Ermittlung möglicher Fusionseffekte im öffentlichen Personennahverkehr – Eine Effizienzanalyse für Nordrhein-Westfalen

Konferenz
Kommunales Infrastruktur-Management, Berlin
6. Juni 2008

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1. German local public transport
2. Methodology
3. Data and mergers
4. Results
5. Conclusions
Market structure and subsidy payments in German local public transport are not sustainable

Current challenges of local public transport in Germany

- High fragmentation with several hundred firms causes inefficiency (cp. Hirschhausen et al. 2008)
- High direct subsidies (level of cost coverage << 100%) will not be sustainable
- Indirect subsidies through loss compensations in municipal utilities legally questionable
- Political guidelines differ from state to state and change from time to time

Tenders

- Tenders in order to
  - enforce competition
  - decrease subsidies
  - increase quality (cp. KCW 2007)
- However, tenders cannot fully resolve the problem of an inefficient market structure

Merger & acquisitions

- “Geographically random” acquisitions by players with a strong capital base
- Acquisitions of urban providers with companies from suburbs
- Mergers of (relatively) equal partners in geographical nearness

(1) E.g. HHA, DB Stadtverkehr, Veolia (2) E.g. DVB with Meißen

Instruments to change the market structure
Mergers seem best feasible with companies operating a common tram network in geographical proximity

Mergers of (relatively) equal partners in geographical proximity

- Rhein-Neckar-Verkehr (RNV): founded as joint-venture for the mobility divisions of MVV (Mannheim), HSB (Heidelberg) and VBL (Ludwigshafen) in 2004
- Meoline: founded as joint-venture for the mobility divisions of EVAG (Essen) and MVG (Mülheim) in 2005
- KVB and SWB: Two merger attempts in 2003 and 2007 of the municipal utilities from Cologne and Bonn failed because of political opposition
- ...
- One more candidate in Germany: Rheinbahn (Düsseldorf), DVG (Duisburg) and SWK (Krefeld)

Characteristics

- Outstanding: Mergers of companies with tram and light railway networks with connecting lines
- Geographical proximity as necessary condition for raising saving potentials and communication between partners

Our objective

- Evaluate the gains of potential mergers which are geographically meaningful
- North-Rhine Westphalia with its large urban agglomeration seems to be best appropriate for a case study

Our objective
Agenda

1. German local public transport
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We use Data Envelopment Analysis to evaluate efficiencies of individual and merged companies.

If economies of scale are present in a sector, in addition to technical efficiency gains further saving potentials (size effect) can be raised by a merger.

Source: Bogetoft & Wang 2005
Additional to an individual technical efficiency and size gains, synergy gains are possible.

Size and synergy gains together are the real merger gains.

Output quantity 3 >> output 2
Output quantity 2 = 2 x output 1
Output quantity 1

Used in practice in the Norwegian Energy Industry.
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We use physical inputs and outputs of 41 companies as data basis for our analysis

Data facts

- 41 companies from North-Rhine Westphalia
  - 12 multi-outputs including Rheinbahn (Düsseldorf), bogestra (Bochum), KVB (Köln) etc.
  - 29 pure bus operators
    plus BVG (Berlin), HHA (Hamburg) and MVG (Munich) as benchmark for very big mergers
- Inputs “labor” and “capital”:
  - # of employees (FTE; adjusted to outsourcing following Leuthardt 1986 and 2005)
  - # of seats in trams, light railways and metros
  - # of seats in buses
- Outputs:
  - # of seat-kilometers in trams, light railways and metros
  - # of seat-kilometers in buses
- Source: Statistics of the Association of German Transport Undertakings 2006 (VDV Statistik)

- Use of cost data not possible due to limited availability of balance sheets (in particular for smaller companies)
- Introduction of a structural variable in an additional analysis: tram index defined as seats in trams divided by seats in all rail-bound vehicles (in order to account for different investments and operation costs)

(1) After deleting outliers (e.g. due to measurement errors)
We propose 14 mergers of local public transport companies in North-Rhine Westphalia

Merger geography

Statistics

• 73 potential mergers evaluated, the map shows selected the 14 (with up to 4 companies)
• 3 mergers of companies with tram and light railway networks with connecting lines
• 4 mergers of a company with a tram and light railway network and up to 2 bus companies
• 7 mergers of pure bus companies
• 5 companies remain unmerged

Legend: Tram or light railway operators in bold font
© Not merged companies

(1) Although VWS (Siegen) is part of Stadtwerke Bonn, we also considered possibilities in which this combination is parted again
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Merger gains are in particular inherent for mergers of tram and light railway operators with bus operators.

Merger gains decomposition with respect to company size

Legend:
- Pure bus merger
- Bus and tram / light railway merger
- Bus and tram / light railway merger on a common network
- Bubble size reflecting company size (in total seat-kilometers)

(1) For Variable returns to scale (VRS), i.e. acknowledging that there is an optimal firm size.

Mergers
1. Köln, Bonn
2. Duisburg, Düsseldorf, Krefeld, Neuss
3. Mülheim, Essen, Oberhausen, Moers
4. Dortmund, Hagen
5. Bochum, Herne
6. Wuppertal, Ennepetal
7. Aachen, Geilenkirchen
8. Bielefeld, Detmold, Extertal
9. Troisdorf, Euskirchen, Düren
10. Gummersbach, Remscheid, Solingen
11. Dormagen, Gladbach, Viersen
12. Hamm, Kamen
13. Monheim, Leverkusen
14. Gütersloh, Soest
The real merger effects mainly rely on synergy effects with possible interdependencies to size effects.

<table>
<thead>
<tr>
<th>Merger</th>
<th>Overall potential effect</th>
<th>Technical efficiency effect</th>
<th>Real merger effect</th>
<th>Synergy effect</th>
<th>Size effect</th>
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<td>2) Duisburg, Düsseldorf, Krefeld, Neuss</td>
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(1) For Variable returns to scale (VRS), i.e. acknowledging that there is an optimal firm size.
Merger gains mostly remain stable when accounting for differences in tram and light railway provision

Merger gains decomposition with respect to company size with tram index\(^1\)

**Legend:**
- Pure bus merger
- Bus and tram / light railway merger
- Bus and tram / light railway merger on a common network
- Bubble size reflecting company size (in total seat-kilometers)

**(1)** For Variable returns to scale (VRS), i.e. acknowledging that there is an optimal firm size

**Mergers**

1. Köln, Bonn
2. (a) Duisburg, Düsseldorf, Krefeld
3. (a) Mülheim, Essen
4. Dortmund, Hagen
5. Aachen, Geilenkirchen
6. Bielefeld, Detmold, Extertal
7. Troisdorf, Euskirchen, Düren
8. Gummersbach, Reimscheid, Solingen
9. Dormagen, Gladbach, Viersen
10. Hamm, Kamen
11. Monheim, Leverkusen
12. Gütersloh, Soest

Note: Some merger composition have changed
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Schlussfolgerungen

• Einsparungen durch Fusionen von bis zu 17% des Faktoreinsatzes erscheinen möglich, speziell für Fusionen von Betreibern eines gemeinsamen Schienennetzes
  - Aussage bleibt erhalten wenn man differenziert zwischen Straßenbahnen und Stadt- und U-Bahnen

• Fusionen von Straßen- oder Stadtbahnbetreibern mit Busunternehmen erscheinen auch generell vorteilhaft
  - Ausnahme: Spezialfall Wuppertal mit Schwebebahn bei Berücksichtigung technologischer Spezifikation

• Fusionen von Busbetreibern erscheint fragwürdig auf Basis dieser Analyse, ein Problem bei dieser Aussage ist jedoch der fehlende Benchmark eines sehr großen puren Busunternehmens
  - DB Stadtverkehr wurde nicht in die Analyse miteinbezogen

• Örtliche Nähe der zu fusionierenden Unternehmen als Vorraussetzung für Fusion in dieser Analyse
Thank you very much for your attention! Any questions or comments?

Papers for download under www.ee2.biz
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Backup
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