
Transportation Policy and Innovation as Determinants of Bus Service Market Design: A Case Study of the German Market

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Abstract:

Purpose: The purpose of this article is to present the impact of regulations in the area of transport policy and innovations introduced on the operation of the German bus service market with a particular focus on the operations of Flix SE.

Design/Methodology/Approach: The temporal analysis covers the period from 2012 to 2023. During the period under study, the liberalization process of the bus market in Germany began. During this period, a dynamic development of the offer of bus companies can be observed, which was correlated with their number. In subsequent years, the tendency to reduce the number of players and the consolidation of the market position by Flix SE can be clearly seen. In this context, the article attempts to identify the main factors that may have influenced the success of this company.

Findings: The article is theoretical and empirical in nature. The theoretical layer presents an overview of the scientific body of work on the role of transportation policy as a tool that influences the functioning of the market. The practical part presents the effects of the changes that occurred after the liberalization of the bus transport market in Germany. Much attention in the article is given to Flix SE in the context of the innovations introduced, which have become a source of competitive advantage for the company.

Practical implications: The process of liberalization of the bus transportation market initiated in Germany has led to a large dynamic of changes in this segment of transportation. In the initial phase, a number of operators emerged. However, in a fairly short period of time there was consolidation in the market, and later practically its monopolization. In this context, it has become valuable to learn about the mechanism that caused this state, and consequently to learn and present the essence of the successful business model that Flix SE has developed.

Originality: The results contribute to the discussion of the impact of transport policy, the tools used, on market development. The case study was the long-distance transport market in Germany. It is also important to present innovative solutions as a source of competitive advantage.

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1. Introduction

The processes taking place in the economy are the resultant of many factors including innovation processes and transport policies pursued by the state. Today, in the area of innovation processes, digitalization of economic processes preceded by the phenomenon of digitalization is becoming an important tool. Both the implemented transport policy and the implemented new and improved existing improvement solutions condition the situation in the transport services market.

They cause, for example, that on the supply side of the market there is a larger number of participants, service providers, which in the framework of the existing competition offers a package of services that is increasingly attractive to the demand side. At the same time, meeting the growing demands of the market and competitive pressures often lead to a transformation of the situation of the market players themselves and, consequently, the situation in the entire market. Thus, it turns out that the effects of the initial changes can be far-reaching and so significant that they often generate further landmark reorganizations.

An interesting example of the impact of regulation of a legal nature and innovation on the market, in this case the long-distance passenger transport segment in Germany, is the creation and development of the company Fliks SE (formerly FlixBus). Flix SE's growth model is based on modern technologies. These apply to all areas of passenger transport service provision. In particular, the information and transportation spheres should be highlighted.

The purpose of this article is to present the impact of transport policy and innovative activities on the functioning of the passenger transport market on the example of the German market with particular emphasis on the activities of Fliks SE.

2. Literature Review

Transportation policy can significantly condition the situation in the transport services market (Kwarciński, 2007; Beim, 2019). Its influence may include, among other things, the removal of various barriers and differences in technical and administrative standards as well as relate to competition distortions or pricing policies (Beim, 2017, p. 31) also in relation to the operation of the bus service

market. An additional determinant also affecting this market can be innovations of a differentiated nature (Markiewicz, Niedzielski, 2022).

Nowadays, in the area of innovation processes, digitalization - understood as the transformation of documents, including contracts, waybills and all relevant information, into a digital format⁵, which allows the use of ICT technologies for analyzing, storing, replicating and transferring data and creating information, and then digitalization of economic processes - involving the transformation of business processes and operations through various forms of automation of the entire customer value creation chain - is becoming an important tool.

As already mentioned, transport policy and the introduced innovative solutions for the course of business processes affect the situation in the bus service market and determine the efficiency and effectiveness of the entities operating in it. The activity of Flix SE is a good example of adaptation to new conditions, otherwise often cited and analyzed in the literature, both in the context of regulatory decisions of this market (Asensio and Matas, 2022; Knorr and Eisenkopf, 2022), as well as in terms of the specific type of practices and strategies of its operation (Guihéry, 2020; De Haas *et al.*, 2022).

3. Research Methodology

This article conducts a deductive analysis of the situation in the German bus transportation market. For this purpose, a study of the literature on the subject and inference based on statistical data were used. The timeframe of conjecture takes into account the period from 2012 to 2023.

The subject of the study covered both the situation in the German bus transport market, as well as the operation of Fliks SE, which gained a dominant position in this market during the period under study. The article attempts to identify the main factors that may have influenced changes in the situation in the German bus transportation market and the position of Fliks SE in this market. Attention was focused on regulatory and innovation-related determinants.

4. The Impact of Regulation on the Development of the Long-Distance Passenger Transport Market in Germany

Passenger transportation in Germany, in addition to the dominant passenger cars (share of about 80%), is carried out by near- (urban, local and regional) and long-distance transport (rail, bus and air). Of these three forms of long-distance transport, only rail transport has been allowed to develop freely, which has been and is actively supported by the state. Impediments, understood as a lack of equal treatment in the

⁵Examples range from managing customer orders to automating production or service processes, e.g. production lines, warehouses, terminals, or autonomizing vehicles.

market, primarily of an economic and legal nature, occurred both within bus transport (which is the mainstream of analysis in this article) and air transport.

The development of long-distance passenger transport in Germany should be linked to legal changes. These were primarily associated with the liberalization of access to the market for car passenger services, in the long-distance segment. They were initiated in 2011. From 1935 to 2012, this market segment was strictly regulated by the state, influenced by two pieces of legislation:

1. Gesetz über die Beförderung von Personen zu Lande of 1934 (Gesetz über..., 1934).
2. Personenbeförderungsgesetz of 1961 (Personenbeförderungsgesetz..., 1961).

According to the aforementioned legislation, the regulations prohibited the launch of a new bus route if it was to compete with already operating rail or bus services (Beim, 2017, p. 33).

Even before the implementation of legal changes to liberalize access to long-distance bus services, there were attempts by bus operators to enter this market segment. A pioneer in this regard was Deutsche Touring, which, after protracted disputes (which lasted 5 years), received approval to provide long-distance services (Federal Senate Ruling 3..., 2010).

Another example was the entry of AutobahnExpress Schnelllinienbus GmbH, which offered bus services in the area of 3 regions (Brandenburg, Thuringia and Saxony) from 2008 to 2012. Its activity, due to little interest ended in failure. At the same time, DeinBus.DE was also founded, which based the organization of passenger transportation on the principle of carpooling (occasional passenger transportation). The course was launched when the required number of people willing to take a given ride applied (via the Internet) (Beim, 2017, pp. 32-35).

The initiation of carpooling by the aforementioned companies met with opposition from Deutsche Bahn (DB) but at the same time led to the start of a political debate on the liberalization of the long-distance passenger transport market in Germany.

It resulted in relevant legislative changes and the liberalization of this market segment as of January 1, 2013. (Beim, 2016). Liberalization made it easier for new companies to enter the market, and resulted in an increase in the number of transportation lines and cities that were included in the long-distance bus transportation network. This has had an impact on improving accessibility to transportation services (Kwarciniński, 2017) for residents on long-distance services.

Liberalization facilitated the entry of new companies into the market and also the growth of transportation lines and the number of cities that were included in the long-distance bus transportation network. Important for the operation of the long-distance transport segment in Germany was (Marktbeobachtung..., 2021, p. 6):

- Entry of the MeinFernbus company 2012,
- Entry of the companies ADAC Postbus, City2City, FlixBus (2013),
- Exit of City2City Megabus enterprises (2014),
- Acquisition of MFB MeinFernbus by FlixBus, entry of RegioJet (2015),
- Entry of Hellö, acquisition of Postbus, Mega-bus by FlixBus, withdrawal of Berlin Linien Bus from the market (2016),
- Acquisition of the Hallo company by FlixBus, bankruptcy proceedings of Deutsche Touring (2017),
- Entry of the Blablabus company and Pinkbus, bankruptcy of the DeinBus.de company (2018),
- Entry of the RoadJet enterprise withdrawal of IC Bus (2020).

The number of entities providing long-distance bus services evolved strongly between 2012 and 2021. Consolidation processes in the market (primarily acquisitions by FlixBus) proved important. In the initial phase (2013-2016), long-distance bus services in Germany were offered by about 100 carriers.

Since 2016, a decline in the number of operators offering long-distance transportation was evident. In 2020, the number of companies providing long-distance coach transport fell to 38 (Marktbeobachtung..., 2021, p. 1). Consolidation efforts, withdrawal from the market or companies declaring bankruptcy are the main reasons for the decline in the number of bus service providers.

In the long-distance transport market, four groups of players can be distinguished, which have undertaken services in this segment with varying degrees of success (Beim, 2019 p. 32-33):

- Companies owned by DB i.e. BEX, BLB, Autokraft, IC Bus;
- Companies that were established before the liberalization of the market Autobahn Expres, Dein Bus.de, SprintBus;
- Enterprises that were established as subsidiaries of foreign corporations, City2City, megabus.com, Hallo, Studens Agency;
- Tourist, local and regional companies, the most numerous group, which on the basis of previous activity decided to expand it to long-distance transportation, Innliner, Fass Reisen.

FlixBus, which does not have its own rolling stock, targeted the fourth group. Its competitive advantage was related to its recognizable brand, innovative ticket distribution channels, price management, fleet of vehicles, and passenger information. A similar strategy was adopted by MeinFernBus, which initially merged with and was later acquired by FlixBus (in 2016).

These and other actions by FlixBus quickly led to a process of consolidation in the long-distance transport segment in Germany (Table 1).

Table 1. Number of active long-distance lines from 2013 to 2020

	2013	2014	2015	2016	2017	2018	2019	2020
BlaBlaBUS	-	-	-	-	-	-	22	-
IC BUS	3	5	5	8	2	3	3	2
Deutsche Touring	11	11	13	14	18	19	13	4
FlixBus	19	58	204	203	220	212	221	35
Pinkbus	-	-	-	-	-	-	3	-
RoadJet	-	-	-	-	-	-	-	2
Pozostali	98	165	77	80	16	19	10	-

Source: Own compilation based on: Marktbeobachtung Güterverkehr. Marktanalyse des Fernbuslinienverkehrs 2021. Köln: Bundesamt für Güterverkehr.

The FlixBus company maintained more than 200 transport lines in 2015-2019. It is also worth noting that the long-distance transport segment, which was competitive at the beginning, after two to three years became practically monopolistic with FlixBus dominating transport lines.

Among the highlighted companies, RoadJet is also worth noting. Its offer is aimed at customers who appreciate the quality of its services. Buses are equipped with numerous passenger amenities (massage, entertainment system, high-speed Internet).

A decline in the number of transportation lines is evident in the following years. According to the German Ministry of Transport, in the number of lines fell by half. In 2023 it amounted to 76 (<https://bmdv.bund.de...>).

The entry of new bus operators into the market, resulted, in addition to improving their offerings, in increased price pressure. In general, it can be noted that bus fares are lower especially relative to rail transportation using DB.

In market terms, the competitiveness of long-distance transportation was affected by the reduction of VAT to 7% from January 1, 2020. However, it should be added that the reduction only covered rail transportation. Bus services are still subject to 19% VAT. On the other hand, the development of bus transport is favored by regulations related to the lack of a “maut” for highway travel. In turn, industry associations indicate that through numerous taxes in fuel, rail carriers cover about 25% of infrastructure access and bus carriers cover about 130% (Mitusch, Gipp, 2015).

In addition to the growth of long-distance service providers, the liberalization of the passenger transport market has had a positive impact on the growth of bus passenger numbers. In Germany (2011-2015), the number of passengers who used long-distance bus services increased from 2.5 million to 22.3 million.

By comparison, in rail transport (DB Fernverkehr)⁶, transports rose from 125.2 million to 131.9 million over the same period. Thus, after the liberalization of the long-distance transport market in Germany, there was no noticeable takeover of passengers by bus operators from rail transport. The increase in long-distance transportation can be explained by the generation of new demand or takeovers from other modes of transport. The volume of long-distance transportation in 2016-2023, along with the share of the long-distance segment, is shown in Table 2.

Table 2. Volume and share of long-distance bus services in Germany 2016-2023

	2016	2017	2018	2019	2020	2021	2022	2023
Number of passengers (in millions)	23	22,8	23,1	21,2	6,0	2,9	7,5	10,4
Market share (%)	14	14	14	12	7	3	5	8

Source: <https://de.statista.com/statistik/daten/studie/263118/umfrage/fahrgaeste-der-fernbuslinien-in-deutschland/>.

In 2016-2019, the volume of passenger transport carried out by long-distance buses was stable at 21-23 million people. Therefore, it can be concluded that 2016 ended the dynamic growth of passenger numbers in the bus transport segment in Germany. As in the case of rail transport, the pandemic caused a drastic decline in traffic, which took place in 2020.

The last few years, there has been a slow increase in the volume of passenger transport, although by 2023 it was not possible to achieve the volume of long-distance bus transport that was recorded through 2020.

In 2023, the share of long-distance bus transportation in about 8%, which was 6 pp lower than in 2016-2018. Such a large decline in market share has intensified the level of competition in this market segment. In the long-distance bus market in Germany, the leading position is maintained by FlixBus. This is related to the dominant share in the number of courses, (in 2017-2019 it exceeded 90%) or the number of stops within Germany from which services are offered. In December 2020, this number was 363 (in 2019 - 386).

In summary, the effect of the liberalization of access to the passenger transport market in Germany was, especially in the initial period, an increase in the number of entities providing long-distance bus services and the number of passengers.

⁶The market for rail transportation services is dominated by 3 DB-owned carriers. In addition to DB Fernverkehr, these are DB Regio and DB Arriva. The latter was sold by DB in June 2024 to I Squared Capital Group. It should be noted that in addition to rail transport services, DB also provides services by car (buses), the number of which exceeds 11,000. The scope of DB bus services is suburban and regional.

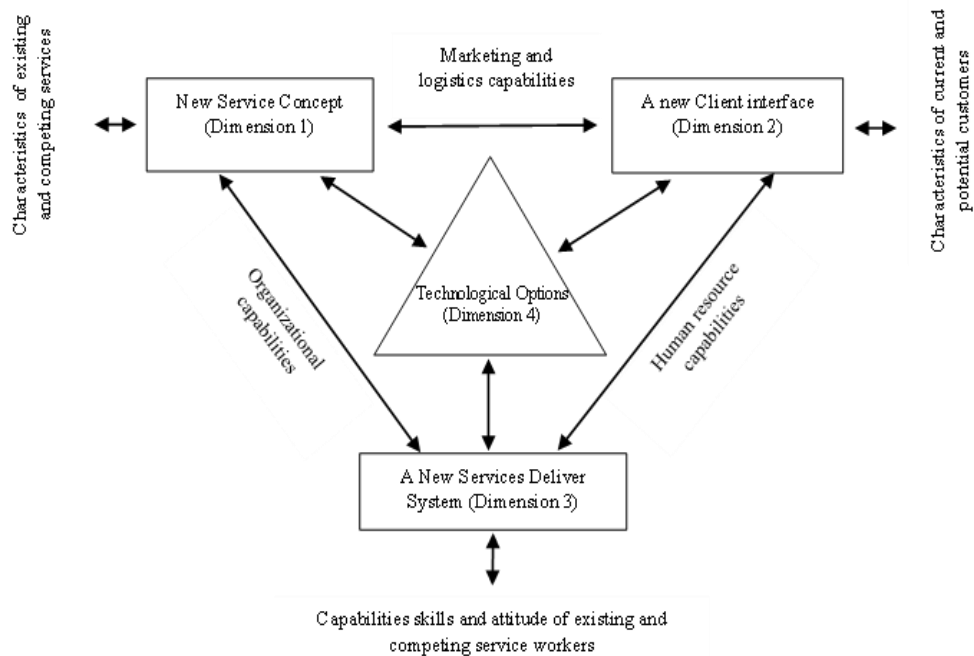
5. Innovation activities of Flix SE

FlixBus was founded in 2013 as a technology start-up. Its founding coincided with the German government's decision on the process of liberalizing access to domestic bus services.

In 2015, the then FlixBus merged with the MeinFernbus bus company, creating, in a relatively short period of time, a leading operator in intercity bus services in the German and later European market. In addition, the company launched a rail service (FlixTrain) in 2018. Today, Flix SE provides its services in more than 40 countries around the world. In addition to Europe, transport services are also provided in North and South America (Brazil 2021, Chile 2023) and Asia (India 2024).

It seems that the basis for such dynamic development of the FlixBus company is primarily the digitization of transportation services. It was implemented based on the service innovation scheme presented by P. Den Hertog (Figure 1), who distinguished four aspects of service innovation behavior (Niedzielski, 2013): a new service concept, a new interface with the customer, a new service delivery system, and the use of new technology.

Figure 1. *Aspects of service innovation.*



Source: Hertog den P., *Co-producers of innovation: on the role of knowledge-intensive business services in innovation, w: Productivity, Innovation and knowledge in services. New economic and socio-economic approaches*, ed. J. Gadrey, F. Gallouj, Edward Elgar, Cheltenham/Northampton, MA, 2002. p. 19.

Digitalization at FlixBus was based on the creation of a modern platform accessible via the Internet, including with the help of a free smartphone application,. The platform uses the concept of dynamic fares. Ticket prices depend on the planned date of travel, the filling of the means of transport, and customer loyalty, so passengers who book their tickets in advance are systemically rewarded. Passengers receive information through the platform and app about possible delays, while suggesting possible rebooking of tickets and automation of transfer coordination.

Thus, an innovative tool has been created, and the data stored in it allows the passenger to choose a connection and quickly book a ticket The application also allows the company to communicate with the customer, for example, when providing information about discount codes and promotions.

Other usability features of the app are related to displaying important travel information (delays, stop changes), access to the lost and found office, the ability to ask questions, the ability to determine where the destination stop is, but also to find out how to get there thanks to the navigation function.

An important element in the development of FlixBus was the development of a new concept of transport service, which is expressed in the creation of a new approach to the problem of making connections. The company realizes a network of connections using the rolling stock potential of many transport companies operating in local markets. FlixBus does not have its own fleet of buses, it uses the potential of local companies.

Contracts, which are signed with subcontractors, distribute the market risk associated with the level of filling of the means of transport to both parties to the contract, by guaranteeing a minimum revenue for the carrier in the form of payment per vehicle kilometer and a partial share of the generated revenue from ticket sales at a high level of filling of the means of transport. The strategy of cooperation with local bus transport carriers, also resolves aspects of access to bus stations and bus stops.

The rolling stock at the disposal of FlixBus' subcontractors meets certain quality standards, both in terms of ecology, safety and travel comfort, as well as capabilities in the area of using modern technologies. Buses equipped with systems using min. GPS technologies that provide management information (e.g. working time⁷, realization of punctuality, verification of drivers' working time , the possibility of real-time transmission of information in the relation means of transport - dispatching center and vice versa) and marketing information useful to the passenger (e.g. where is the means of transport, time of arrival, time of delay, etc.).

⁷*Using a GPS tracking system, the internal control department can check drivers' work and rest times and where buses are at any time. Night rides are operated at FlixBus by two drivers who regularly rotate.*

All participants (subcontractors) providing services, use one name - FlixBus, and there is also one color scheme. Buses are equipped with state-of-the-art electronic driver support systems to enhance safety. ESP, emergency braking system, lane departure warning system, adaptive speed control system, light sensor, marker lights, toilet. In addition, they feature ample luggage space, a significant advantage over low cost air travel. They are equipped with comfortable seats with adjustable backrests.

In addition, Flix SE's innovation activities are related to:

1. Time management during travel. Buses are equipped with numerous passenger amenities, such as charging outlets for smartphones, laptops. Passengers also have access to: a database of movies (watch), music (listen), a wide collection of e-books (listen), games (play), free Wi-Fi access.
2. Hotline in 16 languages a very extensive system when it comes to passenger service, taking into account the diversity of nationalities.

6. Conclusions and Discussion

The effect of the implemented transport policy in the form of liberalization of the long-distance bus transport market was, at first, the entry of new companies, and then the acquisition by one of the companies of a dominant position in the market, that is, the de facto monopolization of this segment. Among the initiatives by which this company can currently be considered the most innovative can be distinguished:

- The creation of a platform. Its task is to associate the supply of transport services and the demand for them.
- Organization. Established in 2013, FlixBus has created an extensive network of connections along with the coordination of transfers. Its network has more than 3,000 destinations in more than 40 countries.
- Application. Allowed to make reservations (purchase tickets). This has created an innovative tool, and the data stored in it allows the passenger to choose a connection and quickly book a ticket without having to fill in the data again.
- Provision of transportation services by subcontractors. The company does not have its own means of transportation. The provision of services on the basis of signed contracts is handled by subcontractors.
- Use of a single brand of buses. All participants (subcontractors) providing services, use one name - FlixBus, one is also the color scheme. Buses meet the highest standards of safety, comfort and environmental protection, providing a comfortable and environmentally friendly alternative to individual travel. They are equipped with state-of-the-art electronic driver support systems that enhance safety. ESP, an emergency system.

The business model created by FlixBus to provide services in the international as well as domestic bus transportation segment has proven to be very successful. It is worth mentioning that FlixBus has also entered the rail passenger transport market, launching Flixtrain (<https://www.flixtrain.com/>) in the German market in 2018, betting on the integration of not only rail services, but rail-bus integration.

In summary, FlixBus' success is based on the digitization of the traditional mode of transportation, and more broadly of the mobility service. Technological innovations such as the booking and ticketing system on the FlixBus app, free wi-fi and GPS-livetracking on buses have created the opportunity to present a higher-value service for the passenger. A smart route network and dynamic fare management make the offer very attractive to the passenger.

The competitive advantage was related to a recognizable brand, innovative ticket distribution channels, price management, vehicle fleet, and passenger information. A similar strategy was adopted by MeinFernBus, which initially merged with and was later acquired by FlixBus (2016). These and other actions by FlixBus quickly led to a process of consolidation in the long-distance transport segment in Germany.

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