

International Scientific Conference on Mobility and Transport
Urban Mobility – Shaping the Future Together
mobil.TUM 2018, 13-14 June 2018, Munich, Germany

Policies addressing possible urban air mobility market distortions – a first discussion

Anna Straubinger*

Bauhaus Luftfahrt e.V., Willy-Messerschmitt-Str. 1, 82024 Taufkirchen, Germany

© 2019 The Authors. Published by Elsevier Ltd.

This is an open access article under the CC BY-NC-ND license (<https://creativecommons.org/licenses/by-nc-nd/4.0/>)

Peer-review under responsibility of the scientific committee of the mobil.TUM18.

Keywords: Regulation; Urban Air Mobility; New Transport Modes; Transport Policy;

1. Introduction

Advances in electric and distributed propulsion open up new options for urban transport by enabling the introduction of a new layer into the urban transport network. Urban Air Mobility (UAM) can be an addition to existing transport modes in the city environment.

UAM is a mobility concept that is mainly assumed to be realized in an on-demand approach. The next-generation vertical take-off and landing (next-gen VTOL) vehicles are expected to be operated autonomously and to need dedicated infrastructure for take-off and landing. Therefore, a platform on which a ride with a next-gen VTOL, from and to specific vertiports, can be booked is assumed as base scenario for UAM introduction.

Yet, welfare effects of UAM are still unclear. Different externalities reaching from noise and visibility to congestion at hubs escort the new transport system. Even the main advantage – the drastic increase in travel speed – may substantially change location choice of companies and households, which could lead to urban sprawl provoking new challenges for cities. Therefore, when discussing UAM introduction it is essential to bear in mind that the regulatory authority, may intrude.

* Corresponding author. Tel.: +49 89 3074-84929; fax: +49 89 3074-84920.

E-mail address: Anna.Straubinger@bauhaus-luftfahrt.net

This research, hence, aims at finding analogies between UAM and existing transport modes with a special focus on the regulatory framework they are facing in order to find different scenarios for UAM related policies.

2. Transport Regulation - Germany as an Example

The transport sector has, traditionally, been facing severe regulatory interventions. In recent years, deregulation tendencies have spread even though still today some regulating policies are inevitable. The main reason for that is the uniqueness of the transport market due to transport only being a derived demand, the strong interrelation of infrastructure and transport operation and the massive occurrence of external costs (Lakshmanan et al. 2001). Especially modes strongly relying on capital-intensive infrastructure are often being regulated. The hereinafter-discussed examples for transport regulation are mostly taken from European directives with a focus on the implementation into German legislation.

Different modes of transport face different policies. In Europe the rail sector is one of the most strictly regulated markets. The massive infrastructure investment need led to nationalization of many rail companies in the middle of the 20th century. Due to strong worsening of efficiency, deregulation tendencies occurred in the 1990's (Cantos & Maudos 2001). In Germany, for example, a separation of infrastructure and operation is in place. The railway undertakings hereby have to bid for tracks while track prices are strictly regulated (Bundesnetzagentur 2008).

Local public transport in contrast faces different policies. Weiß (2003) emphasizes that German local public transport is unprofitable and that despite deregulation actions different forms of regulation are still in place. The market entry for public transport companies is regulated; in most cases, the public authority initiates a competition for the market by calling for tender. Herein the public transport offer is clearly specified. The public transport companies can therefore only compete via costs. Once the contract has been awarded, all changes have to be authorized by the governmental authority.

The taxi market can be seen as a mixture between the public and private transport. In Germany, the taxi market is quantity-regulated by concessions. Former high vehicle acquisition costs are seen as origin of regulation in this transport sector (Haucap et al. 2015). Nowadays the asymmetry of information and the externalities arising within the taxi market are the main reasons for ongoing regulation. Information asymmetry thereby arises because potential taxi users cannot foresee the ride's quality or the driver's trustworthiness (Baake & von Schlippenbach 2014). The taxi market's externalities are basically the same as on the private car market. Additional external costs are caused by users' waiting times brought about by the taxi's occupancy through other users. Each taxi user hereby potentially prolongs the waiting time for the next user (Cairns & Liston-Heyes 1996).

In Germany private car users are not actively confronted with regulation. The governmental authority strongly subsidizes infrastructure like roads and parking lots, for which users do not pay at all or do not pay sufficiently (Shoup 1997). Yet, there are various options to regulate private motorized transport, such as peak load pricing (Bailey 1972), value pricing (Small & Yan 2001) or congestion pricing (De Palma & Lindsey 2004).

3. Policy Options and reasons for regulation

The introduction of new transport modes can pose different challenges. The market entry of Uber can be regarded as an example. Not subject to any transport policies, the transport service did not face any regulatory interventions, but mainly profited from subsidies to the private motorized transport. While some countries did not intervene, some European countries like Germany and Spain reacted by prohibiting the service (Rabadjieva 2016). Yet, Haucap et al. (2015) have shown that the deregulation of the taxi market and the acceptance of Uber's market entrance can lead to significant welfare gains.

Generally, there are three reasons for regulation: natural monopolies, externalities and information asymmetries (Schulz 2003). As indicated above the introduction of UAM has the potential to significantly change the urban transport market. Therefore, the public authorities will closely monitor the changes and will either introduce policies affecting UAM before or after its introduction.

UAM will generate various external costs, very similar to those caused by road traffic even if they are operated electrically. Besides that, the impact of their visibility in the sky will probably be more disturbing than the existing road traffic. Furthermore, the assumed on-demand concept will generate losses through waiting times, as they occur

in the taxi market and are described by Cairns & Liston-Heyes (1996). Besides the different externalities the need for dedicated infrastructure leads to a massive land consumption. Depending on the business model the required infrastructure investment could presuppose a natural monopoly.

4. Conclusion

This implies that it is likely that UAM will face regulatory interventions. The above mentioned examples from existing transport modes show three different regulation strategies. Basically the regulating authority can determine either the price, the quality or the quantity which can be implemented in multiple ways (Sheshinski 1976). In order to evaluate the welfare impacts of the various options, different scenarios have to be set up. These scenarios are to be determined by finding analogies to existing transport modes. Concessions, price-cap regulation, peak-load pricing, taxation, competition for the market, but also infrastructure subsidies could be possible policy scenarios that are to be discussed further and whose impacts are to be measured in a later state of this research.

References

- Baake, P. & von Schlippenbach, V., 2014. Taximarkt: Kein Markt für eine vollständige Liberalisierung. *DIW-Wochenbericht*, 81.
- Bailey, E.E., 1972. Peak-Load Pricing under Regulatory Constraint Author (s): Elizabeth E. Bailey Published by: The University of Chicago Press Stable URL : <http://www.jstor.org/stable/1829360> JSTOR is a not-for-profit service that helps scholars , researchers , and stud.
- Journal of Political Economy*, 80(4), pp.662–679.
- Bundesnetzagentur, 2008. *Abschlussbericht der Bundesnetzagentur zur Einführung einer Anreizregulierung im Eisenbahnsektor*, Available at: https://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Eisenbahn/Unternehmen_Institutionen/Veroeffentlichungen/Gutachten/AbschlussberichtId15476pdf.pdf?__blob=publicationFile&v=3 [Accessed November 14, 2017].
- Cairns, R.D. & Liston-Heyes, C., 1996. Competition and regulation in the taxi industry. *Journal of Public Economics*, 59(1), pp.1–15.
- Cantos, P. & Maudos, J., 2001. Regulation and efficiency: the case of European railways. *Transportation Research Part A*, 35, pp.459–472.
- Haucap, J. et al., 2015. Chancen der Digitalisierung auf Märkten für urbane Mobilität : Das Beispiel Uber. *DICE Ordnungspolitische Perspektiven*, 73.
- Lakshmanan, T.R. et al., 2001. Classification , methodologies and policies. *Papers in Regional Science*, 80, pp.139–164.
- De Palma, A. & Lindsey, R., 2004. Congestion pricing with heterogeneous travelers: A general-equilibrium welfare analysis. *Networks and Spatial Economics*, 4, pp.135–160. Available at: <http://link.springer.com/10.1023/B:NETS.0000027770.27906.82>.
- Rabadjeva, M., 2016. Die “schöpferische Zerstörung” der Sharing Economy: Wie ein Dienstleister die Verkehrsordnung in Städten verändert. *Forschung Aktuell, Institut Arbeit und Technik (IAT)*, 03/2016.
- Schulz, N., 2003. *Wettbewerbspolitik : eine Einführung aus industrieökonomischer Perspektive*, Mohr Siebeck.
- Sheshinski, E., 1976. Price, Quality and Quantity Regulation in Monopoly Situations. *Economica*, 43(170), pp.127–137.
- Shoup, D.C., 1997. The High Cost of Free Parking. *Journal of Planning Education and Research*, 17(1), pp.3–20. Available at: <http://journals.sagepub.com/doi/10.1177/0739456X9701700102> [Accessed November 14, 2017].
- Small, K. a & Yan, J., 2001. The Value of “Value Pricing” of Roads: Second-Best Pricing and Product Differentiation. *Journal of Urban Economics*, 49(2), pp.310–336. Available at: <http://linkinghub.elsevier.com/retrieve/pii/S0094119000921958>.
- Weiß, H.-J., 2003. Die Doppelrolle der Kommunen im ÖPNV. *Diskussionsbeiträge // Institut für Verkehrswissenschaft und Regionalpolitik*, 90.