

Wider Economic Benefits or Catalytic Effects of Air Transport ? How to assess airport investments

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The Issues...

- WEBs and CE play an increasingly important role in assessing air transport policy
 - Rationale for BBI builds on CE
 - Rationale for new runway at Heathrow builds on WEBs
- WEBs and CEs are similar, but distinct concepts
- While CEs as part of Economic Impact Analysis are misleading,
- WEBs as part of CBA/CGE are not.
- What problems are there in assessing WEBs of air transport?
 - What are they really? How to measure? And the problems remaining

WEBs and Air Transport

- Use of WEBs (and WEIs- wider economic impacts) and CEs is more recent than in surface transport
- Similar but not identical effects
- Considerable interest now
- COST Project “Air Transport and Regional Development” <http://www.atard.net/>

Agenda

- Catalytic Effects and Economic Impact
 - Definition, Measurement and Results
- WEBS, WEIs and CBA/CGE
 - Definition, Measurement and Results
- Assessing the techniques
- Conclusions

Catalytic Effects & EIA: Definition

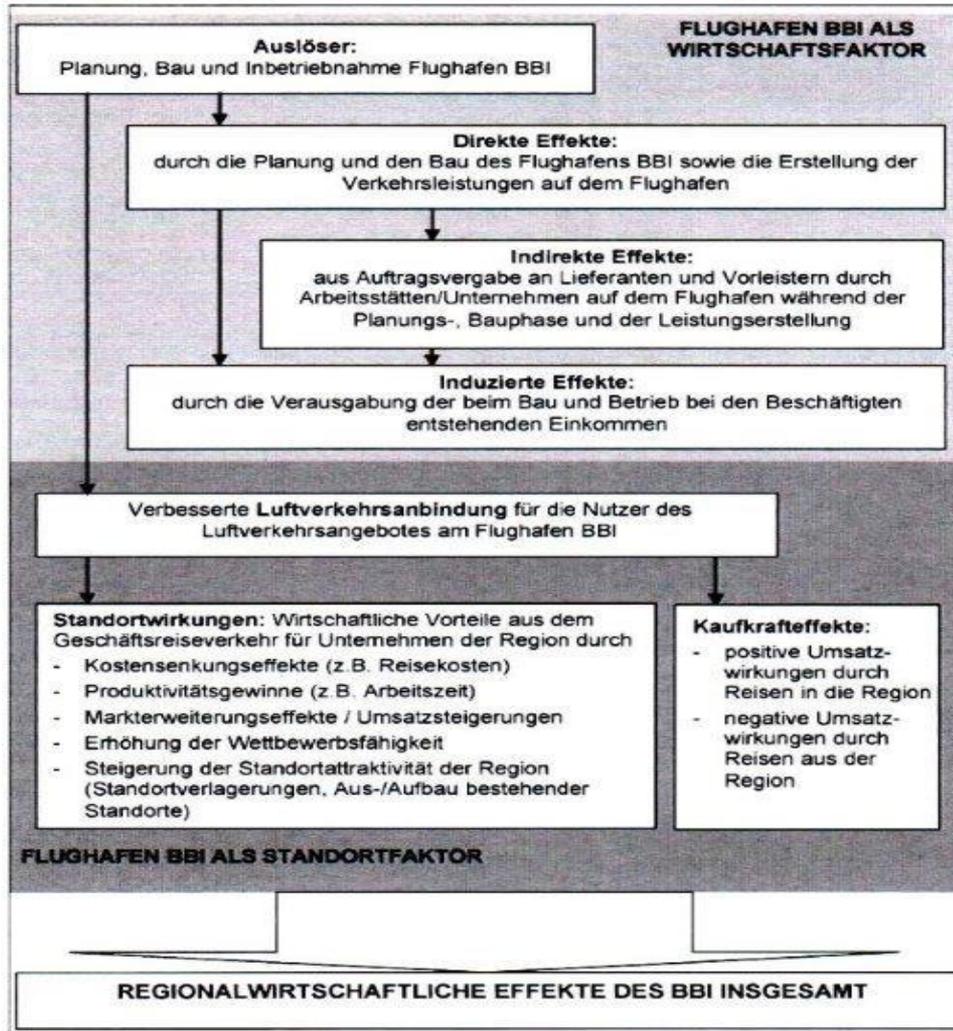
- Catalytic impact = “employment and income generated in the economy of the study area by the wider role of the airport in improving the productivity of business and in attracting economic activities such as inward investment and inbound tourism” (ACI Europe/York, 2004 p.5).
- Defined in this way catalytic effects share elements of WEB
- Eurocontrol/Oxford Economic Forecasting (2002), ECAD (2008), Pancer-Cybulska et al. (2014) include consumer surplus and environment impacts.
- Definitions becomes wider and wider and less and less clear as the concepts of consumer welfare and external effects have no function and meaning in impact analysis.

Catalytic Effects & EIA: Measurement

- Old and new EIA differ in how they measure and interpret catalytic effects
- Common Elements
 - Direct and indirect effects by (regionalized) input-output table
 - Induced effect by Keynesian Multiplier
- Old studies analyse catalytic effects separately and do not add them up
- New studies
 - quantify at least some of the catalytic effects
 - some effects are thought of being not quantifiable
 - some add catalytic to the direct, indirect and induced, some not

Catalytic Effects & EIA: New Studies

Abbildung 1-1: Regionalwirtschaftliche Effekte des Flughafens BBI



- Baum (2005) combines traditional EIA with quantitative analysis of catalytic effects
- Clear definition
 - Net effect of tourism
 - Questionnaire on increased revenues and cost reduction from improved connectivity and competitiveness of regions
 - Adds catalytic effects to total impact.

Catalytic Effects & EIA: Results

Author/ year	Direct jobs	Indirect, induced, Total jobs	Type of Catalytic Absolute & relative to total jobs	Separ- ate or add up	Purpose
Infras (2005)	3081	1055, 6383 = 10519	Incoming tourism: 2636 jobs = 25 %	Added	Movement limit/hub function loss
Booz (2008)	12460	10.100, 1679= 24239	Location: 9000 jobs = 37 % Cheaper business trips: € 94Mio Incoming tourism: + € 270 Mio/ Outgoing tourism: - € 50 Mio	Se- parate	Prevent stricter night Curfew
Baum (2005) Results for BBI 2012	17100	7700 + 3600 = 28400	Inbound minus outbound tourism: 12.200. Location: 32.400 Total catalytic: 40.600 = 142 %	Added	Rationale for new BBI airport
BBI 2012 vers. 2004	+ 3700	+ 3400	+ 3600 from net tourism + 32400 from location = 36000 from catalytic		

Author/ year	Direct jobs	Indirect, induced, Total jobs	Type of Catalytic	Separat e or add up	Purpose
Basler & Bulwien (2007)	27.400 (2005)	30140 = 57540.	Examples of catalytic effects from net tourism and location, not analyzed	Unclear + 0,4 growth rate of gross value	Rationale for 3 rd runway at Munic airport
3rd Runway in 2025	+ 8221	16700indirect /induced			
Klop- haus (2013) in 2012	704	1466 indirect/ induced	+ 389 incoming tourist (19% of addit. impact) 100 to 1000 from locational	Added	Rationale for regional airport Kassel Calden
in 2023	+ 725	+ 1315 ind./in- duced = 2040			

Author/ year	Direct jobs	Indirect, induced, Total jobs	Type of Catalytic	Separat e or add up	Pur- pose
ECAD (2008) Ger- many 2007	n.a.	n.a.	Incoming tourism 391,670 +1% connectivity = .22% jobs, .66% labour pro. 4.96 innovation 5.36 FDI	Add up	Pro ex- pansion
Inter- vistas/ ACI-EU (2015)	1.7 Mio	1.35 Mio indirect/ 1.4 induced = 4.45 Mio	WEI by econometrics 7.89 jobs = 177 %	Add up	Signifi- cance

Catalytic Effects & EIA: Results

- Old EIA studies interpret catalytic effects as a necessary, but not sufficient condition for locational choices of firms and hence for regional competitiveness.
- New EIA studies are divided:
 - Catalytic impacts difficult to quantify. Net or gross tourism add 20 % more for total jobs
 - Baum and Intervistas/ACI claim 144 to 177 % more jobs
- Are catalytic effects the magic bullet?
 - Economic Advisors to the German Transport minister (2011) claim that these catalytic effects are even greater than the direct and indirect effects (p. 99).

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WEBs, WEIs and CBA/CGE: The Case of London

- Background on 3rd runway.
 - Coalition was divided and set up the UK Airports Commission.
 - Assessed the different options in terms of economic welfare and other impacts
 - Final options assessed with CBA/CGE
 - Gatwick Airport
 - Heathrow Northern Runway
 - Heathrow Northwest Runway

WEBs, WEIs: London Results

- Preferred Option LHR North West Runway
 - Highest absolute and relative WEBs
 - Higher Agglomeration Benefits because of existing business cluster

2014 prices	Gatwick		LHR North West	
	£ Billion	%B/DB	UK £ Billion	%B/DB
Consumer SP	47.1	77	54.8	79
WEB	8.1	13,5	11.5	16.6
Environment	-1.6	3,7	-2.7	6.6
Benefits	60.1		69.1	
Dis-benefits	-43.3		-41.1	
NPV	10.8		11.8	

WEBs, WEIs and CBA/CGE: The Case of London

- Airports Commission's conclusion: "While all three shortlisted schemes were credible options for expansion, the **Heathrow Airport Northwest Runway** scheme offers the strongest solution to the **UK's aviation capacity and connectivity needs.**"
- Final decision for politicians: Gatwick is still an option.

Challenges of Assessing WEBs in Air Transport

Seven Sources of WEBs:

1. Frequency externality
- 2. Connectivity and Interaction benefits**
3. Tourism benefits and costs
4. Imperfect competition and market power in air transport
5. Aviation time savings and the value of time
6. Agglomeration
7. Competition specialisation and trade

2 Connectivity and Interaction

- The most often mentioned/measured WEB
- Can be measured using a micro simulation study
- But most measures are similar to the Ashauer approach to evaluating infrastructure
- I.e., the macro-econometric approach
- Captures a range of different effects
- Can argue that there are at least two distinct effects:
 - Connectivity effect
 - Interaction effect

Connectivity

- Better connections can enable gains to passengers
- Several connectivity indices (Grimme, 2016)
- Several *theoretical* studies of airline networks confirm externalities
- Optimise over frequency, aircraft size, routes served (in aircraft and hub passenger time)
- Network or connectivity externalities
- For business travellers, will be manifest as a productivity gain
- Leisure travellers also gain (not in GDP)
- Simulation studies suggest a WEB, though not a big one- 5-20% of revenue

Interaction

- To do with benefits people gain when they connect
- Eg, business travellers can gain higher productivity
- Is there an externality?
- Analogy to telecoms: Callers pay but recipients also gain from the call, even they do not have to pay
- Two sided market (Rochat and Tirole, 2006; Gillen on air transport)
- Is an externality, potentially quite big
- Applies to business, VFR (visiting friends and relatives), but not holiday passengers

What about Coase?

- Coase showed how externalities can be internalised by negotiation
- Farmers with adjoining fields
- The parties (traveller, recipient of visits) have the ability to internalise the externality often
- Frequent trades enable arrangements to be made
- You pay for one trip, I the other
- In short, there is an externality gain, but how much is internalised?

Who Gains What Benefits?

- Consider three types of traveller: Business; VFR (visiting friends and relatives); Leisure
- All three gain connectivity benefits- better off as a result of better connected air services
- Business travellers convert gains into higher GDP
- Business travellers gain from interaction benefits (convert to higher GDP)
- VFR travellers gain from interaction benefits (your mother-in-law is pleased to see you)- no effect on GDP
- Leisure travellers do not gain any interaction benefits usually (picking up chicks and guys at the beach?)

Connectivity and Interaction Benefits

Type of Travel		Busi- ness	VFR	Leisure
Connectivity Benefit	Present?	Y	Y	Y
	Impact on GDP?	Y	N	N
Interaction Benefits	Present?	Y	Y	N
	Impact on GDP?	Y	N	N

Measuring Connectivity and Interaction Benefits

- Micro simulation: modest benefits; do not include any interaction benefits (not in the model) versus several macro econometric studies. May include interaction benefits
- Causality an issue- ideally, do a systems study, including causality both ways
- Many studies have BIG benefits (way above fares & revenues). Would swamp non widen traditional benefits in a CBA
- Suggestion: analyst should compare the measured benefits to standard magnitudes, such as air fares of airline revenues
- *Major problem: Why are benefits estimated by the macro econometric approach so much bigger than those measured by the micro simulation approach ?*

Airport Commission: WEBs, WEIs & CBA/CGE

- WEB substantial & critical assessed
- Peter Mackie, David Starkie & Dan Graham (2013)
 - „Does connectivity drive trade and tourism or the reverse?“
 - Seat capacity definition ignores indirect routes
 - Data problems with FDI and outbound tourism
 - “results have to be interpreted with caution and ‘literal’ interpretation of the magnitude of estimates should be eschewed.”
- Peter Mackie & Brian Pearce (2015)
 - Too high elasticity of productivity on seat capacity
 - Prefer full employment assumption
 - “We counsel caution in attaching significant weight either to the absolute or relative results”

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Assessing the techniques

- Impacts or Benefits?
 - Additional air transport can have an IMPACT of variables of interests- eg revenue, GDP, Employment etc.
 - Eg, firms internalise the gains they make from moving close to an airport
 - BENEFIT is the net social gain (or welfare gain, net social benefit)

Assessing the techniques

- In terms of GDP and jobs catalytic effects are bigger than wider economic impact which in turn are bigger than wider economic benefits
 - CE - very large , always positive
 - WEI - large positive or negative
 - WEB - moderate, positive or negative
- $CI > WEI > WEB$

Assessing the techniques

	Catalytic	WEB	WEI
Crowding Out	No	Yes	Yes
General Equilibrium Effects	No	Yes	Yes
Impact on Output	Yes	NA	Yes
Impact on Employment	Yes	Yes	Yes
Connectivity	Yes- impact on output	Yes-impact on welfare	Yes-impact on output
Tourism Inbound	Yes	Yes	Yes
Tourism Outbound	Very often not	Yes	Yes
Scale Economies	Yes in principle	Yes	Yes
Welfare	No	Yes	NA

Assessing the techniques

- The “old” criticism of EIA holds (Forsyth 2002, Niemeier 2001, Malina & Wollersheim 2007, Wollersheim 2011, Thießen, 2009 CE Delft 2013):
 - EIA assumes that investment is financed by neutral public debt (Pfähler, 2001), but airports are no public bureau anymore.
 - Direct & indirect effects of are greater the more costly an airport is.
 - Induced effect is independent of the investment object.
 - Substitution and price effects are neglected.
 - Additional investment adds to output and jobs no matter how useless or valuable it is
 - EIA is useful for (useless) economic significance and regional agglomeration
- **EIA should not be used to assess decisions on investment, night curfews and subsidies for regional airports.**

Assessing the techniques

- If catalytic effects are properly defined as wider economic impact and either qualitatively or quantitatively studied they can be part of estimating the significance of an airport.
- Some studies and airports like Vienna airport have done so, but majority have not and have abused EIA
- For the first time this is acknowledged by ACI-Europe & Intervistas (2015, page 81/2) in Appendix B:
 - “Economic impact assessments are a powerful tool in communicating the importance of an industry.... They can stimulate new policy initiatives and inform strategies to boost economic growth. **However, they are easily abused.**
 - CBA and EIA “are not contradictory, **but if used correctly, complementary**”
 - The figurers are nothing “**more than their actual significance**”

Assessing the techniques

- Airport Commission approach guides the public to a rational discourse while the German Airport Planning based on EIA leads to an irrational discourse
- CBA/CGE are the techniques to be used as they guide the planning process to answer the question if a region or country is better or worse of.
- BUT estimation of WEB in air transport is challenging

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Conclusion: unanswered Questions

1. CI as part of EIA are a dead end in research as significance is irrelevant for policy decisions.
 - Will ACI and IATA engage in a rational dialogue?
 - How can economists guide politics?
 2. If WEBs are a important, combine CBA with CGE.
 - Are specific benefits wider, or already counted?
 - Causality: flows in both directions. How to test?
 - Can we add benefits up? Measures in comparable terms
 - Some measures should better be treated “qualitatively as indications from emerging research” (Mackie et.al)
- Research on WEBs of air transport needs to be catalyzed without catalytic effects of EIA.

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