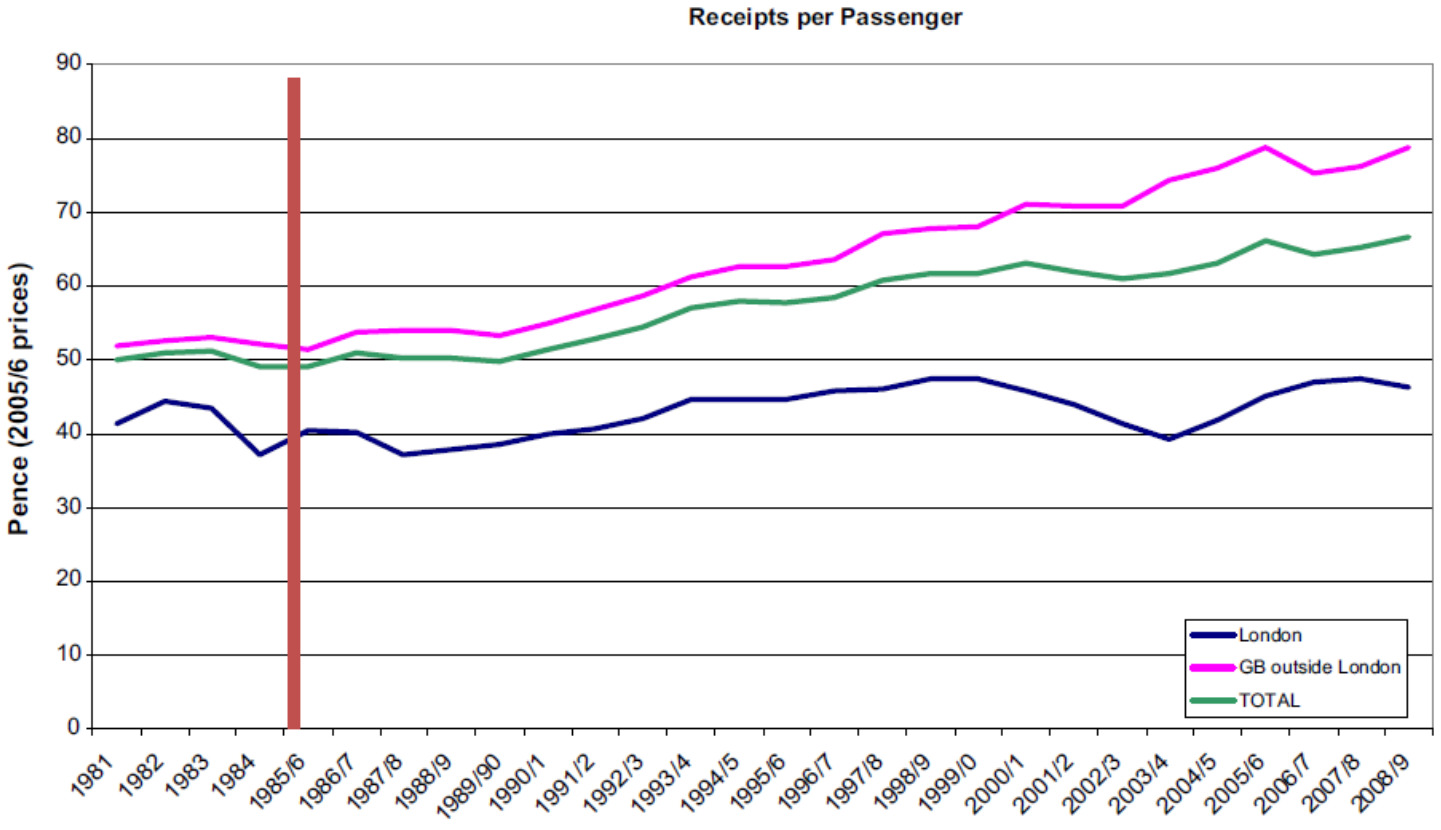

Fig. 3. Trends in fares (receipts per passenger, excluding concessionary fares reimbursement) pence, 2005/6 prices.

Costs

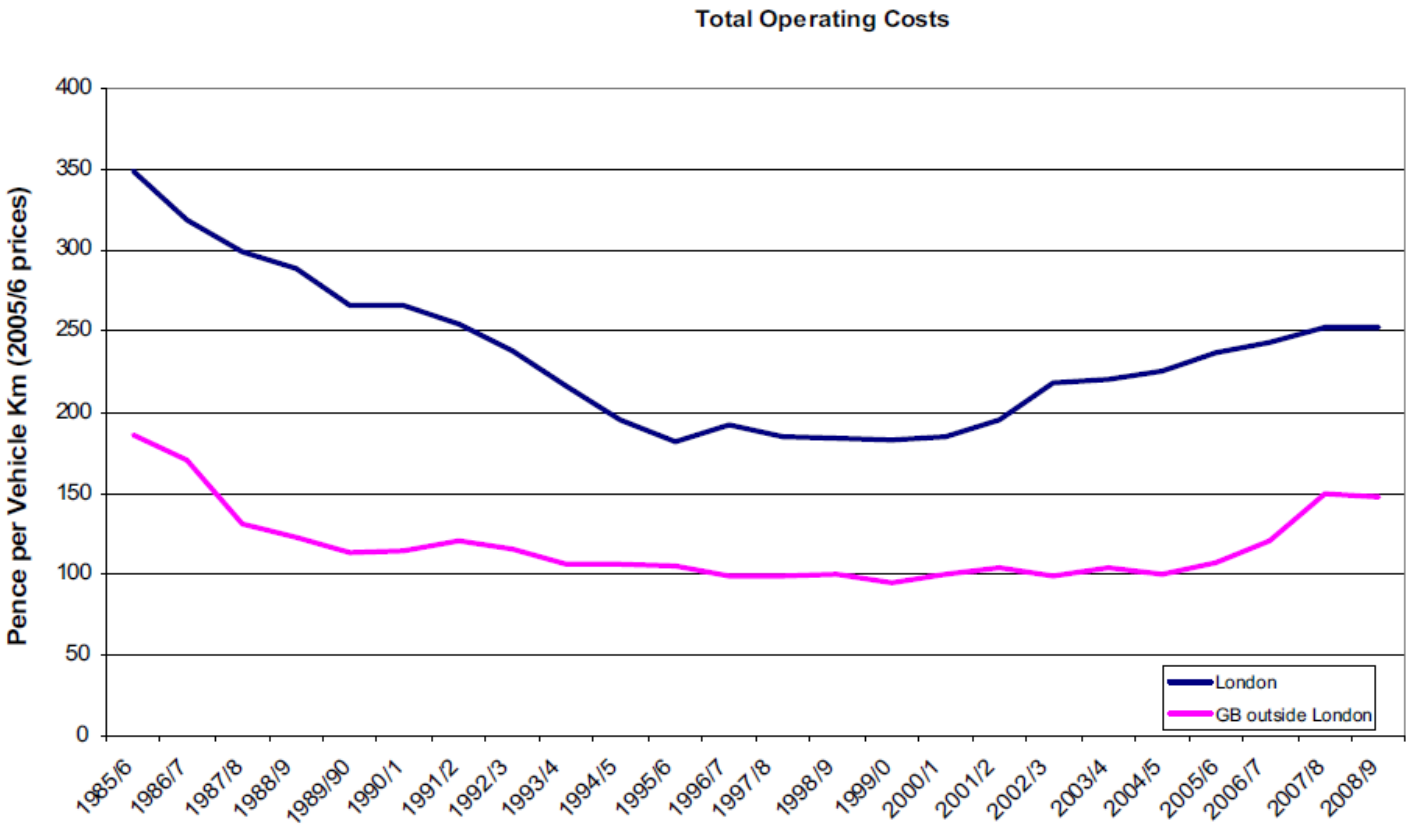

Fig. 4. Trends in vehicle operating costs: pence per km, 2005/6 prices.

Subsidy

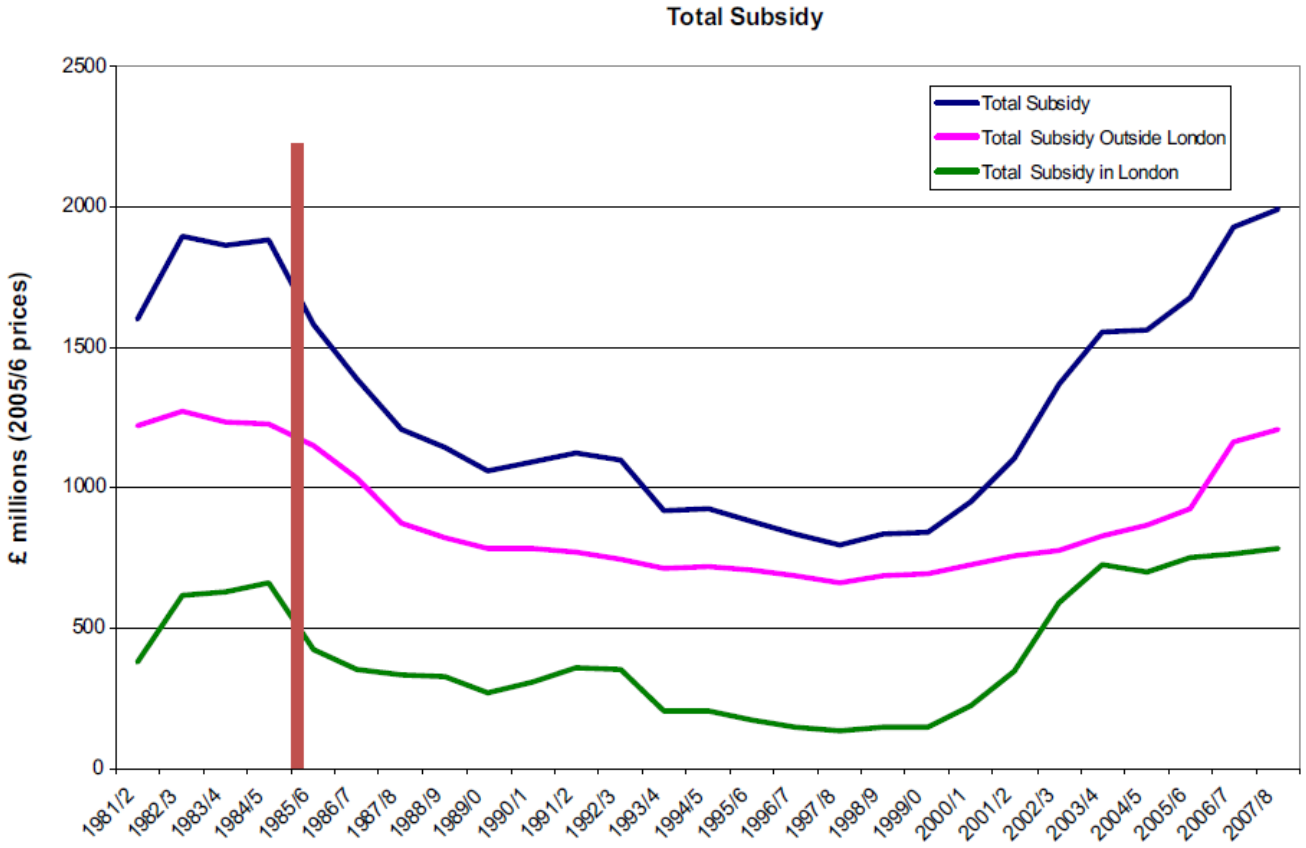

Fig. 5. Trends in subsidy. £ million, 2005/6 prices. Note: does not include bus service operators grant (previously fuel duty rebate) – £414 million in 2007/8.

Key changes

Table 1
Key changes in the local bus market since 1985/6.

	Outside London	London
Demand	−31%	+87%
Fares	+55%	+15%
Services	+20%	+78%
Costs	−20%	−28%
Subsidy	+5%	+84%

Conclusion

- It is found that outside London, bus demand declined strongly, at least up to the year 2000 and some of this reduction can be ascribed to deregulation. By contrast in London, demand has generally been increasing.
- However, in both areas operating costs also declined strongly, again up to 2000, but since then there have been strong increases in costs and subsidy. Our initial finding is that there are net welfare increases both outside and inside London, but with welfare increases per capita being five times greater in London than elsewhere.
- However, sensitivity analysis shows that our results are sensitive to the specification of the modelling system and assumptions made concerning the counterfactual, particularly for the results for London.

6.5 Summary

Summary

- Open access passenger rail competition has undoubtely positive impacts on demand, however qustionable impacts on supply and creates significant regulation challenges
- Competitive tendering of rail services enables to decrease total subsdies, howegver the design is critical
- Competition for the market seems to work better for British buses than comeptition on the market

Readings for Lecture 7

- Reform of the Railway Sector and its Achievements - Network Industries Quarterly - Vol 18 - No 4 (December 2016)
- Preston, J., & Robins, D. (2013). Evaluating the long term impacts of transport policy: The case of passenger rail privatisation. *Research in Transportation Economics*, *39*(1), 14-20.